“L”

Water Availability Analysis

Pridmore Property
General Plan Amendment P17-00135
Rezone P20-00223 and Use Permit P20-00222
Planning Commission Hearing May 15, 2024

CMP Civil Engineering & Land Surveying Inc.
1607 Capell Valley Road
Napa, CA 94558
(707) 266-2559
Cameron@CMPEngineering.com
CMPEngineering.com

Water Availability Analysis Report

for the

Pridmore Property

(Formally Capell Valley School)

1191 Capell Valley Road

Napa, CA 94558

APN: 032-130-026

Prepared By:

CMP Civil Engineering & Land Surveying Inc.

1607 Capell Valley Road

Napa, CA 94558

(707) 266-2559

Date: 2/9/2023

Table of Contents

Contact Information	
Property Owner:	Pridmore Family
Owner Address:	1305 Capell Valley Road Napa, CA 94558
Owner Phone:	(707) 224-0682
Contact:	Cameron Pridmore
Contact Phone:	707-266-2559
Contact Email	cameron@cmpengineering.com

Site Map

Please see the Use Permit Site Plan for this project which has been included with this submittal for details and locations of proposed improvements. Below there is an included well location map which shows the existing water source (existing well) for this project and its proximity to other water sources.

Narrative

Up until a few years ago this 5 acre parcel located at 1191 Capell Valley Road was home to Capell Valley Elementary School. The school was open and in use for decades up until a few years ago when the district closed it and then recently sold the property to the Pridmores. The Pridmores are now proposing to install a maximum of 9 small tourist lodging units, 1 caretaker unit, 1 office/storage building and a barn type structure where local 4-H members could showcase a variety of their farming projects. Currently the property is served by a state approved small community water system (CA2800633) sourced by an existing well and 10,000 gallon storage tank. The said well is located on the general southeastern end of the property. See well location map below for the exact location. The well is currently used to provide potable water to the existing school buildings and has a capacity of 45 gallons per minute (GPM). Please see the well logs and other pertinent information included below. The well is currently fitted with a 55' deep seal with a minimum 3" annular space. The well water has been tested for adverse and hazardous constituents as required by local, state and federal permitting agencies. No constituents were found to be above allowable drinking water levels. There are only two neighboring wells within 500' of the subject parcels well. The first is 92' away and supplies water to the neighboring fire station. The second is 308' away and supplies water to an existing residence.

Tier 1 Analysis

Looking at the entire subject parcels water use and availability, the calculated historical elementary school water use for this parcel was 6.26 acre feet per year. The proposed calculated annual water use for this parcel is 3.20 acre feet. See the Water Availability Calculations included below. Given that this parcel is 5.08 acres in size and has a groundwater recharge rate of 0.98 acre feet of water per acre (see included Groundwater Recharge Calculations below) the maximum allowed water use for this parcel in a given year would be 4.98 acre feet of water per year. Onsite emergency water is available in the form of the existing 10,000 gallon water tank which will be utilized and if needed potable water will be hauled in from

the City of Napa or another public water system until repairs are made or a new well is installed. Please note that should there be an extreme emergency, such as a fire, there is an existing fire station right next store to the property which has multiple fire engines on hand at all times.

Comparing the proposed use of 3.20 acre feet per year to the above 4.98 acre feet value as well as the annual well capacity value of 72.59 acre feet per year, it is clear that the subject parcel and well has more than enough capacity to serve the proposed use. It is also clear that the proposed water use will be substantially less than what the calculated historical water use was. For further details please see the Tier 1 analysis support documents in Attachment A.

Tier 2 Analysis

There are 2 neighboring wells within 500 feet of the project well listed in this report. One is 92 feet away and the other is 308 feet away. Because of this a Tier 2 well interference analysis was required to for this project. Attached to this report is the Tier 2 Water Availability Analysis prepared by Certified Engineering Geologist and Hydrogeologist David H. Peterson. In summary, the findings of this Tier 2 Analysis are as follows. The project well is expected to pump for a total of 66 minutes per day if pumping at its maximum yield of 43 GPM. Should the well pump for 66 minutes all at once (which is unlikely since it supplies water as needed throughout a given day) then it would draw down the well that is 92' away by only 1 foot. It would have little or no effect on the well that is 308' away. Further, a worst case scenario pumping event was considered. The estimated pump time was almost doubled to 120 minutes and it was found that the draw down on the 92' away well would be 8 feet and the draw down to the 308' well would be 2 feet. In both of these situation the drawdown on either neighboring well is less than 10 foot default well interference criteria for wells 6 inches in diameter or less as outlined in Appendix F-1 of the Napa County WAA Guidelines. Coupling this analysis with the fact that the well has been in service since 2006 when the school was operating at a much higher water demand along with the fact that during this time there were no reported adverse impacts to neighboring wells; it seems clear that the existing project well, operating at the lower proposed water demand, won't have a significant impact on any of its neighboring wells. For further details please see the said Tier 2 analysis in Attachment B.

Tier 3 Analysis

There are no significant streams within 1500 feet of the subject project, so a Tier 3 analysis is not necessary for this project. For further details see Tier 3 water availability documents in Attachment C.

Conclusion

In conclusion there is plenty of water onsite to support the proposed project. The proposed project will use significantly less water than the historical use. There is no significant impact to any neighboring wells. There is no impact to any significant streams. From a water standpoint there are no issues with this proposed project.

Attachment “A”

Tier 1 Water Availability
Analysis Support Documents

CMP Civil Engineering & Land Surveying Inc.
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Napa, CA 94558
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Water Availability Calculations

for the

Capell School Lodging Project

Located at:

1191 Capell Valley Road

Napa, CA 94558

Date: 2/7/2023

Project # 00055

Legend
Requires Input
Automatically Calculates
Important Value Automatically Calculates
Important Value Requires Input

Hit ctrl+alt+shift+F9 when finished to recalc a

WATER AVAILABILITY ANALYSIS- PHASE ONE STUDY

WATER USE CALCULATIONS FOR HISTORICAL USE

RESIDENTIAL	#	FACTOR	AF/YR
PRIMARY RESIDENCES=	0	0.5	0.00
SECONDARY RESIDENCES=	0	0.2	0.00
FARM LBR DWELLING (# OF PPL) =	0	0.06	0.00
		SUB TOTAL=	0.00

NON- RESIDENTIAL CALCULATIONS

AGRICULTURAL	# ACRE	FACTOR	AF/YR
VINEYARD IRRIGATION ONLY=	0	0.3	0.00
VINEYARD HEAT PROTECTION=	0	0.25	0.00
VINEYARD FROST PROTECTION=	0	0.25	0.00
IRRIGATED PASTURE=	0	4	0.00
ORCHARDS=	0	4	0.00
LIVESTOCK (SHEEP/COWS)=	0	0.01	0.00
		SUB TOTAL=	0.00
SCHOOL	**# GAL**	**FACTOR**	**AF/YR**
DOMESTIC WATER USE =	345379	SEE WW CALC	1.06
LANDSCAPING WATER USE =	1694310	SEE IRR. CALC	5.20
		SUB TOTAL=	6.26
INDUSTRIAL	**# EMPL**	**FACTOR**	**AF/YR**
FOOD PROCESSING=	0	31	0.00
PRINTING/ PUBLISHING=	0	0.6	0.00
		SUB TOTAL=	0.00
COMMERCIAL	**# EMPL**	**FACTOR**	**AF/YR**
OFFICE SPACE=	0	0.01	0.00
WAREHOUSE=	0	0.05	0.00
		SUB TOTAL=	0.00

EXISTING USE TOTALS

RESIDENTIAL=	0.00	AF/YR
AGRICULTURAL=	0.00	AF/YR
SCHOOL=	6.26	AF/YR
INDUSTRIAL=	0.00	AF/YR
COMMERCIAL=	0.00	AF/YR
OTHER USAGE (LIST BELOW)		
RECYCLED WASTE WATER =		AF/YR
		AF/YR
		AF/YR
		AF/YR
		AF/YR
TOTAL EXISTING WATER USE=	**2039688**	**G/YR**
TOTAL EXISTING WATER USE=	**6.26**	**AF/YR**

WATER AVAILABILTY CALCULATIONS FOR HISTORICAL USE			
WELL NUMBER	Q - GPM	AF/YR	
1	45	72.590	
2		0.000	
3		0.000	
4		0.000	
5		0.000	
TOTAL=	45	72.590	
SPRING NUMBER	Q - GPM	AF/YR	
1		0.000	
2		0.000	
3		0.000	
4		0.000	
5		0.000	
TOTAL=	0	0.000	
TANK #	GAL	AF	
1	10000	0.031	
2		0.000	
3		0.000	
4		0.000	
5		0.000	
TOTAL=	10000	0.031	
RESERVOIR #	GAL	AF	
1	0		
2	0		
3	0		
4	0		
5	0		
TOTAL=	0.000	0	
GROUND WATER RECHARGE	AF/YR/ACRE	PARCEL AC	AF/YR
See Groundwater Recharge Analysis	0.98	5.08	4.98
TOTAL AVAILABLE WATER =	**1622106.10**	**G/YR**	
TOTAL AVAILABLE WATER =	**4.98**	**AF/YR**	
TOTAL EXISTING WATER USE=	**6.26**	**AF/YR**	
REMAINING AVAILABLE WATER =	**-1.28**	**AF/YR**	

WATER USE CALCULATIONS FOR PROPOSED USE				
RESIDENTIAL	**#**	**FACTOR**	**AF/YR**	
PRIMARY RESIDENCES=		0.5	0.00	
SECONDARY RESIDENCES=		0.2	0.00	
FARM LBR DWELLING (# OF PPL) =		0.06	0.00	
		SUB TOTAL=	0.00	
NON- RESIDENTIAL CALCULATIONS				
AGRICULTURAL	**# ACRE**	**FACTOR**	**AF/YR**	
VINEYARD IRRIGATION ONLY=		0.3	0.00	
VINEYARD HEAT PROTECTION=		0.25	0.00	
VINEYARD FROST PROTECTION=		0.25	0.00	
IRRIGATED PASTURE=		4	0.00	
ORCHARDS=		4	0.00	
LIVESTOCK (GOATS/CHICKENS)=	0.1	0.01	0.00	
		SUB TOTAL=	0.01	
LODGING	**# GAL**	**FACTOR**	**AF/YR**	
DOMESTIC WATER USE =	289988	SEE WW CALC	0.89	
LANDSCAPING WATER USE =	749406	SEE IRR. CALC	2.30	
		SUB TOTAL=	3.19	
INDUSTRIAL	**# EMPL**	**FACTOR**	**AF/YR**	
FOOD PROCESSING=	0	31	0.00	
PRINTING/ PUBLISHING=	0	0.6	0.00	
		SUB TOTAL=	0.00	
COMMERCIAL	**# EMPL**	**FACTOR**	**AF/YR**	
OFFICE SPACE=	0	0.01	0.00	
WAREHOUSE=	0	0.05	0.00	
		SUB TOTAL=	0.00	

PROPOSED USE TOTALS		
RESIDENTIAL=	0.00	AF/YR
AGRICULTURAL=	0.01	AF/YR
LODGING=	3.19	AF/YR
INDUSTRIAL=	0.00	AF/YR
COMMERCIAL=	0.00	AF/YR
OTHER USAGE (LIST BELOW)		
RECYCLED WASTE WATER =		AF/YR
		AF/YR
		AF/YR
		AF/YR
		AF/YR
TOTAL PROPOSED WATER USE=	**1042652**	**G/YR**
TOTAL PROPOSED WATER USE=	**3.20**	**AF/YR**

WATER AVAILABILTY CALCULATIONS FOR PROPOSED USE

WELL NUMBER	Q - GPM	AF/YR
1	45	72.590
2		0.000
3		0.000
4		0.000
5		0.000
TOTAL=	45	72.590
SPRING NUMBER	Q - GPM	AF/YR
1		0.000
2		0.000
3		0.000
4		0.000
5		0.000
TOTAL=	0	0.000
TANK #	GAL	AF
1	10000	0.031
2		0.000
3		0.000
4		0.000
5		0.000
TOTAL=	10000	0.031
RESERVOIR #	GAL	AF
1	0	
2	0	
3	0	
4	0	
5	0	
TOTAL=	0	0.000

GROUND WATER RECHARGE	AF/YR/ACRE	PARCEL AC	AF/YR
See Groundwater Recharge Analysis	0.98	5.08	4.98

TOTAL WATER AVAILABLE =	**1622106.10**	**G/YR**
TOTAL WATER AVAILABLE =	**4.98**	**AF/YR**
TOTAL PROPOSED WATER USE=	**3.20**	**AF/YR**
REMAINING AVAILABLE WATER =	**1.78**	**AF/YR**

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Ground Water Recharge Analysis

for the

Capell School Lodging Project

Located at:
1191 Capell Valley Road
Napa, CA 94558

Date: 2/7/2023

Project # 00055

Legend	
Requires Input	
Automatically Calculates	
Important Value Automatically Calculates	
Important Value Requires Input	Hit ctrl+alt+shift+F9 when finished.

GROUND WATER RECHARGE CALCULATIONS

PARCEL VARIABLES

Parcel size =	5.08	ac
Average annual rainfall (P) =	25.40	in (from Prism 2012 - 2021)
Total parcel average rainfall volume =	10.75	ac-ft/yr

EVAPOTRANSPIRATION (E)

Surface Type	Area (ac)	E (ac-ft)	
Vineyard =	0.00	0.00	
Orchard =			
Hay =			
Other Crops =			
Impervous Surfaces onto Grassland =	0.72	0.00	
Totals =	0.72	0.00	

Native plants area =	4.36	ac
Native plants estimated coefficient =	0.35	coefficient
Plant density =	80%	percent
Native Plant Growth Cycle Factor =	0.70	factor
Grass refernce ETo =	47.04	in (from Zone 8 ITRC value typ yr)
Native plant ETc =	11.52	in
Total annual native plant E =	3.35	ac-ft
Total annual E for parcel =	**3.35**	**ac- ft**

RUNOFF (R)

Average runoff relief coefficient =	8%	%
Average runoff soil coefficient =	6%	%
Average runoff vegitation coefficient =	6%	%
Average runoff surface coefficient =	8%	%
Total Runoff Coefficient =	28%	%
Average annual rainfall =	10.75	ac-ft
Runoff producing rainfall =	80%	%
Total Annual Runoff (R) =	**2.41**	**ac-ft**

ANNUAL GROUND WATER RECHARGE STORAGE (S) = P-(R+E)

Total Annaul Precipitation (P) =	10.75	ac-ft
Total Annual Runoff (R) =	2.41	ac-ft
Total Annual Evapotranpiration (E) =	3.35	ac-ft
Total Annual Ground Recharge (S) =	**4.99**	ac-ft
Annual Recharge Rate Per Acre =	**0.98**	**ac-ft / yr / ac**

IRRIGATION CALCULATIONS FOR THE CAPELL SCHOOL LODGING PROJECT - 7/22/2020

HISTORICAL LANDSCAPE WATER USE CALCULATIONS		
LAWN LANDSCAPE AREA =	63237.45	SF
MISC. LANDSCAPE PLANT AREA =	0.00	SF
DROUGHT RISISTANT LANDSCAPE AREA =	0.00	SF
DISTRIBUTION UNIFORMITY =	0.85	RATIO
AVERAGE ANNUAL WATER USAGE =	**5.20**	**AF**
PROPOSED LANDSCAPE WATER USE CALCULATIONS		
LAWN LANDSCAPE AREA =	21780.00	SF
MISC. LANDSCAPE PLANT AREA =	10890.00	SF
DROUGHT RISISTANT LANDSCAPE AREA =	10890.00	SF
DISTRIBUTION UNIFORMITY =	0.85	RATIO
AVERAGE ANNUAL WATER USAGE =	**2.30**	**AF**

Zone 8 Monthly Evapotranspiration
Sprinkler Irrigation Typical Year
IRRIGATION TRAINING AND RESEARCH CENTER, California Polytechnic State University, San Luis Obispo
Table includes adjustments for bare spots and reduced vigor
(Typical Year)

	January	February	March	April	May	June	July	August	Septembe	October	Novembe	Decembe	Annual
	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches
Precipitation	6.21	0.29	0.34	0.30	0.49	0.22	0.07	0.31	0.43	0.65	4.92	4.29	18.52
Grass Reference ETo	1.53	2.43	3.44	4.82	5.74	5.79	5.92	5.70	4.78	3.58	1.56	1.74	47.04
Adjusted Site Specific Values													
Precipitation Average (NCRSS)	11.40	0.53	0.62	0.55	0.90	0.40	0.13	0.57	0.79	1.19	9.03	7.88	34.00
Grass Eto (ITRC)	1.53	2.43	3.44	4.82	5.74	5.79	5.92	5.70	4.78	3.58	1.56	1.74	47.04
Irrigation water required after rain	0.00	1.90	2.82	4.27	4.84	5.39	5.79	5.13	3.99	2.39	0.00	0.00	36.51
Miscelaneous Landscape Plants (ITRC)	0.78	0.88	1.19	1.77	2.75	3.26	3.01	2.76	1.52	0.87	0.52	1.03	20.34
Irrigation water required after rain	0.00	0.35	0.57	1.22	1.85	2.86	2.88	2.19	0.73	0.00	0.00	0.00	12.64
Drought Resistant Landscape Plants (CMP)	0.59	0.66	0.89	1.33	2.06	2.45	2.26	2.07	1.14	0.65	0.39	0.77	15.26
Irrigation water required after rain	0.00	0.13	0.27	0.78	1.16	2.04	2.13	1.50	0.35	0.00	0.00	0.00	8.36

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Historical Wastewater Flow Calculations

for the

Capell School Lodging Project

Located at:

1191 Capell Valley Road

Napa, CA 94558

Date: 7/22/2020

Project # 00055

Legend

Requires Input
Automatically Calculates
Important Value Automatically Calculate
Important Value Requires Input

Hit ctrl + alt + shift + F9 when finished to recalc all formulas

Historical Waste Flow Summary

The subject property used to be a public school with a peak attendence of 90 students, 3 teachers, 2 part time aids and a part time grounds keeper. The calculated flows below are based on this.

Historical School Peak Domestic Waste Flow Calculations

Historical Student Peak Student Domestic Waste Flows

Estimated peak number of students attending =	90	#
Peak wasteflow per student =	20.00	gal/day/std
Peak Student Waste Flow =	**1800.00**	gal/day

Historical School Peak Employee Domestic Waste Flows

Peak Employee Waste Flows		
Number of FT Employees =	3	#
Number of PT Employees =	3	#
FT employee daily domestic waste flow =	45.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	24.00	gal/day (8 g/p)
Peak Employee Waste Flows =	**69.00**	**gal/day**
Total Combined Domestic Waste Flows =	**1869**	**gal/day**

Historical School Annual Waste Flow Volume Calculations

Historical Student Average Domestic Waste Flows

Estimated peak number of students attending =	90	#
Ave wasteflow per student =	10.00	gal/day/std
Ave Student Waste Flow =	900.00	gal/day
Total Design Peak Domestic Waste Flows =	**328500**	**gal/yr**

Historical Employee Average Domestic Waste Flows

Peak Employee Waste Flows		
Number of FT Employees =	3	#
Number of PT Employees =	2	#
FT employee daily domestic waste flow =	22.50	gal/day (8 g/p)
PT employee daily domestic waste flow =	8.00	gal/day (4 g/p)
Total Dimestic Flow =	30.50	gal/day
Total Design Peak Domestic Waste Flows =	**11133**	**gal/yr**

Historical Average Event Domestic Waste Flows

Special Event Volumes	visitors	days/yr	flow/day	gallons
Large Events =	200	4	5	4000
Medium Events =	50	12	5	3000
Other =			5	0
Other 2 =			5	0
Total Annual Event Visitor Waste Volume =	**7000**	**gal/year**		
Total Annual Waste Flow Volume =	**346633**	**gal/yr**	**1.06**	**af**

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Proposed Wastewater Flow Calculations

for the

Capell School Lodging Project

Located at:

1191 Capell Valley Road

Napa, CA 94558

Date: 7/22/2020

Project # 00055

Legend

Requires Input
Automatically Calculates
Important Value Automatically Calculate
Important Value Requires Input

Hit ctrl + alt + shift + F9 when finished to recalc all formulas

Waste Flow Summary

The existing school wastewater system was under designed to handle a peak flow of 600 gallons per day of domestic wastewater. The proposed change in use will exceed this amount thus an additional wastewater system will be required. All proposed events will be serviced by portable toilets.

Peak Domestic Waste Flow Calculations

Proposed Lodging Units Peak Domestic Waste Flows

Total number of single bedroom lodging units =	4	lodging units
Total number of double bedroom lodging units =	5	lodging units
Total number of single bedroom caretaker units =	1	caretaker units
Peak wasteflow per lodging bedrooms =	106.00	gal/day/br
Peak wasteflow per care taker bedrooms =	120.00	gal/day/br
Peak Lodging Units Domestic Waste Flow =	**1604.00**	gal/day

Proposed Employee Peak Domestic Waste Flows

Peak Employee Waste Flows		
Number of FT Employees =	4	#
Number of PT Employees =	0	#
FT employee daily domestic waste flow =	60.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	0.00	gal/day (8 g/p)
Peak Employee Waste Flows =	**60.00**	**gal/day**
Total Combined Domestic Waste Flows =	**1664**	**gal/day**

Annual Waste Flow Volume Calculations

Average Lodging Units Domestic Waste Flows

Total number of single bedroom lodging units =	4	lodging units
Total number of double bedroom lodging units =	5	lodging units
Total number of single bedroom caretaker units =	1	caretaker units
Total bedroom (br) count =	15	br
Average wasteflow per bedroom =	50.00	gal/day/br
Total Design Peak Domestic Waste Flows =	750.00	gal/day
Total Design Peak Domestic Waste Flows =	**273750**	**gal/yr**

Average Employee Domestic Waste Flows

Peak Employee Waste Flows		
Number of FT Employees =	4	#
Number of PT Employees =	0	#
FT employee daily domestic waste flow =	30.00	gal/day (7.5 g/p)
PT employee daily domestic waste flow =	0.00	gal/day (4 g/p)
Emplyee Domestic Flow =	30.00	gal/day
Total Design Peak Domestic Waste Flows =	**10950**	**gal/yr**

Average Event Domestic Waste Flows

Special Event Volumes	visitors	days/yr	flow/day	gallons
Large Events =	150	6	3	2700
Medium Events =	60	12	3	2160
Other =			3	0
Other 2 =			3	0
Total Annual Event Visitor Waste Volume =	**4860**	**gal/year**		
Total Annual Waste Flow Volume =	**289560**	**gal/yr**	**0.89**	**af**

[redacted]

SA 12/6/06

ORIGINAL
File with DWR

Page 1 of 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. e039625

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./ STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. 1-'06
Date Work Began 6/29/2006, Ended 7/13/2006
Local Permit Agency Napa County Environmental Mgmt
Permit No. E06-01092 Permit Date 6/28/2006

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)
DRILLING METHOD ROTARY FLUID BENTONITE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
0	54	BROWN CLAY
54	80	GREEN CLAY WITH SANDSTONE
80	250	90% SANDSTONE/ 10% SHALE
250	260	90% SHALE & CLAY/ 10% SANDSTONE

TOTAL DEPTH OF BORING 260 (Feet)
TOTAL DEPTH OF COMPLETED WELL 250 (Feet)

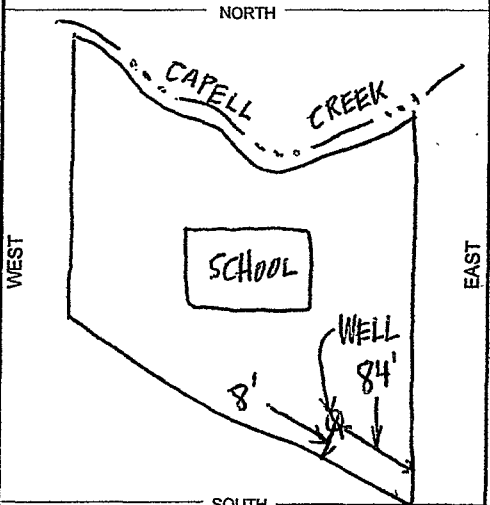
WELL OWNER

Name [redacted] Valley Unified School District
Mailing Address [redacted] Lincoln Avenue
[redacted] CA [redacted] 94558
CITY STATE ZIP

WELL LOCATION

Address 1191 Capell Valley Road
City Napa CA
County Napa
APN Book 032 Page 130 Parcel 026
Township ____ Range ____ Section ____
Latitude ____ DEG. MIN. SEC. ____ DEG. MIN. SEC.

LOCATION SKETCH



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
— MONITORING
— TEST WELL
— CATHODIC PROTECTION
— HEAT EXCHANGE
— DIRECT PUSH
— INJECTION
— VAPOR EXTRACTION
— SPARGING
— REMEDIATION
— OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 70 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 15 (Ft.) & DATE MEASURED 7/13/2006
ESTIMATED YIELD * 45 (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 3 (Hrs.) TOTAL DRAWDOWN N/A (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	260	12								
0	70		✓				PVC F480	6	SDR-21	
70	170			✓			PVC F480	6	SDR-21	.032
170	190		✓				PVC F480	6	SDR-21	
190	250			✓			PVC F480	6	SDR-21	.032

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	5	✓			CONCRETE
5	22		✓		GROUT
22	55	✓			CEMENT
55	250			✓	#6 SAND

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— 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 HUCKFELDT WELL DRILLING, INC.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
2110 Penny Lane Napa CA 94559
ADDRESS CITY STATE ZIP
Signed [signature] 07/14/06 439-746
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

DAVE BESS PUMP & WELL
LIC.# C-57-C-10 487027

1115 MT GEORGE AVE.
NAPA, CALIF. 94558
707-226-2539 / 253-0574

WATER WELL TEST
REPORT # W-17-039

LOCATION (well address): 1191 Capell Valley Rd Napa CA Date 05Oct2017
TEST REQUESTOR: Gil Pridmore

SURFACE INSPECTION

CASING DIA. 6" pvc EST. AGE OF WELL 12 Years (Per Well Log) DEPTH OF WELL 250' (Per Well Log)
SANITARY SEAL (functional) PIPING SYSTEM (functional) ELECTRICAL SYSTEM (functional)
PRESSURE TANKS (functional)
WELL SIZE OF PUMP 2 (HP)
OPERATING VOLTS: 239 AMPS: R: 2.8 B: 9.5 Y:P 10.0

FLOW TEST DATA

METHOD OF TEST: 2 HOUR OPEN FLOW DISCHARGE TEST USING THE INSTALLED PUMP AND EXISTING EQUIPMENT. (TEST EQUIPMENT USED), 2" FLOW METER, 2" THROTTLING DISCHARGE VALVE, 0/200 PRESSURE GAGE AND A POWERS WELL DEPTH STATIC METER.

TIME	RATE (GPM)	WATER LEVEL
14:00	50	20ft
15:20	43	56ft
15:40	43	61ft
16:00	43	61ft

STATIC LEVEL PRIOR TO TEST 20 FT STATIC LEVEL @ END OF TEST 61 FT
TOTAL DRAW DOWN DURING THIS TEST WAS 41 ft
(AVG.)GALLONS PER MIN. 44.75 FOR 2 HOURS OF TESTING.

GENERAL COMMENTS

Well and well equipment in working order @ time of testing. The well fills a storage tank and is pressurized from the storage tank with 2 Goulds Booster pumps One ¾ HP (HB707) and 1 1hp (HB2510). Pressure Tanks are showing signs of deterioration (Rusting) and should be replaced. It seems that all controls are low voltage. The water is treated with a Culligan system, it is unknown if its operational or being serviced. Some information was taken from the well completion report Dated 6/28/2006 Log #e039625. Pump Depth is unknown at this time. Flow Meter Installed after the Booster pumps reads 5155799 Gallons.

TEST CONDUCTED BY: _____ DATE: 08Oct2017
(optional) Bacteria sampled Yes __ No X Chemical sampled: Yes __ No X

00055 - FROM

NELAP/ORELAP Certification 4036

Caltest
ANALYTICAL LABORATORY
ENVIRONMENTAL ANALYSES

CA-ELAP Certification 1664

Thursday, March 29, 2018

Gil Pridmore
Pridmore Bros. Inc.
1191 Capell VAlley
Napa, CA 94558

Re Lab Order: T030808
Project ID: CAPELL SCHOOL

Collected By: GIL PRIDMORE
PO/Contract #: PD MC $345.00

Dear Gil Pridmore:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, March 15, 2018. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Enclosures

Project Manager: Holly Long

1885 North Kelly Road • Napa, California 94558
(707) 258-4000 • Fax (707) 226-1001 • e-mail: info@caltestlabs.com

SAMPLE SUMMARY

Lab Order: T030808
Project ID: CAPELL SCHOOL

Lab ID	Sample ID	Matrix	Date Collected	Date Received
T030808001	**CAPELL SCHOOL WELL HEAD**	Water	03/15/2018 12:07	03/15/2018 13:01

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NARRATIVE

Lab Order: T030808
Project ID: CAPELL SCHOOL

General Qualifiers and Notes

Caltest authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that all test results for wastewater and hazardous waste analyses meet all applicable NELAC requirements; all microbiology and drinking water testing meet applicable ELAP requirements, unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 20th Edition except where noted (SMOL=online edition).

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (RL), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Filtrations performed at Caltest for dissolved metals (excluding mercury) and/or pH analysis are not performed within the 15 minute holding time as specified by 40CFR 136.3 table II.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte. An analyte not detected at or above the RL is reported as ND unless otherwise noted or qualified. For analyses pertaining to the State Implementation Plan of the California Toxics Rule, the Caltest Reporting Limit (RL) is equivalent to the Minimum Level (ML). A standard is always run at or below the ML. Where Reporting Limits are elevated due to dilution, the ML calibration criteria has been met.

J - reflects estimated analytical result value detected below the Reporting Limit (RL) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.

E - indicates an estimated analytical result value.

B - indicates the analyte has been detected in the blank associated with the sample.

NC - means not able to be calculated for RPD or Spike Recoveries.

SS - compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

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ANALYTICAL RESULTS

Lab Order: T030808
Project ID: CAPELL SCHOOL

Lab ID T030808001 Date Collected 3/15/2018 12:07 Matrix Water
Sample ID CAPELL SCHOOL WELL HEAD Date Received 3/15/2018 13:01

Parameters	Result	Units	R. L.	DF	Prepared	Batch	Analyzed	Batch	Qual
pH, Electrometric Analysis	**Analytical Method:**	SM 4500-H+ B-00/-11					**Analyzed by:**	MYS	
pH	8.2	pH Units		1			03/25/18 14:48	BIO 19114	
Calculation, Hardness	**Analytical Method:**	Calculated					**Analyzed by:**	LM	
Hardness Calculation	33	mg/L	0.5	1			03/23/18 16:18	CALC	
Calculation, Total Anions	**Analytical Method:**	Calculated					**Analyzed by:**	DR	
Total Anions	4.3	meq/L		1			03/23/18 16:46	CALC	
Calculation, Total Cations	**Analytical Method:**	Calculated					**Analyzed by:**	LM	
Total Cations	4.5	meq/L		1			03/23/18 16:18	CALC	
Metals by ICPMS, Collision Mode, Total	**Prep Method:**	EPA 200.8					**Prep by:**	UKS	
	Analytical Method:	EPA 200.8					**Analyzed by:**	LM	
Arsenic	ND	mg/L	0.00080	4	03/22/18 00:00	MPR 15782	03/23/18 16:18	MMS 8940	
Boron	3.6	mg/L	0.10	10	03/22/18 00:00	MPR 15782	03/26/18 16:44	MMS 8940	
Calcium	12	mg/L	2.0	4	03/22/18 00:00	MPR 15782	03/23/18 16:18	MMS 8940	
Iron	0.20	mg/L	0.10	4	03/22/18 00:00	MPR 15782	03/23/18 16:18	MMS 8940	
Magnesium	ND	mg/L	2.0	4	03/22/18 00:00	MPR 15782	03/23/18 16:18	MMS 8940	
Manganese	0.013	mg/L	0.0020	4	03/22/18 00:00	MPR 15782	03/23/18 16:18	MMS 8940	
Potassium	ND	mg/L	4.0	4	03/22/18 00:00	MPR 15782	03/23/18 16:18	MMS 8940	
Silica (as SiO2)	15	mg/L	4.0	4	03/22/18 00:00	MPR 15782	03/23/18 16:18	MMS 8940	
Sodium	88	mg/L	4.0	4	03/22/18 00:00	MPR 15782	03/23/18 16:18	MMS 8940	
Zinc	0.13	mg/L	0.080	4	03/22/18 00:00	MPR 15782	03/23/18 16:18	MMS 8940	
Electrical Conductance Analysis	**Analytical Method:**	SM 2510 B-97/-11					**Analyzed by:**	DR	
Conductivity	410	umhos/cm	10	1			03/23/18 13:48	WET 9472	
Anions by Ion Chromatography	**Analytical Method:**	EPA 300.0					**Analyzed by:**	MYS	
Nitrogen, Nitrate (as N)	ND	mg/L	0.1	1			03/16/18 01:29	WIC 6217	
Fluoride	0.35	mg/L	0.1	1			03/16/18 01:29	WIC 6217	
Chloride	7.8	mg/L	1	1			03/16/18 01:29	WIC 6217	
Sulfate (as SO4)	ND	mg/L	0.5	1			03/16/18 01:29	WIC 6217	
Alkalinity, Total by Standard Methods	**Analytical Method:**	SM 2320 B-97/-11					**Analyzed by:**	DR	
Alkalinity, Total (as CACO3)	204	mg/L	10	1			03/23/18 16:46	WTI 3032	
Hydroxide (as OH)	ND	mg/L	2	1			03/23/18 16:46	WTI 3032	
Bicarbonate (as HCO3)	244	mg/L	12	1			03/23/18 16:46	WTI 3032	
Carbonate (as CO3)	ND	mg/L	6	1			03/23/18 16:46	WTI 3032	

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The following information is from California Code of Regulations Title 22, Napa County Env. Health "Interpreting Drinking Water Test Results" and UC Davis Department of Land, Air, and Water Resources - Cooperative Extension. This information is provided for your convenience. Caltest does not provide consultation regarding the suitability of water for a given purpose.

Arsenic has a drinking water Maximum Contaminant Level (MCL) of 10 ug/L (ppb) or 0.010 mg/L (ppm)

Boron has an agricultural recommended limit and a state drinking water Action (Advisory) Limit of 1000 ug/L (ppb) or 1 mg/L (ppm). Boron affects the health and production of boron sensitive plants. Drinking water with greater than 10 times the Action Limit Level are recommended for removal from service.

Calcium and **Magnesium** are related to water hardness. See Hardness remarks.

Chloride has a drinking water Maximum Contaminant Level (MCL) of 600 mg/L, with a recommended level of 250 mg/L and a short-term limit of 600 mg/L.

Copper has a drinking water Maximum Contaminant Level (MCL) of 1000 ug/L (ppb) or 1 mg/L (ppm).

Electrical Conductance has a drinking water Maximum Contaminant Level (MCL) of 1,600 umhos/cm, with a recommended level of 900 umhos/cm and a short term limit of 2,200 umhos/cm. Electrical Conductance is a measure of the ability of a water to conduct an electrical current and is expressed in micromhos per centimeter at 25 degrees C.

Fluoride has a recommended level of 1.0 mg/L in temperate climates. Fluoride in concentrations greater than 3 mg/L can cause dental fluorosis (a brownish discoloration of the teeth).

Iron has a drinking water Maximum Contaminant Level (MCL) of 300 ug/L (ppb) or 0.3 mg/L (ppm).

Hardness is due primarily to calcium and magnesium carbonates and bi-carbonates. Up to 60 mg/L is SOFT. Between 60 to 120 mg/L is MODERATE (typically most desirable). Between 120 to 180 mg/L is HARD. Over 180 mg/L is VERY HARD.

Manganese has a drinking water Maximum Contaminant Level (MCL) of 50 ug/L (ppb) or 0.05 mg/L (ppm).

Sodium has a recommended limit of 100 mg/L. According to the American Heart Association, water containing more than 270 mg/L should not be
consumed by those on a moderately restricted sodium diet.

Nitrate as N, has a drinking water Maximum Contaminant Level (MCL) of 10 mg/L.
Nitrate as NO3 has a drinking water MCL of 45 mg/L.

Lead has a drinking water Action Limit of 15 ug/L (ppb) or 0.015 mg/L (ppm).

pH suggested level is 6.5 - 8.5.

Silica has a recommended limit of 70 mg/L. Silica in water may etch various household materials such as leaded crystal, marble, tile, windows, and porcelain.

Sulfate has a drinking water Maximum Contaminant Level (MCL) of 500 mg/L, with a recommended level of 250 mg/L and a short term limit of 600 mg/L.

Zinc has a drinking water Maximum Contaminant Level (MCL) of 5000 ug/L (ppb) or 5 mg/L (ppm).

Caltest
ANALYTICAL LABORATORY
ENVIRONMENTAL ANALYSES

Dear Client:

Caltest provides a variety of water analyses, but cannot provide an opinion regarding the quality of the water or its suitability for any particular use. If you would like information, please feel free to contact any of the following suggested resources listed below.

Human Health Concerns:

EPA Safe Drinking Water Hotline	800/426-4791
Napa County Environmental Health	707/253-4471
Sonoma County Environmental Health	707/565-6565

Irrigation Concerns:

University of California at Davis Department of Land, Air, and Water Resources/ Cooperative Extension. Ask for Blaine Hanson or Steve Grattan	530/752-1130

Thank you for choosing Caltest for your water testing needs. Please feel free to contact us if we can provide you with any further testing assistance.

Sincerely,
Caltest Analytical Laboratory

Todd M Albertson
Vice President

(For your information, the next page contains various regulatory limits)

Caltest ANALYTICAL LABORATORY

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SAMPLE CHAIN OF CUSTODY

PAGE _____ OF _____

LAB ORDER #: T030808

PROJECT #/ PROJECT NAME: Capell School

P.O. #:

CLIENT: Pridmore Bros Inc

REPORT ATTN: Send TO Pridmore office@ Email.com

ADDRESS: 1191 ~~1305~~ CITY: Capell Valley STATE: Napa Ca ZIP: 94558

BILLING ADDRESS: 1305 ~~Same~~ Capell Valley " " "

PHONE #: 2240682 FAX PHONE: 224 8104 SAMPLER (PRINT & SIGN NAME): Gil Pridmore

ANALYSES REQUESTED

Package W

TURN-AROUND TIME
☐ STANDARD
☐ RUSH

DUE DATE:

REV. 2/13

CALTEST #	DATE SAMPLED	TIME SAMPLED	MATRIX	CONTAINER AMOUNT/TYPE	PRESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB #	COMP. or GRAB	REMARKS
	3/15	1207				Capell School Wellhead			

PAID
CK. NO. MC $345.00
DATE 3/15/18

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	RELINQUISHED BY	DATE/TIME	RECEIVED BY
	3/15 1301				

FOR LAB USE ONLY

Samples: WC_____ MICRO_____ BIO_____ MET_____ SV_____ VOA_____ TEMP: 13.8 °C SEALED: (Y) / N INTACT: (Y) / N

BC: BIO_____ WC_____ MET_____

CC: AA_____ SV_____ VOA_____

SIL: HP_____ PT_____ QT_____ VOA_____

W/HNO$_3$_____ H$_2$SO$_4$_____ NaOH_____

PIL: HNO$_3$_____ H$_2$SO$_4$_____ NaOH_____ HCL_____

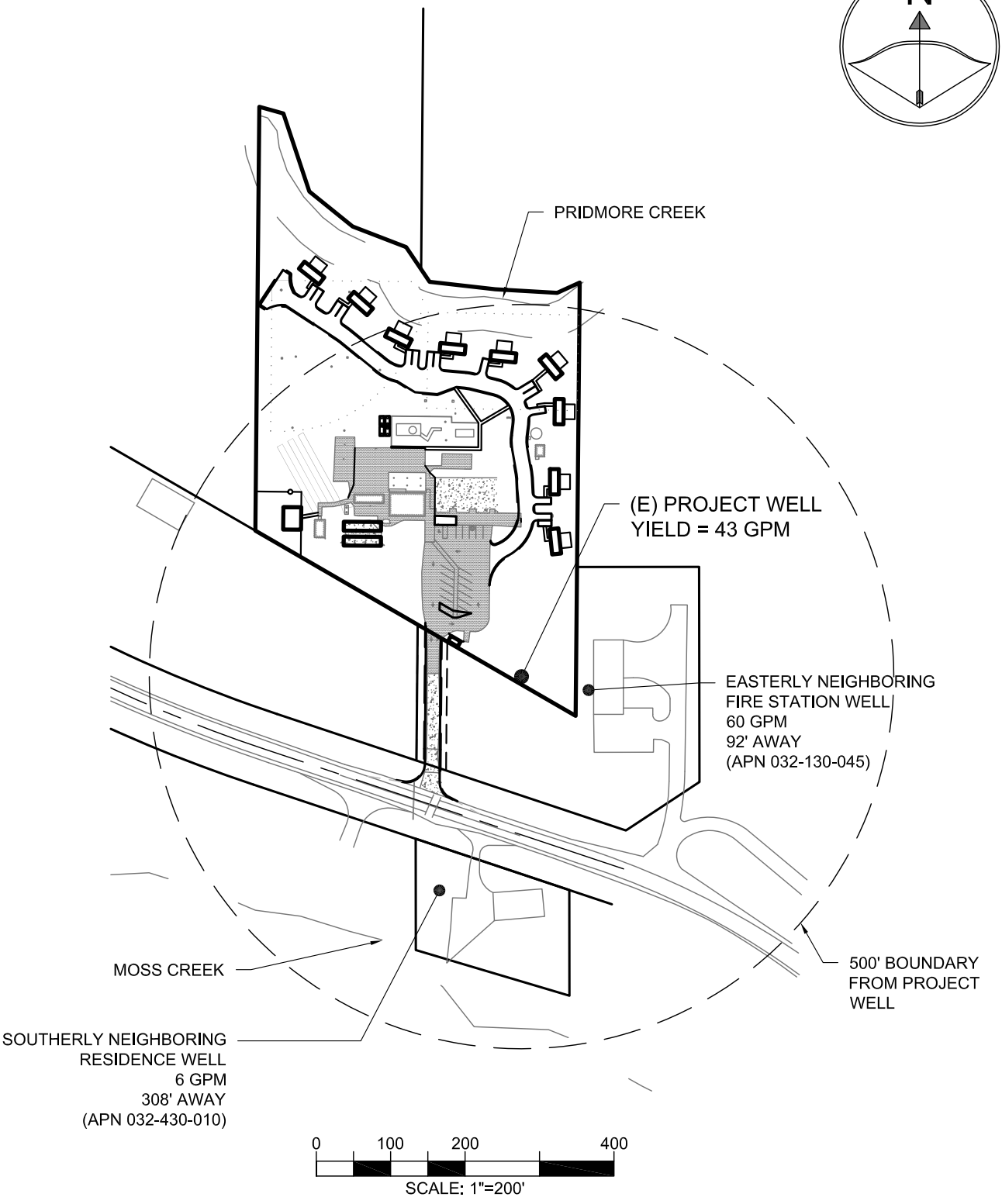
COMMENTS

#2018 4/3 22-18

MATRIX: W = Aqueous Nondrinking Water, Digested Metals; ML = Low R.L.s, Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water; SL = Soil, Sludge, Solid; FP = Free Product

CONTAINER TYPES: AL = Amber Liter; AHL = 500 ml Amber; PT = Pint (Plastic); QT=Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL.VOA; OTC = Other Type Container

WHITE - ORIGINAL TO LABORATORY YELLOW - CLIENT COPY AS RECEIPT



WELL LOCATION MAP

SHEET: 1 OF 1

PROJECT INFO:

PRIDMORE PROPERTY
(FORMALLY CAPELL
VALLEY SCHOOL)
1191 CAPELL VALLY ROAD
NAPA, CA 94558
032-130-026

PREPARED BY:

CMP CIVIL ENGINEERING &
LAND SURVEYING INC.
1607 CAPELL VALLEY ROAD
NAPA, CA 94558
(707) 266-2559

P #: 00055 DATE: 02/07/2023

CMP
CIVIL & LAND
ENGINEERING SURVEYING

Attachment “B”

Tier 2 Water Availability
Analysis & Supporting Documents

By: Wagner & Bonsignore Consulting Civil Engineers
David H. Peterson, CEG, CHg

Wagner&Bonsignore
Consulting Civil Engineers, A Corporation

Nicholas F. Bonsignore, P.E.
Robert C. Wagner, P.E.
Paula J. Whealen

Martin Berber, P.E.
Patrick W. Ervin, P.E.
David P. Lounsbury, P.E.
Vincent Maples, P.E.
Leah Orloff, Ph.D, P.E.
David H. Peterson, C.E.G., C.H.G.
Ryan E. Stolfus

MEMORANDUM

To: Mr. Cameron Pridmore. P.E.

From: David H. Peterson, CEG, CHg

Date: February 8, 2023

Re: **Tier 2 Water Availability Analysis**
Pridmore Family - Capell School Lodging Project
1191 Capell Valley Road, Napa, CA

This memorandum summarizes the Tier 2 water availability analysis performed for the proposed Capell School Lodging Project, located at 1191 Capell Valley Road, Napa, California. The property is located on the northeast side of Capell Valley Road and about 0.8 miles northwest of the intersection of Highways 121 and 128 in eastern Napa County, as shown on the attached *Site and Well Location Maps*, **Figures 1 and 2**.

A Tier 1 Water Availability Analysis (WAA) was performed by CMP Civil Engineering & Land Surveying Inc. (CMP) of Napa, California and summarized in a February 7, 2023 report. A copy of the *Well Location Map* from the CMP report is included as **Figure 3**. In that report, a project description and estimated water use were presented. Based on analysis of the project acreage, prior and planned water use, and guidelines presented in the County of Napa's Water Availability Analysis (WAA) – Guidance Document (dated May 12, 2015), the Tier 1 analysis concluded that annual recharge of 4.98 acre-feet per year (AFY) exceeded proposed water use of 3.20 AFY and so fell within allowable groundwater use guidelines. However, we understand that a Tier 2 analysis will be required by the County to assess the impacts of pumping by the project well on wells located within a 500-foot radius of project well.

Project Description

The subject property (Napa APN 032-130-026) is the site of the former Capell Valley School. The property slopes very slightly to the southwest, toward Oak Moss Creek. From review of the Tier 1 Water Availability Analysis by CMP (2023) and discussions with CMP, we understand that the planned project will consist of constructing up to nine small tourist lodging units, a caretaker unit, an office/storage building, and a barn-type structure for local 4-H events.

Water supply for the project will be from an existing well on the property, referred to as the Project Well. Total domestic and landscaping water demand for the project is calculated by CMP at 1,042,652 gallons per year, or 3.20 acre-feet per year (AFY). The estimated annual water

demand equates to about 2,857 gallons per day, or as will be discussed, about 66 minutes of daily pumping from the Project Well.

As part of the Tier 1 analysis, two offsite wells were identified within 500 feet of the Project Well (see *Well Location Map*, **Figure 3**); a well located 92 feet to the east at the Capell Valley Fire Department property (APN 032-130-045), and a domestic well located 308 feet to the southwest on a neighboring property (APN 032-430-010).

The purpose of our scope of services was to address the Tier 2 analyses required by the County of Napa. Our scope consisted of reviewing prior reports and plans for the project, available well completion reports, published geologic maps and groundwater reports for the site and vicinity; performing a site and area review; analyzing the data obtained; and preparing this memorandum. Subsurface investigation or well testing were not performed for the current scope. For project details, we relied primarily on the project description and water use estimates presented in the Tier 1 study by CMP (2023).

Hydrogeologic Setting

Geologic Units

The geologic setting in the vicinity of the site is shown on **Figure 4**, adapted from California Geological Survey (Delattre and Sowers, 2006) and our interpretation of the subsurface conditions is shown on Cross Section A-A' on **Figure 5**. As shown, the oldest mapped bedrock unit bounding and underlying the Capell Valley and subject property consists of a deformed mélange unit of the Jurassic- to Cretaceous-age Great Valley Sequence (map symbol *KJgvm*). This unit is described as consisting of fault-bounded, structurally disrupted mudstone, sandstone, shale and pebble conglomerate. While described as lithologically indistinguishable from more laterally continuous and less deformed strata in the Great Valley Sequence (unit *KJgv*), the mudstone in the mélange unit lacks bedding, while the sandstone and shale units are sheared and tightly folded. From the standpoint of groundwater storage and movement, flow through the highly sheared, faulted, and deformed mélange units of varying permeability is difficult to predict or model.

In the valley floor of Capell Valley, the deformed units of the Great Valley Sequence are blanketed by alluvial deposits, consisting of flat, relatively undissected fan, terrace and basin deposits of latest Pleistocene to Holocene age (Delattre and Sowers, 2006). Review of the well logs for the subject property and adjacent properties indicates that the alluvium ranges in thickness from about 38 feet in the adjacent properties, to about 54 feet in the Project Well. In general, the alluvium is described as consisting of brown clay, and brown clay with embedded rock. To the south of the subject property at APN 032-430-010, the alluvium also contains interbedded sandy clay and gravel.

Review of the Project Well Log

The well completion report (WCR e039625) for the Project Well is included as **Attachment 1**. The well was drilled in June-July 2006 by Huckfeldt Well Drilling Inc. of Napa, California. The initial wellbore (12-inch diameter) was drilled to a total depth of 260 feet by mud

rotary methods. The geologic log on the WCR indicates that alluvium consisting of brown clay was encountered to a depth of 54 feet. From a depth of 54 to 80 feet, green clay and sandstone are logged, that may be weathered bedrock, or sheared bedrock materials. Below 80 feet, "90% sandstone/10% shale" was encountered to 250 feet, underlain by "90% shale & clay/10% sandstone" to the bottom of the hole.

The wellbore was subsequently completed with a 250-foot deep, 6-inch (inside) diameter well casing. The well construction details indicate the well perforations extend from a depth of 70 to 170 feet and 190 to 250 feet, entirely within the Great Valley Sequence mélange unit. A bentonite and cement seal was placed in the upper 55 feet of the well, which extends through the surface alluvial units. Based on the reported 54-foot thickness of the alluvium on the log, it appears that the 55-foot well seal completely sealed off the alluvium from the underlying Great Valley Sequence bedrock units.

The WCR indicates that groundwater was first encountered at a depth of 70 feet in the boring, within the Great Valley Sequence. The static water level subsequently rose to a depth of 15 feet, indicating that groundwater is locally semi-confined or confined in the Great Valley Sequence bedrock. The well initially produced 45 gallons per minute during development, although the associated water level drawdown was not listed on the drillers report.

A well test was performed in 2017 by Dave Bess Pump & Well of Napa, California. A copy of that test is also included in **Attachment 1**. At the time of the testing in October 2017, the static water level in the well was 20 feet, somewhat lower than when first measured in July 2006. In the well test, the Project Well was pumped for two hours, at an initial rate of 50 gpm and later at 43 gpm. During the test, a total of 41 feet of pumping drawdown was recorded, indicating a specific capacity (the yield in gpm per foot of drawdown) of about 43gpm/41 ft drawdown = 1.05 gpm/ft drawdown. Based on the limited water level measurements presented on the test report, it appears that the water level in the well dropped for about 100 minutes and may have begun to level off after that time.

Tier 2 – Analysis of Well Pumping Interference

Pursuant to Appendix F of the WAA Guidelines, an evaluation of the approximate lateral extent of well pumping interference from the Project Well was performed. The Tier 1 WAA by CMP Engineering identified a well to the east on APN 032-130-045, located about 92 feet from Project Well. About 308 feet to the south, a well was identified on APN 032-430-010 (WCR 576432; see **Figure 3** for well locations and **Attachment 2** for well reports). The locations of the offsite wells were also verified on Google Earth aerial photography and during our site review.

Based on the method discussed in Driscoll (1986), the U.S. Geological Survey (Thomasson and others, 1960), and notes from the Groundwater Resources Association's *Low Yield Aquifer Testing* (2004) short course**,** the relationship between specific capacity and transmissivity was used to estimate the lateral pumping influence using information on the Well Completion Report for the Project Well and subsequent 2017 well test by Dave Bess Pump & Well. We used a procedure in

Driscoll (1986) based on the Cooper-Jacob straight-line method, which analyzes pumping drawdown vs. distance from the pumping well. An approximate relationship between specific capacity calculated from the 2017 well test and aquifer transmissivity was used, based on "typical" pump test values. As discussed above, the well was tested in 2017 at a discharge rate of 43 gallons per minute (gpm) with an associated measured drawdown of 41 feet, corresponding to a specific capacity of 1.05 gpm/ft drawdown.

The well completion report for the Project Well indicates that groundwater was first encountered at a depth of 70 feet and subsequently rose to static level of 15 feet indicating that groundwater in the bedrock (sandstone/shale) penetrated by the Project Well is likely confined and sealed off from the overlying unconfined alluvial aquifer. For our analysis, transmissivity was estimated for confined aquifer conditions, using the relationship of Specific Capacity (yield/drawdown) x 2,000, or 1.05 gpm/ft x 2,000 = 2,100 gallons per day/ft (gpd/ft). This relationship is presented both in Driscoll (1986) and Thomasson and others (USGS, 1960). This calculated transmissivity is higher than would be obtained using the County's hydraulic conductivity on Table F-4 of the WAA Guidelines (for Great Valley Sequence sandstone). Therefore, we consider the calculated transmissivity of 2,100 gpd/ft to be the more conservative estimate, as it would yield a larger potential extent of pumping impact.

To develop the slope of the drawdown curve to project away from the pumping well, the value of Δs (drawdown over one log graph cycle) was calculated for a distance-drawdown relationship, where $T = 528Q/\Delta s$ (Driscoll,1986, Equation 9.11; where T = transmissivity and Q = pumping rate in gpm, or rearranged to solve for $\Delta s = 528$ (43 gpm)/2,100 gpd/ft = 10.8.

Other assumptions in the calculation include adjusting the drawdown for the efficiency of the well. Frictional losses due to well screen size and sand pack can lead to reduced efficiency of the well (i.e., the water level in the formation outside of the well bore is higher than the level measured in the well). A properly designed, constructed, and developed well generally has an efficiency in the range of 70 to 80 percent (Driscoll, 1986; Rosco Moss Company, undated). Since the Project Well is newer, with factory-milled casing perforations, a higher efficiency of 80 percent was assumed.

The analysis is shown graphically on the attached semi-log plots (see **Attachment 3**). Using the estimated transmissivity of 2,100 gallons per day per foot of aquifer, pumping the project well at 43 gpm for 120 minutes under confined aquifer conditions would result in a zone of lateral pumping influence extending approximately 540 feet from the well. Under this scenario, the pumping influence would extend to the wells on both neighboring properties. It is estimated that at 120 minutes (the duration of the pumping test), the Project Well might cause about 8 feet of drawdown in the easterly well at APN 032-130-045 (Capell Fire Department), and about 2 feet of drawdown at the neighboring well to the south at APN 032-430-010. At these estimated drawdowns, effects to the neighboring wells would be within the allowable limit of the default well interference criteria (10 ft. for wells 6-inches in diameter or less) outlined in Appendix F-1 of the WAA Guidelines.

We also plotted the 2017 pump test data by Dave Bess Pump & Well as a time vs. drawdown relationship to assess the drawdown at the end of a typical project pumping cycle. After 66 minutes of pumping (the average daily project water demand at a rate of about 43 gpm), drawdown was estimated at 32 feet in the Project Well and 25.6 feet in the borehole wall (assuming 80 percent well efficiency). As shown on **Attachment 3** drawdown in the Project Well after 66 minutes would cause an associated drawdown of only about one foot at the Capell Fire Department well, and no measured drawdown in the southerly neighbor's well. However, the well pumps to a pressure tank and actual pumping cycles would likely be much shorter than 66 minutes. While these calculations are estimates, it should also be noted that the Project Well has been in operation since 2006 with no reported adverse impacts to neighboring wells.

Discussion and Conclusions

From the well logs, geologic maps and reports reviewed, and our analysis, groundwater pumping from the onsite Project Well under confined aquifer conditions appears to have a potential to influence two neighboring wells. Using the data from the Project Well log and 2017 well test data, we estimate that pumping the Project Well for 120 minutes would have an associated drawdown in the well at APN 032-130-045 (the Capell Valley Fire Station property) of about 8 feet. At the property to the south (APN 032-430-010), about 2 feet of drawdown was estimated. However, the effects after pumping for 66 minutes (the average daily project pumping demand) were estimated to amount to only about one foot of drawdown in the Capell Valley Fire Station well and little or no drawdown in the well at the property to the south. The analysis indicates that under both scenarios, effects would be within the allowable default values presented on Table F-1 of the County WAA Guidance Document.

We trust this memorandum provides the information requested by the County of Napa. Please contact us if you have questions about the findings or require additional information.

David H. Peterson

REGISTERED GEOLOGIST
DAVID H. PETERSON
No. 1186
CERTIFIED
Exp 12-31-24
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

Figures and Attachments

Figures 1 and 2 – Site and Location Map
Figure 3 – Well Location Map, from CMP Engineering (2023)
Figure 4 - Vicinity Geologic Map
Figure 5 – Cross Section A-A'

Attachment 1 – Onsite Well Log
Attachment 2 – Offsite Well Logs (2)
Attachment 3 – Well Pumping Interference Plots

References

California Department of Water Resources, 2020, Well Completion Report Map Application: https://dwr.maps.arcgis.com/apps/webappviewer/index.html?id=181078580a214c0986e2da28f8623b37

California Department of Water Resources, 2022, Water Data Library, online map application with groundwater level and water quality data: http://wdl.water.ca.gov/waterdatalibrary/

CMP Civil Engineering & Land Surveying Inc., 2023, Water Availability Analysis Report for the Pridmore Property (Formally Capell Valley School), 1191 Capell Valley Road, Napa, CA 94558. APN 032-130-026: unpublished consultant's report dated February 7, 2023, 30p.

County of Napa, 2015, Water Availability Analysis (WAA) – Guidance Document: Adopted May 12, 2015, 42p.

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Johnson, A.I., Specific Yield – Compilation of Specific Yields for Various Materials in Hydrologic Properties of Earth Materials: U.S. Geological Survey Water-Supply Paper 1662-D, 80p.

Kunkel, F. and Upson, J.E., 1960, Geology and Ground Water in Napa and Sonoma Valleys, Napa and Sonoma Counties, California: U.S. Geol. Survey Water-Supply Paper 1495, 252p., with illustrations.

Rosco Moss Company, undated, Case Study; a Comparison of Well Efficiency and Aquifer Test Results Louvered Screen vs. Continuous Wire-Wrapped Screen, Big Pine, California: Technical Memorandum 004-1, 5p.

Thomasson, H.G., Olmsted, F.H., an LeRoux, E.F., 1960, Geology, Water Resources and Usable Ground-Water Storage Capacity of Part of Solano County, California: U.S. Geological Survey Water-Supply Paper 1464, 711p. (p.220-223; Hydraulic Characteristics Estimated from Pump-Efficiency Tests).

U.S. Geological Survey, 2022, National Water Information Service, online surface and groundwater data: https://waterdata.usgs.gov/nwis

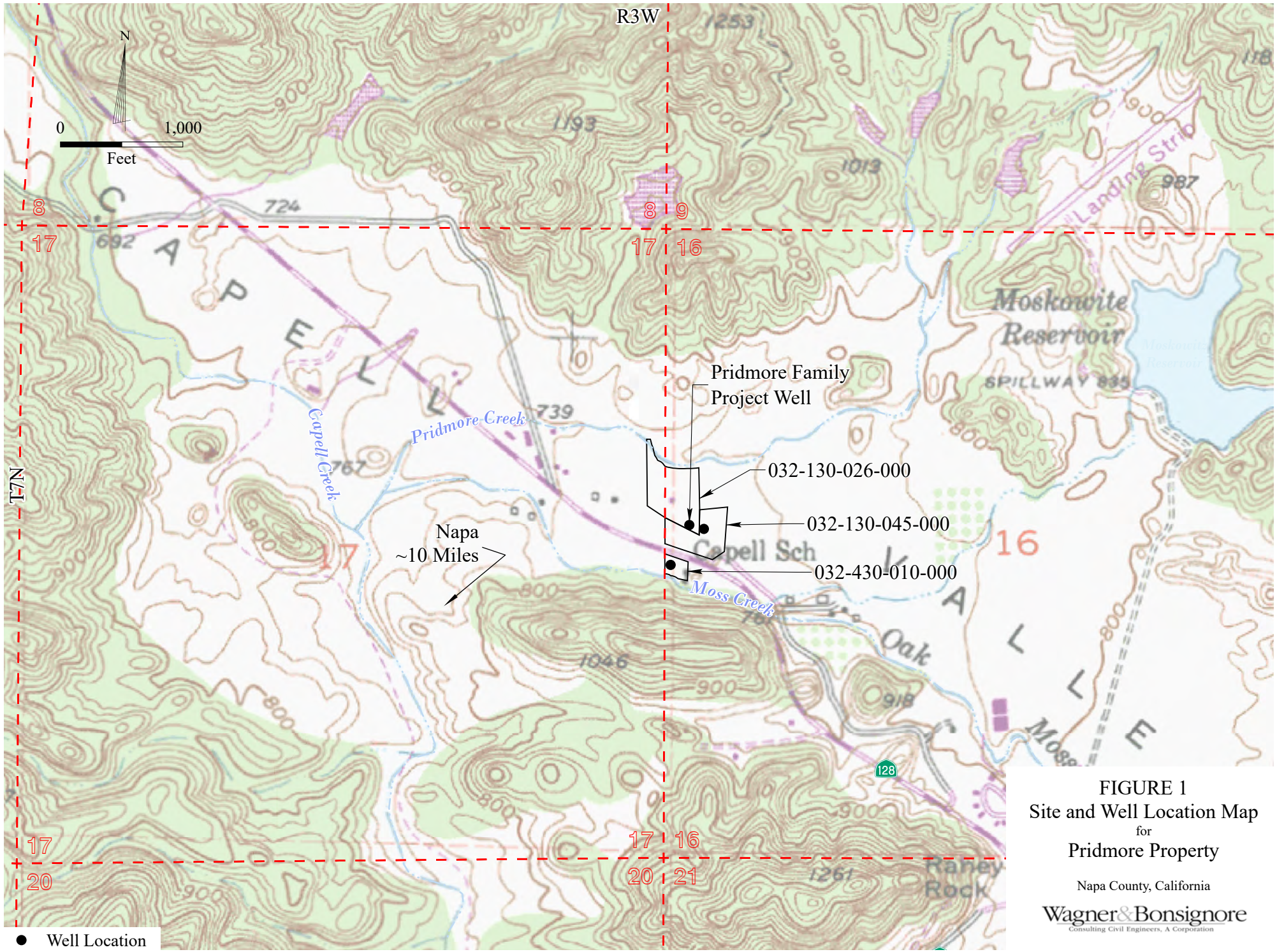


FIGURE 1
Site and Well Location Map
for
Pridmore Property

Napa County, California

Wagner&Bonsignore
Consulting Civil Engineers, A Corporation

Base map per USGS 7.5 minute quad map for Capell Valley.

Q:\Drawings\Pridmore\Pridmore.aprx

June 2022

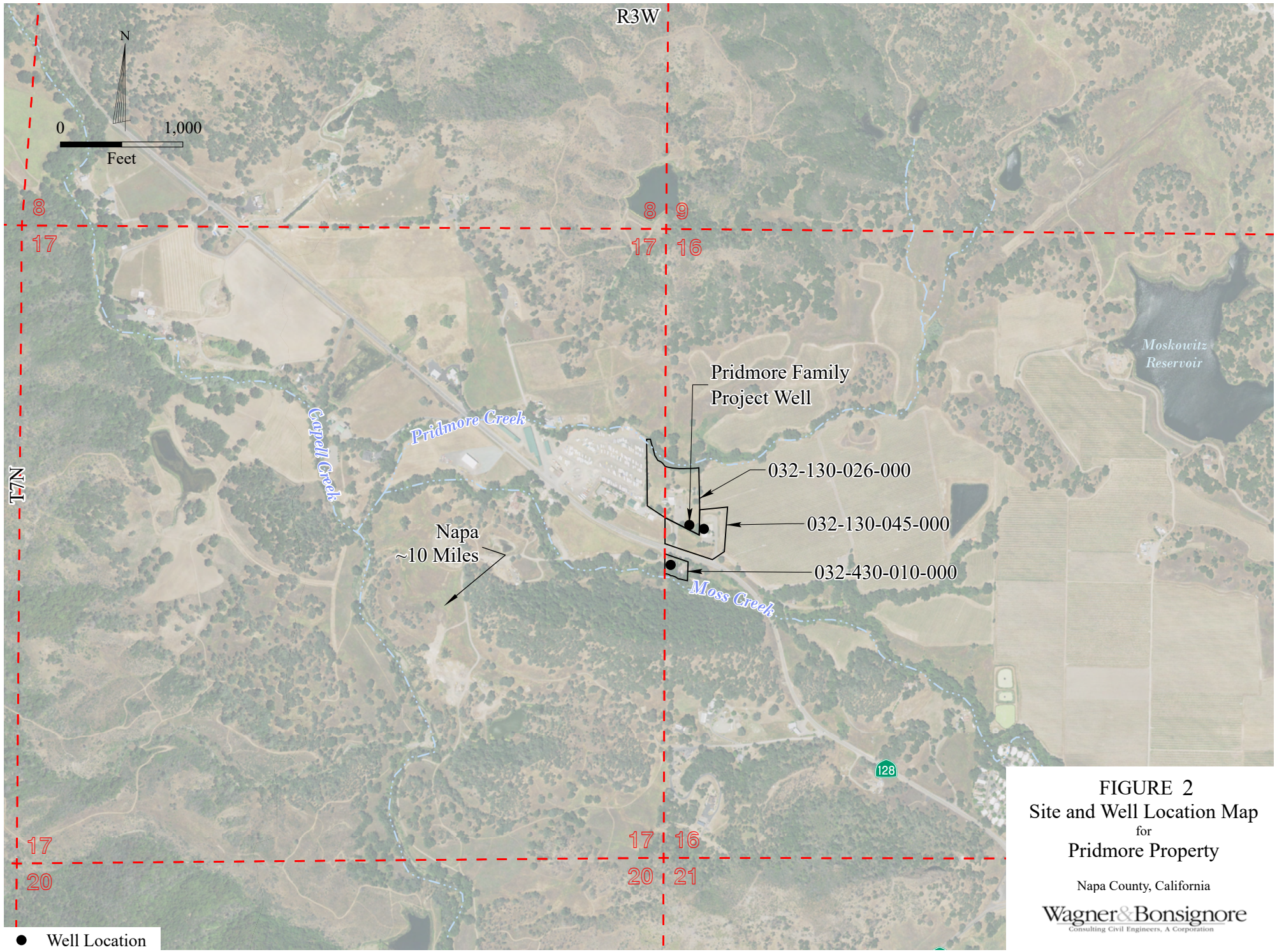


FIGURE 2
Site and Well Location Map
for
Pridmore Property

Napa County, California

Wagner&Bonsignore
Consulting Civil Engineers, A Corporation

Aerial Imagery per U.S. Department of Agriculture (USDA) - Aerial Photography Field Office, National Agricultural Inventory Project, Flown May 28, 2020.

Q:\Drawings\Pridmore\Pridmore.aprx

June 2022

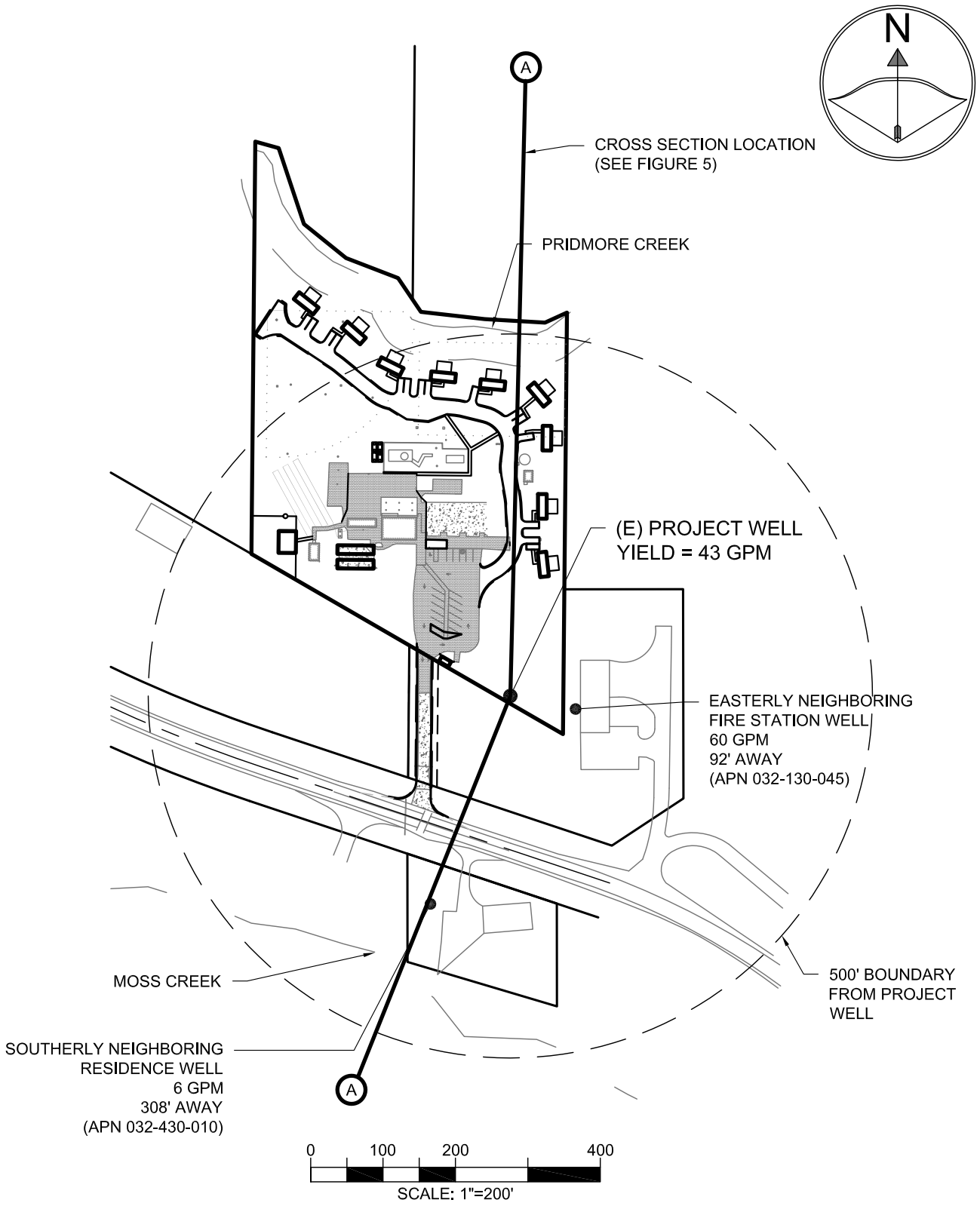


FIGURE 3
WELL LOCATION MAP

SHEET: 1 OF 1

PROJECT INFO:

PRIDMORE PROPERTY
(FORMALLY CAPELL
VALLEY SCHOOL)
1191 CAPELL VALLY ROAD
NAPA, CA 94558
032-130-026

PREPARED BY:

CMP CIVIL ENGINEERING &
LAND SURVEYING INC.
1607 CAPELL VALLEY ROAD
NAPA, CA 94558
(707) 266-2559

P #: 00055 DATE: 02/07/2023

CMP
CIVIL & LAND
ENGINEERING SURVEYING

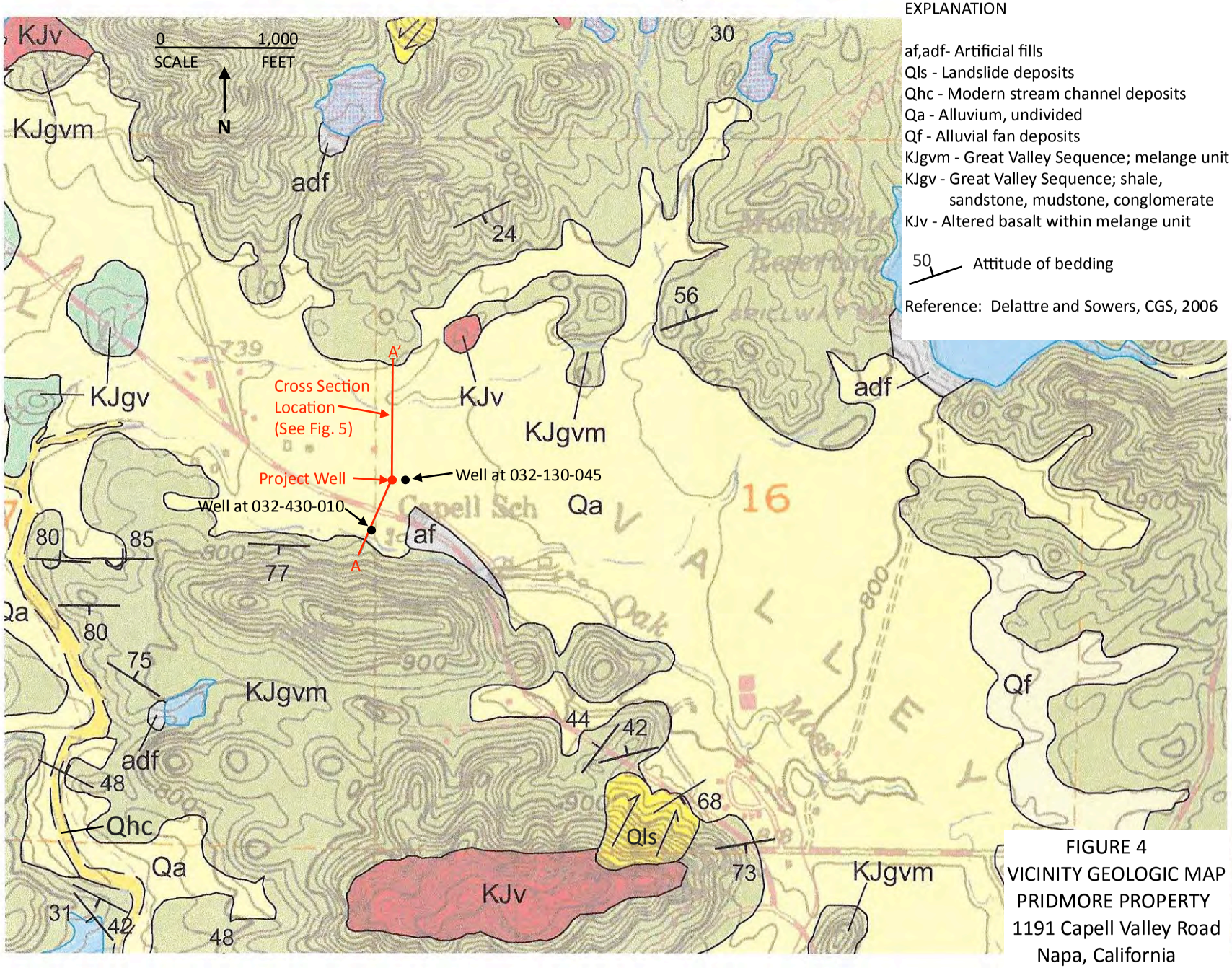


FIGURE 4
VICINITY GEOLOGIC MAP
PRIDMORE PROPERTY
1191 Capell Valley Road
Napa, California

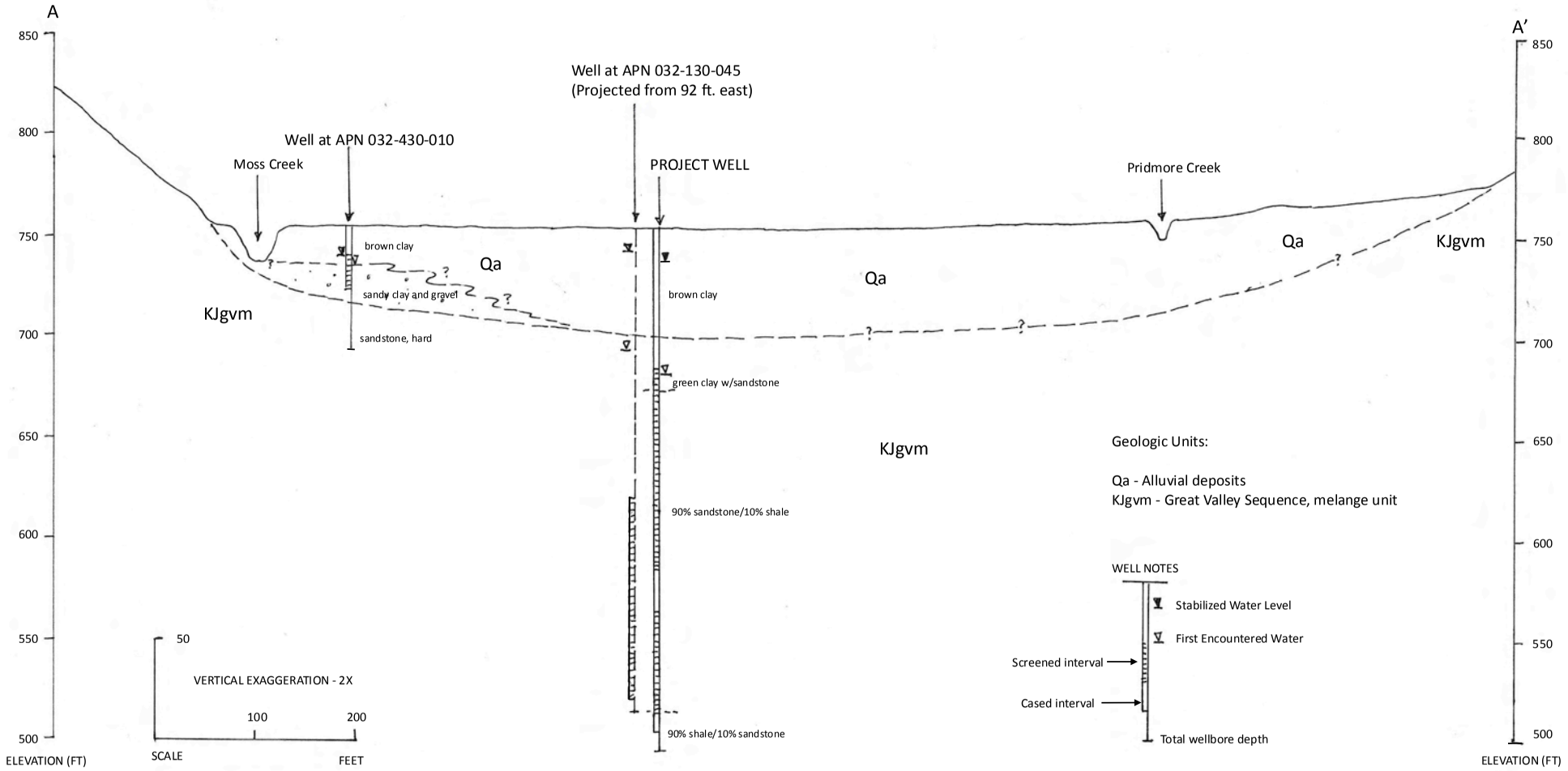


FIGURE 5
CROSS SECTION A - A'
PRIDMORE PROPERTY
1191 Capell Valley Road
Napa, California

ATTACHMENT 1

SA 12/6/06

ORIGINAL
File with DWR

Page 1 of 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. e039625

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./ STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. 1-'06
Date Work Began 6/29/2006, Ended 7/13/2006
Local Permit Agency Napa County Environmental Mgmt
Permit No. E06-01092 Permit Date 6/28/2006

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID BENTONITE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
0	54	BROWN CLAY
54	80	GREEN CLAY WITH SANDSTONE
80	250	90% SANDSTONE/ 10% SHALE
250	260	90% SHALE & CLAY/ 10% SANDSTONE

TOTAL DEPTH OF BORING 260 (Feet)
TOTAL DEPTH OF COMPLETED WELL 250 (Feet)

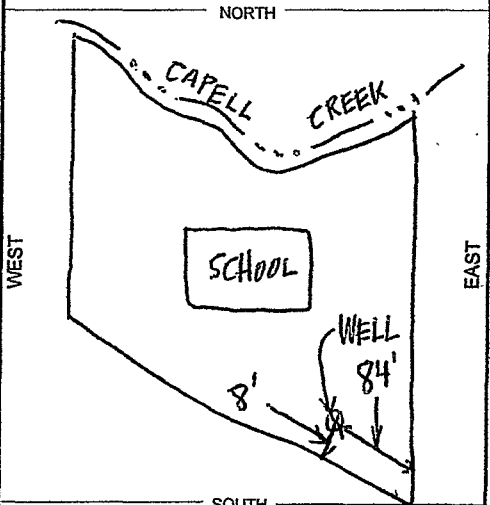
WELL OWNER

Name [redacted] Valley Unified School District
Mailing Address [redacted] Lincoln Avenue
[redacted] CA [redacted] 94558
CITY STATE ZIP

WELL LOCATION

Address 1191 Capell Valley Road
City Napa CA
County Napa
APN Book 032 Page 130 Parcel 026
Township ___ Range ___ Section ___
Latitude ___ DEG. ___ MIN. ___ SEC. ___ DEG. ___ MIN. ___ SEC.

LOCATION SKETCH



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
___ MONITORING
___ TEST WELL
___ CATHODIC PROTECTION
___ HEAT EXCHANGE
___ DIRECT PUSH
___ INJECTION
___ VAPOR EXTRACTION
___ SPARGING
___ REMEDIATION
___ OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 70 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 15 (Ft.) & DATE MEASURED 7/13/2006
ESTIMATED YIELD * 45 (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 3 (Hrs.) TOTAL DRAWDOWN N/A (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	260	12								
0	70		✓				PVC F480	6	SDR-21	
70	170			✓			PVC F480	6	SDR-21	.032
170	190		✓				PVC F480	6	SDR-21	
190	250			✓			PVC F480	6	SDR-21	.032

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	5	✓			CONCRETE
5	22		✓		GROUT
22	55	✓			CEMENT
55	250			✓	#6 SAND

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ 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 HUCKFELDT WELL DRILLING, INC.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
2110 Penny Lane Napa CA 94559
ADDRESS CITY STATE ZIP
Signed [signature] 07/14/06 439-746
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

CAPELL SCHOOL WELL YIELD

DAVE BESS PUMP & WELL
LIC.# C-57-C-10 487027

1115 MT GEORGE AVE.
NAPA, CALIF. 94558
707-226-2539 / 253-0574

WATER WELL TEST
REPORT # W-17-039

LOCATION (well address): 1191 Capell Valley Rd Napa CA Date 05Oct2017
TEST REQUESTOR: Gil Pridmore

SURFACE INSPECTION

CASING DIA. 6" pvc EST. AGE OF WELL 12 Years (Per Well Log) DEPTH OF WELL 250' (Per Well Log)
SANITARY SEAL (functional) PIPING SYSTEM (functional) ELECTRICAL SYSTEM (functional)
PRESSURE TANKS (functional)
WELL SIZE OF PUMP 2 (HP)
OPERATING VOLTS: 239 AMPS: R: 2.8 B: 9.5 Y:P 10.0

FLOW TEST DATA

METHOD OF TEST: 2 HOUR OPEN FLOW DISCHARGE TEST USING THE INSTALLED PUMP AND EXISTING EQUIPMENT. (TEST EQUIPMENT USED), 2" FLOW METER, 2" THROTTLING DISCHARGE VALVE, 0/200 PRESSURE GAGE AND A POWERS WELL DEPTH STATIC METER.

TIME	RATE (GPM)	WATER LEVEL
14:00	50	20ft
15:20	43	56ft
15:40	43	61ft
16:00	43	61ft

STATIC LEVEL PRIOR TO TEST 20 FT STATIC LEVEL @ END OF TEST 61 FT
TOTAL DRAW DOWN DURING THIS TEST WAS 41 ft
(AVG.)GALLONS PER MIN. 44.75 FOR 2 HOURS OF TESTING.

GENERAL COMMENTS

Well and well equipment in working order @ time of testing. The well fills a storage tank and is pressurized from the storage tank with 2 Goulds Booster pumps One ¾ HP (HB707) and 1 1hp (HB2510). Pressure Tanks are showing signs of deterioration (Rusting) and should be replaced. It seems that all controls are low voltage. The water is treated with a Culligan system, it is unknown if its operational or being serviced. Some information was taken from the well completion report Dated 6/28/2006 Log #e039625. Pump Depth is unknown at this time. Flow Meter Installed after the Booster pumps reads 5155799 Gallons.

TEST CONDUCTED BY: _____ DATE: 08Oct2017
(optional) Bacteria sampled Yes __ No X Chemical sampled: Yes __ No X

ATTACHMENT 2

Environmental

Cover Sheet

APN	032-130-045-000
Permit #	
Program	WELL
DocType	WL
Street #	4193
Street Name	CAPELL VALLEY
Year	2000

QUADRUPLICATE
For Local Requirements

Page 1 of 1

Owner's Well No. _____

Date Work Began 9-13-00, Ended 9-21-00

Local Permit Agency Napa County Environmental Mgmt.

Permit No. 96-11636 Permit Date 9-12-00

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 747744

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD rotary FLUID _____

DEPTH FROM SURFACE Ft. to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0 to 20	brown clay with embedded rock
20 to 38	brown clay
38 to 60	shale & clay
60 to 240	90% sandstone/ 10% shale

RECEIVED
OCT 13 2000
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

TOTAL DEPTH OF BORING 240 (Feet)
TOTAL DEPTH OF COMPLETED WELL 233 (Feet)

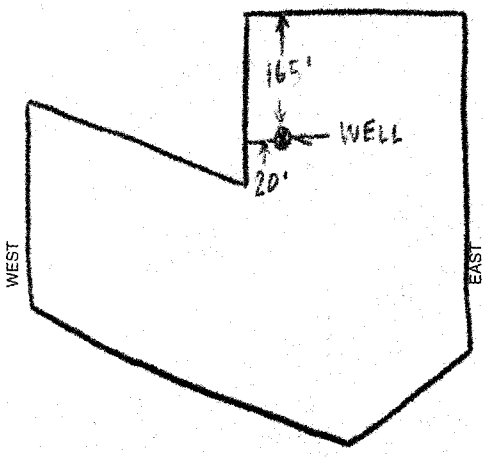
WELL OWNER

Name [redacted]
Mailing Address
CITY STATE ZIP

WELL LOCATION

Address HWY. 128
City
County Napa
APN Book 32 Page 130 Parcel 45
Township Range Section
Latitude DEG. MIN. SEC. NORTH Longitude DEG. MIN. SEC. WEST

LOCATION SKETCH

NORTH


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 (✓)

X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USES (✓)

WATER SUPPLY
___ Domestic X Public
___ Irrigation ___ Industrial
MONITORING ___
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 65 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 11 (Ft.) & DATE MEASURED 9-21-00
ESTIMATED YIELD * 60 (GPM) & TEST TYPE air lift
TEST LENGTH 2 (Hrs.) TOTAL DRAWDOWN N/A (Ft.)
** May not be representative of a well's long-term yield.*

CASING (S)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0 to 240	13								
0 to 133		X				PVC F480	6	SDR-21	.
133 to 233			X			PVC F480	6	SDR-21	.032

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0 to 28	X			concrete
28 to 61		X		chips
61 to 233			X	pea gravel

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 HUCKFELDT WELL DRILLING (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 2110 Penny Lane CITY Napap STATE CA ZIP 94559

Signed _____ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) DATE SIGNED 10-10-00

C-57 LICENSE NUMBER 438-746

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Environmental

Cover Sheet

APN	032 - 430 - 010 - 000
Permit #	
Program	WELL
DocType	WL
Street #	1191
Street Name	Capell Vly Rd
Year	1996

QUADRUPLICATE
For Local Requirements

Page 1 of 1

Owner's Well No. _____

Date Work Began 7-26-96, Ended 7-29-96

Local Permit Agency Napa County Environmental Mgmt

Permit No. 42682 Permit Date 7-23-96

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 576432

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DEPTH TO FIRST WATER 18 (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	18	brown clay
18	38	sandy clay & gravel
38	60	sandstone hard

RECEIVED
OCT 07 1996
DEPT OF
ENVIRONMENTAL MANAGEMENT

TOTAL DEPTH OF BORING 60 (Feet)

TOTAL DEPTH OF COMPLETED WELL 30 (Feet)

WELL OWNER

Name [redacted]

Mailing Address [redacted]

CITY [redacted] STATE ZIP

WELL LOCATION

Address same

City _____

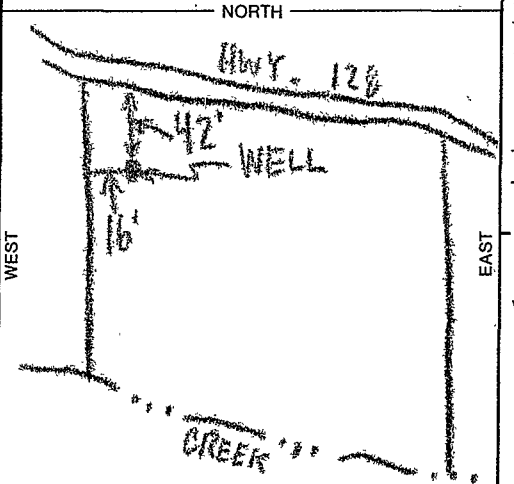
County Napa

APN Book 032 Page 430 Parcel 010

or Township _____ Range _____ Section _____

or Latitude _____ DEG. MIN. SEC. NORTH Longitude _____ DEG. MIN. SEC. WEST

LOCATION SKETCH



Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc.
PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USE(S) (✓)

___ MONITORING

WATER SUPPLY
X Domestic
___ Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD Rotary air FLUID _____

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 13 (Ft.) & DATE MEASURED 7-29-96

ESTIMATED YIELD* 6 (GPM) & TEST TYPE air lift

TEST LENGTH 2 (Hrs.) TOTAL DRAWDOWN N/A (Ft.)

** May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL/ GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	60	10								
0	15		X				plastic	5	SDR-21	
15	30			X			plastic	5	SDR-21	.032

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	11	X			concrete
11	30			X	pea gravel

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.

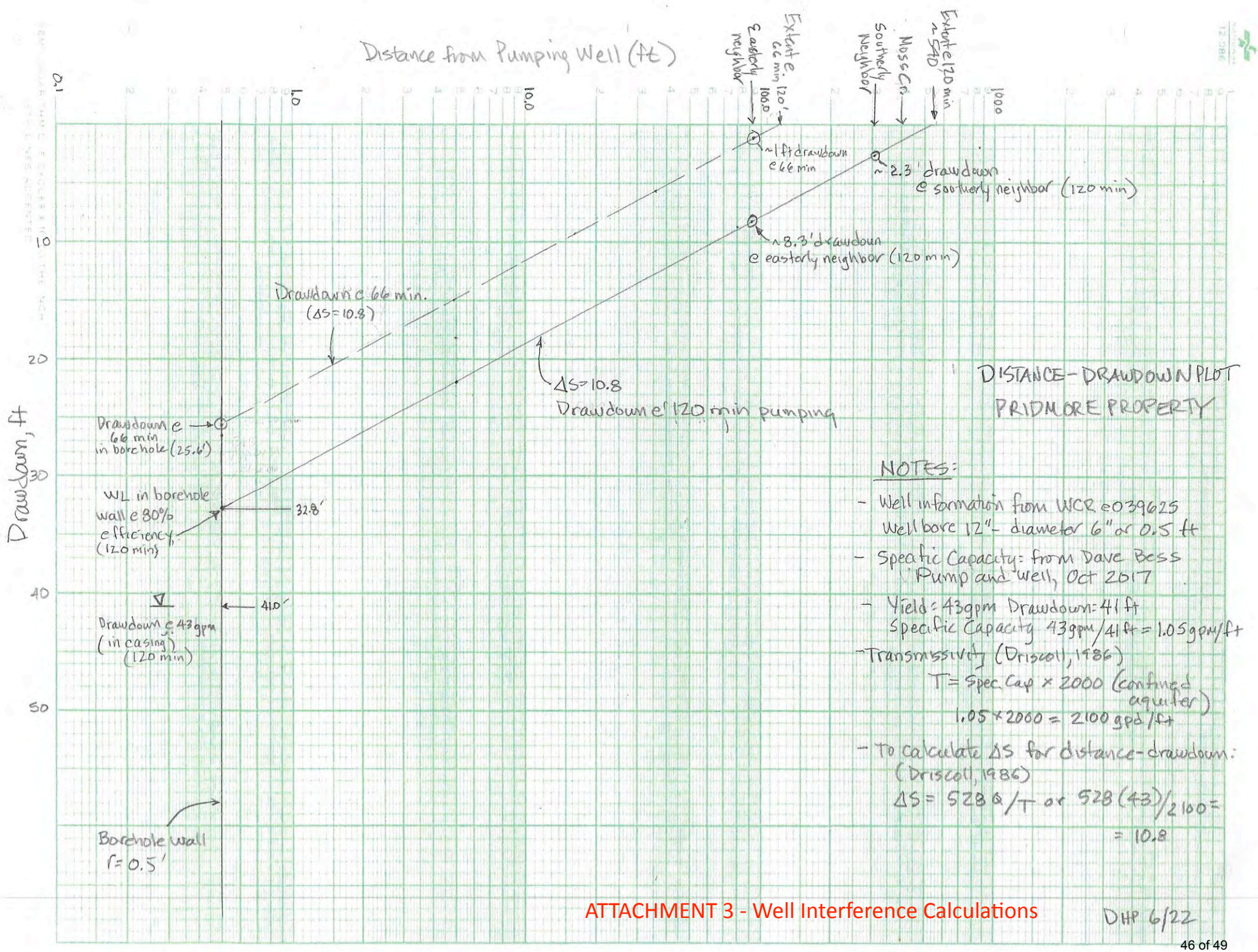
NAME HUCKFELDT WELL DRILLING
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

2110 Penny Lane Napa CA 94559
ADDRESS CITY STATE ZIP

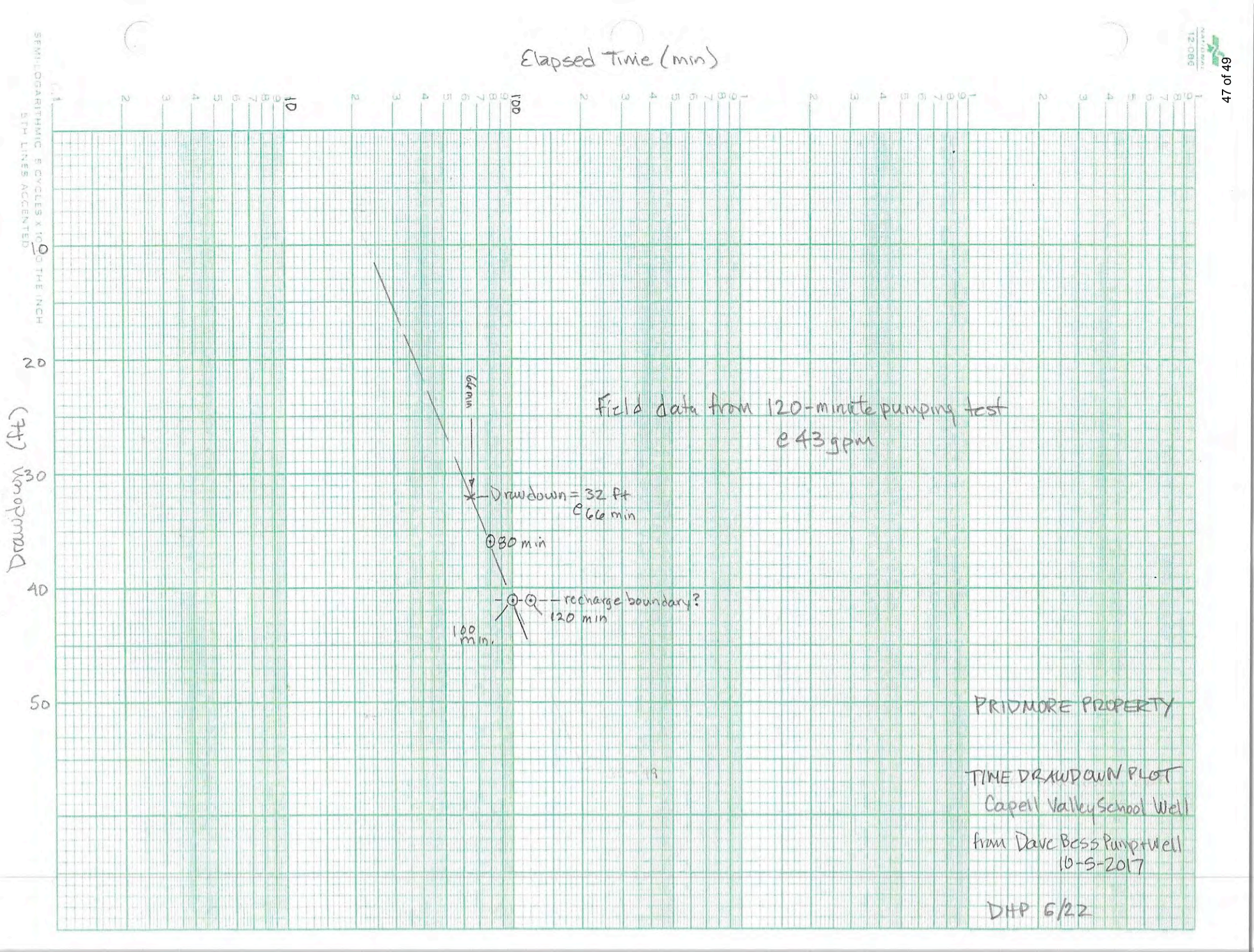
Signed _____ 10-2-96 439-746
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM



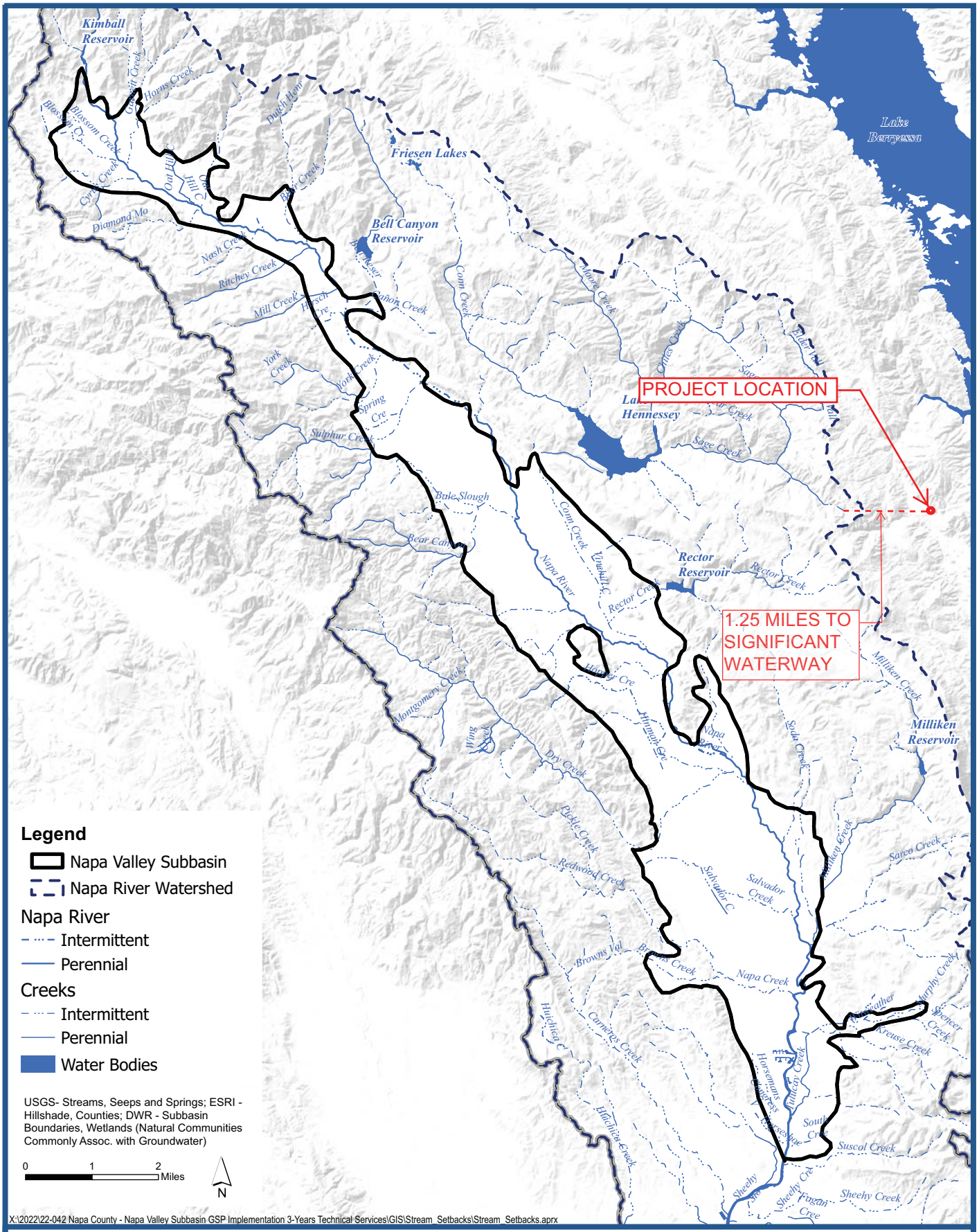
ATTACHMENT 3 - Well Interference Calculations


Elapsed Time (min)
Drawdown (ft)
10
20
30
40
50
66 min
Drawdown = 32 ft
@ 66 min
80 min
recharge boundary?
120 min
100 min.
Field data from 120-minute pumping test
@ 43 gpm
PRIDMORE PROPERTY
TIME DRAWDOWN PLOT
Capell Valley School Well
from Dave Bess Pump+Well
10-5-2017
DHP 6/22

Attachment “C”

Tier 3 Water Availability Analysis Documents

CAPELL SCHOOL SIGNIFICANT WATERWAY EXHIBIT, DATE: 7/26/2022



Luhdorff & Scalmanini
Consulting Engineers

Napa County Well Permit Standards: Significant Streams

Napa County Well Permit Standards
Napa County, California

Figure 1

Wagner&Bonsignore
Consulting Civil Engineers, A Corporation

Nicholas F. Bonsignore, P.E.
Robert C. Wagner, P.E.
Paula J. Whealen

Martin Berber, P.E.
Patrick W. Ervin, P.E.
David P. Lounsbury, P.E.
Vincent Maples, P.E.
Leah Orloff, Ph.D, P.E.
David H. Peterson, C.E.G., C.H.G.
Ryan E. Stolfus

MEMORANDUM

To: Cameron Pridmore. P.E.

From: David H. Peterson, CEG, CHg

Date: July 24, 2023

Re: **Supplemental Tier 3 Water Availability Analysis**
Pridmore Family - Capell School Lodging Project
1191 Capell Valley Road, Napa, CA

This memorandum summarizes the supplemental Tier 3 water availability analysis performed for the proposed Capell School Lodging Project, located at 1191 Capell Valley Road, Napa, California. The property is located on the northeast side of Capell Valley Road and about 0.8 miles northwest of the intersection of Highways 121 and 128 in eastern Napa County, as shown on the attached *Site and Well Location Maps*, **Figures 1 and 2**.

We previously performed a Tier 2 analysis for the project, summarized in a February 8, 2023 report. The purpose of that study was to assess the impacts of pumping by the project well on neighboring wells located within 500 feet. We understand Napa County has accepted the Tier 2 study. However, we understand the County will now also require a Tier 3 analysis of the potential effects of groundwater pumping on nearby surface waters.

Project Description

A description of the project and the local hydrogeologic setting were presented in our Tier 2 analysis report and we have limited the description in this supplemental study to data pertinent to the Tier 3 analysis. Water supply for the project will be from an existing well on the property, referred to as the Project Well. Total domestic and landscaping water demand for the project is calculated by CMP Engineering and Surveying at 1,042,652 gallons per year, or 3.20 acre-feet per year (AFY). The estimated annual water demand equates to about 2,857 gallons per day, or at the tested pumping rate of 43 gallons per minute (gpm), about 66 minutes of daily pumping from the Project Well.

The *Well Location Map* from CMP and the Tier 2 study is shown on **Figure 3**. An intermittent stream, informally designated Pridmore Creek, is about 500 feet north of the Project Well and generally bounds the northerly margin of the subject property. South of the property and Capell Valley Road is Oak Moss Creek, shown on the U.S. Geological Survey Capell Valley 7.5-

minute quadrangle as an intermittent (blue-line) creek. Oak Moss Creek is about 400 feet south-southwest of the Project Well at its nearest point.

Project Well

The local geologic setting is shown on **Figure 4** and the well completion report (WCR e039625) for the Project Well is included as **Attachment 1**. The well was drilled in June-July 2006 by Huckfeldt Well Drilling Inc. of Napa, California. The initial wellbore was drilled to a total depth of 260 feet. The well log indicates that clay alluvium was encountered to a depth of 54 feet, underlain by clay, shale and sandstone bedrock of the Great Valley Sequence. The wellbore was competed with a 250-foot deep, 6-inch diameter casing. As constructed, the well perforations extend from a depth of 70 to 170 feet and 190 to 250 feet, entirely within the Great Valley Sequence mélange unit. A bentonite and cement seal was placed in the upper 55 feet of the well, which extends through the surface alluvial units. Based on the reported 54-foot thickness of the alluvium on the log, it appears that the 55-foot well seal completely sealed off the alluvium from the underlying Great Valley Sequence bedrock units.

The WCR indicates that groundwater was first encountered at a depth of 70 feet, within the Great Valley Sequence. The static water level subsequently rose to a depth of 15 feet, indicating that groundwater is semi-confined or confined in the Great Valley Sequence bedrock.

Tier 3 – Analysis of Groundwater-Surface Water Interaction

The subsurface conditions in the site vicinity are shown graphically on Cross Section A-A' on **Figure 5.** As shown, Pridmore Creek lies about 500 feet north of the Project Well and Oak Moss Creek lies about 400 feet to the south. Our field observations and review of the Project Well log indicate that Pridmore Creek is likely underlain by about 30 to 35 feet of clay alluvium. To the south, field observations indicate that alluvium is generally exposed in the bed and banks of Oak Moss Creek, although bedrock of the Great Valley Sequence was also observed to be locally exposed in the bed and lower banks just west of APN 032-430-010. Based on interpretation from our cross section, alluvium generally underlies the bed of Oak Moss Creek to a depth of about 10 feet.

In the County's Approach for Evaluating the Potential Effects of Groundwater Pumping on Surface Water Flows (October 11, 2013), it is noted that "*Any potential for direct impacts to surface water courses resulting from groundwater pumping relies on a physical connection between the pumped groundwater system and the surface water course."* Review of the well log for Project Well indicates that it penetrates 54 feet of clay alluvium, underlain by sandstone and shale bedrock strata of the Great Valley Sequence. The well was constructed with a 55-foot-deep grout and cement seal, which seals off the alluvium. Since water was first at a depth of 70 feet, groundwater from the Project Well appears to be confined in bedrock units at depth within the Great Valley Sequence. It therefore appears unlikely that groundwater at that depth is in direct physical connection with either creek.

The calculated extent of lateral pumping influence from the Tier 2 analysis was also considered to assess potential effects of pumping on the two watercourses. Based on time-drawdown data taken from a 2017 pumping test by Dave Bess Pump & Well, pumping for 66 minutes (the average daily pumping demand for the project) would create a zone of lateral pumping influence extending about 120 feet from the Project Well. Given that the two watercourses are about 400 and 500 feet away, a typical pumping cycle would not be anticipated to directly reach either creek. Since an average daily pumping cycle is estimated at only 66 minutes, it is also expected that the water level near the Project Well would recover between pumping cycles.

As an additional screening tool, the U.S. Geological Survey stream depletion program STRMDEPL08 (Reeves, 2008) was used to assess if the short pumping cycles from the Project Well had a potential for stream depletion. Use of STRMDEPL08 has limitations, since it assumes that the well pumps from a laterally infinite and homogeneous aquifer of uniform thickness. However, as discussed, the sheared mélange bedrock beneath the site is probably not laterally uniform. Additionally, STREMDEPL08 only calculates depletion in full-day increments. STRMDEPL08 estimates stream depletion under four alternate scenarios:

1. Fully penetrating stream with no streambed resistance (Jenkins, 1968)
2. Fully penetrating stream with streambed resistance (Hantush, 1965)
3. Partially penetrating stream with streambed resistance (Hunt, 1999)
4. Partially penetrating stream in an aquitard overlying a pumped aquifer (Hunt, 2003)

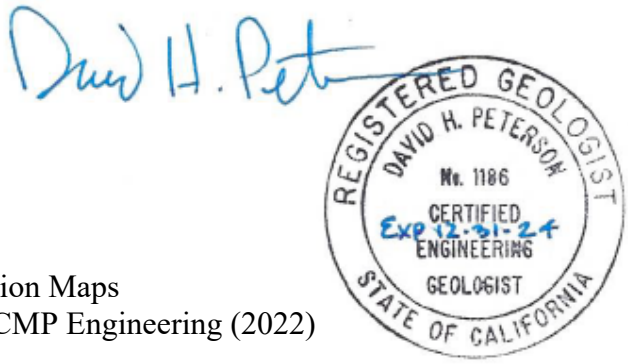
For our screening analysis, Scenario 4 - *Partially penetrating stream in an aquitard overlying a pumped aquifer (Hunt, 2003)* was used, since both creeks appear to lie within clay alluvium (aquitard) overlying a confined, fractured/sheared rock aquifer at depth. For inputs to the program, a transmissivity of 2,100 gallons/day/ft (converted to 281 ft/ft/day), derived in the Tier 2 analysis was used. In addition, the storage coefficient of 0.014 for the bedrock aquifer was calculated using information from the Tier 2 study (pumping duration, lateral extent of pumping influence, and transmissivity) and an online inverse Theis Equation Calculator developed by the New Mexico Office of the State Engineer (2017; see **Attachment 2**). Hydraulic conductivity (0.01 to 0.001 ft/day) and specific yield (0.01) for the clayey alluvial aquitard were obtained from Tables F-2 and F-4 of the Napa County WAA Guidance Document. Aquitard thickness and channel dimensions were estimated from the cross section on **Figure 5**. For the purposes of this analysis, a full day of pumping was used as an input, although as previously discussed, actual pumping cycles would be of much smaller duration. Based on these inputs and an assumed distance of 400 feet (i.e., Oak Moss Creek), STRMDEPL08 calculates that no depletion would occur after one full day of pumping at 43 gpm. A copy of the STRMDEPL08 input and output files is included as **Attachment 3**.

From this screening analysis and the previously described approaches to analyzing to the potential for stream depletion, it appears that the limited duration pumping cycles required for the project would not directly impact nearby streams.

Discussion and Conclusions

Analysis of potential streamflow depletion using the data from the 2017 well test by Dave Bess Pump & Well and our estimates of lateral pumping influence for the Tier 2 study indicated that pumping from the Project Well would not reach Pridmore Creek or Oak Moss Creek during a typical daily pumping cycle. Using default inputs from the Napa County WAA Guidelines and USGS program STRMDEP08, a longer period (i.e. a full day) of pumping from the Project Well would also not be expected to have a direct effect on Pridmore or Oak Moss Creeks. At the planned pumping rate and daily project water demand, direct depletion effects on Pridmore Creek or Oak Moss Creek from pumping the Project Well appear unlikely.

We trust this supplemental memorandum provides the information requested by the County of Napa. Please contact us if you have questions about the findings or require additional information.



Figures and Attachments

Figures 1 and 2 – Site and Well Location Maps
Figure 3 – Well Location Map, from CMP Engineering (2022)
Figure 4 - Vicinity Geologic Map
Figure 5 – Cross Section A-A'

Attachment 1 – Project Well Log
Attachment 2 – Coefficient of Storage Calculation (New Mexico OSE, 2017)
Attachment 3 – USGS STRMDEPL08 files

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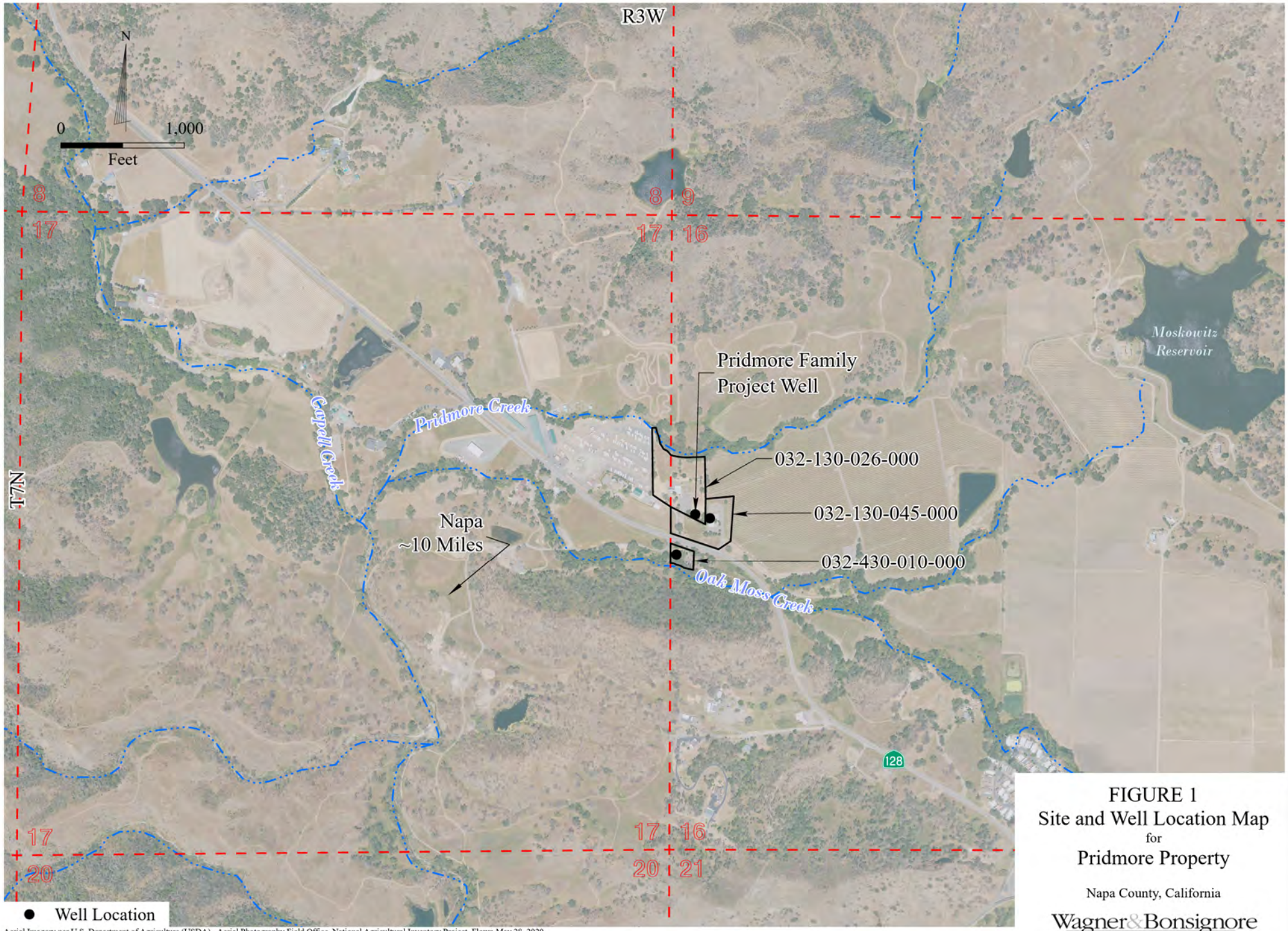

FIGURE 1
Site and Well Location Map
for
Pridmore Property

Napa County, California

Wagner&Bonsignore
Consulting Civil Engineers, A Corporation

July 2023

Aerial Imagery per U.S. Department of Agriculture (USDA) - Aerial Photography Field Office, National Agricultural Inventory Project, Flown May 28, 2020.
Streams from Napa County OpenGIS catalog, updated January 27, 2004 https://gis.napa.ca.gov/giscatalog/catalog_xml.asp?srch_opt=all&db_name=x&theme=x&sort_order=layer&meta_style=fgdc&submit=Submit , accessed June 7, 2023.
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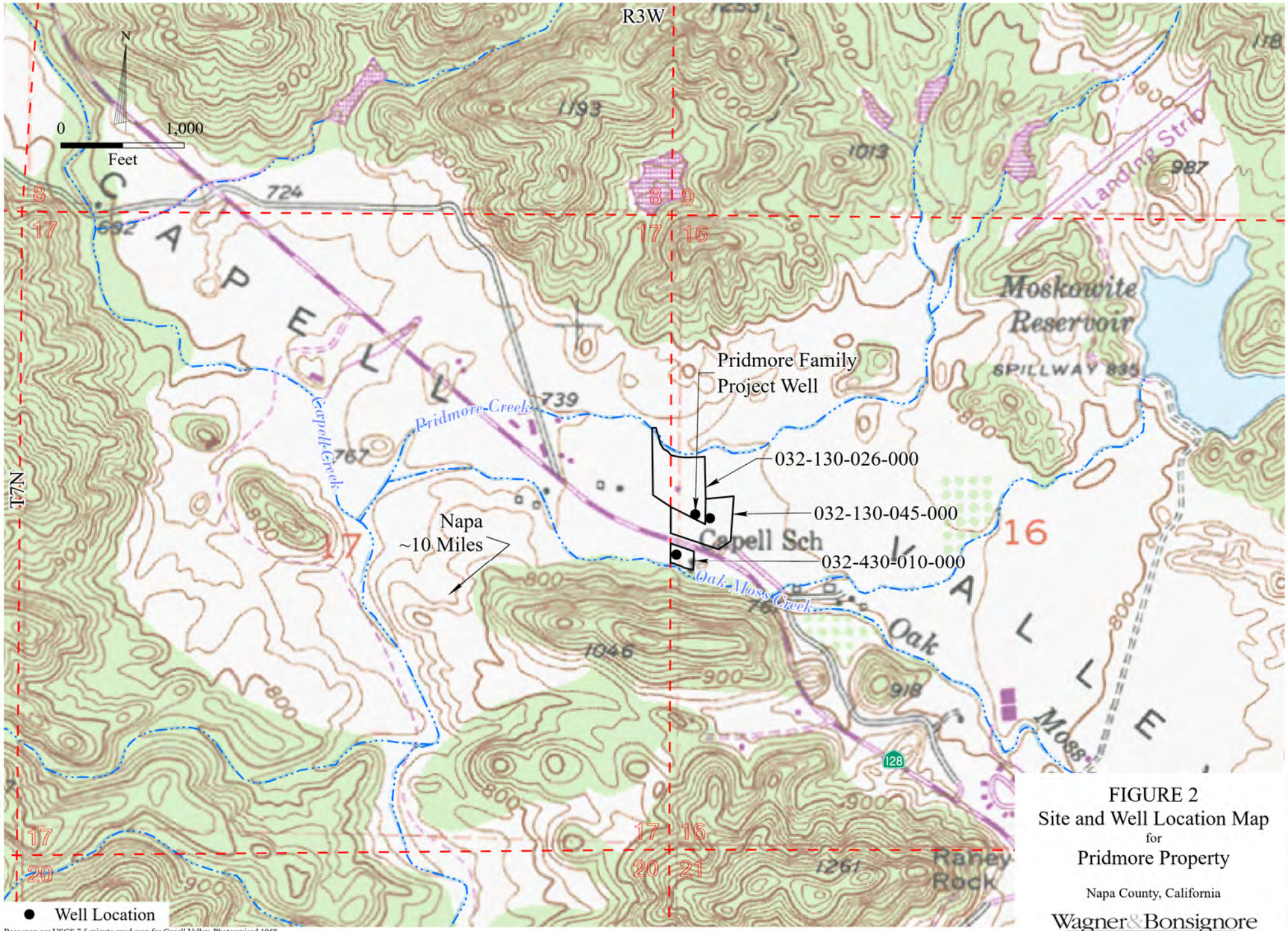


FIGURE 2
Site and Well Location Map
for
Pridmore Property

Napa County, California

Wagner&Bonsignore
Consulting Civil Engineers, A Corporation

July 2023

Base map per USGS 7.5 minute quad map for Capell Valley, Photorevised 1968.
Streams from Napa County OpenGIS catalog, updated January 27, 2004 https://gis.napa.ca.gov/giscatalog/catalog_xml.asp?srch_opt=all&db_name=x&theme=x&sort_order=layer&meta_style=fgdc&submit=Submit , accessed June 7, 2023.
Projected Sections per California Department of Conservation; California Geologic Energy Management Division (CalGEM, formerly DOGGR); Bureau of Land Management; California Department Pesticide Regulation, January 2021.
Parcel Boundaries per Napa County OpenGIS catalog, updated March 16, 2023, https://gis.napa.ca.gov/giscatalog/catalog_xml.asp?srch_opt=all&db_name=x&theme=x&sort_order=layer&meta_style=fgdc&submit=Submit , accessed June 12, 2023.
Roads per Napa County OpenGIS catalog, updated March 16, 2023, https://gis.napa.ca.gov/giscatalog/catalog_xml.asp?srch_opt=all&db_name=x&theme=x&sort_order=layer&meta_style=fgdc&submit=Submit , accessed June 7, 2023.

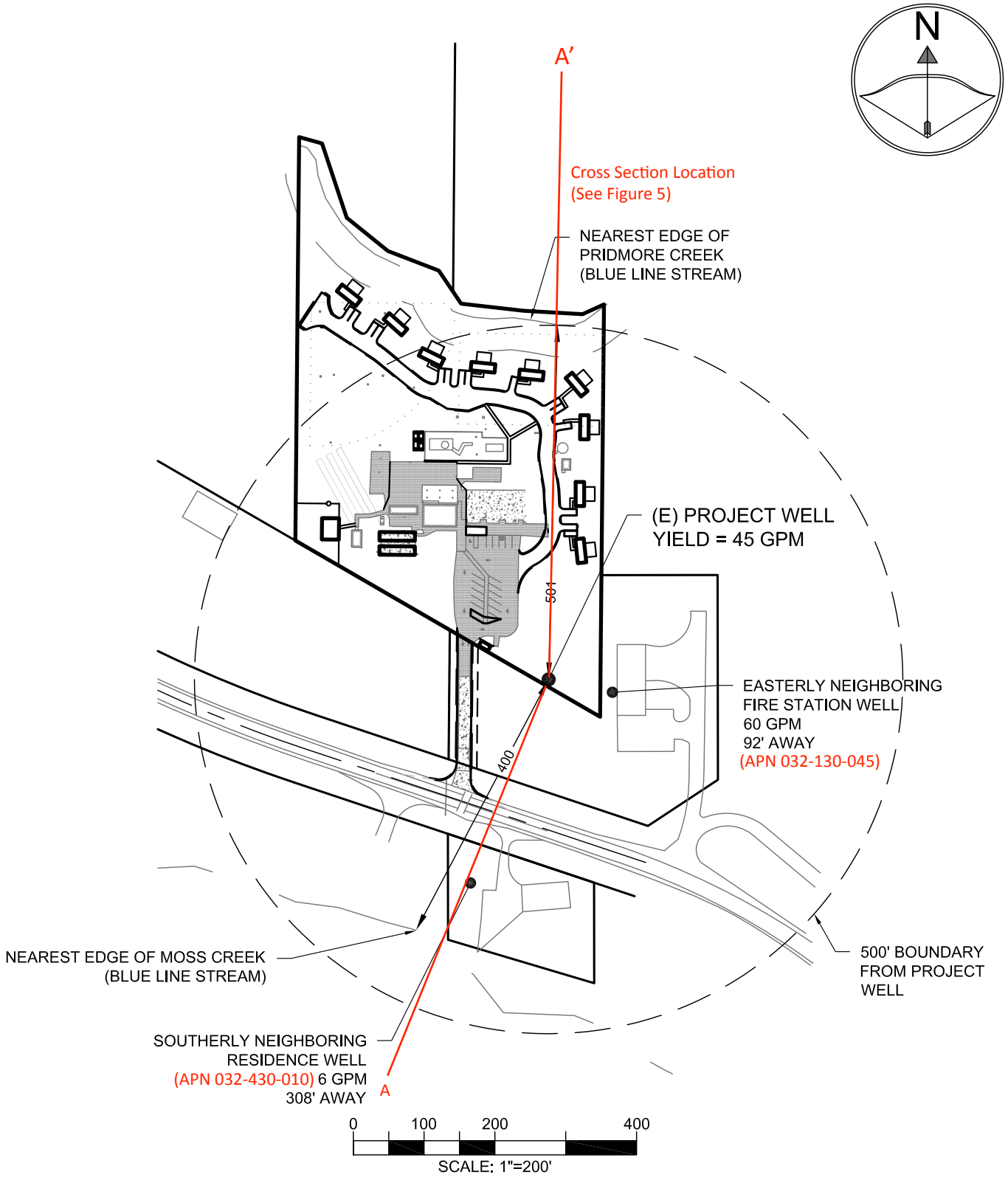


FIGURE 3

WELL LOCATION MAP

SHEET: 1 OF 1

PROJECT INFO:

PRIDMORE PROPERTY
(FORMALLY CAPELL
VALLEY SCHOOL)
1191 CAPELL VALLY ROAD
NAPA, CA 94558
032-130-026

PREPARED BY:

CMP CIVIL ENGINEERING &
LAND SURVEYING INC.
1607 CAPELL VALLEY ROAD
NAPA, CA 94558
(707) 266-2559

P #: 00055 DATE: 04/05/2022

CMP
CIVIL ENGINEERING & LAND SURVEYING

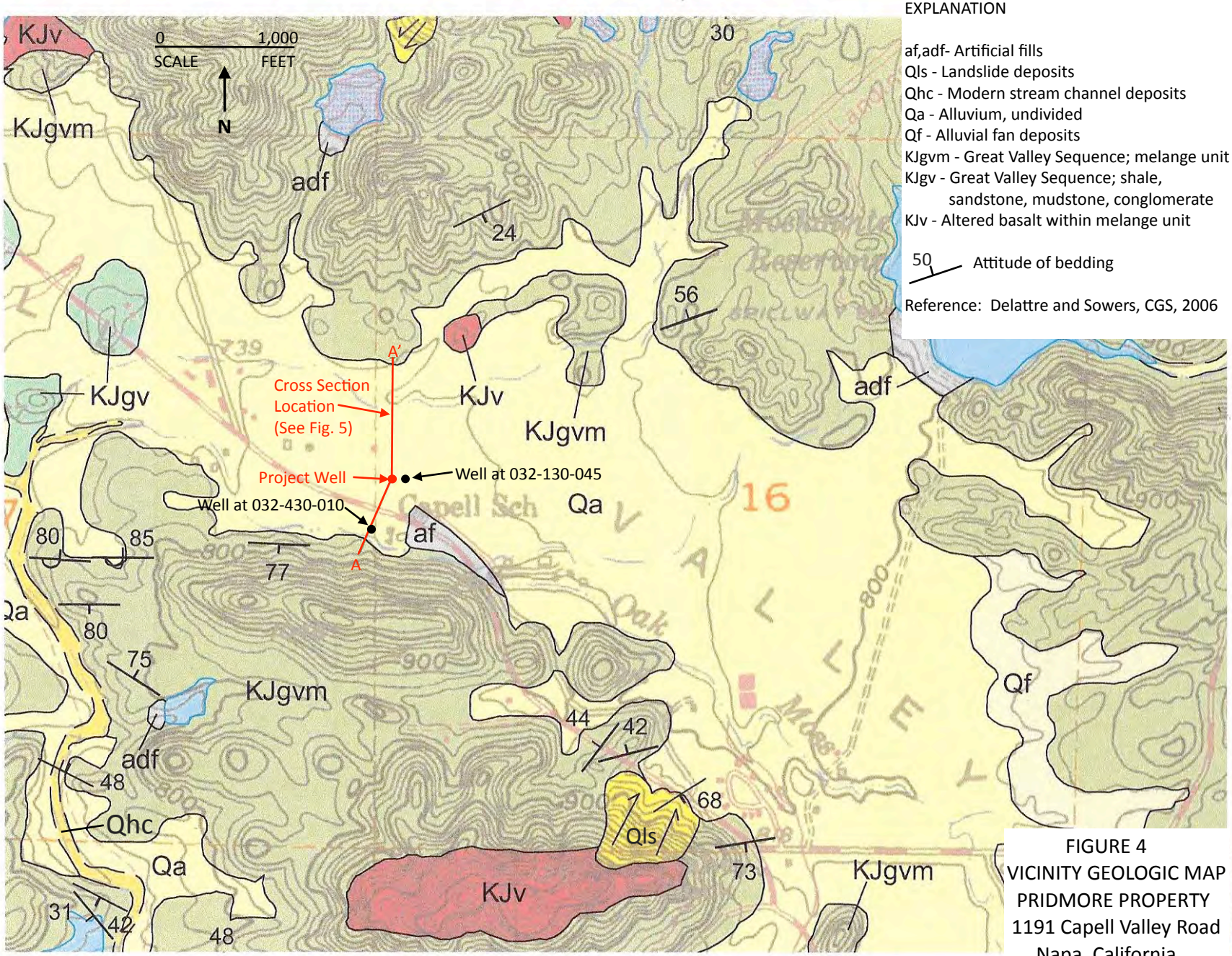


FIGURE 4
VICINITY GEOLOGIC MAP
PRIDMORE PROPERTY
1191 Capell Valley Road
Napa, California

Text

Text

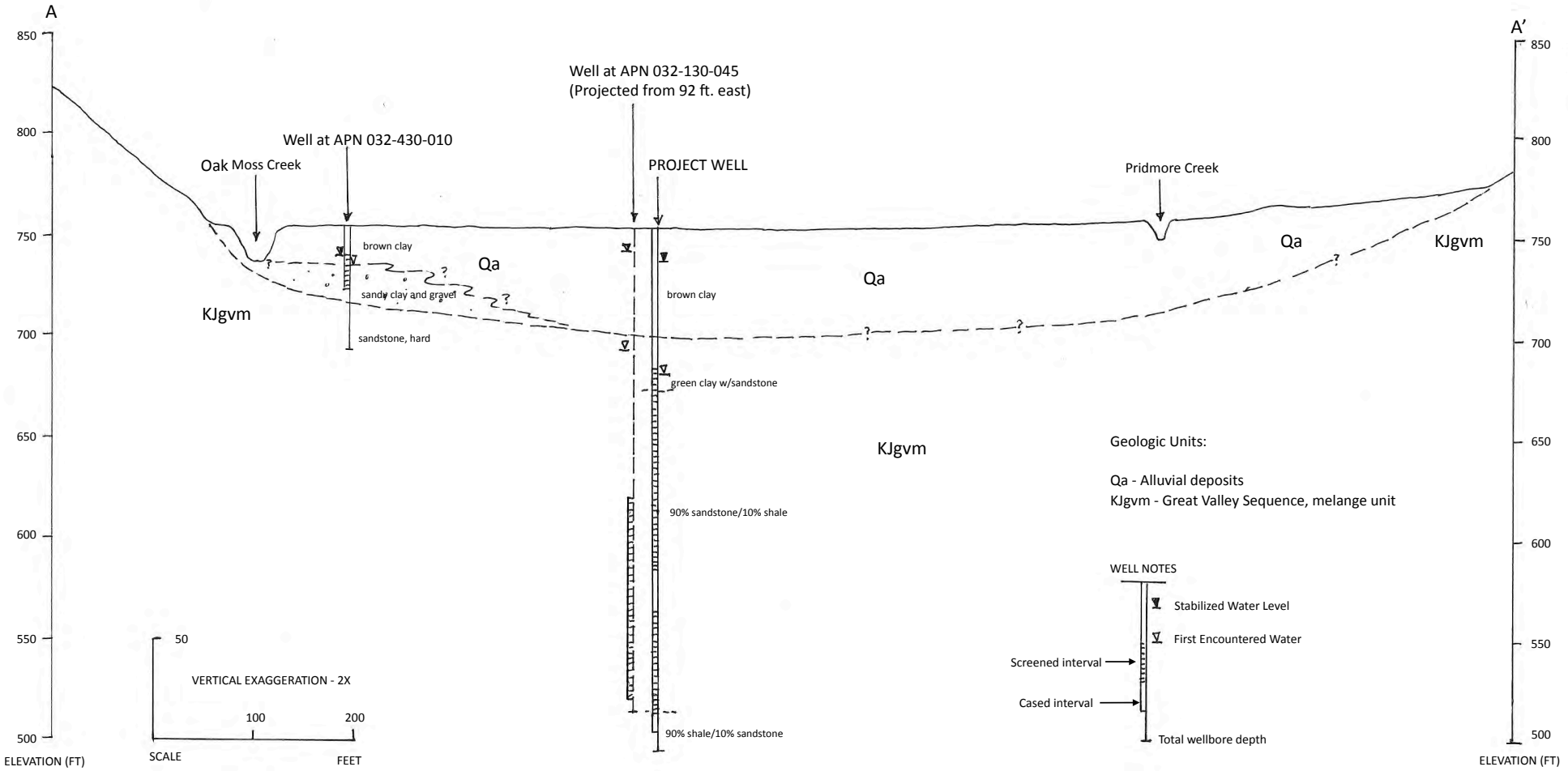


FIGURE 5
CROSS SECTION A - A'
PRIDMORE PROPERTY
1191 Capell Valley Road
Napa, California

ATTACHMENT 1 - PROJECT WELL

9A 12/6/06

ORIGINAL
File with DWR

Page 1 of 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. e039625

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./ STATION NO.
LATITUDE LONGITUDE
APN/TRS/OTHER

Owner's Well No. 1-'06
Date Work Began 6/29/2006, Ended 7/13/2006
Local Permit Agency Napa County Environmental Mgmt
Permit No. E06-01092 Permit Date 6/28/2006

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD ROTARY FLUID BENTONITE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
0	54	BROWN CLAY
54	80	GREEN CLAY WITH SANDSTONE
80	250	90% SANDSTONE/ 10% SHALE
250	260	90% SHALE & CLAY/ 10% SANDSTONE

TOTAL DEPTH OF BORING 260 (Feet)
TOTAL DEPTH OF COMPLETED WELL 250 (Feet)

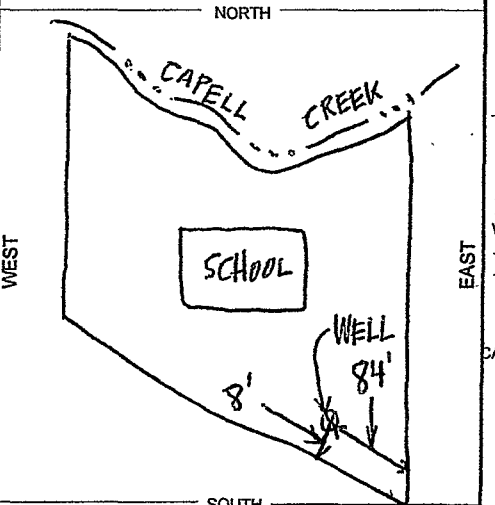
WELL OWNER

Name [redacted] Valley Unified School District
Mailing Address [redacted] Lincoln Avenue
[redacted] CA [redacted] 94558
CITY STATE ZIP

WELL LOCATION

Address 1191 Capell Valley Road
City Napa CA
County Napa
APN Book 032 Page 130 Parcel 026
Township ___ Range ___ Section ___
Latitude ___ DEG. ___ MIN. ___ SEC. ___ DEG. ___ MIN. ___ SEC.

LOCATION SKETCH



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
___ MONITORING
___ TEST WELL
___ CATHODIC PROTECTION
___ HEAT EXCHANGE
___ DIRECT PUSH
___ INJECTION
___ VAPOR EXTRACTION
___ SPARGING
___ REMEDIATION
___ OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 70 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 15 (Ft.) & DATE MEASURED 7/13/2006
ESTIMATED YIELD * 45 (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 3 (Hrs.) TOTAL DRAWDOWN N/A (Ft.)
May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	260	12								
0	70		✓				PVC F480	6	SDR-21	
70	170			✓			PVC F480	6	SDR-21	.032
170	190		✓				PVC F480	6	SDR-21	
190	250			✓			PVC F480	6	SDR-21	.032

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	5	✓			CONCRETE
5	22		✓		GROUT
22	55	✓			CEMENT
55	250			✓	#6 SAND

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ 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 HUCKFELDT WELL DRILLING, INC.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
2110 Penny Lane Napa CA 94559
ADDRESS CITY STATE ZIP
Signed [signature] 07/14/06 439-746
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

CAPELL SCHOOL WELL YIELD

DAVE BESS PUMP & WELL
LIC.# C-57-C-10 487027

1115 MT GEORGE AVE.
NAPA, CALIF. 94558
707-226-2539 / 253-0574

WATER WELL TEST
REPORT # W-17-039

LOCATION (well address): 1191 Capell Valley Rd Napa CA Date 05Oct2017
TEST REQUESTOR: Gil Pridmore

SURFACE INSPECTION

CASING DIA. 6" pvc EST. AGE OF WELL 12 Years (Per Well Log) DEPTH OF WELL 250' (Per Well Log)
SANITARY SEAL (functional) PIPING SYSTEM (functional) ELECTRICAL SYSTEM (functional)
PRESSURE TANKS (functional)
WELL SIZE OF PUMP 2 (HP)
OPERATING VOLTS: 239 AMPS: R: 2.8 B: 9.5 Y:P 10.0

FLOW TEST DATA

METHOD OF TEST: 2 HOUR OPEN FLOW DISCHARGE TEST USING THE INSTALLED PUMP AND EXISTING EQUIPMENT. (TEST EQUIPMENT USED), 2" FLOW METER, 2" THROTTLING DISCHARGE VALVE, 0/200 PRESSURE GAGE AND A POWERS WELL DEPTH STATIC METER.

TIME	RATE (GPM)	WATER LEVEL
14:00	50	20ft
15:20	43	56ft
15:40	43	61ft
16:00	43	61ft

STATIC LEVEL PRIOR TO TEST 20 FT STATIC LEVEL @ END OF TEST 61 FT
TOTAL DRAW DOWN DURING THIS TEST WAS 41 ft
(AVG.)GALLONS PER MIN. 44.75 FOR 2 HOURS OF TESTING.

GENERAL COMMENTS

Well and well equipment in working order @ time of testing. The well fills a storage tank and is pressurized from the storage tank with 2 Goulds Booster pumps One ¾ HP (HB707) and 1 1hp (HB2510). Pressure Tanks are showing signs of deterioration (Rusting) and should be replaced. It seems that all controls are low voltage. The water is treated with a Culligan system, it is unknown if its operational or being serviced. Some information was taken from the well completion report Dated 6/28/2006 Log #e039625. Pump Depth is unknown at this time. Flow Meter Installed after the Booster pumps reads 5155799 Gallons.

TEST CONDUCTED BY: _____ DATE: 08Oct2017
(optional) Bacteria sampled Yes __ No X Chemical sampled: Yes __ No X

ATTACHMENT 2

OSE Inverse Theis Calculator

This application allows one to input 5 of the following 6 parameters to predict the 6th (with the exception of Transmissivity): Transmissivity (select units of gpd/ft or ft^2/d); Storage Coefficient; Time (years) since the beginning of pumping; pumping rate (select units of gpm or acre-feet/yr); Distance (select units of feet or miles) from the pumping well; and Drawdown (ft) at the given distance. You cannot solve for Transmissivity because for most sets of parameter values, there is not a unique solution for Transmissivity.

Please select the parameter to be determined and enter the the other parameter values:

Transmissivity	2100	◉ gpd/ft	○ ft^2/d
◉ Storage Coefficient			
○ Pumping Rate	43	◉ gpm	○ acre-ft/yr
○ Time	0.046	○ years	◉ days
○ Distance	120	◉ feet	○ miles
○ Drawdown (feet)	0.01		

Calculate **The Storage is 0.0140**

Notes:

- If using Internet Explorer, you may need to click the button at the bottom of the window to "Allow blocked content". Another option is to change your IE security settings to "Allow active content to run in files on My Computer".
- If you have problems or detect errors with this program, please contact the webmaster.
- Disclaimer: This application uses numerical algorithms to estimate output values. OSE has attempted to ensure that these algorithms and code are error free, but makes no such guarantee. The user should attempt to verify the results. Anyone utilizing the output of this program does so at their own risk.
-

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ATTACHMENT 3 - STRMDEPL08

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Michigan Water Science Center

Michigan Water Science Center ◆ Water Resources Ground Water Software

The Web-Based STRMDEPL08 evaluates four analytical solutions that simulate streamflow depletion by a nearby pumping well. It is based on STRMDEPL08 (**Reeves, 2008**) and the earlier STRMDEPL (**Barlow, 2000**). These two earlier programs are written in Fortran, require text input files, and produce tabular output. The web-based version was written to provide an easier interface to the analytical solutions with more convenient units and simplified output. (**View more...**)

Calculate Streamflow Depletion by Nearby Pumping Well

Fully penetrating stream with no streambed resistance (Jenkins, 1968)

Distance (ft):	
Transmissivity (ft2/day):	
Storage Coefficient:	
Pumping Rate (gpm):	
Days of Pumping:	

Fully penetrating stream with streambed resistance (Hantush, 1965)

Distance (ft):	
Transmissivity (ft2/day):	
Storage Coefficient:	
Streambed Leakance (ft):	
Pumping Rate (gpm):	
Days of Pumping:	

Partially penetrating stream with streambed resistance (Hunt, 1999)

Distance (ft):	
Transmissivity (ft2/day):	
Storage Coefficient:	
Streambed Conductance (ft/day):	
Pumping Rate (gpm):	
Days of Pumping:	

Partially penetrating stream in an aquitard overlying a pumped aquifer (Hunt, 2003)

Distance (ft):	400
Transmissivity (ft2/day):	281
Storage Coefficient:	0.014
Specific Yield of Aquitard:	0.01
Hydraulic Conductivity of Aquitard (ft/day):	0.01
Stream Width (ft):	30
Thickness of Aquitard (ft):	30
Distance from Streambed to Bottom of Aquitard (ft):	10
Pumping Rate (gpm):	43
Days of Pumping:	1

Units used

- ft: foot
- ft2/day: square foot per day
- gpm: gallons per minute
- ft/day: foot per day
- Note, 1 cubic foot per second = 448.8 gallons per minute

Day	Stream Depletion (cubic foot per second) 1 cubic foot per second=448.8 gallons per minute
1	0.0000