STETSON
ENGINEERS INC.

TECHNICAL MEMORANDUM

2171 E. Francisco Blvd., Suite K • San Rafael, California • 94901
TEL: (415) 457-0701 FAX: (415) 457-1638 e-mail: allanr@stetsonengineers.com

TO: Megan Alton, Marin County Planner
Community Development Agency

DATE: September 19, 2022

FROM: Allan Richards, P.E.
Miles McCammon, P.G.
Stetson Engineers Inc.

JOB No: 2834

RE: Stinson Beach County Water District Coastal Permit, Project ID P3489
Ranch Tank Replacement Well No. 2 – Cone of Depression Analysis

Introduction

This Technical Memorandum provides information regarding the Ranch Tank Replacement Well No. 2 ("Replacement Well") that was constructed by Weeks Well Drillers ("Weeks") for the Stinson Beach County Water District ("District") in March 2022. The Replacement Well was constructed to replace the existing well at that location (Ranch Tank Well No. 1). The need to replace the existing well is urgent because it is failing, and the on-going drought conditions have significantly reduced surface water resources that the District uses in conjunction with well water to provide safe and reliable drinking water to the Community of Stinson Beach.

The Technical Memorandum compares differences between the existing well and the Replacement Well pertaining to the construction of the wells, the source of water bearing zones that the wells pump water from, and describes the results of a "cone of depression analysis" based on the differences between the existing well and the Replacement Well. The cone of depression analysis was requested by the Marin County Planning Department (Ms. Megan Alton) in an email to the District's General Manager (Mr. Ed Schmidt) on August 18, 2022. The analysis was requested to supplement information that was most recently submitted by the Stinson Beach County Water District on July 28, 2022 to support its Coastal Development Permit for the Ranch Tank Replacement Well No. 2 (Project ID P3489).

The analysis conducted and described in this study indicates that the operation of the Replacement Well would have less of a potential effect on coastal resources than operation of the existing well that is being replaced.

Historical and Planned Operation of Wells

The District has a diverse portfolio of water supply sources, including both surface water and groundwater, that it manages conjunctively. Historical operations of the Ranch Tank Well No. 1 and planned operation of the Replacement Well have been, and are intended to be, on an intermittent and as needed basis. Typically, the District prefers to utilize surface water sources when available, as these sources can be accessed by gravity, and therefore do not have the energy costs associated with pumping water. In general, the historical use of the existing Ranch Tank Well No. 1 has occurred during dry or drought conditions when other preferred sources are limited. In those conditions, well operations tend to be intermittent which reduces the potential for impacting local resources.

Description of the Area where the Existing Well and Replacement Well are Located

The well being replaced (Ranch Tank Well No. 1) and the Replacement Well are both located in Stinson Gulch at a site that is referred to as the Ranch Tank Site. **Attachment A** is a map showing the existing Ranch Tank Well No. 1, the Ranch Tank Replacement Well No. 2, and their locations relative to the Stinson Gulch Creek. Elevation contours shown on Attachment A are relative an arbitrary datum that is based on an elevation of 100 feet for the concrete foundation of the Ranch Tank (a 410,000 gallon raw water tank). Stinson Gulch Creek is located to the north of the wells and is steeply flowing to the southwest. Based on the survey in Attachment A, the thalweg or lowest point on the centerline of the Stinson Gulch Creek is at about 20 feet below the ground surface elevation of the wells at the Ranch Tank Site. The Ranch Tank Site also includes a pump house, storage, and other utility sheds. There are no other nearby wells that would be impacted by either the existing well or the Replacement Well.

The area of the Ranch Tank is geologically mapped as the Franciscan complex. This geologic formation is Cretaceous aged (66–145-million-year-old) assemblage of metamorphosed and deformed rocks including hard rocks of shales and conglomerates composition that formed in an accretionary wedge. The San Andreas fault zone is located a third of a mile to the west, and movement along the San Andreas fault is a potential source of fractures.

Wells drilled in hard rock may produce water if the drilling penetrates rock formations containing fractures or faults that bear water. Rock formations that do not contain any significant fracturing or faulting typically do not yield very much water, or no water at all. Hard rock formations without faults or fractures may also serve as an impermeable barrier to the vertical flow of groundwater. The impermeable barriers to vertical flow created by hard rock formations can serve to provide a protective barrier from surface water infiltration into the deeper groundwater aquifer, thereby protecting the aquifer from surface water influences and potential contaminants in surface water sources that may be present near the well.

All of Stinson Beach is located outside of the California's 515 groundwater basins defined by the Department of Water Resources (DWR) Bulletin 118. A groundwater basin is an aquifer or stacked series of aquifers with reasonably well-defined boundaries in a lateral direction with definable bottom.[1] The water bearing fractures that are the well targets for the District do not meet these definitions. The water pumped from the existing well and the Replacement Well would likely be considered "percolating groundwater" and not be classified as groundwater in a subterranean stream flowing through a known and defined channel, using State Water Resources Control Board terminology.

Existing Ranch Tank Well No. 1

The existing Ranch Tank Well No. 1 was drilled in 1981 in response to critical drought years that were experienced in the late 1970s. The steel casing is failing and unrepairable based on a recent inspection that was performed by Weeks. The existing well was constructed over 40 years ago and it has reached the end of its useful life as a source of water supply. This well is located approximately 72 feet from the centerline of Stinson Gulch Creek.

The Ranch Tank Well No. 1 was constructed with a 10-inch diameter borehole down to a depth of 193 feet. The driller's log describes the upper 11 feet as clay and rock, above hard shattered and weathered rock down to 77 feet. Below 77 feet, the well log indicates hard grey rock and shaley clay was encountered during drilling. The well was completed with steel casing diameter of 6.625 inches down to 116 feet, filter pack from 27 to 120 feet, and perforations as louvered slots between 35 to 115 feet. The static water level was at 23 feet below ground surface according to the 1981 well log.

The well yield in the well driller's report of the 1981 pump test was 48 gallons per minute ("gpm") with 75 feet of drawdown after 24 hours of pumping. However, pump tests conducted in 2002 showed a maximum pumping rate of 22 gallons per minute, and historically, the District could only produce about 25 gpm from the well. When the steel casing started to fail, the District was only able to produce about 5-7 gpm. The Well Driller's Log for the existing Ranch Tank Well No. 1 is provided in **Attachment B**.

Ranch Tank Replacement Well No. 2 ("Replacement Well")

The Replacement Well was drilled in 2022 in response to the determination that the existing Ranch Tank Well No. 1 was no longer usable as a long-term reliable water supply, and in response to the ongoing drought conditions. The Replacement Well is located approximately 43 feet northeast of the existing well, at about the same land surface elevation, and approximately 96 feet from the centerline of Stinson Gulch Creek.

The Replacement Well was drilled with a 12.5-inch diameter borehole down to a depth of 240 feet. As indicated in the Well Completion Report, the well drilling encountered clay and rock down to 16 feet, followed by several thick layers of hard rock formations without fractures near the ground surface down to a depth of 55 feet. Below 55 feet, there were several zones of

[1] Title 23, Division 2, Chapter 1.5, Subchapter 1, Article 2, Section 341(g)(1) of the California Code of Regulations

loose mixed angular rocks, or fracture zones. Static water was measured at a depth of 46 feet. The well was completed with PVC well casing with a diameter of 6.625 inches down to 237 feet. Conductor casing was installed down to 20 feet, a cement sanitary seal was installed down to 50 feet, and 7-foot bentonite seal was included down to a depth of 57 feet below the ground surface. A #6 sand filter pack was installed from 57 to 240 feet. Between 67 and 227 feet, four screened intervals were set based on the locations of rock fractures that could potentially bear water.

Based on the Geologic Log and discussions with the well drillers during construction of the Replacement Well, it is believed that most of the water produced from the Replacement Well exists in the water-bearing formations that are below 187 feet from the ground surface. The placement of the well pump in the casing at a depth of 230 was intended to optimize the ability to efficiently pump water from the deeper water bearing formations. The well yield in the well driller's report of the 2022 pump test was at 50 gpm resulting in 94 feet of drawdown after 8 hours of pumping. **Attachment C** includes the well log for the Replacement Well.

Comparisons of Ranch Tank Well No. 1 and Replacement Well

Despite being located very close to each other (about 43 feet apart), there are some noticeable differences between the two wells based on their well completion reports. Both are generalized as clayey layer with rocks at the surface, above some weathered or shattered rocks, above hard blue gray rocks. Both wells indicate angular, brecciated, or fractured rock, and most groundwater is located in these fractured zones. A potential source of fracturing is movement from the San Andreas fault zone, which is located less than a mile west of the site.

Several features of the well completion reports specifically indicate that there is less of a potential hydraulic connection between the Replacement Well and the nearby Stinson Gulch Creek, as compared to the existing Ranch Tank Well No. 1 and the Stinson Gulch Creek. The following facts would indicate that, under similar operations, the Replacement Well would have less of a potential effect on coastal resources than operation of the existing well that is being replaced:

- The primary water production zone for the Replacement Well is expected to be from the lowermost fracture zone, which is located below a 37-foot thick layer of hard unfractured rock;

- The deep fracture zone that is expected to produce most of the water from the Replacement Well is below the bottom of the borehole associated with the Ranch Tank Well No. 1;

- The static water level in the Ranch Tank Well No. 1 well was at a depth of 23 feet below the ground surface which is similar to the elevation of the nearby Stinson Gulch Creek at its closest location. Whereas, the static water level measured in the Replacement Well was twice as deep (46 feet below ground surface). This much deeper static water level indicates that the Replacement Well is less likely to be in hydraulic connection with the Stinson Gulch Creek relative to the Ranch Tank Well No. 1;

- The pump test drawdown at the Replacement Well was significantly greater over a shorter period of time (94 feet of drawdown in 8 hours). Whereas the drawdown during the pump test on the Ranch Tank Well No. 1 was 75 feet over 24 hours. This indicates that the formations that the Replacement Well was drawing water from were unable to provide the same rate of replenishment to the well as compared to the Ranch Tank Well No. 1 which is another indicator that the Replacement Well would have less of a potential effect on the Stinson Gulch Creek than the well being replaced;

- The dense conglomerate above the sanitary seal in the Replacement Well potentially acts as a better barrier to interaction with nearby surface water;

- The Replacement Well is further away from the Stinson Gulch Creek than the Ranch Tank Well No. 1, so that the effects of similar pumping, if it was occurring in a similar fracture zone, would be expected to be reduced and delayed.

Cone of Depression Analysis

As part of the filings for Project ID P3489, on February 25, 2022 Marin County cited "Marin County Local Coastal Program, Implementation Plan Section 22.64.140 and Policy C-PFS-13" as the basis for a request for the District to "…*provide professional engineering or other studies demonstrate that groundwater or stream withdrawals will not have adverse direct or cumulative impacts on coastal resources, including groundwater basins, aquifers, and streams, and include as necessary any other hydrologic studies*." As identified by the District's environmental consultant (WRA) in a response letter dated June 27, 2022, the two cited policies are for <u>new</u> water sources serving five or more parcels and are not applicable to this project which is for <u>replacement</u> of an existing water source. Notwithstanding WRA's points regarding the applicability of the cited policies, a cone of depression analysis was conducted in accordance with the Marin County Planning Department's request.

The cone of depression is the area where the groundwater pressure is lowered due to the production of water from a pumping well. Where an aquifer is laterally extensive, has homogeneous and isotropic properties, and does not have preferential flow directions, pumping water from a well in the aquifer would result in a conical shape (unless there is a source of recharge into the cone of depression area). Under these ideal conditions, the shape of the cone of depression can be predicted relatively accurately with a few other assumptions for the aquifer properties and the rate of pumping. However, in the Ranch Tank area the existing well and the Replacement Well are both constructed in, and pumping water from, fracture zones in hard rock. Fractured rock has complex geometries, and as such, the cone of depression analysis that is conducted for this study (using the Theis equation) should be considered a qualitative assessment.

Based on the available pump test parameters, transmissivity was calculated for each of the two wells. **Table 1** summarizes the properties of the wells used in the cone of depression calculations. The calculated transmissivity is within published ranges of fractured metamorphic rocks.[2] Both wells were assumed to be primarily confined conditions, so a storage coefficient of 0.001 consistent with confined conditions was assumed. A larger storage coefficient is typical of unconfined conditions and would result in less drawdown. Additionally, these calculations assumed no natural subsurface movement of water, meaning a flat aquifer gradient was assumed.

Table 2 shows the calculated drawdown at the radius of influence that would extend to Stinson Gulch Creek resulting from the pumping wells.

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[2] Ralph C. Heath. (2004) Basic Ground-Water Hydrology. Water Supply Paper 2220. Revised. Tenth Printing. United States Geological Survey. 86pg. DOI: 10.3133/wsp2220.

***Table 1** Well Completion Report Pump Test Parameters*

Well	Test Rate	Test Duration	Drawdown	Estimated Transmissivity	Distance to Stinson Gulch Creek
	(gpm)	(hours)	(feet)	(gal/day)/ft	(ft)
Ranch Tank Well No. 1	48	24	75	920	72
Replacement Well	50	8	94	770	96

***Table 2** Cone of Depression, Calculated Drawdown (feet) at Stinson Gulch Creek Radius, assuming confined aquifer conditions.*

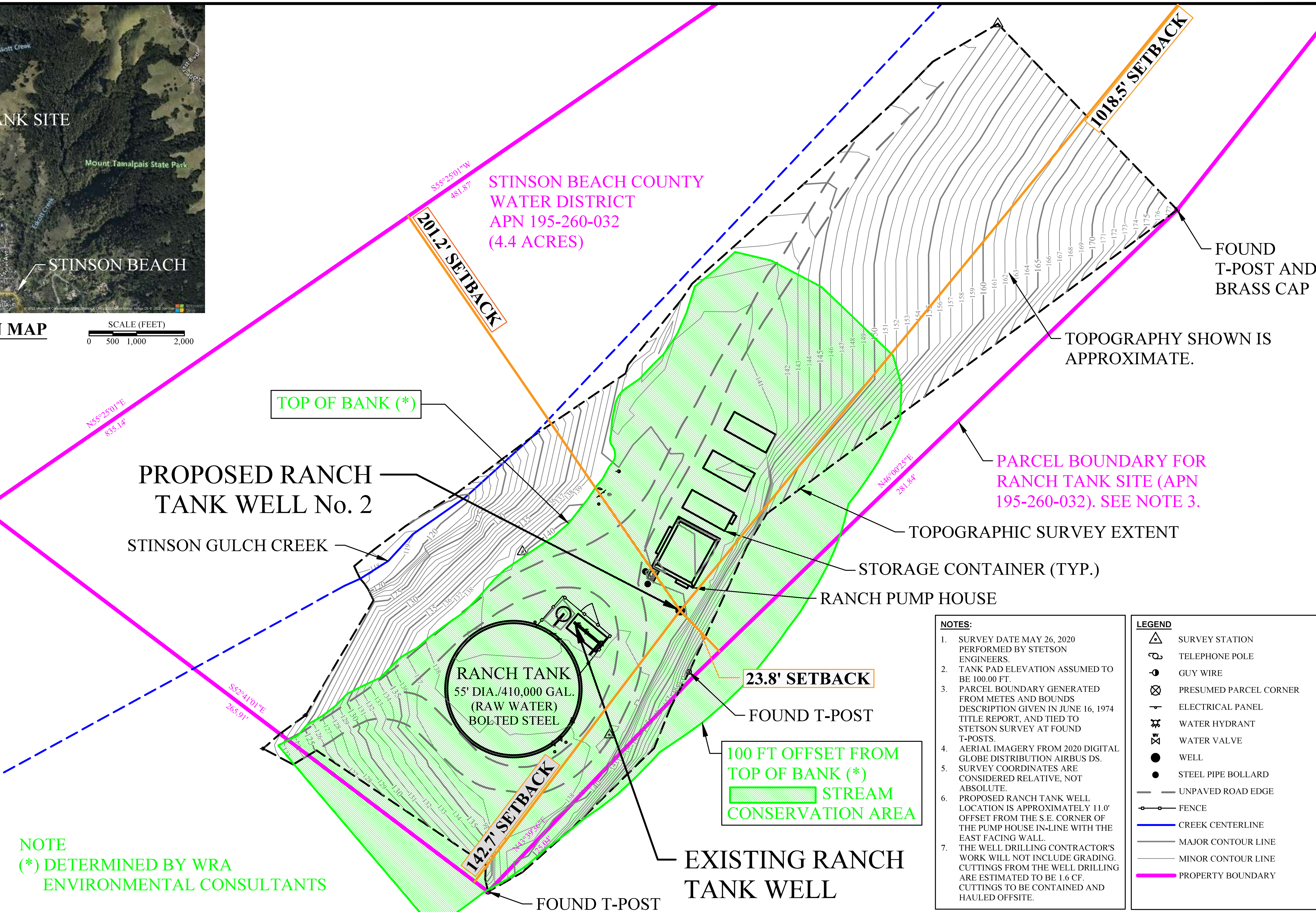
Time Pumped	**0.5 Days**			**1 Days**			**1.5 Days**		
Average Pumping Rate (GPM)	**5**	**10**	**50**	**5**	**10**	**50**	**5**	**10**	**50**
Drawdown from Existing Ranch Tank Well No. 1	2.06	4.11	20.57	2.48	4.96	24.82	2.73	5.47	27.33
Drawdown from Replacement Well	1.91	3.83	19.15	2.41	4.83	24.14	2.71	5.42	27.10
Difference	**0.15**	**0.28**	**1.42**	**0.07**	**0.13**	**0.68**	**0.02**	**0.05**	**0.23**

The results of the cone of depression calculations, quantified in Table 2 above, represent a lowering of water pressure in the aquifer by the amounts shown. However, drawdown (reduction of pressure) determined by a cone of depression analysis in a fractured rock system would not necessarily correlate to a reduction of flow in the nearby creek. In a fractured rock system, the extent and direction of the fractures are not known, and potential pathways for water in the fractures to connect to streams are also unknown. The well logs for both wells indicate there are thick layers of hard rock that may act as barriers to vertical flow. For the Replacement Well, most of the productive fractures are below the bottom of the borehole associated with the Ranch Tank Well No. 1 and below a 37-foot-thick layer of unfractured hard rock.

Conclusion

The analysis conducted and described in this study indicates that the operation of the Replacement Well would have less of a potential effect on coastal resources than operation of the existing well that is being replaced.

SITE LOCATION MAP



NOTES:

1. SURVEY DATE MAY 26, 2020 PERFORMED BY STETSON ENGINEERS.
2. TANK PAD ELEVATION ASSUMED TO BE 100.00 FT.
3. PARCEL BOUNDARY GENERATED FROM METES AND BOUNDS DESCRIPTION GIVEN IN JUNE 16, 1974 TITLE REPORT, AND TIED TO STETSON SURVEY AT FOUND T-POSTS.
4. AERIAL IMAGERY FROM 2020 DIGITAL GLOBE DISTRIBUTION AIRBUS DS.
5. SURVEY COORDINATES ARE CONSIDERED RELATIVE, NOT ABSOLUTE.
6. PROPOSED RANCH TANK WELL LOCATION IS APPROXIMATELY 11.0' OFFSET FROM THE S.E. CORNER OF THE PUMP HOUSE IN-LINE WITH THE EAST FACING WALL.
7. THE WELL DRILLING CONTRACTOR'S WORK WILL NOT INCLUDE GRADING. CUTTINGS FROM THE WELL DRILLING ARE ESTIMATED TO BE 1.6 CF. CUTTINGS TO BE CONTAINED AND HAULED OFFSITE.

LEGEND

- SURVEY STATION
- TELEPHONE POLE
- GUY WIRE
- PRESUMED PARCEL CORNER
- ELECTRICAL PANEL
- WATER HYDRANT
- WATER VALVE
- WELL
- STEEL PIPE BOLLARD
- UNPAVED ROAD EDGE
- FENCE
- CREEK CENTERLINE
- MAJOR CONTOUR LINE
- MINOR CONTOUR LINE
- PROPERTY BOUNDARY

DESIGNED:	A.R.	No.	DATE	REVISION	BY	APPROVED
DRAFTED:	G.T.					
CHECKED:	___					

Stetson Engineers Inc.
2171 E. Francisco Blvd., Suite K
San Rafael, CA. 94901
(415) 457-0701

DRAFT

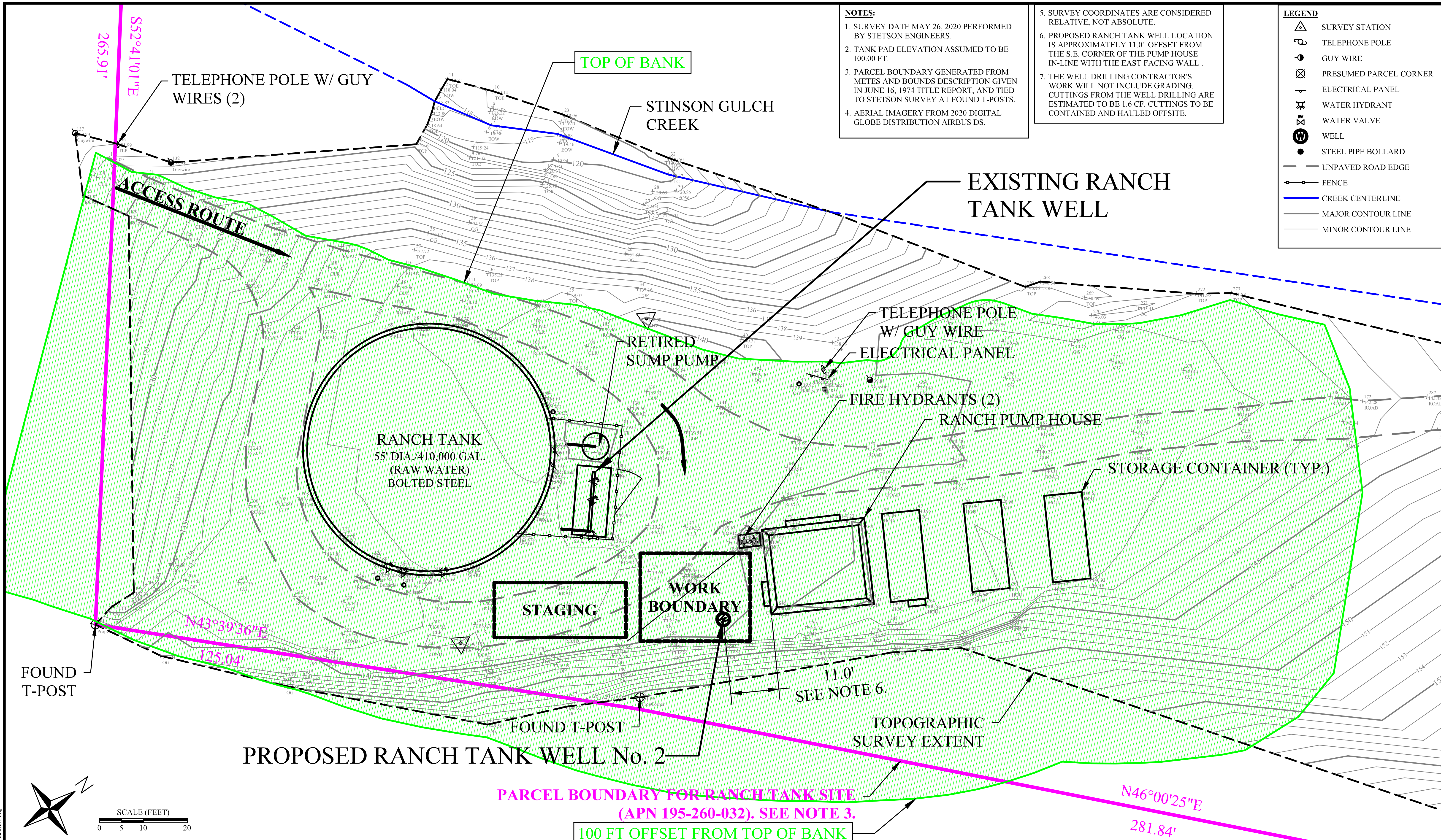
PROPOSED RANCH TANK WELL No. 2
STINSON BEACH COUNTY WATER DISTRICT
STINSON BEACH, CALIFORNIA

PROPOSED WELL LOCATION

DATE: MARCH 16, 2022
SCALE: AS INDICATED
PROJECT No.: 2834-001

SHEET 1 OF 2

F:\DATA\2834\AutoCAD\Ranch Tank Well No.2.dwg



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- GUY WIRE
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- WATER HYDRANT
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- WELL
- STEEL PIPE BOLLARD
- UNPAVED ROAD EDGE
- FENCE
- CREEK CENTERLINE
- MAJOR CONTOUR LINE
- MINOR CONTOUR LINE

No.	DATE	REVISION	BY	APPROVED

DESIGNED: A.R.
DRAFTED: G.T.
CHECKED: ___

Stetson Engineers Inc.
2171 E. Francisco Blvd., Suite K
San Rafael, CA. 94901
(415) 457-0701

DRAFT

PROPOSED RANCH TANK WELL No. 2
STINSON BEACH COUNTY WATER DISTRICT
STINSON BEACH, CALIFORNIA

PROPOSED WELL LOCATION

DATE: MARCH 16, 2022
SCALE: AS INDICATED
PROJECT No.: 2834-001

SHEET 2 OF 2

F:\DATA\2834\AutoCAD\Ranch Tank Well No.2.dwg

ATTACHMENT B

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

Do not fill in

No. 228948

State Well No.
Other Well No.

Intent No.
Permit Date

(1) OWNER: Name Stinson Beach County Water District
P. O. Box 245
Stinson Beach, CA Zip 94970

(2) LOCATION OF WELL (See instructions): Marin
Owner's Well Number Ranch Tank #1
Address if different from above Hwy.1, Stinson Beach

Township Range Section

Distance from cities, roads, railroads, fences, etc.

RANCH #1
6/21/01

WELL LOCATION SKETCH

(3) TYPE OF WORK:
New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:
Domestic ☐
Irrigation ☐
Industrial ☐
Test Well ☐
Stock ☐
Municipal ☒
Other ☐

(12) WELL LOG: Total depth 193 ft. Depth of completed well 116 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
		LOG OF RANCH TANK #1
0	6	Very hard boulders
6	11	Shaley brown clay and rock
11	16	Hard shattered rock
16	25	Hard weathered rock
25	77	Hard shattered multi-colored rock-mostly blues
77	176	Hard gray rock and talcy clay.
176	193	Very hard blue rock

(5) EQUIPMENT:
Rotary ☒ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) GRAVEL PACK:
Yes ☒ No ☐ Size Pea
Diameter of bore 10"
Packed from 27 to 120 ft.

(7) CASING INSTALLED:
Steel ☒ Plastic ☐ Concrete ☐

(8) PERFORATIONS:
Type of perforation or size of screen Roscoe Moss

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
	116	65/8	.188	35	115	.093
				Louvred slots		

(9) WELL SEAL:
Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 27 ft.
Were any strata sealed against pollution? Yes ☐ No ☐ Interval ft.
Method of sealing Concrete on pack

(10) WATER LEVELS:
Depth of first water, if known ft.
Standing level after well completion 23' ft.

(11) WELL TESTS:
Was well test made? Yes ☒ No ☐ If yes, by whom? Forster Eng.
Type of test Pump ☒ Bailer ☐ Air lift ☐
Depth to water at start of test 23 ft. At end of test 98 ft.
Discharge 48 gal/min after 24 hours Water temperature cool
Chemical analysis made? Yes ☐ No ☒ If yes, by whom?
Was electric log made? Yes ☒ No ☐ If yes, attach copy to this report

Work started April 27 19 81 Completed May 8 19 81

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED Gerald G. Thompson, By: Ward Thompson
(Well Driller)

NAME WEEKS DRILLING AND PUMP COMPANY
(Person, firm, or corporation) (Typed or printed)
Address P. O. Box 176
City Sebastopol, CA Zip 95472
License No. C57-177681 Date of this report June 10, 1981

(REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

State of California

Well Completion Report

Form DWR 188 Submitted 4/6/2022
WCR2022-003947

Owner's Well Number: RT W2 | Date Work Began: 03/16/2022 | Date Work Ended: 03/31/2022

Local Permit Agency: Marin County Environmental Health Services

Secondary Permit Agency: | Permit Number: TH/DW B28237 | Permit Date: 01/31/2022

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: STINSON BEACH COUNTY WATER DISTRICT,

Mailing Address: P.O. Box 24

City: Stinson Beach | State: Ca | Zip: 94970

Planned Use and Activity

Activity: New Well

Planned Use: Water Supply Public

Well Location

Address: 3785 Shoreline HWY

City: Stinson Beach | Zip: 94970 | County: Marin

Latitude: 37 Deg. 54 Min. 37.9439 Sec. N | Longitude: -122 Deg. 38 Min. 50.8632 Sec. W

Dec. Lat.: 37.91054 | Dec. Long.: -122.647462

Vertical Datum: | Horizontal Datum: WGS84

Location Accuracy: 10 Ft | Location Determination Method:

APN: 195-260-32

Township: 01 N

Range: 07 W

Section: 28

Baseline Meridian: Mount Diablo

Ground Surface Elevation:

Elevation Accuracy:

Elevation Determination Method:

Borehole Information

Orientation: Vertical | Specify:

Drilling Method: Direct Rotary | Drilling Fluid: Bentonite

Total Depth of Boring: 240 Feet

Total Depth of Completed Well: 237 Feet

Water Level and Yield of Completed Well

Depth to first water: (Feet below surface)

Depth to Static Water Level: 46 (Feet) | Date Measured: 03/31/2022

Estimated Yield*: 50 (GPM) | Test Type: Air Lift

Test Length: 8 (Hours) | Total Drawdown: 94 (feet)

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

Geologic Log - Free Form

Depth from Surface Feet to Feet		Description
0	7	Broken rock in brown clay
7	16	Tan clayey sand with broken rock
16	22	Gray fractured rock
22	30	Hard gray brown rock
30	38	Mixed rock conglomerate
38	44	Loose mixed rock
44	55	Dense gray conglomerate
55	65	Loose mixed rock, angular
65	87	Dense gray conglomerate rock with small fractures
87	105	Hard blue gray rock
105	134	Blue gray rock with some fractured zones
134	150	Blue gray rock with some fractured zones - fractures with soft white silty tuff
150	187	Hard blue gray with white rock
187	197	Soft light blue with white sandstone, some fractured

197	214	Blue sandstone with light colored silty tuff, dense
214	227	Fractured blue green with white rock
227	240	Blue green with white sandstone - some fractured zones

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	20	Conductor or Fill Pipe	Other	N/A	0.375	14			Steel
2	0	67	Blank	PVC	OD: 6.625 in. | SDR: 17 | Thickness: 0.390 in.	0.39	6.625			
2	67	87	Screen	PVC	OD: 6.625 in. | SDR: 17 | Thickness: 0.390 in.	0.39	6.625	Milled Slots	0.032	
2	87	107	Blank	PVC	OD: 6.625 in. | SDR: 17 | Thickness: 0.390 in.	0.39	6.625			
2	107	127	Screen	PVC	OD: 6.625 in. | SDR: 17 | Thickness: 0.390 in.	0.39	6.625	Milled Slots	0.032	
2	127	147	Blank	PVC	OD: 6.625 in. | SDR: 17 | Thickness: 0.390 in.	0.39	6.625			
2	147	167	Screen	PVC	OD: 6.625 in. | SDR: 17 | Thickness: 0.390 in.	0.39	6.625	Milled Slots	0.032	
2	167	187	Blank	PVC	OD: 6.625 in. | SDR: 17 | Thickness: 0.390 in.	0.39	6.625			
2	187	227	Screen	PVC	OD: 6.625 in. | SDR: 17 | Thickness: 0.390 in.	0.39	6.625	Milled Slots	0.032	
2	227	237	Blank	PVC	OD: 6.625 in. | SDR: 17 | Thickness: 0.390 in.	0.39	6.625			

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	20	Cement	Portland Cement/Neat Cement		Conductor Seal
0	50	Cement	Portland Cement/Neat Cement		Seal
50	57	Bentonite	Non Hydrated Bentonite		Seal
57	240	Filter Pack	Other Gravel Pack		#6 Sand

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	20	20
20	240	12.25

Attachments

195-260-32.pdf - Location Map

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name: WEEKS DRILLING AND PUMP CO
Person, Firm or Corporation

PO BOX 176	SEBASTOPOL	CA	94573-
Address	City	State	Zip

Signed	*electronic signature received*	04/06/2022	177681
	C-57 Licensed Water Well Contractor	Date Signed	C-57 License Number

DWR Use Only

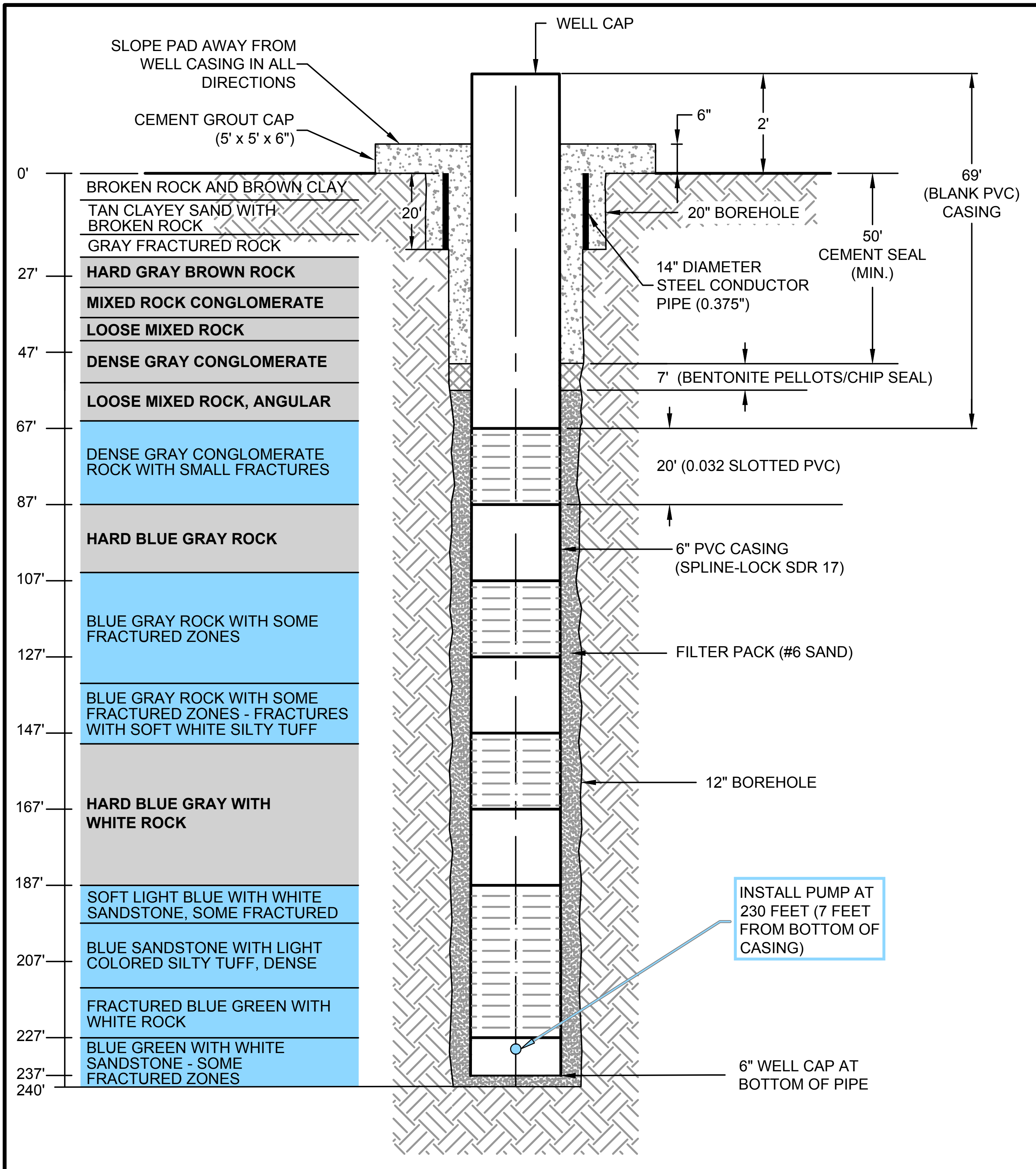
CSG #	State Well Number	Site Code	Local Well Number

N — Latitude Deg/Min/Sec

W — Longitude Deg/Min/Sec

TRS:

APN:



NOT TO SCALE

STETSON ENGINEERS INC
2171 E. Francisco Blvd., Suite K
San Rafael, California 94901
Tel: (415) 457-0701
Fax: (415) 457-1638

STINSON BEACH COUNTY WATER DISTRICT

RANCH TANK REPLACEMENT WELL No. 2
(AS-BUILT WITH GEOLOGY - 07/15/2022 - DRAFT)

F:\DATA\1925\RANCH TANK WELL NO. 2\AUTOCAD\AS-BUILT RANCH TANK WELL NO.2 (DETAIL).DWG