Appendix I

Groundwater Reports

KATHERMAN
EXPLORATION CO, LLC

Post Office Box 1812
Santa Maria, CA 93456
(805) 928-0223

ARCTIC COLD PROJECT AREA GROUND WATER ANALYSIS

BETTERAVIA AND ROSEMARY ROAD, SANTA BARBARA COUNTY, CA

Purpose

This ground water study and evaluation was prepared at the request of Fisher Construction Group, the project manager for the development of a fruit and vegetable processing and cold storage facility on the subject property and proposed future water system. The purpose of this evaluation is to analyze the current ground water conditions within the area surrounding and including the Arctic Cold parcel and determine the reliability of the area water aquifer(s) to service a proposed project water system with a long term supply of potable water. In addition this analysis should satisfy at least one of the requirements (adequacy of water supply) for permitting the project water with the County of Santa Barbara's Planning & Development and Environmental Health Services.

Location and Description

The Arctic Cold property is located approximately 1 mile east of the City of Santa Maria and can be reached via US Highway 101 South to the Betteravia Road exit, then east 1 mile to the intersection of Betteravia Rd. and Rosemary Road (Figures 1 & 2). The subject property is situated on the south side of Betteravia Road and is comprised of approximately 110 acres (Figure 3). The Assessor Parcel Numbers (APN) for the Arctic Cold parcel is 128-097-001 and -002 (Figure 4). The physical address of the parcel is 1750 East Betteravia Road, Santa Maria, CA 93454.

Lying within the east-central part of the Santa Maria Valley, the Arctic Cold property ranges in elevation from 295 to 310 feet above sea level (Figure 5). This parcel consists of mostly flat-lying terrain, where area land use is generally agricultural with a mix of row crops, livestock grazing and ag related warehouses. In addition there was oil and gas production on the subject land in the past, as the property is within the State designated Santa Maria Valley Oil Field.

There are active oil operations approximately ½ mile to the north and northwest of the Arctic Cold property. Parcel sizes typically vary in this region from 10 acres to 200 acres.

Area Geology and Hydrology

Geologically, the Arctic Cold property is situated along the northeast flank of the Santa Maria Basin, an east-west trending sedimentary trough containing as much as 15,000 feet of consolidated and unconsolidated sediments. Generally the consolidated rocks of the Pt. Sal, Monterey and Sisquoc Formations comprise nearly 90% of the overall sediment thickness in the basin. These Tertiary-aged units consist of fractured shales, claystones, siltstones and sandstones that are usually not of interest as water-bearing sediments for several reasons (Figure 6). One, they are typically deeply buried (>1200 feet). Two, these sediments have very low porosity, low permeability and therefore have limited fluid storage. And three, if any water is present in these older sediments, the water quality is usually very poor and very saline. Most often water from the older sediments requires treatment in order to be utilized as drinking water and/or irrigation water.

Overlying these older Tertiary sediments are the unconsolidated, water-bearing sediments of the Pliocene Careaga Formation and Plio-Pliestocene Paso Robles Formation, as well as the near surface Recent Alluvium (Figure 5&6). The Careaga Formation is a thick, continuous series of medium to very fine grained marine sands containing very few silt and/or clay beds, as is the case for the overlying Paso Robles. Typically 400-800 feet in thickness the Careaga is a primary source of ground water in the southern and eastern parts of the Santa Maria Basin. However, in much of the area within the north central part of the basin, including the area of the Arctic Cold project, the Careaga is often greater than 800 feet deep and therefore, has been more expensive to access (drill) and to produce from than the shallower aquifers. Consequently, there are very few if any area water wells producing from the Careaga Formation.

The main aquifers producing water in the Santa Maria Basin are within the Paso Robles Formation. Lying above the Careaga, the Paso Robles consists of the thick sequence (up to 1000 feet) of interbedded gravels, sands, silts and clays (Figure 7). Drilling through the Paso Robles section usually penetrates numerous water-bearing sands and gravels, typically 20-100 feet in thickness. Due to the fluvial nature (river-borne sediments) of the Paso Robles

Formation, these sands and gravels are very lenticular (laterally discontinuous) and can be difficult to correlate from one well to the next. Nevertheless, a majority of the water wells in the Santa Maria Plain Area, including the Arctic Cold property, are producing varying amounts of fresh water from only the Paso Robles.

Hydrologically, the subject property is located within the Santa Maria Plain Subbasin (Figure 8), the biggest subbasin within the larger Santa Maria Basin. This larger Santa Maria Plain Subbasin stretches from the San Rafael Mountains on the north, northeast to the Pacific Ocean on the west. The Santa Maria Plain Subbasin is confined only to the northeast and east by the older rocks of the San Rafael Range and to the south by the consolidated rocks of the Solomon Hills. This subbasin is in subsurface communication with the Nipomo Upland Subbasin to the northwest, and with the Orcutt Subbasin and Sisquoc Subbasin to the south.

Recharge to the Santa Maria Plain Subbasin is primarily from rainfall infiltration, infiltration from the Santa Maria and Sisquoc Rivers and from subsurface communication. Some replenishment is also occurring from stream and creek runoff and seepage into Bradley Canyon to the east. Irrigation infiltration and runoff are assumed to also contribute to recharge but to a lesser degree.

Existing Water Wells

Data on two existing water wells located on the Arctic Cold property have been examined. Both of the wells were drilled to extract water for agricultural irrigation (row crops). The oldest well, installed in April of 1969 by Longwell & Taylor Drilling, was drilled to a total depth of 600 feet. The well was subsequently completed with 14 inch steel casing to a depth of 590 feet (see Drillers Report in the Appendix). The production perforations are 3/8" slots consisting of four milled intervals from 375-404 feet, 430-456 feet, 462-510 feet and 575 to 590 feet. It doesn't appear as though there is gravel pack in the annular space around the casing. In addition the drillers report indicated that no sanitary seal was placed in the upper 20-50 feet of this well. Both the State of California and Santa Barba County now have regulations which post-date this well that require the placement of a sanitary seal on all wells regrading of use. After examining the cuttings descriptions in the drillers report, it appears as though the subject well penetrated a long section of Paso Robles from 20 feet to 600 feet, which is the total depth. The estimated

location of this well is somewhere within 50 feet of the western boundary of the parcel and approximately 1300-1400 feet south of East Betteravia Rd. This well appears to still be functioning at this point as a water supply well, even though it's 50 years old. A 24 hour pump test was performed on this well at a rate of 1350 gallons per minute (gpm). The static level before the pumping phase began was 202 feet, while the pumping fluid level was measured at 243 feet or a total drawdown of 41 feet. Consequently the specific capacity of the well is calculated at 33 gallons per foot of drawdown. In most cases a value for specific capacity of greater than 10 indicates that a well has very good water productivity. Since there is no indication of a pump depth or setting, it's impossible to know what the calculation is for the percent of total drawdown displayed by this well during testing. However, based on area knowledge of the surrounding wells I suspect that there was minimal impact to the well and the overall productivity of the aquifers even at this high production rate. In a recent write-up by Farm Credit in 2018 it is stated that this older well is now only 400 feet deep and has output of 250-350 gpm. This also fits with a description made by Sam Taylor of Taylor Drilling & Pump, who has done work on this well, that the well suffers from heavy corrosion on the 50 year old steel casing which has resulted in large holes in the casing wall. This ultimately causes the migration of fines (sediment) into the wellbore, not only resulting in fill accumulating in the bottom of the well but fines clogging and damaging the turbine or downhole pump. Either way the production capacity of this well will continue to decrease over time.

The second well appears to be located not far from the older well mentioned above. While the drillers report shows only a general location, the well is just north of the office building for the existing onsite cooler; nearly 1600-1700 feet south of East Betteravia Road. Drilled in April of 2004 by Ron Taylor Drilling, this well was constructed for the Newman Ranch on the subject parcel 128-097-001. Reaching a total depth of 620 feet, this well, like the older well, only penetrated sand and gravel aquifers within the Paso Robles Formation. The well was completed with 16 inch steel casing wih a ¼" wall thickness to a depth of 606 feet. The screened or milled interval is from 370 feet to 606 feet. The drilled borehole size is indicated as 26 inches. The Newman Ranch well was gravel packed with a filter sand of 1/4x8 from the well bottom up to a depth of 30 feet. A 30 foot cement sanitary seal was placed at the top of the gravel pack in the casing. A pump test was conducted on the well with a static water level prior to pumping at 189 feet. The test period was 12 hours at a flow rate of 1200 gallons per minute (gpm). The drawdown during the test was 71 feet and therefore the specific capacity

calculation is 17 gallons per foot of drawdown. Similar to the older well a determination of the percent of total drawdown can't be made without knowing the test pump setting. A short duration pump test run by M&W Pump in 2015 indicated that this well is producing at a rate of approximately 700 gpm with a drawdown of 37 feet. The static level was 251 feet and the pumping fluid level during the test was 288 feet. With the depth of the pump setting at 380 feet, the percent of total possible drawdown was 28.7% (37'/129').

Additional Area Water Wells

Three additional area water wells that are within ½ mile of the subject parcel were examined in detail with respect to their well designs and their pumping capacity. All of the wells were drilled within the last 6 years. The first well located on a 12 acre parcel (APN 128-093-012) directly west of the subject property was drilled in June of 2014 by Ron Taylor Drilling for Los Padres Farms. The total depth of this well was 640 feet and was consequently completed at a depth of 613 feet with 12 inch SDR21 PVC casing. The screened interval (perforations) was from 300 feet to 600 feet with a filter pack or gravel pack (8x16) placed in the annular space up to a depth of 50 feet where a cement sanitary seal was poured. A pump test of 8 hours was performed on this well at a stabilized rate of 850 gallons per minute (gpm). When the test began the static level was 248 feet. The pumping fluid level at the end of the test was 271 feet or a drawdown of 23 feet. Consequently, the specific capacity observed during this test was 37 gallons per foot of drawdown, a strong indication of a highly productive aquifer. No depth was given for the pump setting (see Parcel Maps in Appendix).

The second water well is situated to the north of the Arctic Cold property on parcel 128-096-016. The exact location of the well on this parcel is unknown. Drilled to a total depth of 700 feet by Ron Taylor Drilling in January of 2014, this well was constructed for OSR, Inc. The completion consisted of 16 inch SDR21 PVC casing run to 640 feet. The screened interval was from 290 to 630 feet with a 8x16 gravel or filter pack run from bottom to a depth of 50 feet. At 50 feet a cement sanitary seal was poured. A 12 hour test was conducted on the well resulting in a 1000 gpm flow rate over the duration of the test. The static level was 235 feet, while the pumping fluid level was 288 feet. Therefore, the total drawdown was measured at 53 feet with a calculated specific capacity of 19 gallons per foot of drawdown. From the description of the

drill cuttings and a geologic interpretation of the electric log, it appears as though this well also only penetrates the Paso Robles section.

The third well is directly north of the subject Arctic Cold property across Betteravia Road on parcel 128-093-019 (See Parcel Maps in Appendix). Like the two above mentioned wells, this water well was also drilled by Ron Taylor Drilling in September of 2016 for NRG Enterprises LP. Reaching a total depth of 660 feet, the well was completed with 16 inch SDR-17 PVC casing set at a depth of 640 feet. The screened interval or perforations are from 300 feet to 620 feet with a 8x20 gravel pack. The well also has 50 feet of 30 inch steel conductor pipe which contains the cement sanitary seal. A short duration test of only 3 hours resulted in a measured static level of 266 feet and a pumping fluid level of 320 feet at a flow rate of 1200 gallons per minutes (gpm). It is assumed that a longer test period would result in a slightly larger drawdown. Consequently, this well's specific capacity is 22 gallons per foot of drawdown with a drawdown during this short test of 54 feet. Geologically, from the description of the drill cuttings this well likely penetrated the entire Paso Robles section as well as the very top 25 feet of the deeper Careaga aquifer at 635 feet (See Drillers Reports & E-logs in the Appendix).

Oil Well Data

The subject parcel is situated along the eastern boundary of the Santa Maria Valley Oil Field, a California State designated oil field. Known in oil circles as the SMVU Vincent lease, the subject property contains eight previously plugged and abandoned wells and two idles wells. These wells are mentioned for this report, as they are an important source of data in the form of electric logs by which to correlate from well to well to determine the lateral and horizontal extent of the area aquifers. In addition these logs provide further information for the geologic thickness of the fresh water-bearing sediments in this area including the project area. A more detailed interpretation of these electric logs will be included in a future revision of this report

Estimated Project Water Usage

Using data from the project manager, the annual projection of water usage for the proposed project is approximately 17 million gallons of water or 52 acre-feet per year. By backing

through the total water demand number, the estimated daily water usage is around 32.3 gallons per minute, but this would be over a 24 hour period and 365 days. However, from a water well production standpoint, by assuming a more realistic 300 days per year of water demand and an 10 hour operating period each day, the required capacity for a water well to serve the project needs is approximately 100 gallons per minute for each 10 hour daily operation.

Conclusions

Based on a thorough review of the area ground water conditions and the pump test data from the existing water wells on the Arctic Cold property as well as three additional area wells, the following conclusions are reached:

1. The existing water wells on the Arctic Cold parcel produce water from a highly productive interval of aquifers within the Paso Robles Formation. These aquifers span depths from 100 to 700+ feet.

2. The Paso Robles at this location consists of approximately 400-500 net feet of water saturated sand and gravel horizons.

3. There is an additional large, widespread water-bearing aquifer under the existing Paso Robles interval known as the Careaga Formation. This zone is comprised of a large sand body (400'+ net thickness) that is fully water saturated. The Careaga contains a significant volume of regional water that to date has not been tapped in the area surrounding and including the subject property.

4. The annual water needs (52 Acre-Feet) of the proposed project can easily be met by the existing capacity of the two water wells present on the subject parcel.

5. The area ground water quality is good and can be utilized for both domestic and agricultural use.

It is my opinion that the existing area ground water aquifers will adequately supply and serve the long term potable water needs of the water system for the proposed Arctic Cold cooler project.

Respectfully submitted,

Charles E. Katherman

Charles E. Katherman
CA Professional Geologist #4069

Date: 3/25/2020

APPENDIX

REPORT FIGURES

FIGURE 1

REGIONAL LOCATION MAP

FIGURE 2
LOCATION MAP

Google Maps Santa Maria

Imagery ©2020 Maxar Technologies, USDA Farm Service Agency, Map data ©2020 500 ft

FIGURE 3

DETAILED LOCATION MAP

Assessor's Map Bk. 128 – Pg. 097
County of Santa Barbara, Calif.

Assessor's Parcel Numbers Shown in Circles

LD/81

FIGURE 4
ASSESSOR PARCEL MAP

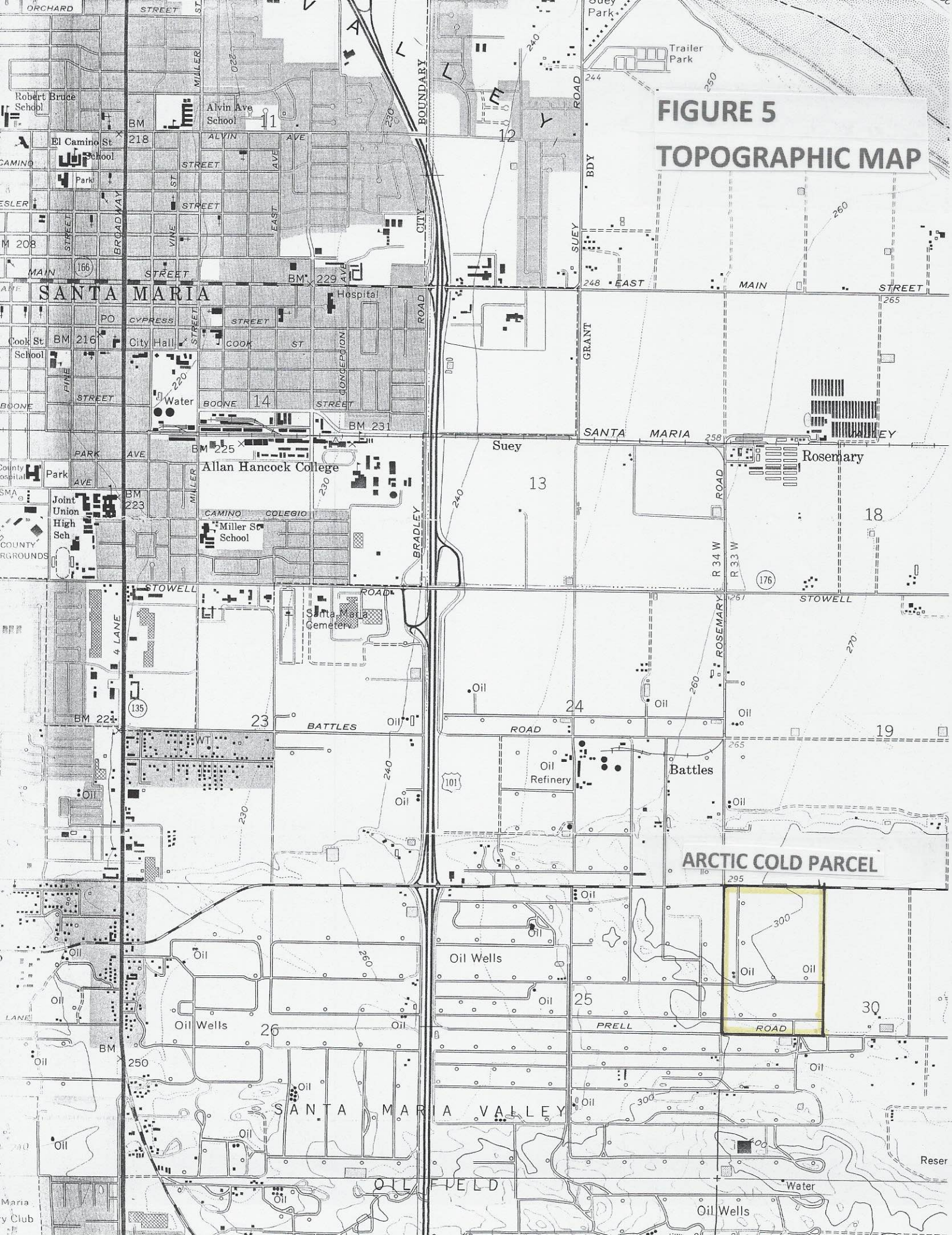
FIGURE 5
TOPOGRAPHIC MAP
ARCTIC COLD PARCEL
SANTA MARIA
SANTA MARIA VALLEY
OIL FIELD
Suey
Rosemary
Battles
Oil Refinery
Allan Hancock College
Hospital
City Hall
Alvin Ave School
Miller St School
Joint Union High Sch
Santa Maria Cemetery
Trailer Park
Suey Park
Robert Bruce School
El Camino School
Oil Wells
Water
BOUNDARY ROAD
BRADLEY ROAD
ROSEMARY ROAD
PRELL ROAD
BATTLES ROAD
STOWELL ROAD
SUEY BDY
CITY
GRANT
MAIN STREET
EAST MAIN STREET
SANTA MARIA STREET
BROADWAY
MILLER
CONCEPTION
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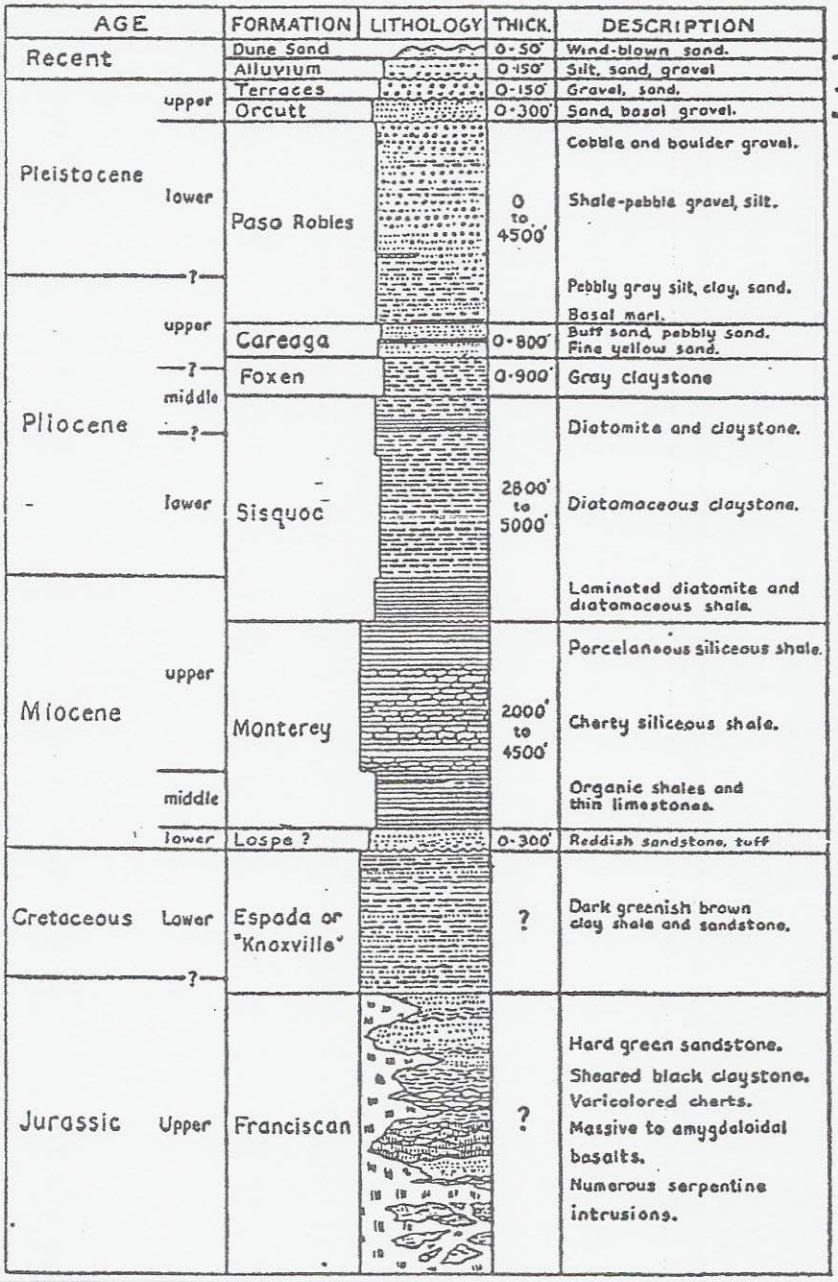
11
12
13
14
18
19
23
24
25
26
30



Santa Maria Basin.

FIGURE 6

STRATIGRAPHIC COLUMN

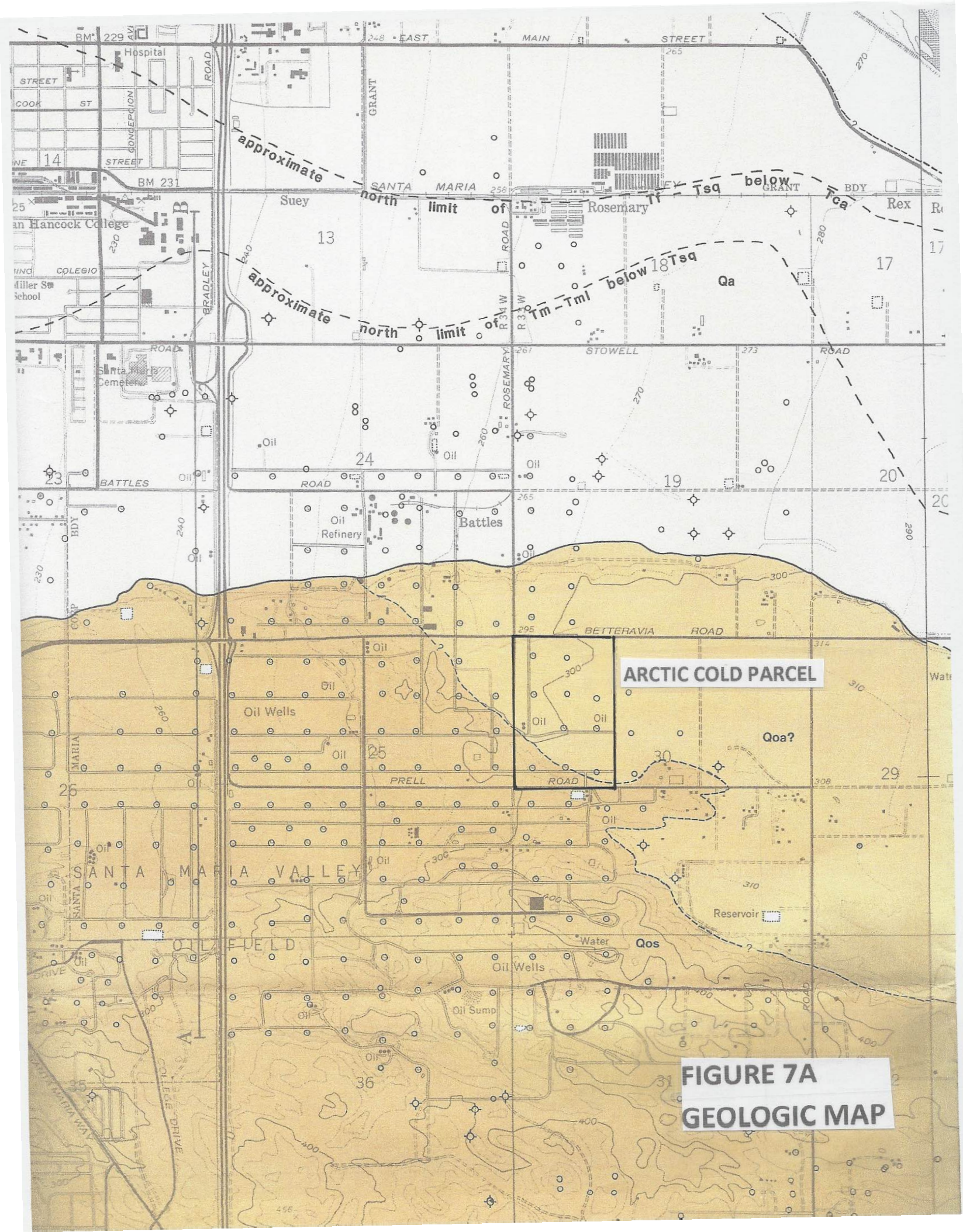


FIGURE 7A
GEOLOGIC MAP

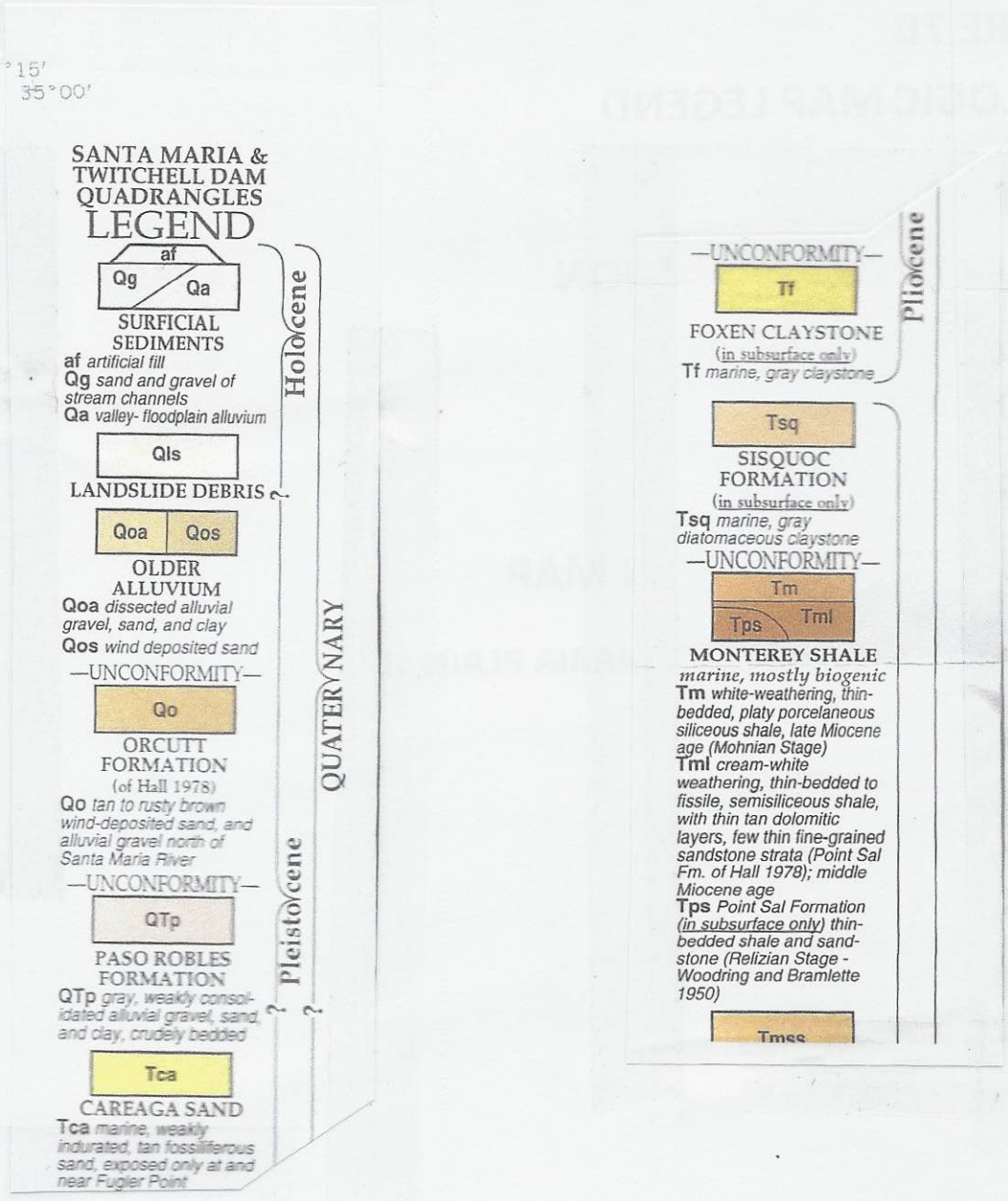


FIGURE 7B

GEOLOGIC MAP LEGEND

ARCTIC COLD
PROJECT

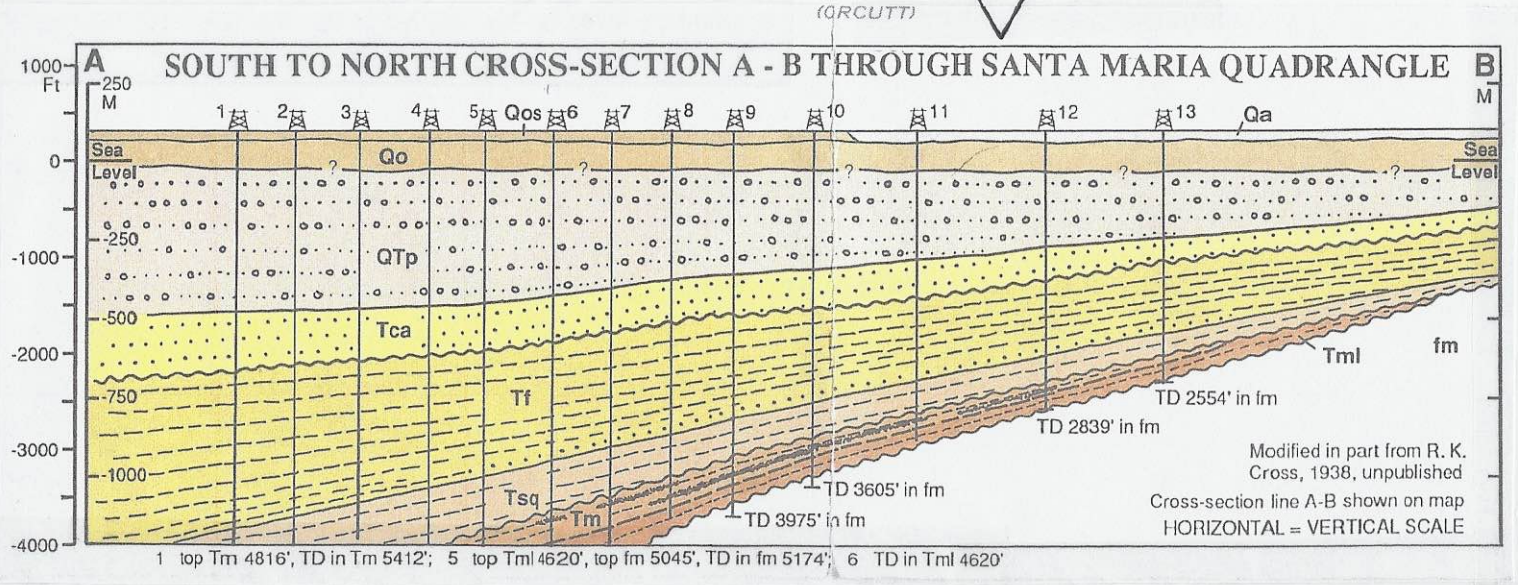


FIGURE 8
GEOLOGIC CROSS SECTION

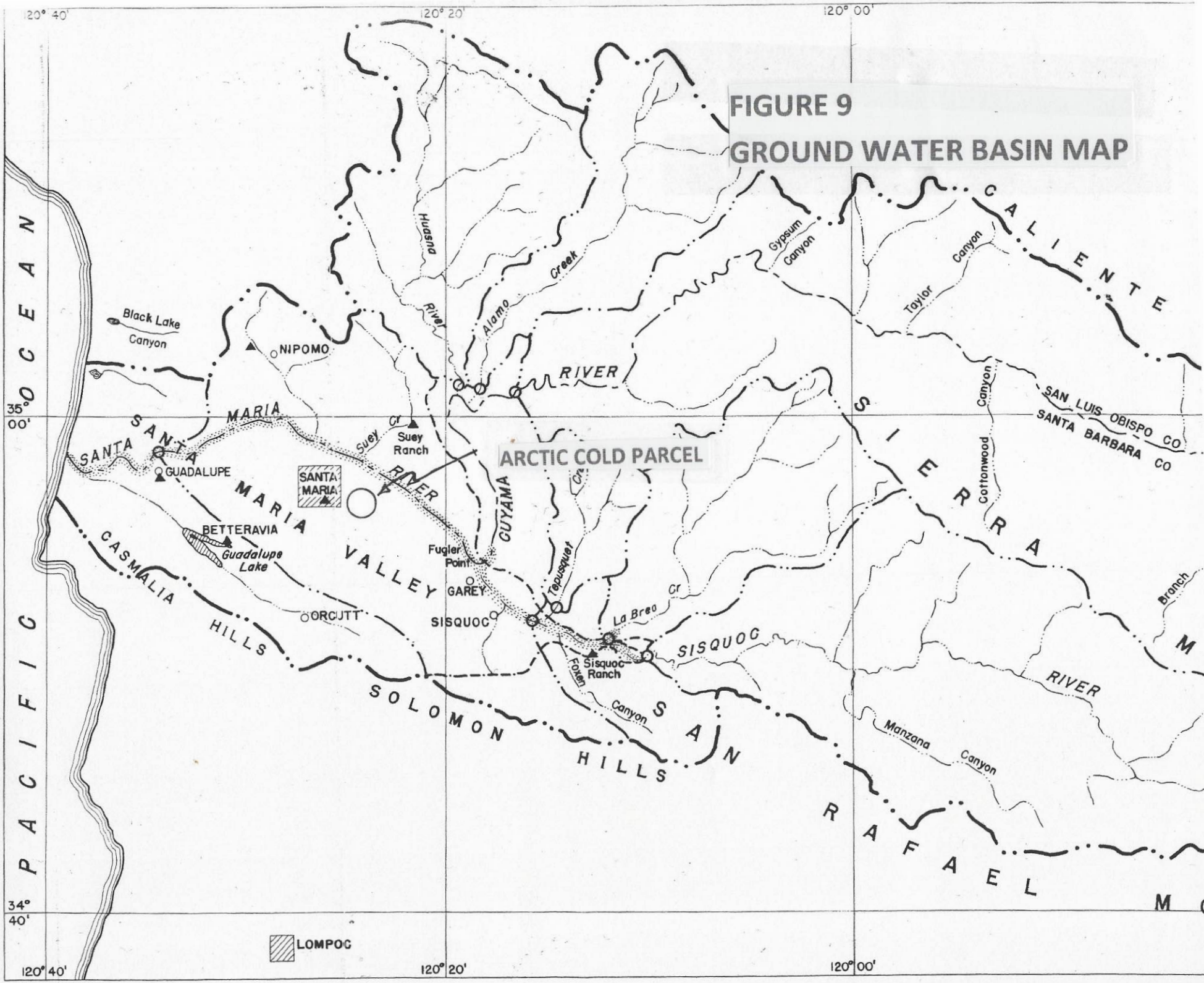
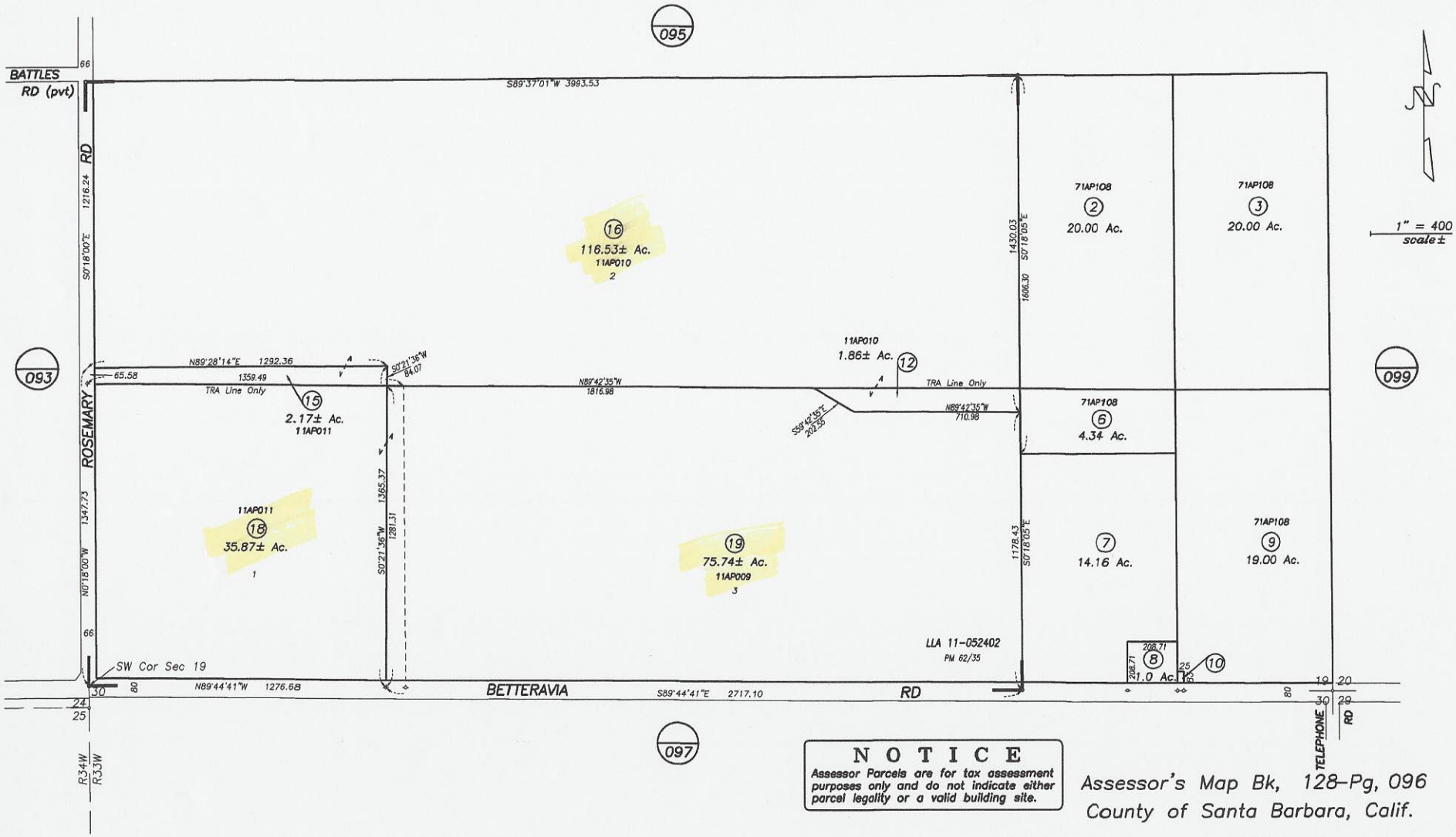


FIGURE 9
GROUND WATER BASIN MAP
ARCTIC COLD PARCEL
120° 40'
120° 20'
120° 00'
35° 00'
34° 40'
PACIFIC OCEAN
Black Lake Canyon
NIPOMO
Huasna River
Alamo Creek
RIVER
Gypsum Canyon
Taylor Canyon
CALIENTE
SIERRA
Cottonwood Canyon
SAN LUIS OBISPO CO
SANTA BARBARA CO
SANTA MARIA VALLEY
SANTA MARIA RIVER
GUADALUPE
SANTA MARIA
Suey Cr
Suey Ranch
BETTERAVIA
Guadalupe Lake
CASMALIA HILLS
ORCUTT
Fugler Point
GAREY
SISQUOC
CUYAMA
Tepusquet Cr
La Brea Cr
Sisquoc Ranch
Foxen Canyon
SOLOMON HILLS
SAN RAFAEL M
Manzana Canyon
LOMPOC

ADDITIONAL ASSESSOR MAPS

S 1/2 SEC 19 T10N R33W SBB&M

128–096



NOTICE

Assessor Parcels are for tax assessment purposes only and do not indicate either parcel legality or a valid building site.

Assessor's Map Bk, 128–Pg, 096
County of Santa Barbara, Calif.

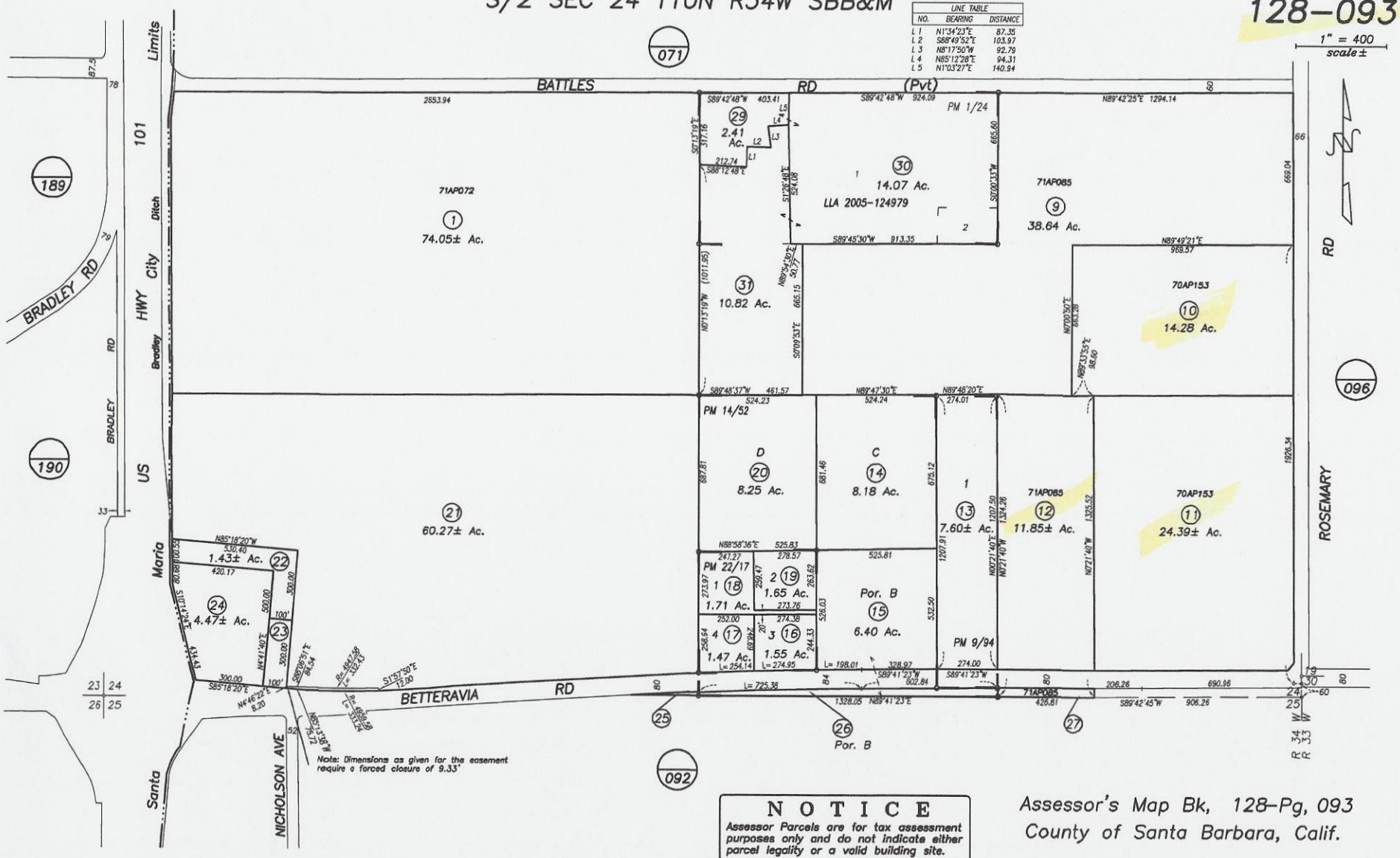
LD/14 New Ag Preserve Contract No.s on 12, 15, 16 ,18 & 19

S/2 SEC 24 T10N R34W SBB&M

128–093

1" = 400 scale ±

LINE TABLE		
NO.	BEARING	DISTANCE
L1	N1°34'23"E	87.35
L2	S88°49'52"E	103.97
L3	N8°17'50"W	92.79
L4	N85°12'28"E	94.31
L5	N1°03'27"E	140.94



NOTICE

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Assessor's Map Bk, 128–Pg, 093
County of Santa Barbara, Calif.

07/18 15, 26; correct acreage

N 1/2 SEC. 25 T10N R34W SBB&M

128–092

NOTICE

Assessor Parcels are for tax assessment purposes only and do not indicate either parcel legality or a valid building site.

Assessor's Map Bk, 128–Pg, 092
County of Santa Barbara, Calif.

09/00 add city limits line

WATER WELL DATA

NEWMAN WELL #1

10N/33W-30E01

ORIGINAL
File with DWR

WATER WELL DRILLERS REPORT

(Sections 7079, 7080, 7081, 7082, Water Code)

THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

Do Not Fill In

No 38166

State Well No. _____

Other Well No. _____

MAY 26 1969

(1) OWNER:

Name [redacted]

Addr

(2) LOCATION OF WELL:

County Santa Barbara Owner's number, if any

Township, Range, and Section T-10-N, R-33-W, Section 30

Distance from cities, roads, railroads, etc.

(3) TYPE OF WORK (check):

New Well ☒ Deepening ☐ Reconditioning ☐ Destroying ☐

If destruction, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(5) EQUIPMENT:

Rotary ☐
Cable ☒
Other ☐

(6) CASING INSTALLED:

STEEL: OTHER:
SINGLE ☒ DOUBLE ☐

From ft.	To ft.	Diam.	Gage or Wall	Diameter of Bore	From ft.	To ft.
0	600	14"	1/4			

If gravel packed

Size of shoe or well ring 14x10x7/8 Size of gravel:

Describe joint Welded

(7) PERFORATIONS OR SCREEN:

Type of perforation or name of screen Mills

From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.
375	404	8	1	3/8 x 3
430	456	8	1	3/8 x 3
462	510	8	1	3/8 x 3
575	590	8	1	3/8 x 3

(8) CONSTRUCTION:

Was a surface sanitary seal provided? Yes ☐ No ☒ To what depth ft.

Were any strata sealed against pollution? Yes ☐ No ☒ If yes, note depth of strata

From ft. to ft.

From ft. to ft.

Method of sealing

(9) WATER LEVELS:

Depth at which water was first found, if known 375 ft.

Standing level before perforating, if known 202 ft.

Standing level after perforating and developing 202 ft.

(10) WELL TESTS:

Was pump test made? Yes ☒ No ☐ If yes, by whom? M&W Pump

Yield: 1350 gal./min. with 41 ft. drawdown after 24 hrs.

Temperature of water Was a chemical analysis made? Yes ☐ No ☒

Was electric log made of well? Yes ☐ No ☒ If yes, attach copy

(11) WELL LOG:

Total depth 600 ft. Depth of completed well 600 ft.

Formation: *Describe by color, character, size of material, and structure*

ft.	to	ft.	
0	to	5	Soil
5		20	Hard pan
20		45	Sand, clay & gravel
45		56	Gravel
56		78	Sand & clay
78		88	Gravel
88		96	Yellow clay
96		118	Yellow clay & gravel
118		136	Yellow clay
136		155	Yellow clay & gravel
155		174	Yellow clay
174		187	Yellow clay & gravel
187		228	Yellow clay
228		270	Yellow clay & gravel
270		308	Yellow clay
308		333	Yellow clay & gravel
333		361	Yellow clay
361		375	Gravel & clay
375		404	Gravel
404		430	Yellow clay & gravel
430		456	Gravel
456		462	Brown clay
462		510	Gravel
510		526	Muddy sand
526		545	Yellow clay
545		554	Muddy sand
554		562	Yellow clay & gravel
562		570	Sand & gravel
570		592	Gravel
592		598	Sand
598		600	Yellow clay

Cement & Rock plug 594'

CONFIDENTIAL - NOT FOR PUBLIC RELEASE

Work started 4-5- 1969, Completed 5-20- 1969

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

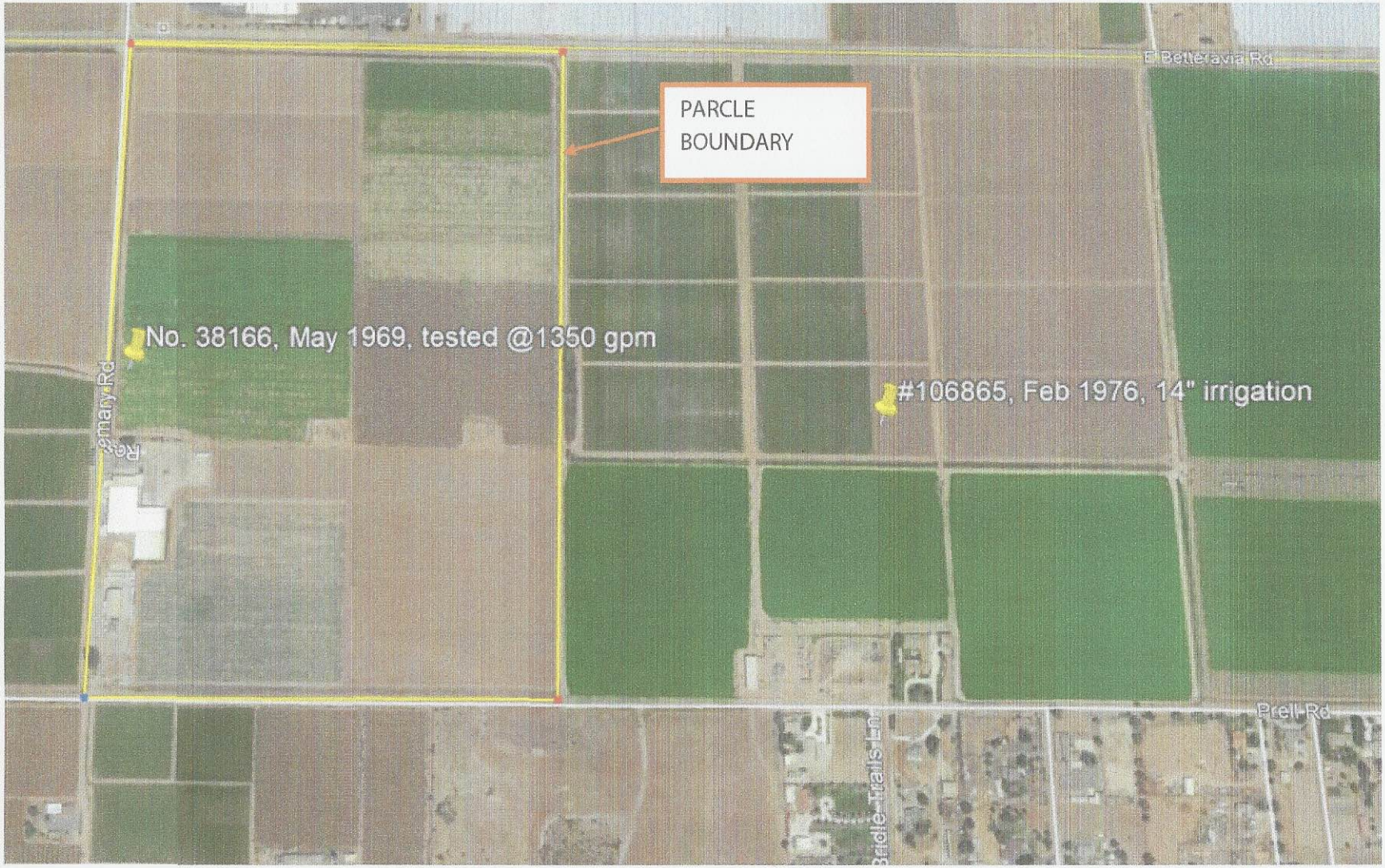
NAME Longwell & Taylor
(Person, firm, or corporation) (*Typed or printed*)

Address 403 So. Ranch St.,
Santa Maria, Calif.

[SIGNED] Merle Taylor
(*Well Driller*)

License No. 230155-C57 Dated 5-21- , 1969

SKETCH LOCATION OF WELL ON REVERSE SIDE


PARCLE
BOUNDARY
No. 38166, May 1969, tested @1350 gpm
#106865, Feb 1976, 14" irrigation
E Betteravia Rd
Preil Rd

NEWMAN WELL #2

DUPLICATE
Driller's Copy

Page ___ of ___

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 748796

Owner's Well No. #2

Date Work Began 3-25-04 Ended 4-06-04

Local Permit Agency Santa Barbara Co

Permit No. SR#0103141 Permit Date 3-16-04

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 Mud

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	121	Brown Sand & Gravel
121	124	Brown Clay
124	166	Brown Sand & Gravel
166	180	Brown Clay
180	531	Brown Sand & Gravel
531	536	Brown Clay
536	620	Brown Sand & Gravel

TOTAL DEPTH OF BORING 620 Feet
TOTAL DEPTH OF COMPLETED WELL 606 Feet

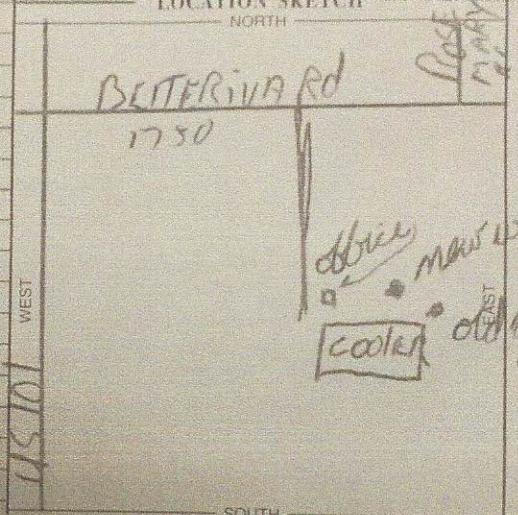
WELL OWNER

Name Neuman Ranch
Mailing Address P O Box 1552
Santa Maria Calif 93456
CITY STATE ZIP

WELL LOCATION

Address 1750 East Betteriva Rd
City Santa Maria Calif 93455
County Santa Barbara Co
APN Book ___ Page ___ Parcel 128-097-01
Township ___ Range ___ Section ___
Latitude ___ DEG ___ MIN ___ SEC NORTH
Longitude ___ DEG ___ MIN ___ SEC WEST

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 (✓)

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

PLANNED USES (✓)

WATER SUPPLY
___ Domestic ___ Public
x 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 189 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 189 (Ft.) & DATE MEASURED 4-10-04
ESTIMATED YIELD * 1200 (GPM) & TEST TYPE Pump
TEST LENGTH 12 (Hrs.) TOTAL DRAWDOWN 21 (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	CASING	PERF.	MATERIAL GRADE	INTERNAL DIAMETER (inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (inches)
0	370	26	x				Steel	16	1/4 in	
370	606	26		x			Steel	16	1/4 in	080

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	30	X			
					#8

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other
___ None

CERTIFICATION STATEMENT

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

NAME Ron Taylor Drilling
PERSON, FIRM, OR CORPORATION (TYPED OR PRINTED)

ADDRESS 2001 Highway Rd Santa Maria Calif 93455
CITY STATE ZIP

SIGNED [signature] 4-31-04
AUTHORIZED REPRESENTATIVE DATE

523-858
AREA CODE TELEPHONE NUMBER

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

SHEEHY WELL

TRIPLICATE
Owner's Copy

Page ___ of ___

Owner's Well No. 2

Date Work Began 5-2-14 Ended 6-2-14

Local Permit Agency Santa Barbara Co

Permit No. SBO 0140171 Permit Date 5-6-14

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 0962157

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 Mud

DEPTH FROM SURFACE Ft. to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0 to 75	Sand & large gravel
75 to 90	Brown Clay
90 to 175	Brown Sand & Gravel
175 to 190	Brown Clay
190 to 260	Sand & Gravel
260 to 275	Brown Clay
275 to 360	Sand & Gravel
360 to 370	Gray Clay
370 to 475	Sand & Gravel
475 to 490	Brown Clay
490 to 520	Sand & Gravel
520 to 555	Clay
555 to 625	Sand & small Gravel
625 to 640	Clay

TOTAL DEPTH OF BORING 640 (Feet)

TOTAL DEPTH OF COMPLETED WELL 600 (Feet)

WELL OWNER

Name Hidden Valley Farms

Mailing Address P O Box 1720

City Santa Maria, Calif 93456 STATE ZIP

WELL LOCATION

Address 1600 E. Betteravia Rd

City Santa Maria, Calif

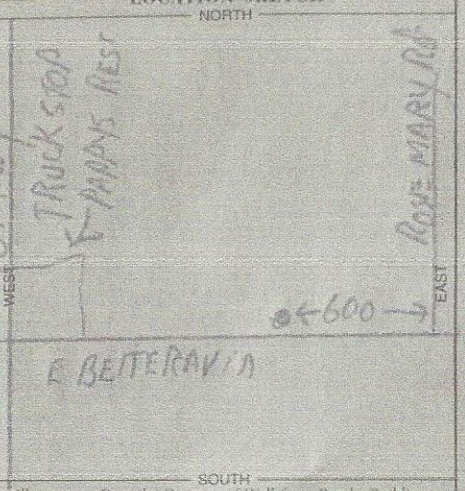
County Santa Barbara

APN Book ___ Page ___ Parcel 128-093-012

Township ___ Range ___ Section ___

Lat ___ DEG ___ MIN ___ SEC N Long ___ DEG ___ MIN ___ SEC W

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 (✓)

X NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

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

USES (✓)

WATER SUPPLY
___ Domestic ___ Public
X 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 ___ (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 248 (Ft.) & DATE MEASURED 6-1-14

ESTIMATED YIELD * 850 (GPM) & TEST TYPE Pump

TEST LENGTH 8 (Hrs.) TOTAL DRAWDOWN ___ (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 20	32	X				Steel	X	STD	
0 to 300	24	X				PVC	12	SDR-21	
300 to 600	24		X			PVC	12	SDR-21	040
600 to 613	24	X				PVC	12	SDR-21	

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	TYPE: CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0 to 50	X			
				#16

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 Ron Seal Taylor Drilling
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 2801 Mahoney Rd Santa Maria CITY Calif 93455 STATE ZIP

Signed [signature] C-57 LICENSED WATER WELL CONTRACTOR

DATE SIGNED 6-5-14

C-57 LICENSE NUMBER 523-250

DWR 188 REV. 05-03

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

welenco

5201 Woodmere Drive, Bakersfield, CA 93313-- www.welenco.com--(800) 445-9914
California Contractor's License No. 722373

ELECTRIC LOG

FILING NO.

COMPANY Taylor Drilling & Pump

WELL Shehe # 1

FIELD Santa Maria

STATE California COUNTY Santa Barbara

LOCATION:
The North side of East Betteravia Road East of Highway 101

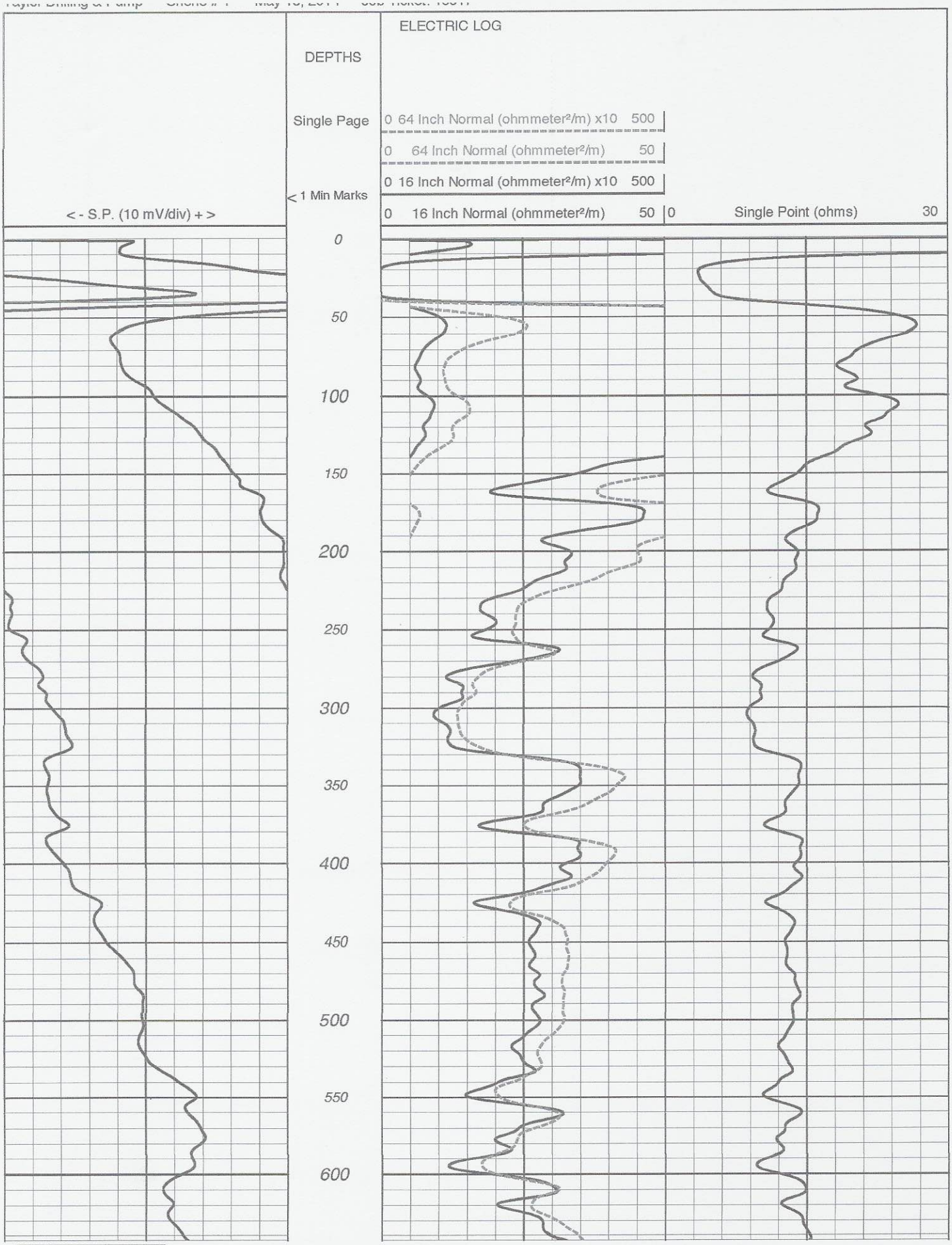
OTHER SERVICES:
None

JOB NO.
16917

SEC: 24 TWP: 10N RGE: 34W LAT.: 34° 55' 26.5" LONG.: 120° 24' 12.7" MERIDIAN.: San Bernardino

Permanent Datum: Ground Level, Elev. 83 Ft. Elev.: K.B. ____ Ft.
Log Measured From: Ground Level, 0 Ft. Above Perm. Datum D.F. ____ Ft.
Drilling Measured From: Ground Level G.L. 83 Ft.

Run	One			
Date	May. 15, 2014			
Depth-Driller	650 Ft	Ft	Ft	Ft
Depth-Logger	642 Ft	Ft	Ft	Ft
Top Logged Interval	1 Ft	Ft	Ft	Ft
Btm. Logged Interval	641 Ft	Ft	Ft	Ft
Casing-Driller	In @ 40 Ft	In @ Ft	In @ Ft	In @ Ft
Casing-Logger	In @ 40 Ft	In @ Ft	In @ Ft	In @ Ft
Bit Size	9.875 In	In	In	In
Time On Bottom	17:35			
Type Fluid In Hole	Bentonite			
Density / Viscosity	N/A / N/A			
pH / Fluid Loss	N/A / N/A ml	ml	ml	ml
Source of Sample	Pit			
Rm @ Measured Temp.	7.1 @ 75 °F	@ °F	@ °F	@ °F
Rmf @ Measured Temp.	6.7 @ 75 °F	@ °F	@ °F	@ °F
Rmc @ Measured Temp.	N/A @ -- °F	@ °F	@ °F	@ °F
Source Rmf / Rmc	Meas / N/A			
Rm @ BHT	N/A @ -- °F	@ °F	@ °F	@ °F
Time Since Circulation	3.5 Hr	Hr	Hr	Hr
Max. Rec. Temp.	N/A °F	°F	°F	°F
Van No. / Location	LV-1 / Bfld			
Recorded By	David Jackson			
Witnessed By				



welenco
CA. Contractor's License: 722373
Phone: (800) 445-9914 Fax: (661) 834-2550 Email: welenco@welenco.com Web: www.welenco.com

NRG/OSR WELL

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. e0330369

Page _____ of _____

Owner's Well Number _____

Date Work Began 09/27/2016 Date Work Ended 10/24/2016

Local Permit Agency Santa Barbara County

Permit Number WP#1571 Permit Date 9/23/16

DWR Use Only – Do Not Fill In

State Well Number/Site Number

N W

Latitude Longitude

APN/TRS/Other

Geologic Log

Orientation ◉ Vertical ○ Horizontal ○ Angle Specify

Drilling Method Mud Rotary Drilling Fluid Bentonite mud

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0	125	Coarse gravel and sand
125	190	Coarse gravel, fine sand, streaks of white
		and gray clay
190	270	Coarse gravel and traces of brown clay
270	325	Brown clay, streaks of coarse gravel
325	385	Coarse gravel, brown clay, fine sand
385	520	Samll gravel and fine sand
520	635	Brown clay, coarse sand
635	660	Blue gravel, fine blue sand

Total Depth of Boring 660 Feet

Total Depth of Completed Well 640 Feet

Well Owner

Name NRG Enterprises, LP

Mailing Address 1910 East Stowell

City Santa Maria State CA Zip 93455

Well Location

Address 1755 East Betteravia Raod

City Santa Maria County Santa Barbara

Latitude ___ Deg. ___ Min. ___ Sec. N Longitude ___ Deg. ___ Min. ___ Sec. W

Datum _____ Dec. Lat. _____ Dec. Long. _____

APN Book 128 Page 096 Parcel 019

Township _____ Range _____ Section _____

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North

West East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. **Please be accurate and complete.**

Activity

◉ New Well
○ Modification/Repair
○ Deepen
○ Other _____
○ Destroy
Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

◉ Water Supply
☐ Domestic ☐ Public
☑ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other _____

Water Level and Yield of Completed Well

Depth to first water 266 (Feet below surface)

Depth to Static Water Level 266 (Feet) Date Measured 10/24/2016

Estimated Yield * 1,200 (GPM) Test Type Step-Drawndown

Test Length 3.0 (Hours) Total Drawdown 54 (Feet)

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

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
0	50	36	Conductor	Steel	0.250	30"	None	
0	300	26	Blank	PVC	SDR17	16"	None	
300	620	26	Screen	PVC	SDR17	16"	Slot	0.040
620	640	26	Blank	PVC	SDR17	16"	None	

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	50	Concrete	Seal
0	640	Gravel	8x20

Attachments

☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☑ Other Plot Plan

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 Sam Taylor, Taylor Drilling &Pump, Inc.
Person, Firm or Corporation

2801 Mahoney Road Santa Maria CA 93455
Address City State Zip

Signed _____ 11.2.2016 523858
C-57 Licensed Water Well Contractor Date Signed C-57 License Number

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

ELECTRIC LOG

Pilot Borehole

boredata
· Phone: (888) 908-5226 Fax: (661) 505-6561 · Web: www.boredata.com Email: ccorbell@boredata.com

Filing No.

COMPANY Taylor Drilling

WELL OSR Ranch 2 - Enos Buss

FIELD Santa Maria

STATE California COUNTY Santa Barbara

LOCATION:
North side of East Betteravia approx .25 Mi. East of cooler

OTHER SERVICES:
None

Job No.
2200

SEC: ____ TWP: ____ RGE: ____ LAT.: 34.92392 LONG.: 120.39571

Permanent Datum: Ground Level Elev.: ____ Ft. Elevs.: K.B. ____ Ft.
Log Measured From: Ground Level, 0 Ft. Above Perm. Datum D.F. ____ Ft.
Drilling Measured From: Ground Level G.L. ____ Ft.

Run	One			
Date	Sep 30, 2016			
Depth-Driller	660 Ft	Ft	Ft	Ft
Depth-Logger	660 Ft	Ft	Ft	Ft
Top Logged Interval	7 Ft	Ft	Ft	Ft
Btm Logged Interval	660 Ft	Ft	Ft	Ft
Casing-Driller	N/A In @ Ft	In @ Ft	In @ Ft	In @ Ft
Casing - Logger In@Ft	In @ Ft	In @ Ft	In @ Ft	In @ Ft
Bit Size	16 In @ 460 Ft	9.875 In @ 460 Ft	In @ Ft	In @ Ft
Time On Bottom	14:49			
Type Fluid in Hole	Bentonite			
Density / Viscosity				
pH / Fluid Loss	ml	ml	ml	ml
Source of Sample	Circ			
Rm @ Mea. Temp	7.8 @ 75 °F	@ °F	@ °F	@ °F
Rmf @ Mea. Temp	7.8 @ 75 °F	@ °F	@ °F	@ °F
Rmc @ Mea. Temp	@ °F	@ °F	@ °F	@ °F
Source Rmf / Rmc	Meas			
Rm @ BHT	@ °F	@ °F	@ °F	@ °F
Time Since Circ.	3 Hr	Hr	Hr	Hr
Max. Rec. Temp.	76.2 °F	°F	°F	°F
Van No. / Location	BD-1 Bfld			
Recorded By	Craig Corbell			
Witnessed By				

This Eagle Plot Heading Conforms To API RP 31A

Taylor Drilling
OSR Ranch 2 - Enos Buss
Sep 30, 2016

ELECTRIC LOG

Single Page

DEPTHS (Feet)

< - S.P. (10 mV/div) S.P. + >

50 64 Inch Normal (ohmm²/m) x10 500
0 64 Inch Normal (ohmm²/m) 50
50 16 Inch Normal (ohmm²/m) x10 500
0 16 Inch Normal (ohmm²/m) 50
0 Single Point(ohms) 30
70 Temperature (°F) 80

50'
100'
150'
200'
250'
300'
350'
400'
450'
500'
550'
600'
650'

Log Depth 662'

KATHERMAN
EXPLORATION CO, LLC

Post Office Box 1812
Santa Maria, CA 93456
(805) 928-0223

ARCTIC COLD PROJECT – AREA GROUND WATER ANALYSIS

ADDENDUM #1

Overview

The initial analysis prepared for the Arctic Cold Project at Betteravia & Rosemary Road in Santa Barbara County, California consisted of a review of the area geology as well as the area hydrological conditions. This evaluation was based on the study and analysis of several area water wells, including two wells located on the subject Arctic Cold property. In addition well specifications from a number of area water wells were examined along with electric logs from both area water wells and from abandoned oil wells. This addendum covers the analysis of those electric logs and a discussion of proposed options for the design of a new water well to serve the project.

Additional Oil Well Data

On the subject property there are a total of 10 oil wells; 8 of these wells have been previously plugged and abandoned, while 2 wells are classified as idle (See well location map). With the two idle wells the surface equipment (wellhead and piping) and subsurface equipment (casing, downhole pump, tubing and rods) are still in place. They are considered idle as these two wells, SMV Vincent 19 and SMV Vincent 20 have not produced any oil and/or gas since November of 1994 and March of 1995 respectively. However, the key data for this study is derived from the electric logs on the various wells. Only those oil wells where an electric log was run through the entire fresh water interval were utilized for this reporting.

The first cross section created to analyze the e-logs is a north-south section shown in (See attached cross sections). The logs used for this figure were Conway Enos F10M, OSR-Ranch 2 water well, Richards & Rowan Enos #1, Vincent 22 and Vincent 19. The upper 300± feet of sediment is comprised of sands, gravels and clays of the Orcutt Formation and older river derived alluvium. From 300 feet to a depth varying from 690 to 670 feet is the Paso Robles

Formation, the primary ground water aquifers of sand and gravel for much of the area. Below the Paso Robles is the Careaga Formation, a predominately massive tan to blue-grey medium to fine-grained sand interval, which is also fresh water-bearing. The top sand aquifer of the Careaga Formation in these cross sectional views is typically around 700 feet. The base of the fresh water interval (or Base of the Careaga) on the area e-logs ranges from 1000 feet to 1100 feet. However, on the southernmost well the fresh water extends to 1200 feet, as the Santa Maria Basin deepens or thickens to the south.

The second cross section is a west to east section. The logs utilized for this figure were Union Battles 9, Sheehy water well, Vincent 18 and Vincent 21. Similar to the north-south section the Orcutt Formation and older Alluvium occupy the first 300 feet of the sedimentary interval. Likewise both the Paso Robles and the Careaga depths or thicknesses are comparable on this west to east section to that of the first cross section. The base of the fresh water zones in second section appears to be 50-100 feet deeper on average relative to the first section.

Revised Water Usage Projections

Based on a recent revision to the estimated water use for the proposed Arctic Cold facilities, it is anticipated that the total annual water consumption for all of the operations eventually planned for the project will be 200-250 acre-feet. As was the case for the previous write-up on water usage, the annual consumption was recalculated to a daily production amount that will be required from any water system supplying the facilities. Assuming similar values for days of operation (300 days) and a 12 hour day, the water system delivery needs will be approximately 380 gallons per minute (gpm) of flow from the producing well and/or storage.

Proposed Water Well Design

Using the numbers above along with the data from a majority of recent water well drilled and constructed in the area of the subject project the following specifications are recommended:

Installation of a 50 foot steel conductor pipe (24" to 30" diameter) – This design feature is recommended due to the need to drill this new well in an area that has been historically farmed for over 50 years. The soft, near surface soils can become a zone of severe drilling mud invasion without a steel conductor. Drilling into the deeper depths of the well (below 500 feet) requires a heavier mud weight, thereby exerting greater pressure on these surface soil horizons. The risk of not constructing a surface conductor string is sometimes liquefaction can occur in the unprotected soft near surface zones, which can jeopardize the stability of the rig equipment.

Total depth – 700 feet. The initial borehole will be approximately 10 inches. Upon reaching the total depth, an electric log will be run to bottom to analyze the zones penetrated by the well drilling. Following the completion of the electric log the borehole will be opened up or increased in diameter in order to accommodate the casing string.

12" PVC SDR21 high strength casing run to near total depth. The casing string will consist of 20 feet of blank (no perf's) casing on bottom, followed by a screened or perforated interval from 680 feet up to 340 feet (actual depths will be determined by e-log correlation). The remaining 340 feet of the well casing run to the surface will be blank. The borehole size will be approximately 20 inches in order to accommodate the casing as well as the 3-4 inches of filter pack or gravel pack (Lapis #3). The filter pack will fill the annular space between the casing and the borehole up to the bottom of the conductor pipe. In this area including the subject property the upper 250-300 feet of water-bearing aquifers (Orcutt Formation and Upper Alluvium) is typically not included in the production interval (screened or perforated interval) due to a build-up in the water of nitrates/nitrites from overfertilization during 50+ years of intensive farming. This well design will allow for a potential flowrate of 800-1000 gallons per minute (gpm) provided the Paso Robles aquifers perform as expected.

Pump Test – Following the removal of the drilling mud from the well and the washing of the screened casing, the well will be pump tested for a period of 4-6 hours. At the conclusion of the test, a water sample will be taken and sent to the lab for analysis.

The estimated cost for this new well based on the design parameters listed above is approximately $123,000. A breakdown in this cost from a local drilling company is included herein.

The cost estimate for this new well does not include the downhole pump or turbine. The actual specifications for the downhole pump will be determined at a later date and will be based on the pump test data, as well as the required flowrates and pressures to meet the demands of the project, including water storage capacity and fire protection requirements from Santa Barbara County. However, a cost estimate ($36,000) for a generic downhole pump capable of a 600-800 gpm production rate is also included.

A second option for the drilling and completion of a new well would be to drill a larger diameter borehole and install a larger diameter, higher strength PVC casing. While the larger diameter well will no doubt produce more water per foot of drawdown, ultimately a cost analysis will likely indicate that the added cost (25-30% increase) for the larger well may not justify the added production capacity relative to the needs of the project.

This addendum to the original Arctic Cold ground water evaluation was composed by the original report author.

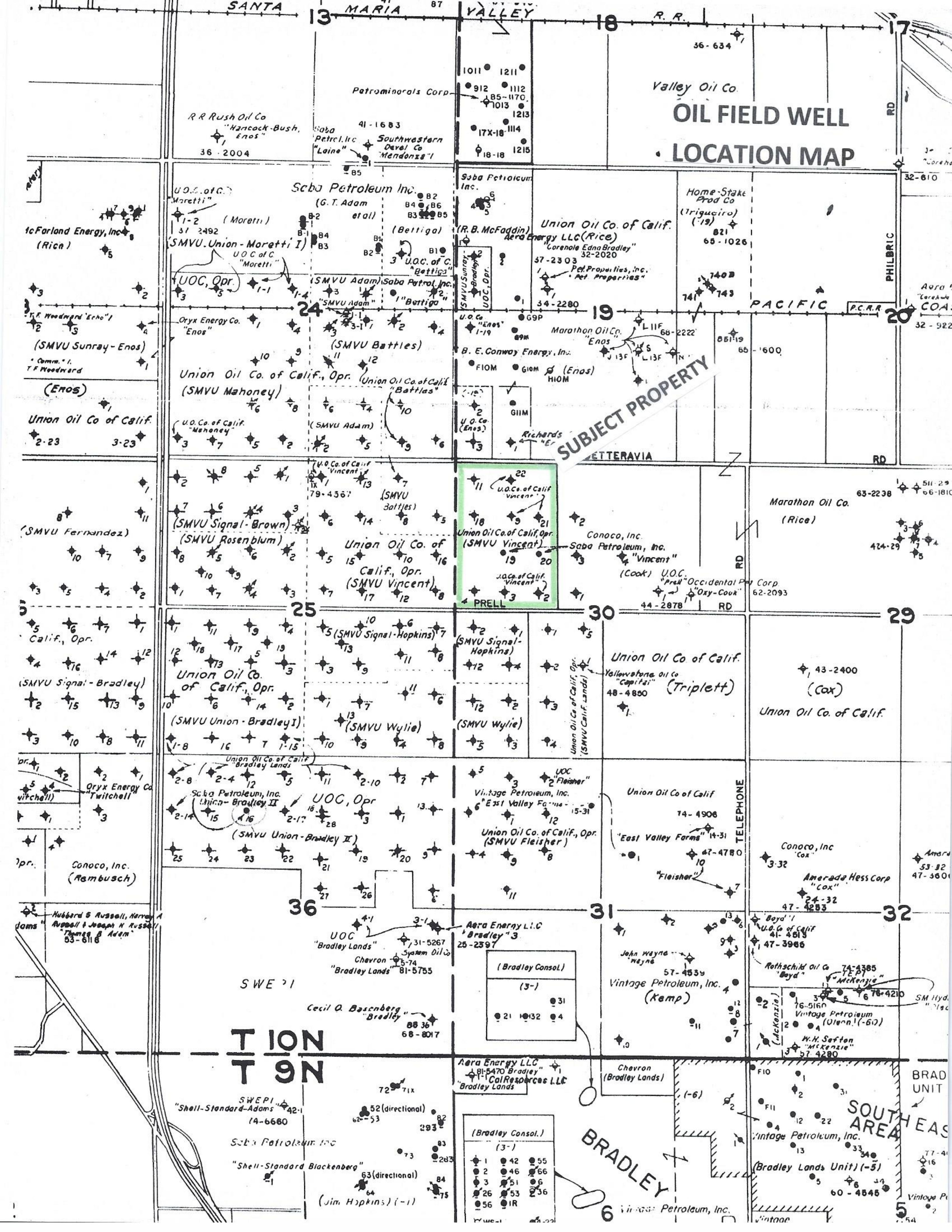
Respectfully submitted,

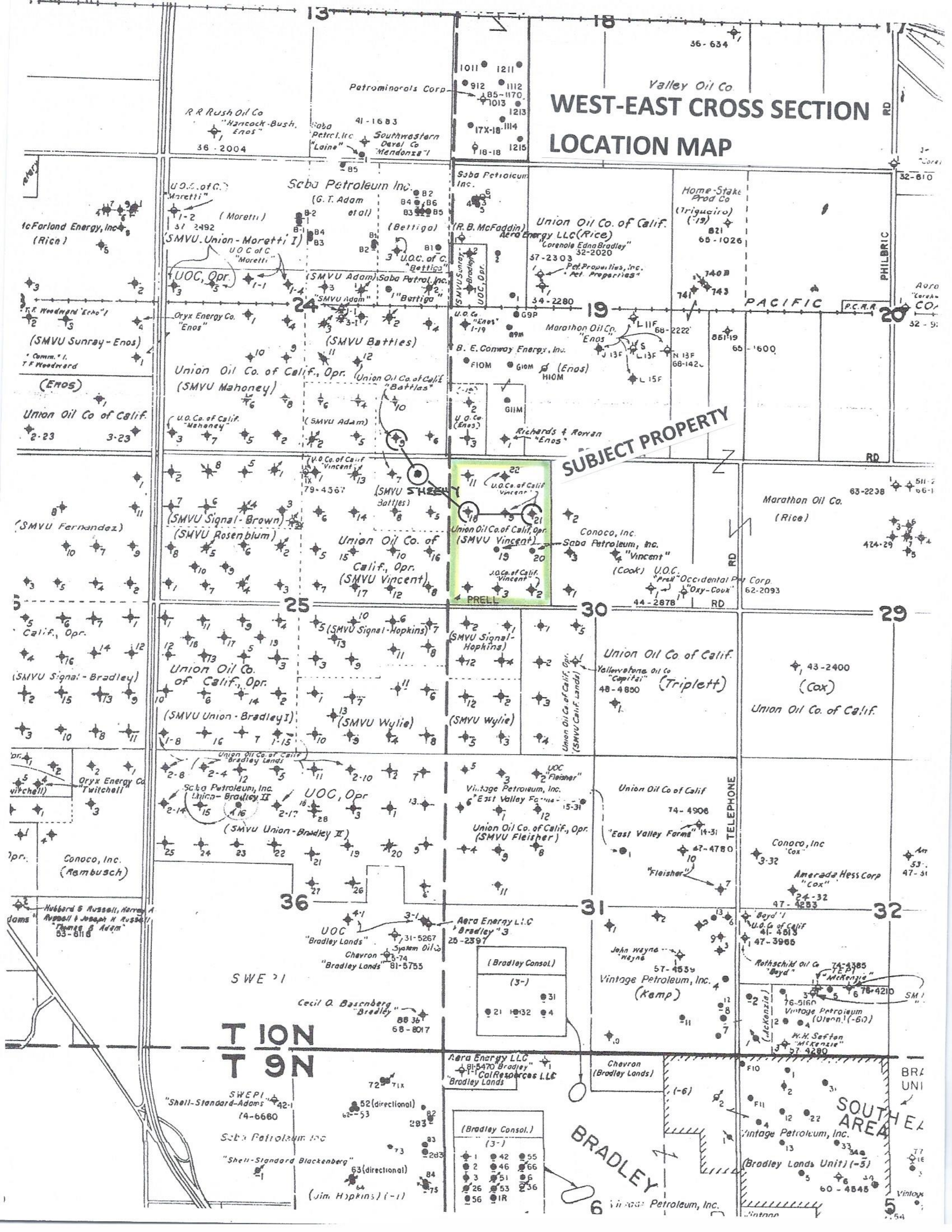
Charles E Katherman

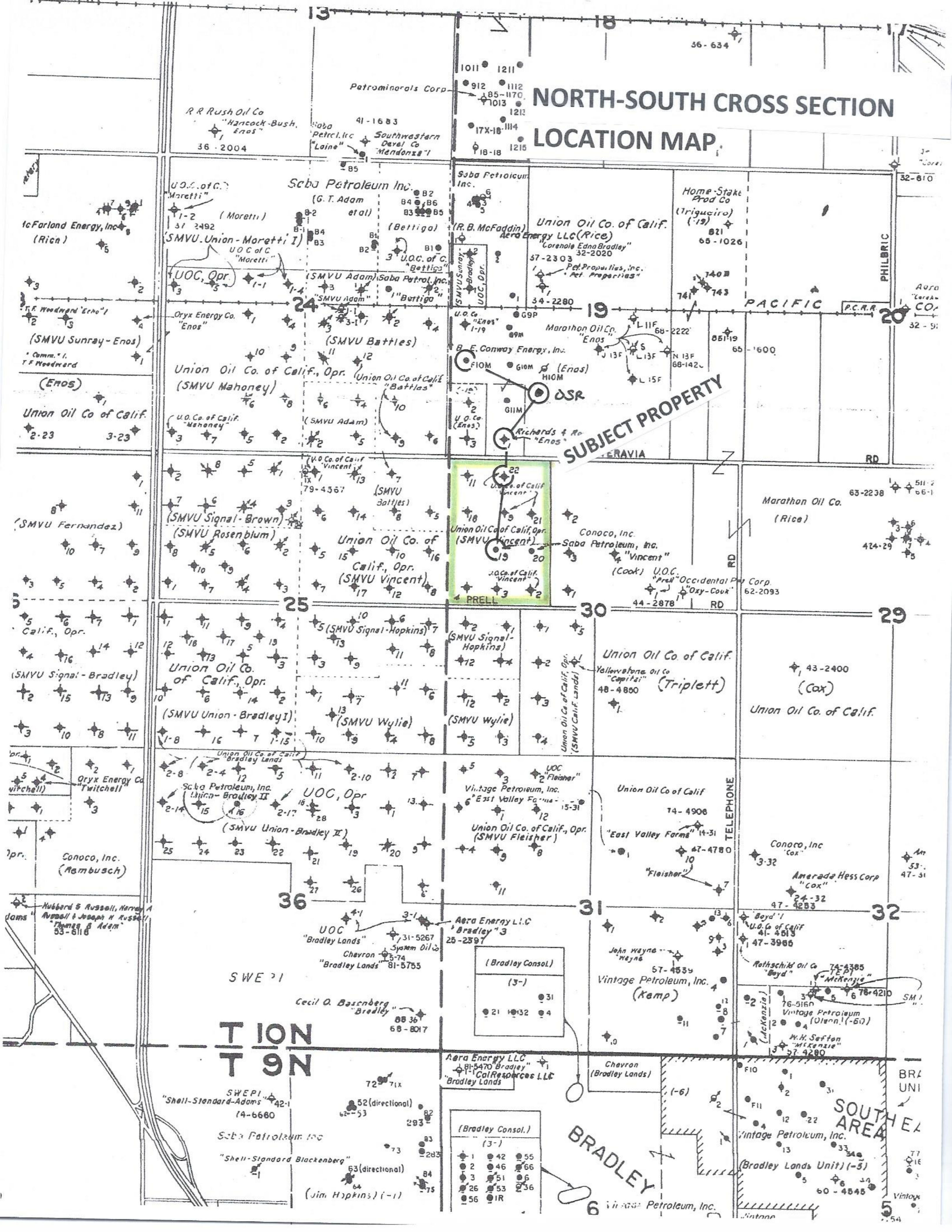
Charles E. Katherman
CA Professional Geologist #4069

Date: 4/16/2020

APPENDIX


OIL FIELD WELL LOCATION MAP
SUBJECT PROPERTY
SANTA MARIA VALLEY R.R.
PACIFIC COAST
BETTERAVIA RD
PRELL RD
TELEPHONE RD
PHILBRIC RD
BRADLEY
T 10N
T 9N
13
18
17
24
19
20
25
30
29
36
31
32
6
5
Valley Oil Co.
Petrominerals Corp.
R R Rush Oil Co "Hancock-Bush, Enos"
Southwestern Devel Co "Mendonza"
Saba Petroleum Inc.
Union Oil Co. of Calif.
Union Oil Co. of Calif., Opr.
(SMVU Vincent)
(SMVU Battles)
(SMVU Mahoney)
(SMVU Adam)
(SMVU Sunray-Enos)
(SMVU Signal-Brown)
(SMVU Rosenblum)
(SMVU Signal-Hopkins)
(SMVU Wylie)
(SMVU Union-Bradley I)
(SMVU Union-Bradley II)
(SMVU Fleisher)
(SMVU Fernandez)
(SMVU Signal-Bradley)
McFarland Energy, Inc. (Rice)
B. E. Conway Energy, Inc.
Marathon Oil Co. "Enos"
Marathon Oil Co. (Rice)
Home-Stake Prod Co (Triqueiro)
Aera Energy LLC (Rice)
Conoco, Inc.
Occidental Pet Corp
Union Oil Co of Calif. (Triplett)
Union Oil Co. of Calif. (Cox)
Vintage Petroleum, Inc. "East Valley Farms"
Union Oil Co of Calif "East Valley Farms"
Conoco, Inc. (Rembusch)
Oryx Energy Co. "Twitchell"
Amerada Hess Corp "Cox"
Aera Energy LLC "Bradley" 3
Chevron "Bradley Lands"
Cecil O. Basenberg "Bradley"
(Bradley Consol.)
Vintage Petroleum, Inc. (Kemp)
Chevron (Bradley Lands)
Vintage Petroleum, Inc. (Bradley Lands Unit)
SWEPI "Shell-Standard-Adams"
Saba Petroleum Inc "Shell-Standard Blackenberg"
(Jim Hopkins)
BRADLEY UNIT
SOUTHEAST AREA

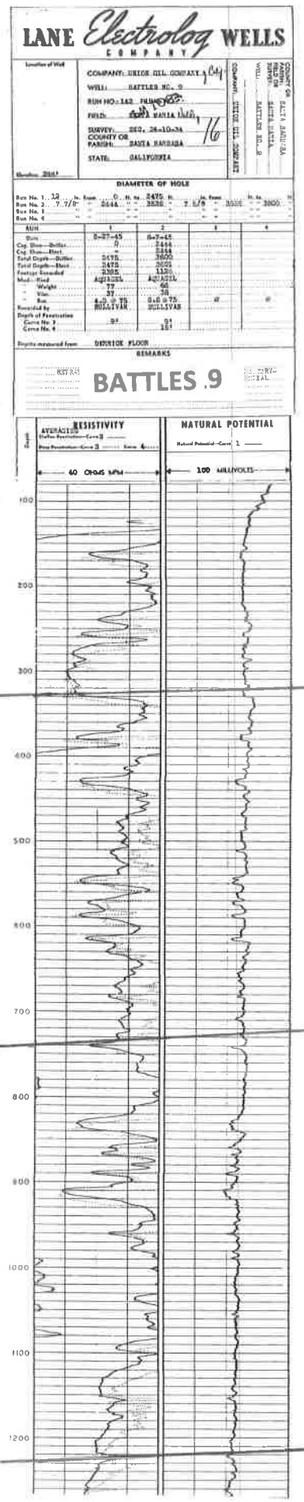

WEST-EAST CROSS SECTION
LOCATION MAP
SUBJECT PROPERTY
13
18
19
20
24
25
29
30
31
32
36
T 10N
T 9N
PACIFIC
PHILBRIC
TELEPHONE
BRADLEY
PRELL
RD
Valley Oil Co.
Petrominerals Corp
R R Rush Oil Co
Saba Petroleum Inc.
Union Oil Co. of Calif.
Union Oil Co. of Calif., Opr.
(SMVU Vincent)
(SMVU Battles)
(SMVU Mahoney)
(SMVU Adam)
(SMVU Sunray - Enos)
(SMVU Fernandez)
(SMVU Signal - Brown)
(SMVU Rosenblum)
(SMVU Signal - Hopkins)
(SMVU Wylie)
(SMVU Union - Bradley I)
(SMVU Union - Bradley II)
(SMVU Fleisher)
Marathon Oil Co.
Conoco, Inc.
B. E. Conway Energy, Inc.
Aera Energy LLC
Oryx Energy Co.
Vintage Petroleum, Inc.
Amerada Hess Corp
Chevron
(Bradley Consol.)
(Triplett)
(Cox)
(Kemp)
(Rambusch)
(Bradley Lands Unit)
SOUTH EAST AREA

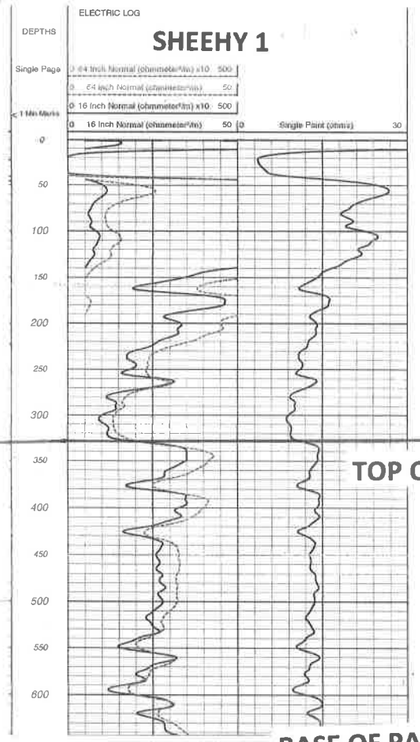


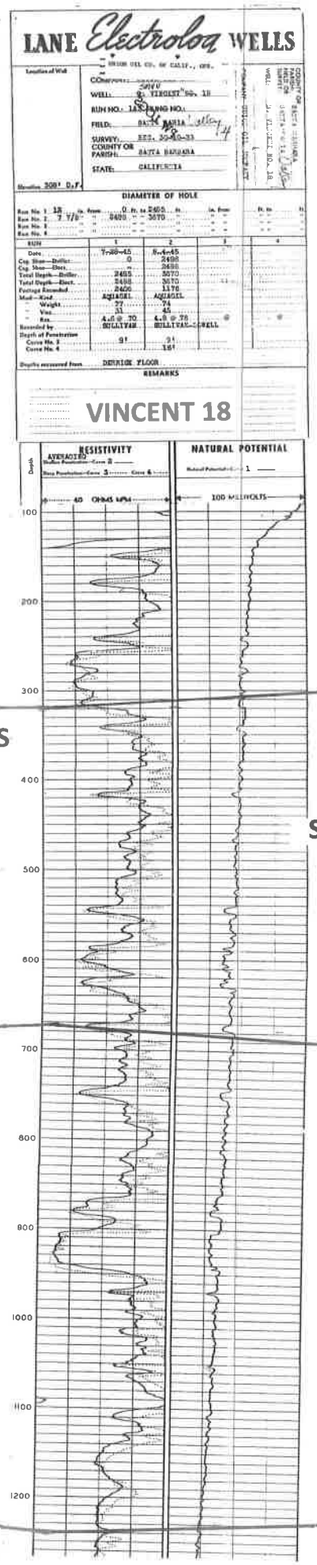
NORTH-SOUTH CROSS SECTION
LOCATION MAP
SUBJECT PROPERTY
OSR
13
18
24
19
20
25
30
29
36
31
32
T 10N
T 9N
Petrominerals Corp.
R R Rush Oil Co
Saba Petroleum Inc.
Union Oil Co. of Calif.
Union Oil Co. of Calif., Opr.
(SMVU Mahoney)
(SMVU Battles)
(SMVU Vincent)
(SMVU Sunray - Enos)
(SMVU Fernandez)
(SMVU Signal - Brown)
(SMVU Rosenblum)
(SMVU Signal - Hopkins)
(SMVU Signal - Bradley)
(SMVU Union - Bradley I)
(SMVU Wylie)
(SMVU Fleisher)
(Triplett)
(Cox)
(Kemp)
Marathon Oil Co.
(Rice)
Conoco, Inc.
Home-Stake Prod Co
Aera Energy LLC
B. E. Conway Energy, Inc.
Vintage Petroleum, Inc.
Oryx Energy Co.
McFarland Energy, Inc
PACIFIC
PHILBRIC
TELEPHONE
PRELL
RD
BRADLEY
(Bradley Consol.)
(Bradley Lands Unit)
Chevron
SWEPI
Cecil O. Basenberg
Amerada Hess Corp

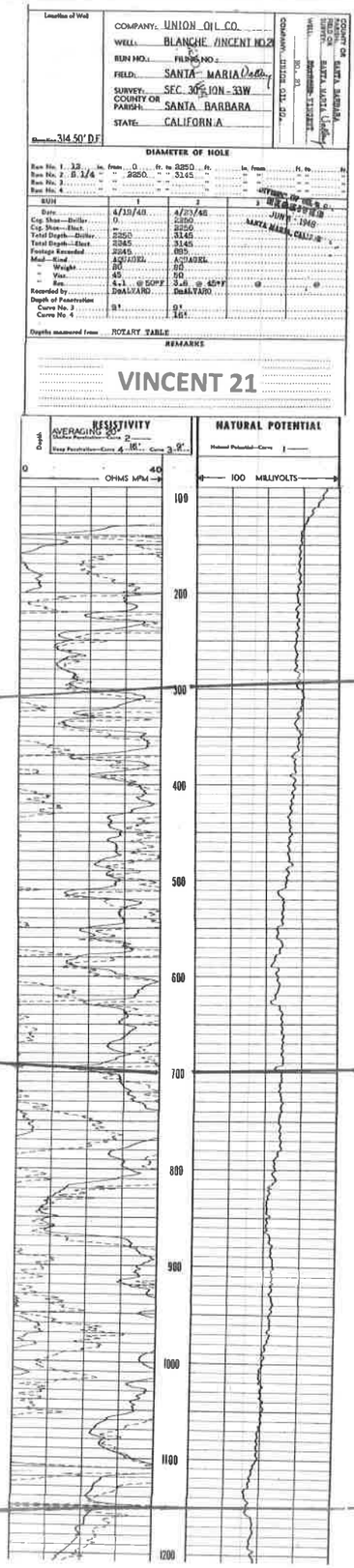
W

E









TOP OF PASO ROBLES

BASE OF PASO ROBLES

TOP OF CAREAGA

BASE OF FRESH WATER

Sea Level Datum

N

S

ENOS F10M

OSR 1

ENOS 1

VINCENT 22

VINCENT 19

Sea Level Datum

TOP OF PASO ROBLES

BASE OF PASO ROBLES

TOP OF CAREAGA

BASE OF FRESH WATER

KATHERMAN
EXPLORATION CO, LLC

Post Office Box 1812
Santa Maria, CA 93456
(805) 928-0223

ARCTIC COLD PROJECT – AREA GROUND WATER ANALYSIS

ADDENDUM #2

Overview

The original ground water report for the Arctic Cold project investigated the current hydrologic conditions existing under and around the subject parcels 128-097-001 and -002 located at 1750 E. Betteravia Road just east of Santa Maria. Consisting of approximately 110 acres of agricultural zoned land, the properties have historically been farmed.

An addendum was prepared to the initial ground water analysis in order to provide additional information on the overall water-bearing interval present in the north central Santa Maria Basin. The preparation of this second report addendum is in response to a request from Rincon Consultants for information regarding the effects of the Arctic Cold project water demand on the local ground water aquifers, as well as identifying any effects to the basin-wide ground water conditions.

Santa Maria Groundwater Basin

The Santa Maria Groundwater Basin is an approximately 170-175 square mile alluvial basin drained by the 1750 square mile Santa Maria watershed. This basin lies in the northwest part of Santa Barbara County and includes the southwest portion of San Luis Obispo County (Figure 1). The basin is bordered by the Nipomo Mesa and Sierra Madre foothills to the north, the San Rafael Mountains to the northeast and east, the Casmalia-Solomon Hills to the south and the Pacific Ocean to the west.

The Santa Maria Groundwater Basin is best described by Worts (1951) in his seminal USGS Water Supply Paper, Geology and Ground-Water Resources of the Santa Maria Valley, California, as well as in reports from Miller & Evanson (1966) and the annual reports of the Santa Barbara County Water Authority (SBCWA). As one of the largest agricultural coastal valleys of California, this basin has been studied extensively. The SBCWA, which defines the groundwater basin as the Santa Maria Valley Management Area (SMVMA), has maintained an extensive network of water level monitoring wells throughout the basin. The data from this network of wells is quite indicative of the conditions of the area of the basin in which they are located. The basin has three distinguishable units that appear to have only limited interaction: The Main Basin Unit, the Nipomo Mesa Unit, and the Arroyo Grande Unit. For this discussion the focus is solely on the Main Unit, where the subject property (Arctic Cold Project) is located. In additional publications reviewed for this study, these units are referred to as: The Santa Maria Valley Unit, the Nipomo Mesa Unit and the Northern Cities Unit (Figure 2).

General Basin Geology

Geologically, the SMVMA is underlain by a thick sequence of unconsolidated deposits that comprise the groundwater or aquifer system. Consisting of primarily gravels, sands, silts and clays, these sediments cumulatively range in thickness from 200 feet along the basin boundaries to nearly 3000 feet in the middle of the basin syncline. These water-bearing sediments are composed of the marine Careaga Sand (Formation), and the non-marine Paso Robles Formation and Orcutt Formation along with surface and near surface sediments of the Quaternary Alluvium and the river channel, dune sand and terrace deposits. The descriptions of these units can be found in the text of the original report for the Arctic Cold project, as well as in the paper by Worts. The Careaga is identified as the lower-most fresh water-bearing formation in the basin and the SMVMA, and along with the Paso Robles, they are the primary aquifer zones in the SMVMA (Figure 3).

General Basin Hydrology

Hydrologically, groundwater levels within the SMVMA have fluctuated greatly since the 1920's, when extensive farming began in the Valley and historical water level measurements were documented. The historical measurements for water levels illustrate that the widespread decline in groundwater levels, from historic lows to historic highs, occurred between 1945 and the late 1960's (Figure 4). In the late 1960's the SMVMA has alternatively experienced significant recharge (recovery) and decline which collectively reflect a general long-term stability for the basin as groundwater levels in both aquifer zones have fluctuated between historical low levels and near historical high levels over subsequent five to 10 year periods. Groundwater levels throughout the SMVMA have exhibited this trend, but with different ranges of decline and recovery. Groundwater levels have repeatedly recovered to near or above previous historic highs, such as from 2000 to 2007, and then again from 2010 to 2013 (Figure 5). Currently in Water Year 2019, which runs from October 1, 2018 to September 30, 2019, precipitation throughout Santa Barbara County was above average at 128% of normal. Water Year 2020 is currently (as of June) at 92% of a normal year.

Additionally, recovery or recharge to the basin has obviously been aided primarily by periods of above average rainfall, but also through recharge from the Santa Maria River and the discharges from the Sisquoc River drainage and the Twitchell Reservoir Project (fully operational beginning in the late 1960's). Long term stability would also appear to be partially attributable to a general leveling-off of agricultural land use average around 48,000 to 52,000 acres and overall water use of 100,000 to 120,000 AFY since the late 1970's. The recent declining trend in groundwater levels after 2000 is considered to be a result of the historical fact that Twitchell Reservoir releases, for in-stream supplemental ground water recharge, and Sisquoc River recharge, have been well below the historical averages. This declining trend was slowed or reversed during years 2005-06, 2010-11 and 2017-19 (Figure 6). During these years, releases from Twitchell

Reservoir, as well as discharge from the Sisquoc River, were above average following above-average rainfall periods. Twitchell Reservoir annual releases for in-stream groundwater recharge since 1967 have ranged from zero in low rainfall years (drought periods) to 243,000 AF (acre-feet) in 1998. In general, groundwater levels in the basin have tended to track Twitchell releases since the beginning of reservoir operations. The long term average annual release is 47,000 AF.

Basin Water in Storage

With regard to water reserves the gross perennial yield of the Santa Maria Groundwater Basin is estimated to be approximately 125,000 AFY (acre-feet per year). In low rainfall years the safe yield of the basin drops to 80,000 – 90,000 AFY. In years with above average precipitation the yield trends as high as 150,000 AFY. Water storage above sea level within the basin was estimated to be around 2.5 million acre-feet (MAF) in 1984 with various updates over the last 20 years ranging from 2 to 2.5 MAF. However, in the basin as a whole there is also significant water in storage within aquifers that are below mean sea level. With gross thicknesses of water-bearing sediments in the basin ranging from 200 feet to 2800+ feet, the Worts Water Supply Paper concludes that the cumulative water in storage for the Santa Maria Basin may exceed 100,000,000 acre-feet (100 MAF).

The total water requirement (combined agricultural and municipal) in 2018 for the SMVMA was approximately 129,960 AF. In 2018 the total water demand for the basin was 92% met by groundwater pumping (111,000 AF). The balance of the total demand was covered by the delivery of imported water (10,000 AF) from the State Water Project. The imported water appears to be utilized almost exclusively for municipal water needs. Historical water requirements in the SMVMA have increased from about 80,000 AF in 1950 to around 150,000 AF in 1990, and have

fluctuated in a relatively constant range between 100,000 AF and 150,000 AF, since that time.

Project Water Demand

Several iterations of the projected water demand for the proposed refrigeration-cooling facility has been discussed. Obviously, this projected water use is dependent on factors such as plant utilization, area crop yields, weather, etc. Currently the estimates for water demand for the project range from 260 to 280 acre feet per year (AFY), which is compared to other cooling operations of like size in the Santa Maria Area.

Breaking down the water usage in the facility, the processing operations are assumed to require 200 AFY. The refrigeration operations are estimated at 72 AFY. The remaining water use is for domestic (drinking water, wash facilities, bathrooms, etc.) which is 1.75 AFY, and for landscaping at 3.11 AFY. Therefore, the total estimated water demand for the project will be approximately 277 AFY. In terms of return flow or water infiltration from the cooler, all of the processed water will be treated onsite and directed to a settling or storage pond. Of this estimated process water of 200 AFY, it is assumed that 15% will be lost to evaporation through the vegetable processing operation, while an additional 25% will be lost to evaporation within the storage pond. Consequently it is estimated that 60% of the process water equaling approximately 120 AFY will be returned to the local water aquifers through infiltration. For the refrigeration/cooling operation whose annual water consumption will be 72 AF almost 65-70% will be lost to evaporation during refrigeration. Approximately 30% or 21 AFY of the cooling water will be directed to the settling or storage pond, where 60% of the remaining cooling water or 13 AFY will find its way into groundwater recharge. This translates into an estimated net water usage for this Arctic Cold Project is 145 AF per year versus a total actual water demand of 277 AFY.

While total water demand on a daily basis varies seasonally according to a spreadsheet of estimated water usage on a monthly basis, the most active months of June through August were examined for maximum daily water demand. This maximum daily water demand for refrigeration ranges from 110,000 to 130,000 gallons versus a daily average for the year of 64,500 gallons or approximately 50% of the maximum level. Applying these same ratios to the total processed water demand of 277 AFY, it is estimated that the average daily process water demand at Arctic Cold is 178,500 gallons. Consequently, an estimate of daily maximum water use for processing is 350,000 gallons. Adding this total for process water to the refrigeration water demand provides a maximum total daily water use of 480,000 gallons. Assuming the water well for the cooling facility operates for an average of 24 hours a day during June, July and August, this equates to a need for a ground water extraction rate of approximately 330 gallons per minute (gpm). The need for this estimated pumping rate assumes there is no onsite storage tanks for the facility.

For comparison purposes the primary land use for the subject property currently and in the recent past has been vegetable and strawberry farming (row crops). According to the University of California Cooperative Extension and the Santa Barbara County Water Authority strawberries require 1"- 2" of overhead water irrigation every other day, especially during the field preparation and planting period of 4-6 week, followed by 2" of water weekly via dripline for 8 weeks through harvest. Assuming that 80 acres out of the total acreage (99 acres) of the Arctic Cold parcel, is planted in strawberries, the daily water demand (utilizing 1" daily) is calculated to be approximately 27,000 gallons per acre or 2,160,000 gallons per day (6.6 AF) for the 80 acres being farmed. The initial 45 days of watering including preparation and planting equals 150 AY and 8 weeks of dripline growing to the completion of harvest for the 80 acres of berries is estimated at 106 AF; for a total water usage of 250+ AF. Assuming two growing periods per year the total water consumption will approach 500 AFY.

Utilizing a different method of estimating crop water demand, the SMVMA has over the years developed applied crop water (AW) requirements for various crop categories depending on crop type, soil type, water application method, evaporation, etc. These AW values range between 4.2 AF/Ac for pasture, 2.5 AF/Ac for rotational vegetables, 1.5 AF/Ac for strawberries and 1.3 AF/Ac for vineyards. Consequently, once again assuming 80 acres of farmed ground the calculated water usage for the subject property would vary between 120 AF and 200 AF per growing period with at least two growing periods per year. The point of this exercise is to confirm that there is similar water demand on this property whether you calculate water usage for crop production or for refrigeration/cooling of vegetables.

Potential Project Impacts to the Santa Maria Groundwater Basin

As was stated previously in this report, there has been a general leveling off of the volume of annual extracted groundwater in the basin along with a stable amount of total acres being irrigated since the late 1970's. During this time period the range of produced water for farming activities has been between 100,000 AFY and 150,000 AFY. This has been offset by a general average of gross perennial safe yield for the basin of 125,000 AFY. This aquifer recharge varies from 80,000 AFY during low rainfall years to 150,000 AFY for periods with above normal rainfall. These estimates have resulted in a calculated overdraft in the basin of 15,000 AFY in 1991 following a 5 year drought period to no overdraft in 2000 (Figure 7). The issue of overdraft within the basin has been often studied because of its implications for long term water supply and water quality degradation including the build-up of nitrates, sulfates, total dissolved solids, and the threat of salt water intrusion from the Pacific Ocean. There have been numerous historic reports by various agencies and private consultants with each concluding with differing levels of overdraft.

On this important issue litigation regarding the status and use of groundwater in the Santa Maria Basin was initiated in 1997. The litigation encompassed all of the Santa Maria Basin, not just the part in Santa Barbara County. Consequently, after a lengthy process of adjudication with an original judgement in 2008 where the judge declared that the basin was not currently in overdraft, but that overdraft is likely in the future unless conservation measures are undertaken. In conjunction with the passage of the Sustainable Groundwater Management Act (SGMA) in 2014, there are now water conservation methods being enacted along with new regulations and water monitoring to slow the decline of water levels within the basin (Figure 8).

With regards to the pending Arctic Cold project the projected water use for this facility is comparable to the historical water use on the property via row crop farming over the last 50+ years. Considering the net water usage of less than 150 AFY after return flows are calculated, this projects water extraction from the local aquifers will likely have little or no impact to the overall health of the Santa Maria Groundwater Basin.

In terms of local impacts, the key area water wells examined in the original hydrology report were again reviewed in regards to their location and distance from the proposed project, and the well characteristics such as specific capacity, percent of total drawdown and estimate zone of influence. The closest water well to the project property is the Sheehy well 600 feet to west. This well, completed to 613 feet, had a static water level of 248 feet. After testing at a rate of 850 gallons per minute (gpm) with a 23 foot drawdown, the specific capacity was calculated at 37 gallons per foot of drawdown. Based on testing experience on multiple water wells within the basin, the estimated zone of influence (radial distance) around this well is less than 200 feet.

The existing well on the subject property, Newman #2, which will not be utilized for this project is approximately 1600 feet to the south. Drilled and completed to

a depth of 606 feet, the Newman well was tested at 1200 gpm with a resulting drawdown of 71 feet. The static water level was 189 feet at the time of drilling. The third well examined in the report, the OSR well, is located nearly 1300 feet to the north of the Arctic Cold parcel. Completed to a depth of 640 feet, this well was tested at 1200 gpm with a resulting drawdown of 54 feet. With a specific capacity of 22 gallons per foot of drawdown, it is estimated that the zone of influence for this well and the Newman well will be 300 feet radially or less. Consequently, drilling and completing a new well at Arctic Cold will have minimal, if any impacts to the local aquifers that will be shared with the above-mentioned area water wells. In addition, as was mentioned previously, the proposed water extraction for the Arctic Cold project is anticipated to be equal to or less than the operating flowrate that has occurred on the property during row crop farming in the recent past as well as currently.

Conclusions

1. The historical safe yield of the Santa Maria basin is 120,000 AF per year.

2. The historical annual extraction of groundwater from the Santa Maria Basin for agricultural purposes, as well as municipal use, is 100,000 AF to 120,000 AF. Municipal water consumption is 9000 to 12000 AFY, much of which is now met by water supplies from the State Water Project.

3. The amount of water in storage for the Santa Maria Groundwater Basin is estimated to be 2,500,000 AF for those water-bearing aquifers above mean sea level. Including water reserves above and below mean sea level, the water in storage increases to approximately 100,000,000 AF.

4. The volume of annual extracted water for the Arctic Cold Project is estimated to be approximately 277 AF. However, of this total nearly 132 AF will be considered return flow into the area shallow aquifers via infiltration, resulting in a net water consumption of 145 AFY.

5. The estimated local groundwater extraction for the current farming operations on the subject property varies from 240 AFY to 400 AFY; an amount equal to or exceeding the volume of demand water for the refrigeration/cooler project.

6. There are no anticipated impacts from the subject project to the long term health of the Santa Maria Groundwater Basin. Likewise due to the distance (greater than 600 feet) from the Arctic Cold project to any neighboring wells, there are minimal impacts anticipated to the local aquifers and the area water table.

7. Due to the recent adjudication of the basin and the application of the newly passed Groundwater Sustainability Act, new regulations are being put in place along with water conservation measures, water usage reduction plans, new water recharge features, etc. that will likely stem the gradual decline of the regional water and water in storage over the next 20 years.

This report was compiled by:

Charles E. Katherman Date: 10/10/2020

Charles E. Katherman
CA Professional Geologist #4069

REGISTERED GEOLOGIST
CHARLES E. KATHERMAN
CEK
NO. 4069
Exp's 8/2021
STATE OF CALIFORNIA

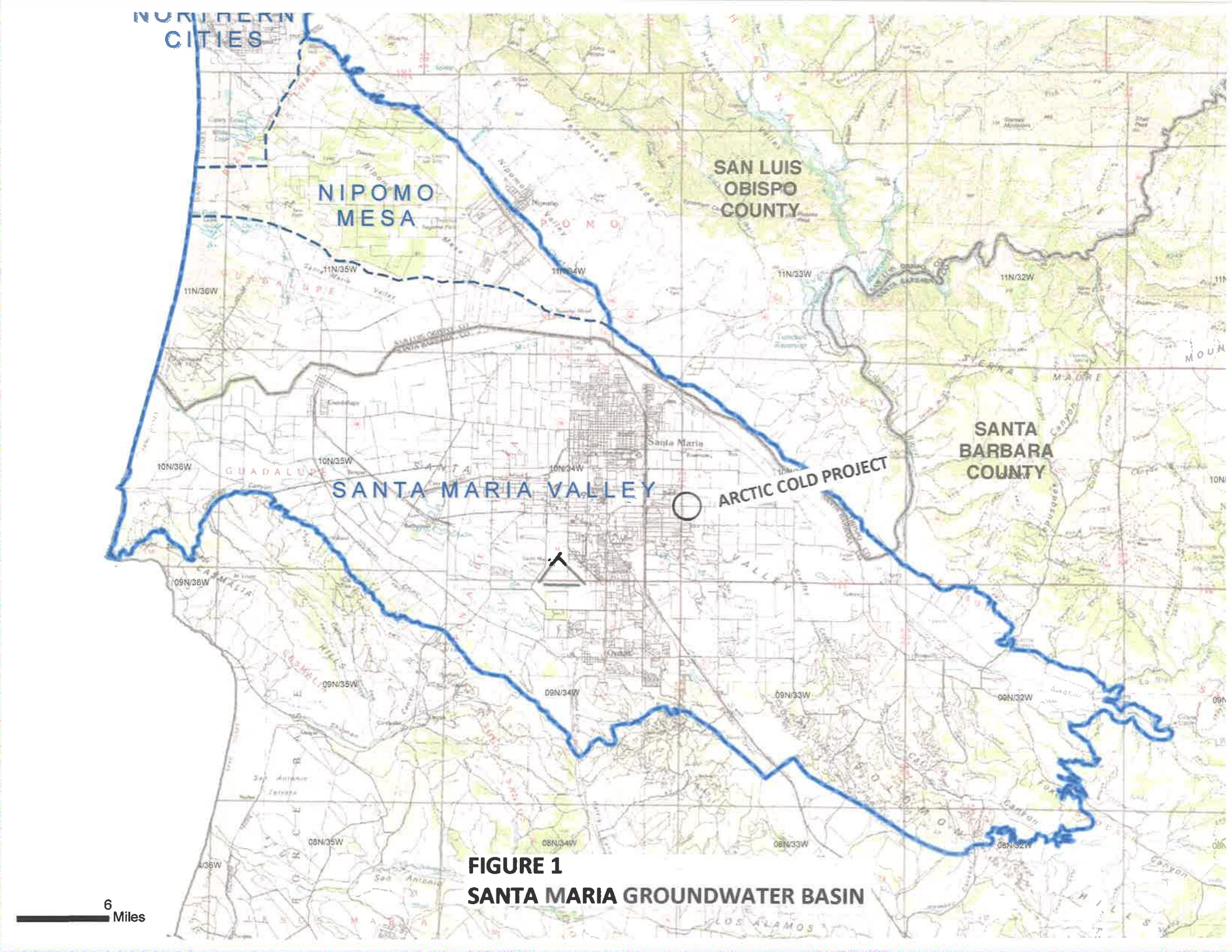


FIGURE 1
SANTA MARIA GROUNDWATER BASIN

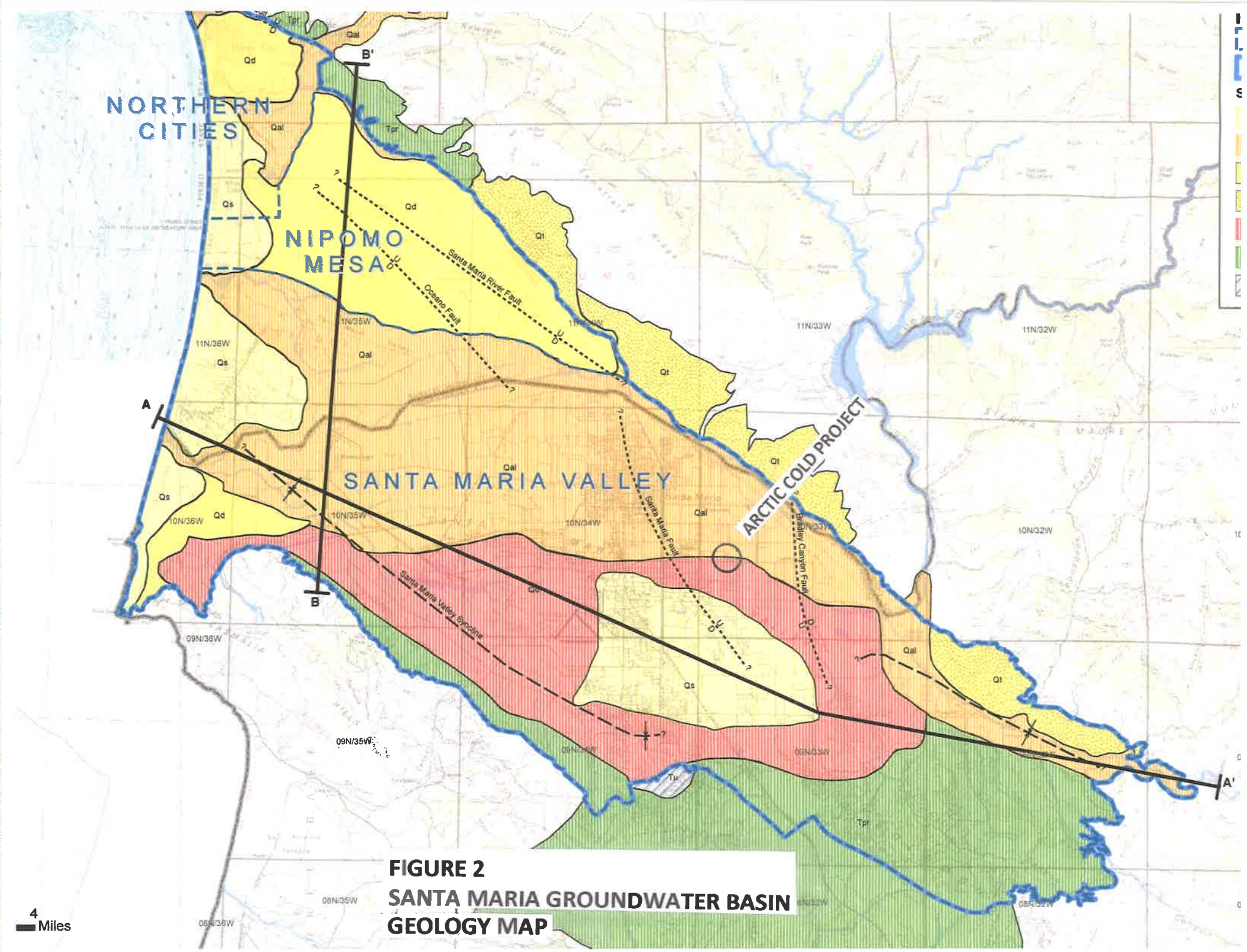
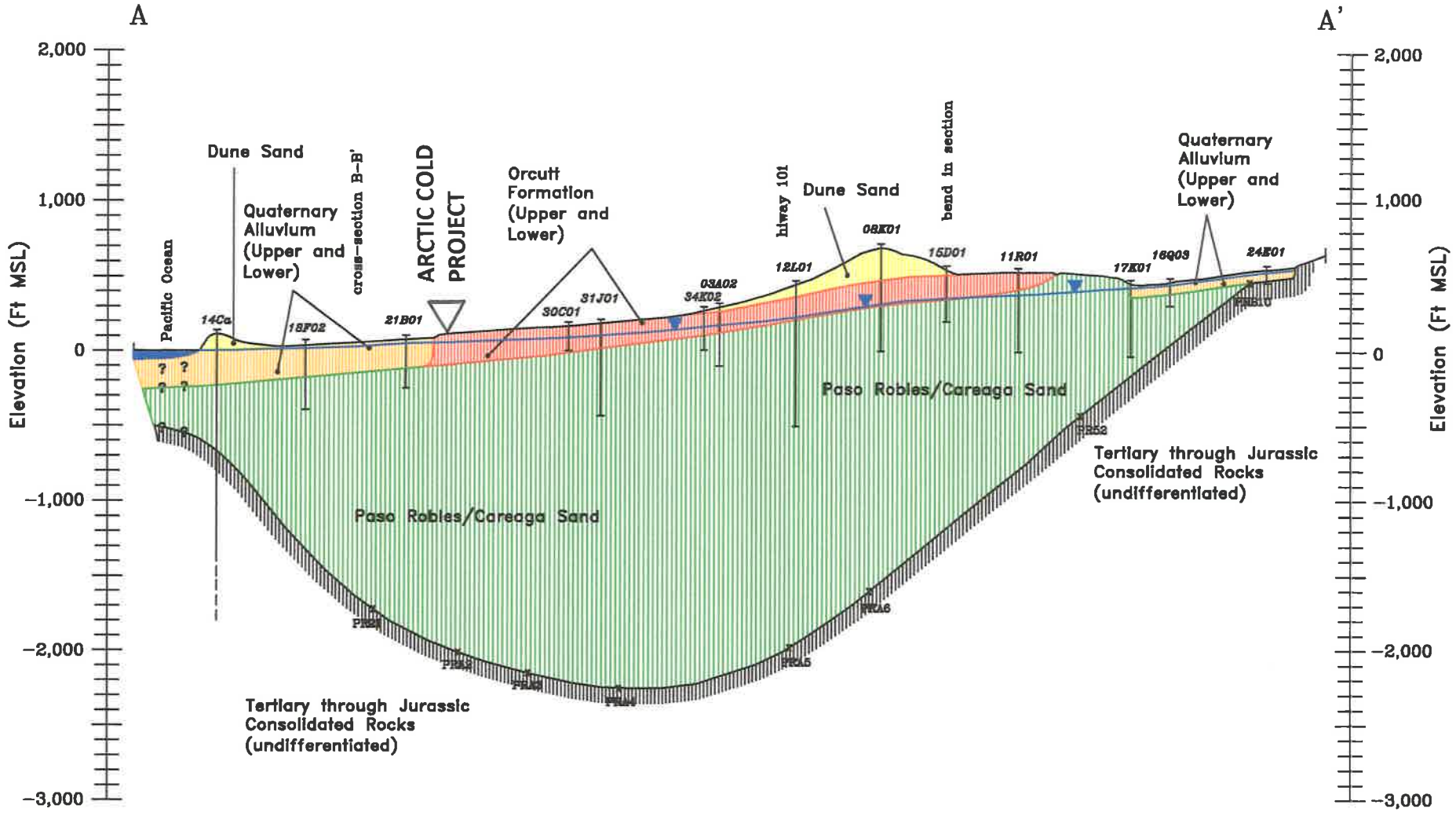


FIGURE 2
SANTA MARIA GROUNDWATER BASIN
GEOLOGY MAP



Ground-water levels shown are based on measurements made in a separate network of wells

Vertical Exaggeration = x20

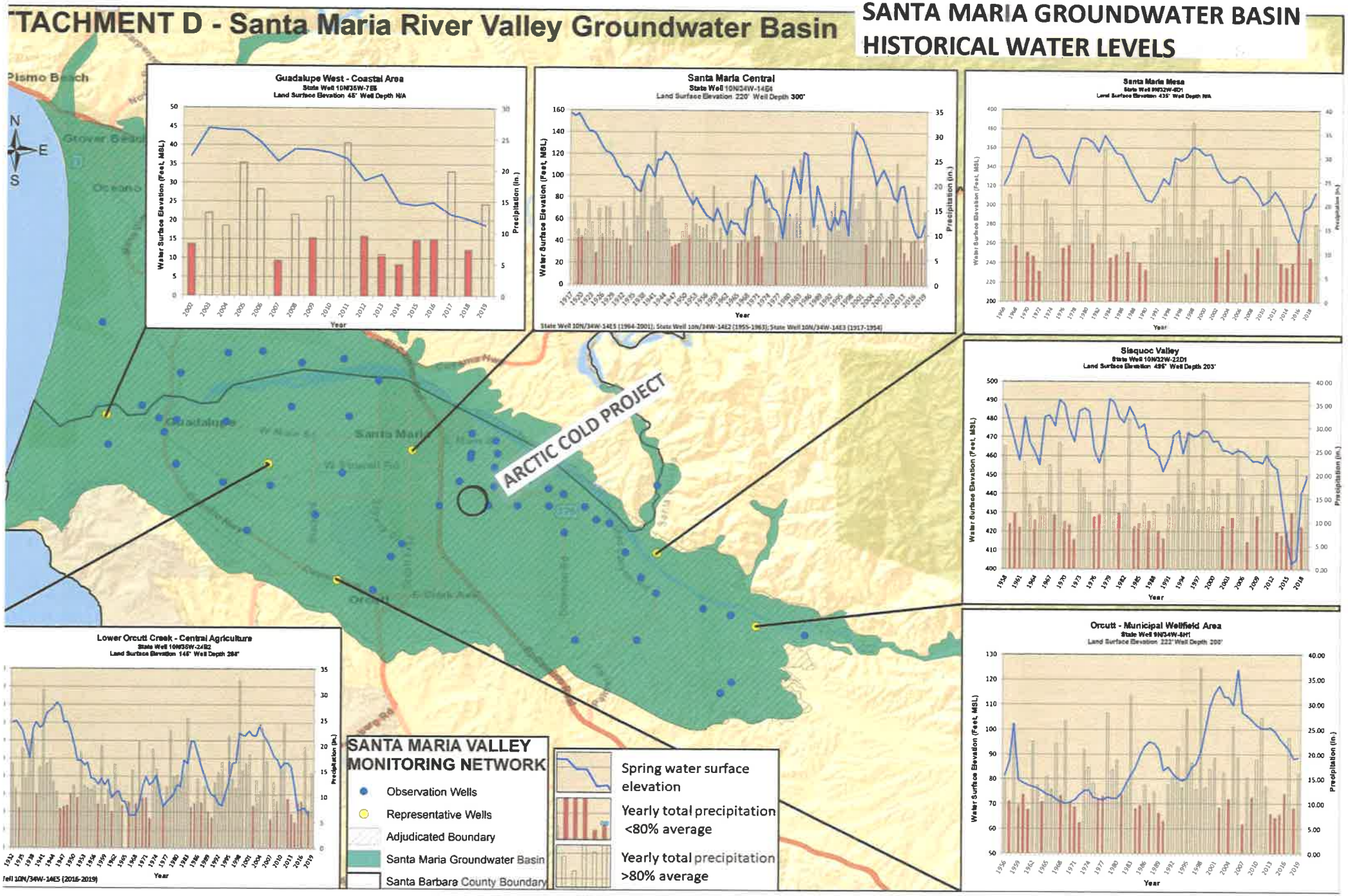
C:\SantaMaria 2008\Annual Report 2008\Fig 2.1-1b XSec A-A' 2008.dwg

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

FIGURE 3

Longitudinal Geologic Cross Section, A-A'
Santa Maria Valley Management Area

FIGURE 4
SANTA MARIA GROUNDWATER BASIN
HISTORICAL WATER LEVELS



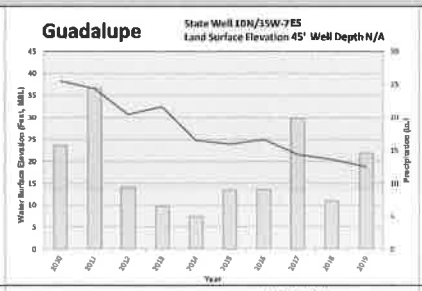
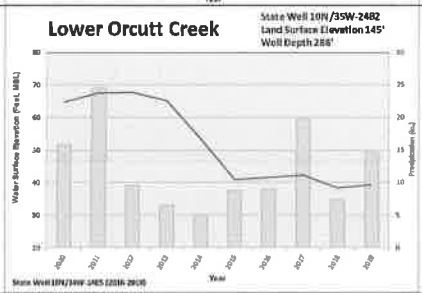
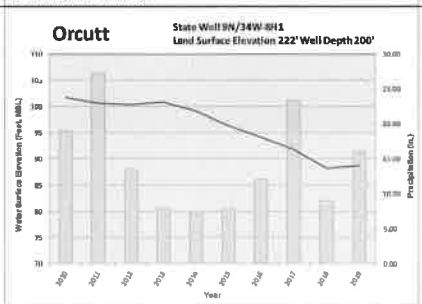
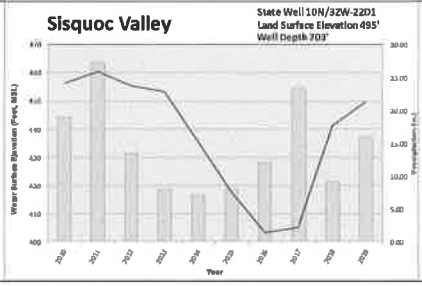
SANTA MARIA RIVER VALLEY GROUNDWATER BASIN	
COASTAL AREA **SUMMARY:** Water levels have been steadily declining since about Water Year 2000, with a more rapid rate of decline during the recent drought.	
CENTRAL AGRICULTURE **SUMMARY:** Water levels have been declining since about Water Year 2000, with a more rapid rate of decline during the recent drought.	
ORCUTT **SUMMARY:** Water levels have been declining since about Water Year 2000, with a more rapid rate of decline during the recent drought.	
SISQUOC VALLEY **SUMMARY:** Water level data show noticeable recent recharge along the Sisquoc River as a result of river infiltration during Water Years 2017 and 2019.	

FIGURE 5
SANTA MARIA GROUNDWATER BASIN AREA WATER LEVELS (2010-2019)

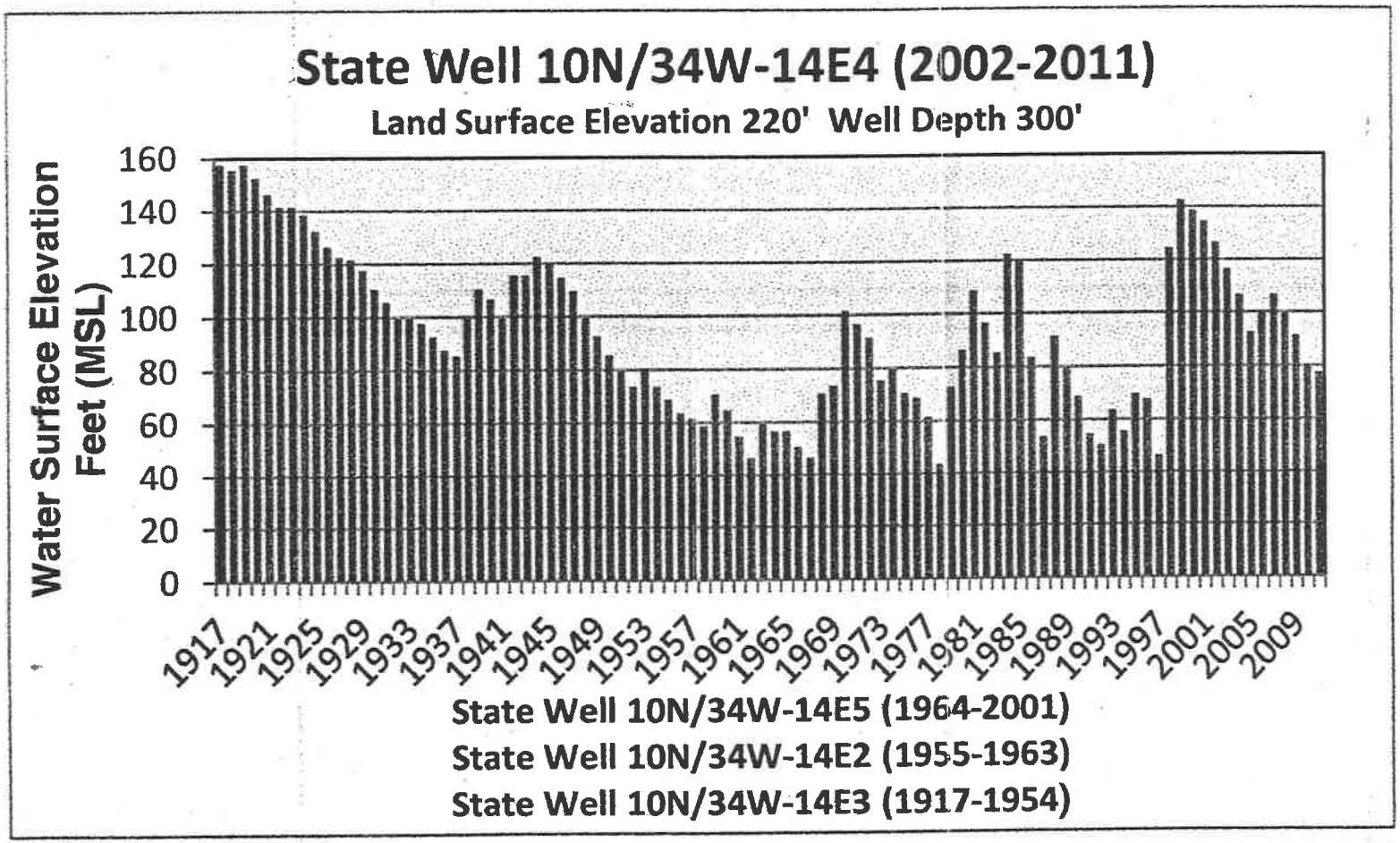


FIGURE 6
STATE MONITORING WELL
WATER LEVELS (1917-2011)

Year	Agency	Calculated Overdraft (AFY)	Base Period Used
1946	USGS	12,000	1931-1946
1966	USGS	20,000	1931-1966
1976	City of Santa Maria	6,000	1935-1974
1976	USGS	10,000	1946-1976
1977	SBCWA	20,000	1918-1975
1991	SBCWA	15,700	1918-1990
2000	SMVWCD	0	1968-1989
2002	SBCWA	2,400	1943-1999

FIGURE 7
SANTA MARIA BASIN
HISTORICAL WATER BUDGET ANALYSIS

GROUNDWATER BASIN	SGMA BASIN PRIORITIZATION	GSP DUE	DWR BULLETIN 118 BASIN
Carpinteria	High	2024	3-018
Montecito	Medium	2024	3-049
Santa Barbara	Very Low	N/A	3-017
Foothill	Very Low	N/A	3-053
Goleta	Very Low	N/A	3-016
Santa Ynez River Valley	Medium	2022	3-015
San Antonio Creek Valley	Medium	2022	3-014
Santa Maria Valley	Very Low	N/A	3-012
Cuyama Valley	High (critically overdrafted)	Submitted 2020	3-013

FIGURE 8
SGMA BASIN PRIORITIZATION
FOR SANTA BARBARA COUNTY WATER BASINS