

Appendix E

Well Feasibility Study

E-1 Well Feasibility Study

E-2 Strauss Well CW-2

E-3 Construction Water Supply Aquifer Letter – September 2019

E-4 Construction Water Supply Aquifer Letter – October 2019

Appendix E-1

Well Feasibility Study



November 30, 2017

Mr. Joshua Franklin
Strauss Wind, LLC
5901 Priestly Drive, Suite 300
Carlsbad, CA 92008

SUBJECT: Assessment of Groundwater Well Feasibility and Siting for Strauss Wind Project Operations and Maintenance Facility, San Miguelito Road, Lompoc, Santa Barbara County.

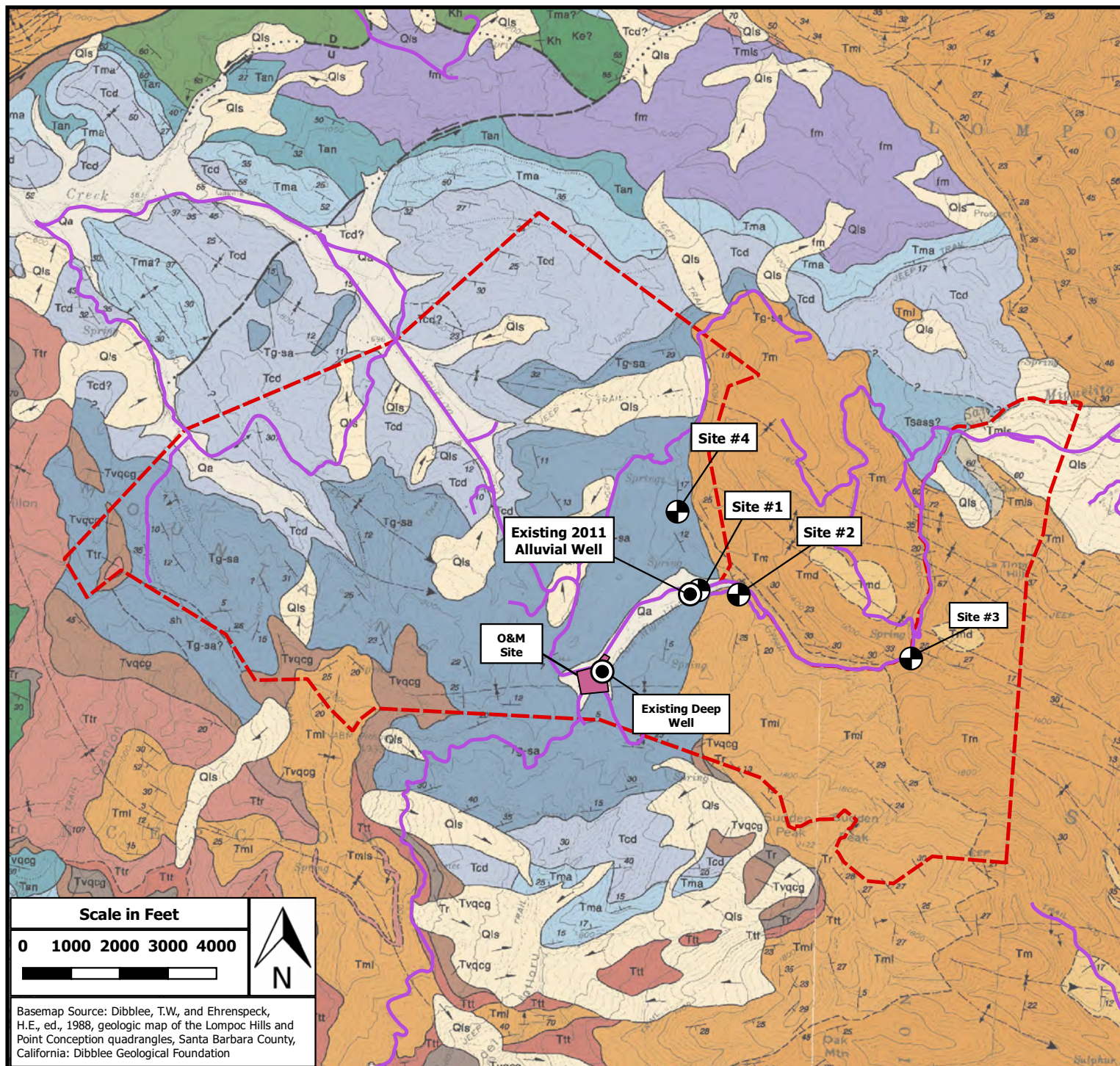
Dear Mr. Franklin:

As requested, Cleath-Harris Geologists (CHG) has completed a review of available hydrogeologic information and performed field reconnaissance in order to assess the feasibility of drilling a water well to supply the proposed Operations and Maintenance (O&M) building for the Strauss Wind Project. Field reconnaissance was performed on November 27, 2017. This letter summarizes the information obtained to date and the results of the assessment.

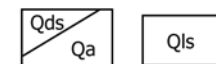
Site Geology

The project site is underlain primarily by undivided, early Tertiary-age Gaviota-Sacate Formations, which are described as a tan, semi-friable, thick-bedded marine sandstone, locally interbedded with gray micaceous siltstone and claystone. There is also Monterey shale mapped on the east side of the project area, and Cosy Dell shale mapped on the north side of the project area. A few outcrops of Vaqueros sandstone are shown on the geology map along the southern project boundary. Among the formations locally present, the Vaqueros sandstone and siliceous member of the Monterey shale are viable targets for groundwater development, while the Cosy Dell shale is a poor target due to water quality issues and low productivity. The Gaviota-Sacate Formations are gradational and contemporaneous with the Coldwater sandstone, portions of which are a viable target for groundwater development in other areas. Alluvial deposits are also present locally, and can provide a source of water to wells if saturated and sufficiently thick. Project site geology is shown on Figure 1.

The O&M site is covered by a thin veneer of seasonally saturated alluvial deposits underlain by the Gaviota-Sacate Formation. There is a syncline mapped through the O&M building envelope, where the Gaviota-Sacate Formation is inferred from local structure to reach a maximum thickness of 800 feet.



Legend



Surficial Sediments



Older Dissected Surficial Sediments

UNCONFORMITY



Sisquoc Shale



Monterey Shale



Tranquillon Volcanic Formation

UNCONFORMITY



Rincon Shale



Vaqueros Sandstone

UNCONFORMITY



Gaviota-Sacate Formations, Undivided



Cozy Dell Shale



Matilija Sandstone



Anita Shale

Figure 1
Geologic Map
Strauss Wind Energy Project

Cleath-Harris Geologists



Available Information

There are two points of information on water wells in the area. A Well Completion Report from 2011 is available for a shallow alluvial well along the drainage channel parallel to San Miguelito Road, and results of a well test with water quality information are described in the EIR for the former Lompoc Wind Energy Project (Aspen Environmental Group, 2008). Some additional information on springs, water levels, and water quality was obtained during site reconnaissance.

Alluvial Well

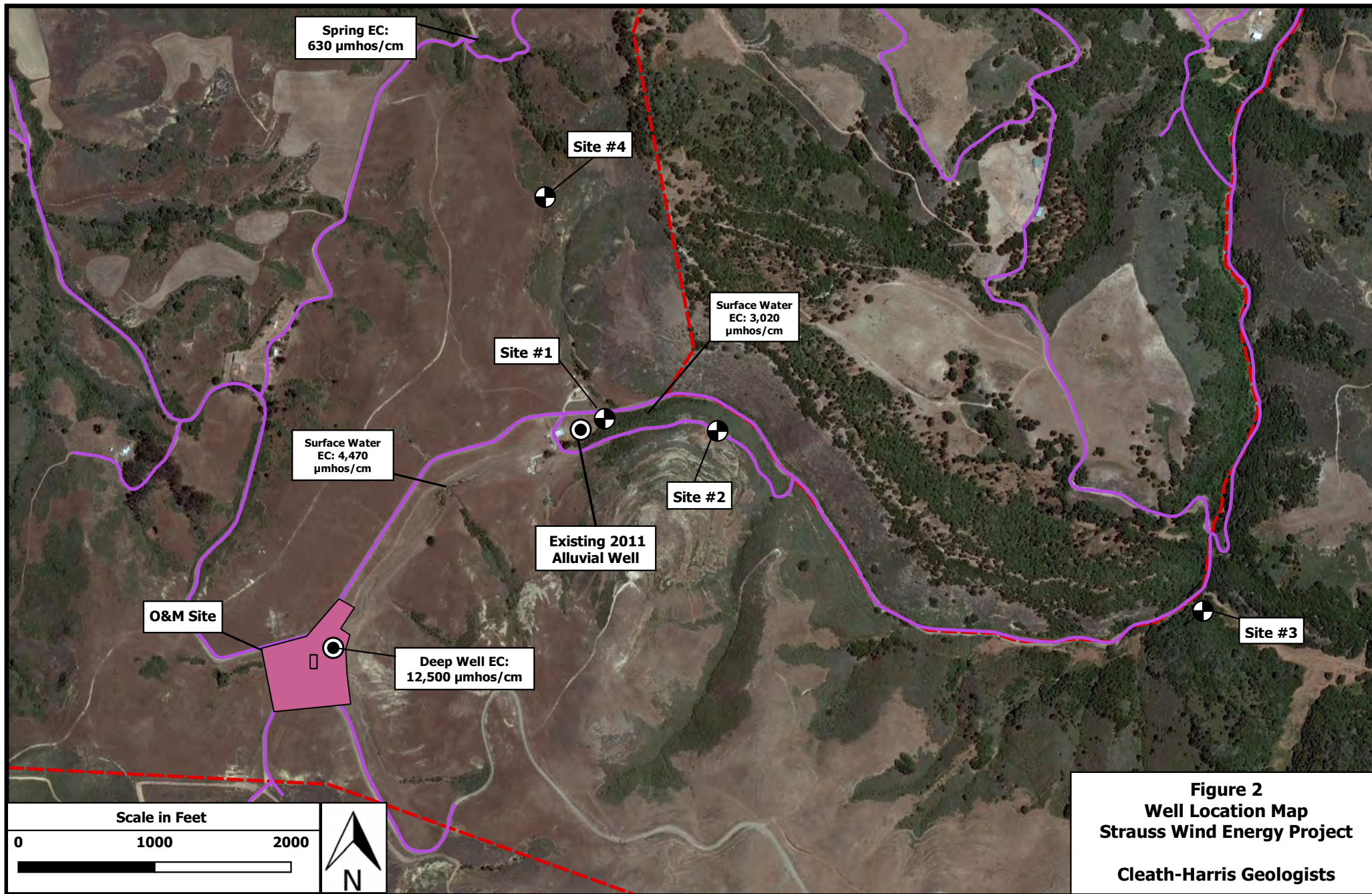
The alluvial well is located in a broad drainage swale approximately 2,500 feet northeast of the San Miguelito Road and Sudden Road intersection (Figure 2). This shallow well taps sand and gravel to a depth of 34 feet, with clay through the total well depth of 50 feet (Well Completion Report attached). Alluvium is also mapped at the O&M site, but geotechnical borings show it to be too shallow for development purposes at that location (less than 20 feet thick). Field reconnaissance indicates the 2011 alluvial well is currently equipped with a pump to serve the local ranch.

Surface water in the alluvial drainage channel was noted at two locations. The first location was approximately 1,000 feet upstream of the alluvial well, and the second location was at the beginning of the bedrock narrows approximately 500 feet downstream of the well. Electrical Conductivity (EC) of the surface water measured 4,470 micromhos per centimeter ($\mu\text{mhos/cm}$) at the upstream location and 3,020 $\mu\text{mhos/cm}$ at the downstream location (Figure 2).

O&M Site Deep Well

Water quality and pumping test information is available for a 475-foot deep, unused well on the Signorelli Ranch. The information, from December 2005 and January 2006, indicates that water quality from the Signorelli Ranch deep well has an elevated salinity of approximately 10 times greater than drinking water standards. CHG located the well during site reconnaissance at the proposed O&M site (Figure 2; Image attached). The static water level was measured at 123.9 feet depth, compared to 125 feet depth reported on December 27, 2005. A grab sample of groundwater in the deep well was also bailed and tested during site reconnaissance. The EC of the water sample measured 12,500 $\mu\text{mhos/cm}$, compared to 16,000 $\mu\text{mhos/cm}$ reported in 2006. The drinking water standard is 1,600 $\mu\text{mhos/cm}$.

Data from two pumping tests are available, the first conducted on December 27, 2005, and the second on January 11, 2006 (attached). The pumping tests showed the well does not meet minimum County standards for domestic supply and may not be able to provide





the nominal 250 gallons per day supply needed for the O&M facility. These pumping tests show excessive drawdown at low production rates.

During the first test in December 2005, the well produced approximately 450 gallons in 60 minutes, with a water level decline of 187 feet. Virtually all of the water pumped was from casing storage (i.e. minimal inflow to the well from the aquifer), based on a nominal 8-inch steel casing size as observed at the wellhead. During the second test, the well produced approximately 940 gallons of water in four hours, with a water level decline of 196 feet. An estimated 510 gallons was from casing storage. The static water level at the beginning of the second test was 57 feet deeper than the static measured two weeks earlier, however, indicating poor recovery from the initial testing. Treatment for potable use from the well would require reverse osmosis, which would further diminish the well's effective yield.

Well Site Feasibility Assessment

A detail of the project site and potential well sites are shown on Figure 2. A nominal 250 gallons per day (based on 4-6 staff with 50 gallons per day per person water use) would be adequate for the O&M facility, although a minimum flow of 3 gallons per minute for 72 hours (4,320 gallons per day) would be needed from a pumping test to meet County standards for domestic supply (Santa Barbara County Code Chapter 34B-18).

Feasible Options

Site #1 A well at this location would tap the alluvial deposits at the lowest possible elevation prior to the bedrock narrows, approximately 2,700 feet to the northeast of the O&M site. The existing alluvial well met the minimum yield test for a domestic well per County standards (3 gpm for 72 hours), and similar production from a new well would be expected. Water quality may require treatment for potable use, based on the EC measurements of surface water in the alluvial drainage. There is an estimated 40 acre-feet of available groundwater stored in the alluvial aquifer, which provides drought period reliability and should be adequate for both local ranch and O&M facility needs. A new alluvial well would be approximately 150 feet from the existing well, and would need a variance from the County to install a 20-foot sanitary seal instead of the 50-foot seal required by County Code. There is power at the ranch. Water from Site #1 could be piped along the County right-of-way or through an easement on the ranch. There is a 70-foot gain in elevation between ground surface at Site #1 and the O&M site.

Site #2 A second location for groundwater development would be to tap the semi-siliceous portion of the lower Monterey shale. There is a good probability of obtaining adequate water to serve the O&M facility, and water quality from the shale is expected to be generally suitable for potable use, although treatment may be required. Site #2 is



approximately 4,000 feet northeast of the O&M facility, on an elevated bench at the former Union Sugar limestone quarry. Existing power lines at the ranch are approximately 1,200 feet from the proposed well site. Pumped water would need to be piped along an easement, either within the County right-of-way or across the ranch. Depth to water in a well at Site #2 location would likely be less than 200 feet. Production capacity from a well at this location could be up to 20 gallons per minute. There is a 20-foot gain in elevation between ground surface at Site #2 and the O&M site.

Site #3 The most favorable location, based on hydrogeology, is within the siliceous Monterey shale. There is a high probability of obtaining adequate water to serve the O&M facility, and water quality from the siliceous shale is expected to be generally suitable for potable use. The preferred well location, however, is approximately 8,000 feet east of the O&M facility along San Miguelito Road, and would require water to be piped along an easement within the County right-of-way. There is also no power within a few thousand feet. Depth to water in a well at Site #3 would likely be less than 50 feet. Production capacity from a well at this location could be up to 20 gallons per minute. There is a 250-foot gain in elevation between ground surface at Site #3 and the O&M site.

Site #4 The upper Gaviota-Sacate sandstone does feed a few springs in the project area. One spring visited during site reconnaissance had been developed for stock water with an EC measuring 620 $\mu\text{mhos/cm}$. A second spring visited was not flowing but there was vegetative evidence of seeps. These springs emanate from an indurated and locally coarser grained sandstone bed that is above the alluvial valley floor. To tap the spring zone, a well would need to be drilled on the ridge above the valley floor at a distance of roughly 4,000 feet from the O&M site. Production capacity would likely be low, and may require a variance from the County standards for flow, but water quality should be suitable for potable use. Depth to water would be close to 300 feet. The closest power lines are approximately 1,400 away. Water pumped from the well would need to be piped along an easement on ranch property. Site grading for rig access would be necessary. There is a 220-foot drop in elevation between ground surface at Site #4 and the O&M site.

Options Considered Infeasible

The source of water to the existing Signorelli Ranch deep well at the proposed O&M site is interpreted to be the lower Gaviota-Secate Formation. Very low production and poor water quality effectively eliminate the feasibility of using the well or developing a new well at the O&M site.

The Vaqueros Sandstone, typically a favorable target for groundwater development, is too high in elevation and mostly unsaturated on the property. Suitable access for a drilling rig is also significantly constrained, based on site reconnaissance.



Well Facilities

A water well for the O&M facilities would be constructed using 5-inch or 6-inch diameter PVC casing, include a sanitary annular seal, and could extend up to several hundred feet below grade, pending the results of test hole drilling. Wells typically include approximately 1-2 feet of casing stickup from the surface (cement) pad.

The well may either be fenced in an enclosure or covered with a small well house. Dimensions vary, but the well house footprint is typically close to 8 x 10 feet and preferably constructed of wood, while fenced enclosures may be the same size or larger and constructed of 6-foot tall chain link. Images of a typical well house and enclosure are attached.

A submersible pump would be placed down the well, where noise levels from pump operation would be negligible at ground surface. A 2,500-gallon or larger water storage tank and small booster pump may be incorporated into the design to provide fire suppression water and greater instantaneous discharge capacity for the O&M building, but would not result in noise nuisance issues.

Well Construction

Water supply well construction and testing should be performed by a C-57 licensed drilling contractor in accordance with Santa Barbara County Code Chapters 34A (Wells) and 34B (Domestic Water Systems). During construction, the drilling rig and support vehicles would require an approximate 60 x 100 foot work area. A drilling crew typically consists of two to three personnel, although during portions of the construction operation, a geologist and County inspector may also be present. The length of time a drilling contractor would be on-site to complete a domestic well for the O&M facility to a depth of several hundred feet, from rig mobilization through development and testing, would be close to 4 weeks.

If you have any questions, please feel free to contact our office.

Sincerely,
CLEATH-HARRIS GEOLOGISTS

Spencer Harris, HG 633
Senior Hydrogeologist

Attachments



ATTACHMENTS:

Well Completion Report for 2011 Alluvial Well

Signorelli Ranch Deep Well Information

Typical Well Enclosures

STATE OF CALIFORNIA
WELL COMPLETION REPORT

Refer to Instruction Pamphlet

Page ____ of ____

Owner's Well No. 2No. 1082592Date Work Began 7-19-11 Ended 9-1-11Local Permit Agency Santa Barbara CoPermit No. Santa Barbara Co Permit Date 7-14-11 SR# 0107925

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

GEOLOGIC LOG

WELL OWNER

ORIENTATION (✓) ☒ VERTICAL ☐ HORIZONTAL ☐ ANGLE (SPECIFY) 1
DRILLING METHOD Rotary FLUID Mud

2011 Alluvial Well

DEPTH FROM SURFACE
FL to Ft. DESCRIPTION
Describe material, grain size, color, etc.

0 21 Sandy Clay With Gravel Streaks

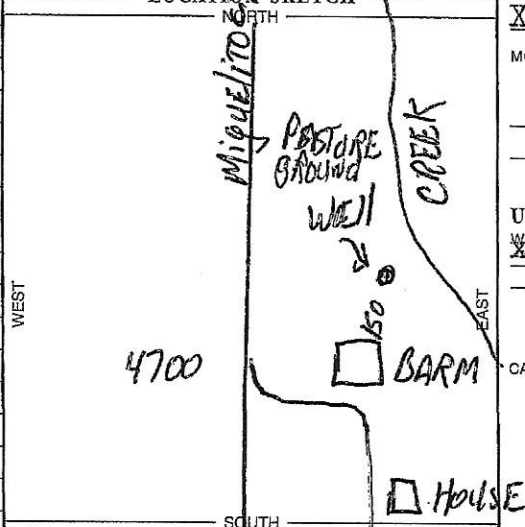
21 34 Small Gravel & Sand

34 55 Blue Clay

* 4700 San Miguelito Rd

WELL LOCATION
Address * 4700 Miguelito Cyn
City Lompoc Calif 93436
County Santa Barbara Co
APN Book _____ Page _____ Parcel 083-100-008
Township _____ Range _____ Section _____
Lat _____ DEG. MIN. SEC. N Long _____ DEG. MIN. SEC. W

LOCATION SKETCH



ACTIVITY (✓)

☒ NEW WELL

MODIFICATION/REPAIR

☐ Deepen
☐ Other (Specify) _____☐ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

USES (✓)

WATER SUPPLY

☒ Domestic ☐ Public
☐ Irrigation ☐ Industrial☐ MONITORING☐ TEST WELL☐ CATHODIC PROTECTION☐ HEAT EXCHANGE☐ DIRECT PUSH☐ INJECTION☐ VAPOR EXTRACTION☐ SPARGING☐ REMEDIATION☐ OTHER (SPECIFY) _____

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.

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER _____ (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 7 (Ft.) & DATE MEASURED 8-20-11ESTIMATED YIELD * 3 (GPM) & TEST TYPE PumpTEST LENGTH 72 (Hrs.) TOTAL DRAWDOWN 22 (Ft.)

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

DEPTH FROM SURFACE		BORE-HOLE DIA. (Inches)	CASING (S)				ANNULAR MATERIAL							
Ft.	to Ft.		TYPE (✓)				TYPE							
			BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
000	14	16	X				PVC	8	SDR-21					
14	50	16	X				PVC	8	SDR-21	040				Montery

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 Taylor Drilling
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)2801 Mahoney Rd Santa Maria Calif 93455

ADDRESS _____ CITY _____ STATE _____ ZIP _____

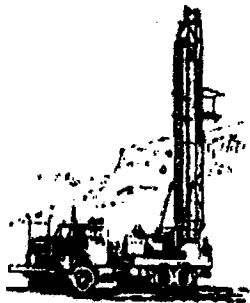
Signed Ron Taylor DATE SIGNED 10-10-11 523-858
C-57 LICENSED WATER WELL CONTRACTOR C-57 LICENSE NUMBER



Signorelli Ranch Deep Well at Proposed O&M Site



Looking East toward Sudden Road /San Miguelito Road Intersection



Alexander Bros., Inc.

WATER WELL DRILLING CONTRACTORS

(805) 684 8136

(805) 736-2645

LIC. NO. 602322

200 LA SALLE CYN RD
LOMPOC, CA 93436

WELL DEPTH: 475 STATIC WATER LEVEL: 125 DATE TESTED: 12/22/05
OWNER'S NAME: Pacific Wind Power LLC PUMP INFO: _____
WELL LOCATION: Sigacelli Ranch Pump Setting 320

STATIC WATER LEVEL: 125

DATE TESTED: 12/22/05

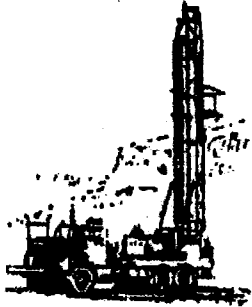
OWNER'S NAME: Pacific Wind Power LLC

PUMP INFO:

WELL LOCATION: Sigorelli Ranch

Pumps Setting 320

[illegible]



Alexander Bros., Inc.

WATER WELL DRILLING CONTRACTORS

(805) 888-6000

(805) 736-2848

LIC. NO. 602322

 200 LA SALLE CYN. RD.
 LOMPOC, CA 93436

WELL DEPTH: 425' STATIC WATER LEVEL: 182 DATE TESTED: 1/11/06
 OWNER'S NAME: Pacific Wind Power LLC PUMP INFO: Pump Setting 460
 WELL LOCATION: Sigorelli Ranch

TIME	GPM	LEVEL	TIME	GPM	LEVEL
W/L		182	1:00	2	378
9:00	15	182			
9:02	4000 5gall	190			
9:05	" 2.5gall	200			
9:10	7.5	215			
9:15	7.5	219			
9:20	7.5	222			
9:35	7.5	236			
9:40	5.75	250			
10:00	5.5	274			
10:10	5	295			
10:20	5	304			
10:35	5	325			
10:50	3.75	349			
11:15	3.5	358			
11:26	3	364			
11:37	2.5	372			
11:46	2	376			
12:17	2				
12:35	2	378			

JAN-28-2006 THU 04:41 PM CLINICAL LAB OF S.B.

FAX NO. 808 825 7686

P. 02/03

CLINICAL LAB OF SAN BERNARDINO, INC
21821 BARTON ROAD
GRAND TERRACE, CA 92313

EX

GENERAL MINERAL & PHYSICAL & INORGANIC ANALYSIS (9/99)

Date of Report: 06/01/26

Sample ID No. M60206-1A

Laboratory

Signature Lab

Name: CLINICAL LABORATORIES OF SAN BERNARDINO

Director:

Name of Sampler: R ALEXANDER

Employed By: A.B.

Date/Time Sample

Date/Time Sample

Date Analyses

Collected: 06/01/11/1100

Received @ Lab: 06/01/12/1015

Completed: 06/02/25

System

System

Name: ALEXANDER BROTHERS

Number: 42CXX11

Name or Number of Sample Source: WELL/SIGNORELLI RANCH

* User ID: 42C

Station Number:

* Date/Time of Sample: 06/01/11/1100

Laboratory Code: 3761

YY MM DD TTTT

YY MM DD

* Submitted by:

Date Analysis completed: 06/01/25

Phone #:

MCI	REPORTING UNITS	CHEMICAL	ENTRY #	ANALYSES RESULTS	DLR
	mg/L	Total Hardness (as CaCO ₃) (mg/L)	00900	33C	5.0
	mg/L	Calcium (Ca) (mg/L)	00916	62	1.0
	mg/L	Magnesium (Mg) (mg/L)	00927	24	1.0
	mg/L	Sodium (Na) (mg/L)	00929	3100	1.0
	mg/L	Potassium (K) (mg/L)	00927	13	1.0

Total Cations Meq/L Value: 141.18

	mg/L	Total Alkalinity (AS CaCO ₃) (mg/L)	00410	180	5.0
	mg/L	Hydroxide (OH) (mg/L)	71830	ND	5.0
	mg/L	Carbonate (CO ₃) (mg/L)	00445	ND	5.0
	mg/L	Bicarbonate (HCO ₃) (mg/L)	00440	220	5.0
*	mg/L+	Sulfate (SO ₄) (mg/L)	00945	ND	0.50
*	mg/L+	Chloride (Cl) (mg/L)	00940	5000	1.0
45	mg/L	Nitrate (as NO ₃) (mg/L)	71850	ND	2.0
2.0	mg/L	Fluoride (F) (Natural-Source)	00951	1.2	0.10

Total Anions Meq/L Value: 144.51

Std. Units+	PH (Laboratory) (Std. Units)	00403	7.9	
*** umho/cm+	Specific Conductance (E.C.) (umhos/cm)	00095	16000	10
*** mg/L+	Total Filterable Residue@180C (TDS) (mg/L)	70300	6500	5.0
15 Units	Apparent Color (Unfiltered) (Units)	00081	50	3
3 TON	Odor Threshold at 60 C (TON)	00086	1	1
5 NTU	Lab Turbidity (NTU)	82079	38.9	0.1
0.5 mg/L+	MBAS (mg/L)	38260	0.020	0.020

* 250-500-600

** 0.6-1.7

*** 900-1800-2200

**** 500-1000-1500

JAN-28-2006 THU 04:41 PM CLINICAL LAB OF S.B.

FAX NO. 903 825 7898

P. 03/03

PAGE 2 OF 2

INORGANIC CHEMICALS

M6C206-1A

MCL	REPORTING UNITS	CHEMICAL	ENTRY #	ANALYSES RESULTS	DLR
1000	ug/L	Aluminum (Al) (ug/L)	01105	310	50
6	ug/L	Antimony (ug/L)	01097	ND	6.0
50	ug/L	Arsenic (As) (ug/L)	01002	ND	2.0
1000	ug/L	Barium (Ba) (ug/L)	01007	6300	100
4	ug/L	Beryllium (ug/L)	01012	ND	1.0
5	ug/L	Cadmium (Cd) (ug/L)	01027	ND	1.0
50	ug/L	Chromium (Total Cr) (ug/L)	01034	ND	10
1000	ug/L+	Copper (Cu) (ug/L)	01042	ND	50
300	ug/L+	Iron (Fe) (ug/L)	01045	7200	100
	ug/L	Lead (Pb) (ug/L)	01051	ND	5.0
50	ug/L+	Manganese (Mn) (ug/L)	01055	100	20
2	ug/L	Mercury (Hg) (ug/L)	71900	ND	1.0
100	ug/L	Nickel (ug/L)	01067	ND	10
50	ug/L	Selenium (Se) (ug/L)	01147	ND	5.0
100	ug/L+	Silver (Ag) (ug/L)	01077	ND	10
2	ug/L	Thallium (ug/L)	01059	ND	1.0
5000	ug/L	Zinc (Zn) (ug/L)	01092	ND	50

ADDITIONAL ANALYSES

	ug/L	Boron (ug/L)	01020	4300	100
10000	ug/L	Nitrate + Nitrite as Nitrogen(N) (ug/L)	A-029	ND	400
1000	ug/L	Nitrite as Nitrogen(N) (ug/L)	00620	ND	400
150	ug/L	Cyanide (ug/L)	01231	ND	100
	ug/L	Vanadium (ug/L)	01087	ND	3.0

+ Indicates Secondary Drinking Water Standards



Example of well pump house



Example of well enclosure

Appendix E-2

Strauss Well CW-2



March 6, 2019

Mr. J rge Beland
Strauss Wind, LLC
5901 Priestly Drive, Suite 300
Carlsbad, CA 92008

Subject: Pumping Test and Water Quality Results for Strauss Wind Energy Project Well CW2, San Miguelito Road, Lompoc, Santa Barbara County.

Dear Mr. Beland:

This letter summarizes the pumping test and water quality results for Well CW2, which will provide a domestic water source for the proposed Strauss Wind Energy project's operations and maintenance (O&M) facility. Well CW2 was constructed between January 29 and February 12, 2019, by Powell and Murphy Drilling of Paso Robles, California (Santa Barbara Well Permit #3208-4669). The well is located off San Miguelito Road approximately 6 miles south of Lompoc (APN 083-250-011).

Well Construction

Well CW2 is cased with 6-inch PVC to a depth of 209 feet, with 0.040-inch perforations from 129 to 209 feet depth. Construction included a 16-inch steel conductor cemented in a 23-inch borehole from surface to 38 feet depth, and a sanitary seal inside the conductor that extends to 50 feet depth. The filter pack is composed of 8x16 sand. The Well Completion Report is attached.

Pumping Test

A 12-hour constant discharge test was performed on February 15, 2019 at a rate of 60 gallons per minute (gpm). Pumping test data and graph are attached. The static water level prior to pumping was measured at 110.6 feet depth. Pumping water levels reached a maximum of 148.6 feet (38 feet of drawdown) at the conclusion of the 12-hour test. The static water level recovered to 120 feet depth within 60 minutes of pump shutdown, and a subsequent static water level of 107 feet depth was measured at 1:30 pm on February 19, indicating full recovery following the pumping test.

The long-term drawdown and reliability of Well CW2 for domestic use has been evaluated using the Jacob method of proportionality between groundwater discharge and water level drawdown. A nominal 250 gallons per day (based on 4-6 staff with 50 gallons per day per person water use) is considered adequate for domestic water use at the O&M facility. Based on the results of the 60 gpm pumping test, Well CW2 provides



a reliable, long-term source of water for the O&M facility. At 250 gallons per day average production from the well (less than 0.2 gpm continuous flow), long-term static water level drawdown is estimated to be less than a foot.

Well CW2 produced approximately 43,000 gallons of water over the 12-hour pumping test, which is enough water to serve the O&M facility for more than 5 months. The static water level in Well CW2 was fully recovered within a few days of the test; Well CW2 has ample capacity to meet the domestic water needs of the O&M facility.

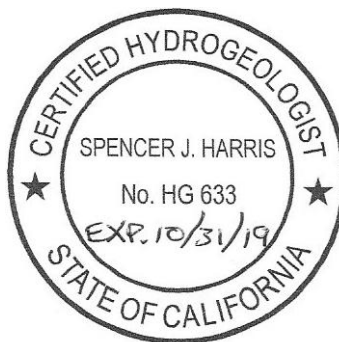
Water Quality

Groundwater samples from Well CW2 were collected, preserved, and transported by an approved sampler and delivered to a State-certified analytical laboratory on February 14, 2019. Water quality testing was performed for constituents listed in Title 22 CCR Tables 64431-A, 64449-A, and 64449-B in accordance with Santa Barbara County Code (Chapter 34B) for domestic water systems.

Water quality results are attached. All constituents tested met drinking water standards except total iron, which was detected at 630 micrograms per liter (the Secondary Maximum Contaminant Level for iron in drinking water is 300 micrograms per liter). Elevated iron concentrations are not unusual for groundwater sources and iron-removal treatment options are available, such as ion exchange or oxidation/filtration. Well CW2 water is suitable for domestic use with treatment for iron removal.

Signed,
CLEATH-HARRIS GEOLOGISTS

Spencer J. Harris, HG 633
Senior Hydrogeologist



DATE: March 6, 2019

attachments



ATTACHMENTS

Well Completion Report
Pumping Test Report
Water Quality Report

State of California
Well Completion Report
 Form DWR 188 Submitted 2/19/2019
 WCR2019-002457

Owner's Well Number _____ Date Work Began 01/29/2019 Date Work Ended 02/12/2019
 Local Permit Agency Santa Barbara County Environmental Health Services
 Secondary Permit Agency _____ Permit Number 3802-4669 Permit Date 01/18/2019

Well Owner (must remain confidential pursuant to Water Code 13752)	Planned Use and Activity
Name <u>SIGNORELLI FAMILY TRUST,</u> Mailing Address <u>P.O. Box 173</u> _____ City <u>Lompac</u> State <u>CA</u> Zip <u>93438</u>	Activity <u>New Well</u> Planned Use <u>Water Supply Domestic</u>

Well Location	
Address <u>0 San Miguelito RD</u> City <u>Lompac</u> Zip <u>93438</u> County <u>Santa Barbara</u> Latitude <u>34</u> <u>34</u> <u>30.0612</u> <u>N</u> Longitude <u>-120</u> <u>29</u> <u>34.2599</u> <u>W</u> Deg. Min. Sec. Deg. Min. Sec. Dec. Lat. <u>34.575017</u> Dec. Long. <u>-120.49285</u> Vertical Datum _____ Horizontal Datum <u>WGS84</u> Location Accuracy _____ Location Determination Method _____	APN <u>083-250-011</u> Township <u>06 N</u> Range <u>34 W</u> Section <u>30</u> Baseline Meridian <u>San Bernardino</u> Ground Surface Elevation <u>341.6</u> Elevation Accuracy _____ Elevation Determination Method <u>GPS</u>

Borehole Information	Water Level and Yield of Completed Well
Orientation <u>Vertical</u> Specify _____ Drilling Method <u>Direct Rotary</u> Drilling Fluid <u>Bentonite</u> _____ Total Depth of Boring <u>210</u> Feet Total Depth of Completed Well <u>209</u> Feet	Depth to first water <u>120</u> (Feet below surface) Depth to Static _____ Water Level <u>110</u> (Feet) Date Measured <u>02/15/2019</u> Estimated Yield* <u>60</u> (GPM) Test Type <u>Pump</u> Test Length <u>12</u> (Hours) Total Drawdown <u>38</u> (feet) *May not be representative of a well's long term yield.

Geologic Log - Free Form		
Depth from Surface Feet to Feet		Description
0	3	Sandy Top Soil
3	26	Light Brown Shale
26	56	Fractured Dark Bown Shale with Light Layers
56	108	Firm Dark Brown Shale
108	118	Dark Brown Shale Hard Layer
118	210	Fractured Dark Brown / Black Shale

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	129	Blank	PVC	OD: 6.625 in. SDR: 21 Thickness: 0.316 in.	0.316	6.625			
1	129	209	Screen	PVC	OD: 6.625 in. SDR: 21 Thickness: 0.316 in.	0.316	6.625	Milled Slots	0.04	

Annular Material					
Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	52	Cement	Other Cement		6 Sack Sand Slurry
52	209	Filter Pack	8 x 16		

Other Observations:

Surface Conductor installed from surface to 38 Ft.

Borehole Specifications		
Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	38	23
38	52	12
52	210	10

Certification Statement

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

Name

POWELL & MURPHY DRILLING INC

Person, Firm or Corporation

4710 PRAIRIE RD

PASO ROBLES

CA

93446

Address

City

State

Zip

Signed

electronic signature received

02/19/2019

999944

C-57 Licensed Water Well Contractor

Date Signed

C-57 License Number

DWR Use Only

CSG #

State Well Number

Site Code

Local Well Number

N

W

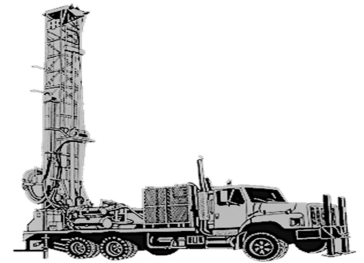
Latitude Deg/Min/Sec

Longitude Deg/Min/Sec

TRS:

APN:

Powell & Murphy Drilling
4710 Prairie Road
Paso Robles, CA 93446
805-369-2568
Lic # - 999944



Test Pump Report

Customer Information

Name: Strauss Wind LLC
Address: San Miguelito Rd
City: Lompoc
Phone Number:

Date: 2/15/2019

State: CA Zip Code: 93438
Email Address:

Well Information

Well Location: 34 34.5010 N 120 29.5710 W : 6 miles south of Lompoc on San Miguelito Rd, 700 Ft East of Gate

Well Casing Size:	6 Inch	Pumping Depth:	180 Feet
Well Depth:	209 Feet	Pump Size:	5 HP
Test Started:	0600 Hrs	Static Level:	110.6 Feet
Test Ended:	1800 Hrs		
Hours Pumped:	12 Hrs	Flow Rate:	60 GPM

Test Information:

Time	Water Level In Feet	Flow Rate In GPM	Comments
0600	110.6	60	Static
0601	120.4	60	Clear with no odor
0602	130.65	60	Clear with no odor
0603	132.5	60	Clear with no odor
0604	133.4	60	Clear with no odor
0605	133.8	60	Clear with no odor
0606	134.15	60	Clear with no odor
0608	134.3	60	Clear with no odor
0610	134.55	60	Clear with no odor
0612	134.75	60	Clear with no odor
0615	134.95	60	Clear with no odor
0620	135.05	60	Clear with no odor
0625	135.4	60	Clear with no odor
0630	135.65	60	Clear with no odor
0640	136.25	60	Clear with no odor
0650	136.8	60	Clear with no odor
0700	136.95	60	Clear with no odor
0715	137.5	60	Clear with no odor
0730	137.8	60	Clear with no odor
0745	138.25	60	Clear with no odor
0800	138.6	60	Clear with no odor
0830	139.2	60	Clear with no odor

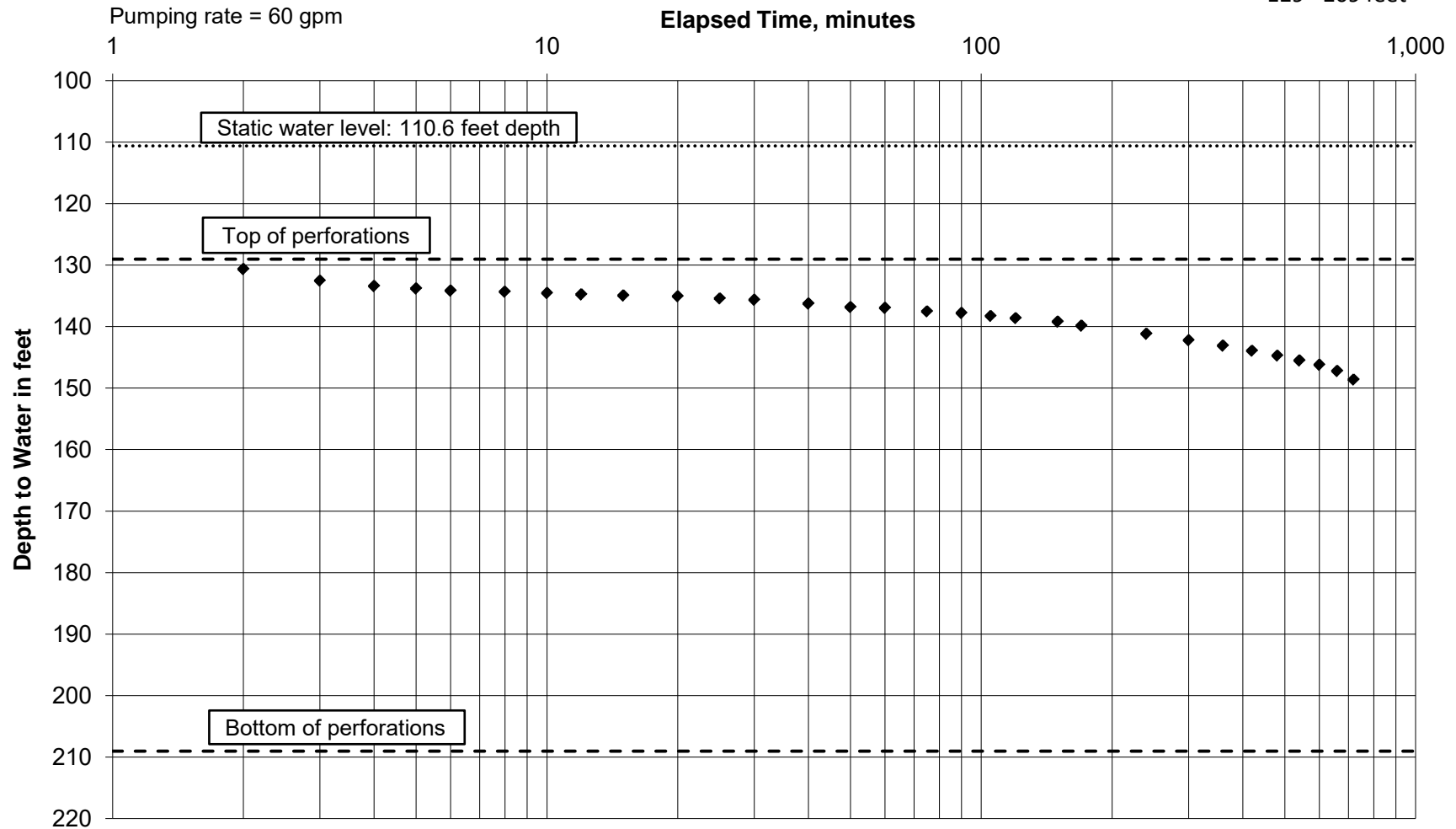
0900	139.85	60	Clear with no odor
1000	141.15	60	Clear with no odor
1100	142.2	60	Clear with no odor
1200	143.1	60	Clear with no odor
1300	143.9	60	Clear with no odor
1400	144.7	60	Clear with no odor
1500	145.5	60	Clear with no odor
1600	146.2	56	Adjust flow to 60 GPM with Stopwatch, Clear with no odor
1700	147.2	58	Adjust flow to 60 GPM with Stopwatch, Clear with no odor
1800	148.6	60	Clear with no odor

Recovery Information

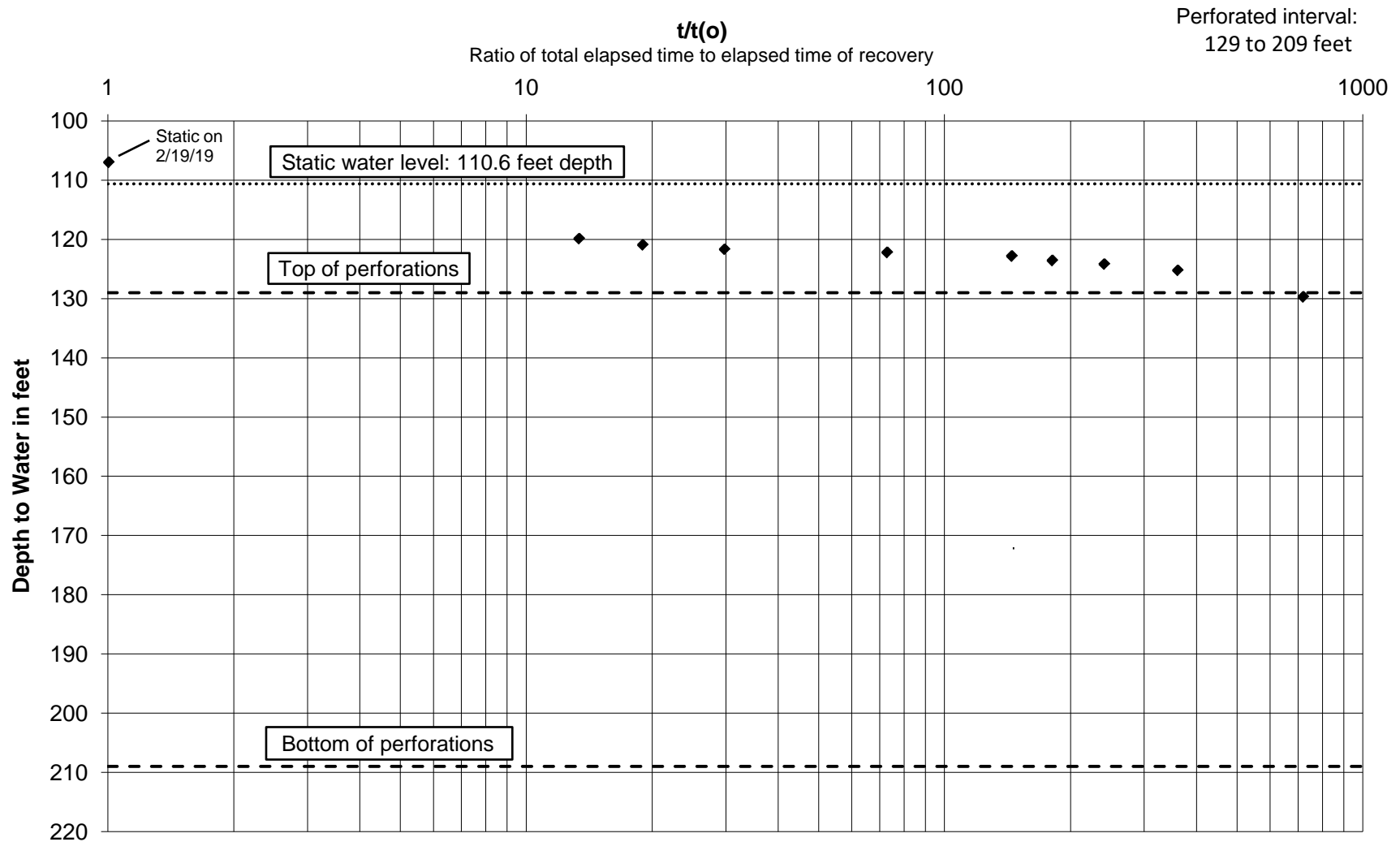
Time	Water Level In Feet	Flow Rate In GPM	Comments
1801	129.7	n/a	
1802	125.2	n/a	
1803	124.15	n/a	
1804	123.55	n/a	
1805	122.8	n/a	
1810	122.2	n/a	
1815	121.65	n/a	
1830	120.9	n/a	
1900	119.85	n/a	

Pumping Test (12-hour) - Well CW2
Strauss Wind Energy
February 15, 2019

Perforated interval:
129 - 209 feet



Recovery Test - Well CW2
Strauss Wind Energy
February 15, 2019



February 22, 2019

Cleath-Harris Geologists
 Attn: Spencer Harris
 71 Zaca Lane
 Suite 140
 San Luis Obispo, CA 93401

Lab ID : CC 1980547
 Customer : 8-514

Laboratory Report

Introduction: This report package contains total of 14 pages divided into 3 sections:

Case Narrative	(3 pages) : An overview of the work performed at FGL.
Sample Results	(4 pages) : Results for each sample submitted.
Quality Control	(7 pages) : Supporting Quality Control (QC) results.

Case Narrative

This Case Narrative pertains to the following samples:

Sample Description	Date Sampled	Date Received	FGL Lab ID #	Matrix
Travel Blank	02/14/2019	02/14/2019	CC 1980547-000	LBW
Strauss CW2	02/14/2019	02/14/2019	CC 1980547-001	DW

Sampling and Receipt Information: All samples were received in acceptable condition and within temperature requirements, unless noted on the Condition Upon Receipt (CUR) form. All samples arrived on ice. All samples were prepared and analyzed within the method specified hold time. All samples were checked for pH if acid or base preservation is required (except for VOAs). For details of sample receipt information, please see the attached Chain of Custody and Condition Upon Receipt Form.

Quality Control: All samples were prepared and analyzed according to the following tables:

Inorganic - Metals QC

200.7	02/16/2019:202307 All analysis quality controls are within established criteria.
	02/18/2019:202413 All analysis quality controls are within established criteria.
	02/16/2019:201763 All preparation quality controls are within established criteria.
200.8	02/18/2019:202419 All analysis quality controls are within established criteria, except: The following note applies to Antimony: 360 CCV above Acceptance Range (AR). Samples which were non detect for this analyte were accepted.
	02/18/2019:201817 All preparation quality controls are within established criteria.
245.1	02/19/2019:202463 All analysis quality controls are within established criteria.
	02/19/2019:201874 All preparation quality controls are within established criteria.

February 22, 2019
Cleath-Harris Geologists

Lab ID : CC 1980547
Customer : 8-514

Organic QC

524.2	02/15/2019:202311 All analysis quality controls are within established criteria.
	02/15/2019:201778 All preparation quality controls are within established criteria.

Inorganic - Wet Chemistry QC

2120B	02/15/2019:202351 All analysis quality controls are within established criteria.
	02/15/2019:201821 All preparation quality controls are within established criteria.
2130B	02/15/2019:202344 All analysis quality controls are within established criteria.
	02/15/2019:201812 All preparation quality controls are within established criteria.
2150B	02/15/2019:201822 All preparation quality controls are within established criteria.
2320B	02/20/2019:202491 All analysis quality controls are within established criteria.
2510B	02/18/2019:202312 All analysis quality controls are within established criteria.
	02/18/2019:201780 All preparation quality controls are within established criteria.
2540CE	02/18/2019:201793 All preparation quality controls are within established criteria.
300.0	02/15/2019:202556 All analysis quality controls are within established criteria.
	02/15/2019:201962 All preparation quality controls are within established criteria.
314.0	02/15/2019:202511 All analysis quality controls are within established criteria.
	02/15/2019:201724 All preparation quality controls are within established criteria.
4500CNCE	02/20/2019:202524 All analysis quality controls are within established criteria.
	02/20/2019:201928 All preparation quality controls are within established criteria.
5540C	02/15/2019:202349 All analysis quality controls are within established criteria.
	02/15/2019:201820 All preparation quality controls are within established criteria.

February 22, 2019

Cleath-Harris Geologists

Lab ID : CC 1980547

Customer : 8-514

Certification:: I certify that this data package is in compliance with ELAP standards, both technically and for completeness, except for any conditions listed above. Release of the data contained in this data package is authorized by the Laboratory Director or his designee, as verified by the following electronic signature.

KD:DMB

Approved By **Kelly A. Dunnahoo, B.S.**



Digitally signed by Kelly A. Dunnahoo, B.S.
Title: Laboratory Director
Date: 2019-02-22

February 22, 2019

Lab ID : CC 1980547-000

Customer ID : 8-514

Cleath-Harris Geologists

Attn: Spencer Harris

71 Zaca Lane

Suite 140

San Luis Obispo, CA 93401

Description : Travel Blank

Project : Strauss Wind Energy

Sampled On : February 14, 2019-13:15

Sampled By : Andrea Berge

Received On : February 14, 2019-15:14

Matrix : Lab. Blank Water

Sample Result - Organic

Constituent	Result	PQL	Units	Note	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
EPA 524.2								
4-Bromofluorobenzene [‡]	101	70-130	%		524.2	02/15/19:201778	524.2	02/15/19:202311
1,2-Dichlorobenzene-d4 [‡]	98.6	70-130	%		524.2	02/15/19:201778	524.2	02/15/19:202311
Methyl tert-Butyl Ether (MTBE)	ND	1	ug/L		524.2	02/15/19:201778	524.2	02/15/19:202311

ND=Non-Detected. PQL=Practical Quantitation Limit. ‡Surrogate. * PQL adjusted for dilution.

February 22, 2019

Lab ID : CC 1980547-001

Customer ID : 8-514

Cleath-Harris Geologists

Attn: Spencer Harris

71 Zaca Lane

Suite 140

San Luis Obispo, CA 93401

Description : Strauss CW2

Project : Strauss Wind Energy

Sampled On : February 14, 2019-13:15

Sampled By : Andrea Berge

Received On : February 14, 2019-15:14

Matrix : Drinking Water

Sample Result - Inorganic

Constituent	Result	PQL	Units	MCL/AL	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
General Mineral								
Total Hardness as CaCO3	439	--	mg/L	1000 ² 300 ² 50 ²	200.7	02/16/19:201763	200.7	02/16/19:202307
Calcium	92	1	mg/L		200.7	02/16/19:201763	200.7	02/16/19:202307
Magnesium	51	1	mg/L		200.7	02/16/19:201763	200.7	02/18/19:202413
Potassium	2	1	mg/L		200.7	02/16/19:201763	200.7	02/16/19:202307
Sodium	30	1	mg/L		200.7	02/16/19:201763	200.7	02/16/19:202307
Total Cations	10.1	--	meq/L		200.7	02/16/19:201763	200.7	02/16/19:202307
Boron	ND	0.1	mg/L		200.7	02/16/19:201763	200.7	02/16/19:202307
Copper	ND	10	ug/L		200.7	02/16/19:201763	200.7	02/16/19:202307
Iron	630	30	ug/L		200.7	02/16/19:201763	200.7	02/16/19:202307
Manganese	20	10	ug/L		200.7	02/16/19:201763	200.7	02/16/19:202307
Zinc	ND	20	ug/L		200.7	02/16/19:201763	200.7	02/16/19:202307
SAR	0.6	--	--		200.7	02/16/19:201763	200.7	02/16/19:202307
Total Alkalinity (as CaCO3)	320	10	mg/L		2320B	02/19/19:201873	2320B	02/20/19:202491
Hydroxide as OH	ND	10	mg/L	2320B	02/19/19:201873	2320B	02/20/19:202491	
Carbonate as CO3	ND	10	mg/L	2320B	02/19/19:201873	2320B	02/20/19:202491	
Bicarbonate as HCO3	390	10	mg/L	2320B	02/19/19:201873	2320B	02/20/19:202491	
Sulfate	105	0.5	mg/L	500 ²	300.0	02/15/19:201962	300.0	02/15/19:202556
Chloride	53	1	mg/L	500 ²	300.0	02/15/19:201962	300.0	02/15/19:202556
Nitrate as NO3	ND	0.4	mg/L	45	300.0	02/15/19:201962	300.0	02/15/19:202556
Nitrite as N	ND	0.2	mg/L	1	300.0	02/15/19:201962	300.0	02/15/19:202556
Nitrate + Nitrite as N	ND	0.1	mg/L	10	300.0	02/15/19:201962	300.0	02/15/19:202556
Fluoride	0.2	0.1	mg/L	2	300.0	02/15/19:201962	300.0	02/15/19:202556
Total Anions	10.1	--	meq/L		2320B	02/19/19:201873	2320B	02/20/19:202491
pH (Field)	7.4	--	units		4500-H B	02/14/19:201884	4500HB	02/14/19:202457
Specific Conductance	953	1	umhos/cm	1600 ²	2510B	02/18/19:201780	2510B	02/18/19:202312
Total Dissolved Solids	550	20	mg/L	1000 ²	2540CE	02/18/19:201793	2540C	02/19/19:202429
MBAS Screen	Negative	0.1	mg/L	0.5 ²	5540C	02/15/19:201820	5540C	02/15/19:202349
Aggressiveness Index	12.3	--	--		4500-H B	02/14/19:201884	4500HB	02/14/19:202457
Langelier Index (20°C)	0.4	--	--		4500-H B	02/14/19:201884	4500HB	02/14/19:202457
Nitrate Nitrogen	ND	0.1	mg/L	10	300.0	02/15/19:201962	300.0	02/15/19:202556
Metals, Total								
Aluminum	50	10	ug/L	1000	200.8	02/18/19:201817	200.8	02/18/19:202419
Antimony	ND	1	ug/L	6	200.8	02/18/19:201817	200.8	02/18/19:202419
Arsenic	1	1	ug/L	10	200.8	02/18/19:201817	200.8	02/18/19:202419
Barium	101	0.2	ug/L	1000	200.8	02/18/19:201817	200.8	02/18/19:202419

February 22, 2019
Description : Strauss CW2

Lab ID : CC 1980547-001
Customer ID : 8-514

Sample Result - Inorganic

Constituent	Result	PQL	Units	MCL/AL	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
Metals, Total								
Beryllium	ND	1	ug/L	4	200.8	02/18/19:201817	200.8	02/18/19:202419
Cadmium	0.5	0.2	ug/L	5	200.8	02/18/19:201817	200.8	02/18/19:202419
Chromium	2	1	ug/L	50	200.8	02/18/19:201817	200.8	02/18/19:202419
Lead	1.4	0.5	ug/L	15	200.8	02/18/19:201817	200.8	02/18/19:202419
Mercury	ND	0.02	ug/L	2	245.1	02/19/19:201874	245.1	02/19/19:202463
Nickel	18	1	ug/L	100	200.8	02/18/19:201817	200.8	02/18/19:202419
Selenium	7	1	ug/L	50	200.8	02/18/19:201817	200.8	02/18/19:202419
Silver	ND	1	ug/L	100 ²	200.8	02/18/19:201817	200.8	02/18/19:202419
Thallium	ND	0.2	ug/L	2	200.8	02/18/19:201817	200.8	02/18/19:202419
Vanadium	4	2	ug/L		200.8	02/18/19:201817	200.8	02/18/19:202419
Wet Chemistry								
Color	ND	5	units	15 ²	2120B	02/15/19:201821	2120B	02/15/19:202351
Cyanide, Total	ND	0.004	mg/L	0.15	4500CNCE	02/20/19:201928	4500CNCE	02/20/19:202524
Odor	ND	1	TON	3 ²	2150B	02/15/19:201822	2150B	02/15/19:202353
Turbidity	3.0	0.1	NTU	5	2130B	02/15/19:201812	2130B	02/15/19:202344
Perchlorate	ND	2	ug/L	6	314.0	02/15/19:201724	314.0	02/15/19:202511

ND=Non-Detected. PQL=Practical Quantitation Limit. * PQL adjusted for dilution.

MCL = Maximum Contamination Level. 2 - Secondary Standard. 3 - CDPH Notification Level. AL = Regulatory Action Level.

February 22, 2019

Lab ID : CC 1980547-001

Customer ID : 8-514

Cleath-Harris Geologists

Attn: Spencer Harris

71 Zaca Lane

Suite 140

San Luis Obispo, CA 93401

Description : Strauss CW2

Project : Strauss Wind Energy

Sampled On : February 14, 2019-13:15

Sampled By : Andrea Berge

Received On : February 14, 2019-15:14

Matrix : Drinking Water

Sample Result - Organic

Constituent	Result	PQL	Units	MCL/AL	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
EPA 524.2								
4-Bromofluorobenzene [‡]	91.1	70-130	%	13	524.2	02/15/19:201778	524.2	02/15/19:202311
1,2-Dichlorobenzene-d4 [‡]	95.6	70-130	%		524.2	02/15/19:201778	524.2	02/15/19:202311
Methyl tert-Butyl Ether (MTBE)	ND	1	ug/L		524.2	02/15/19:201778	524.2	02/15/19:202311

ND=Non-Detected. PQL=Practical Quantitation Limit. [‡]Surrogate. * PQL adjusted for dilution.

MCL = Maximum Contamination Level. 2 - Secondary Standard. 3 - CDPH Notification Level. AL = Regulatory Action Level.

February 22, 2019
Cleath-Harris Geologists

Lab ID : CC 1980547
 Customer : 8-514

Quality Control - Organic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Organic 1,2-Dichlorobenzene-d4	524.2	02/15/19:201778VRG (SP 1901992-001)	Blank	ug/L	10.00	91.4 %	70-130	
			MS	ug/L	10.00	108 %	70-130	
			MSD	ug/L	10.00	117 %	70-130	
			MSRPD	ug/L	10.00	7.8%	≤20	
	524.2	02/15/19:202311VRG	CCV	ug/L	10.00	112 %	70-130	
4-Bromofluorobenzene	524.2	02/15/19:201778VRG (SP 1901992-001)	Blank	ug/L	10.00	86.1 %	70-130	
			MS	ug/L	10.00	117 %	70-130	
			MSD	ug/L	10.00	113 %	70-130	
			MSRPD	ug/L	10.00	3.5%	≤30	
4-Bromofluorobenzene (BFB)	524.2	02/15/19:202311VRG	CCV	ug/L	10.00	116 %	70-130	
Methyl tert-Butyl Ether	524.2	02/15/19:202311VRG	CCV	ug/L	10.00	123 %	70-130	
Methyl tert-Butyl Ether (MTBE)	524.2	02/15/19:201778VRG (SP 1901992-001)	Blank	ug/L		ND	<1.0	
			MS	ug/L	10.00	134 %	11-168	
			MSD	ug/L	10.00	147 %	11-168	
			MSRPD	ug/L	10.00	9.2%	≤29	
Definition								
CCV : Continuing Calibration Verification - Analyzed to verify the instrument calibration is within criteria.								
Blank : Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.								
MS : Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.								
MSD : Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.								
MSRPD : MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.								
ND : Non-detect - Result was below the DQO listed for the analyte.								
DQO : Data Quality Objective - This is the criteria against which the quality control data is compared.								

February 22, 2019
Cleath-Harris Geologists

Lab ID : CC 1980547
 Customer : 8-514

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals Boron	200.7	(STK1932317-001)	MS	mg/L	4.000	93.9 %	75-125	
			MSD	mg/L	4.000	93.0 %	75-125	
			MSRPD	mg/L	800.0	1.0%	≤20.0	
	200.7	02/16/19:202307AC	CCV	ppm	5.000	93.2 %	90-110	
			CCB	ppm		0.002	0.1	
			CCV	ppm	5.000	95.0 %	90-110	
			CCB	ppm		0.001	0.1	
Calcium	200.7	(STK1932317-001)	MS	mg/L	12.00	94.5 %	75-125	
			MSD	mg/L	12.00	91.4 %	75-125	
			MSRPD	mg/L	800.0	1.4%	≤20.0	
	200.7	02/16/19:202307AC	CCV	ppm	25.00	97.8 %	90-110	
			CCB	ppm		0.003	1	
			CCV	ppm	25.00	98.6 %	90-110	
			CCB	ppm		0.001	1	
Copper	200.7	(STK1932317-001)	MS	ug/L	800.0	98.0 %	75-125	
			MSD	ug/L	800.0	96.6 %	75-125	
			MSRPD	ug/L	800.0	1.5%	≤20.0	
	200.7	02/16/19:202307AC	CCV	ppm	1.000	96.9 %	90-110	
			CCB	ppm		-0.00008	0.01	
			CCV	ppm	1.000	97.0 %	90-110	
			CCB	ppm		0.0001	0.01	
Iron	200.7	(STK1932317-001)	MS	ug/L	4000	94.8 %	75-125	
			MSD	ug/L	4000	93.7 %	75-125	
			MSRPD	ug/L	800.0	1.2%	≤20.0	
	200.7	02/16/19:202307AC	CCV	ppm	5.000	93.7 %	90-110	
			CCB	ppm		0.0013	0.03	
			CCV	ppm	5.000	94.6 %	90-110	
			CCB	ppm		0.0024	0.03	
Magnesium	200.7	(STK1932317-001)	MS	mg/L	12.00	114 %	75-125	
			MSD	mg/L	12.00	115 %	75-125	
			MSRPD	mg/L	800.0	0.3%	≤20.0	
	200.7	02/18/19:202413AC	CCV	ppm	25.00	107 %	90-110	
			CCB	ppm		-0.03	1	
			CCV	ppm	25.00	106 %	90-110	
			CCB	ppm		-0.03	1	
Manganese	200.7	(STK1932317-001)	MS	ug/L	800.0	96.4 %	75-125	
			MSD	ug/L	800.0	94.9 %	75-125	
			MSRPD	ug/L	800.0	1.6%	≤20.0	
	200.7	02/16/19:202307AC	CCV	ppm	1.000	95.5 %	90-110	
			CCB	ppm		-0.0002	0.01	
			CCV	ppm	1.000	96.1 %	90-110	
			CCB	ppm		-0.0002	0.01	
Potassium	200.7	(STK1932317-001)	MS	mg/L	12.00	103 %	75-125	
			MSD	mg/L	12.00	101 %	75-125	
			MSRPD	mg/L	800.0	1.0%	≤20.0	
	200.7	02/16/19:202307AC	CCV	ppm	25.00	104 %	90-110	
			CCB	ppm		0.09	1	
			CCV	ppm	25.00	104 %	90-110	
			CCB	ppm		0.06	1	
Sodium	200.7	(STK1932317-001)	MS	mg/L	12.00	99.1 %	75-125	
			MSD	mg/L	12.00	95.0 %	75-125	
			MSRPD	mg/L	800.0	1.8%	≤20.0	
	200.7	02/16/19:202307AC	CCV	ppm	25.00	102 %	90-110	
			CCB	ppm		0.02	1	
			CCV	ppm	25.00	103 %	90-110	

February 22, 2019
Cleath-Harris Geologists

Lab ID : CC 1980547
 Customer : 8-514

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Sodium	200.7	02/16/19:202307AC	CCB	ppm		0.03	1	
Zinc	200.7	(STK1932317-001)	MS	ug/L	800.0	99.9 %	75-125	
			MSD	ug/L	800.0	101 %	75-125	
			MSRPD	ug/L	800.0	1.1%	≤20.0	
	200.7	02/16/19:202307AC	CCV	ppm	1.000	108 %	90-110	
Aluminum	200.8	(STK1932316-001)	CCB	ppm		0.0018	0.02	
			CCV	ppm	1.000	100 %	90-110	
			CCB	ppm		0.0003	0.02	
	200.8	02/18/19:202419AC	MS	ug/L	5.000	100 %	75-125	
Antimony	200.8	(STK1932316-001)	MSD	ug/L	5.000	88.7 %	75-125	
			MSRPD	ug/L	5.000	0.58	≤10	
			CCV	ppb	120.0	96.8 %	90-110	
	200.8	02/18/19:202419AC	CCB	ppb		0.2	10	
Arsenic	200.8	(STK1932316-001)	CCV	ppb	120.0	98.0 %	90-110	
			CCB	ppb		0.2	10	
			CCV	ppb	120.0	111 %	90-110	360
	200.8	02/18/19:202419AC	CCB	ppb		-0.15	1	
Barium	200.8	(STK1932316-001)	CCV	ppb	120.0	112 %	90-110	360
			CCB	ppb		-0.16	1	
			CCV	ppb	120.0	110 %	75-125	
	200.8	02/18/19:202419AC	MSD	ug/L	5.000	101 %	75-125	
Beryllium	200.8	(STK1932316-001)	MSRPD	ug/L	5.000	5.8%	≤20	
			CCV	ppb	120.0	101 %	90-110	
			CCB	ppb		0.04	1	
	200.8	02/18/19:202419AC	CCV	ppb	120.0	102 %	90-110	
Cadmium	200.8	(STK1932316-001)	CCB	ppb		0.02	1	
			CCV	ppb	120.0	107 %	75-125	
			MSD	ug/L	5.000	75.4 %	75-125	
	200.8	02/18/19:202419AC	MSRPD	ug/L	5.000	1.6%	≤20	
Chromium	200.8	(STK1932316-001)	CCV	ppb	120.0	102 %	90-110	
			CCB	ppb		0.017	0.2	
			CCV	ppb	120.0	102 %	90-110	
	200.8	02/18/19:202419AC	CCB	ppb		0.024	0.2	
Cadmium	200.8	(STK1932316-001)	MS	ug/L	5.000	96.9 %	75-125	
			MSD	ug/L	5.000	86.8 %	75-125	
			MSRPD	ug/L	5.000	0.50	≤1	
	200.8	02/18/19:202419AC	CCV	ppb	120.0	92.1 %	90-110	
Cadmium	200.8	(STK1932316-001)	CCB	ppb		-0.015	0.2	
			CCV	ppb	120.0	93.1 %	90-110	
			CCB	ppb		-0.017	0.2	
	200.8	02/18/19:202419AC	CCV	ppb	120.0	102 %	90-110	
Chromium	200.8	(STK1932316-001)	CCB	ppb		0.013	0.2	
			CCV	ppb	120.0	102 %	90-110	
			CCB	ppb		0.014	0.2	
	200.8	02/18/19:202419AC	MS	ug/L	5.000	97.4 %	75-125	
Chromium	200.8	(STK1932316-001)	MSD	ug/L	5.000	88.3 %	75-125	
			MSRPD	ug/L	5.000	7.3%	≤20	
			CCV	ppb	120.0	95.9 %	90-110	
	200.8	02/18/19:202419AC	CCV	ppb	120.0	95.9 %	90-110	

February 22, 2019
Cleath-Harris Geologists

Lab ID : CC 1980547
 Customer : 8-514

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Chromium	200.8	02/18/19:202419AC	CCB CCV CCB	ppb ppb ppb	120.0	0.04 96.4 % 0.05	1 90-110 1	
Lead	200.8	(STK1932316-001)	MS	ug/L	5.000	105 %	75-125	
			MSD	ug/L	5.000	95.3 %	75-125	
			MSRPD	ug/L	5.000	9.9%	≤20	
	200.8	02/18/19:202419AC	CCV CCB CCV CCB	ppb ppb ppb ppb	120.0 120.0 120.0	93.1 % 0.004 93.3 % 0.005	90-110 0.5 90-110 0.5	
Nickel	200.8	(STK1932316-001)	MS	ug/L	5.000	100 %	75-125	
			MSD	ug/L	5.000	90.0 %	75-125	
			MSRPD	ug/L	5.000	0.52	≤1	
	200.8	02/18/19:202419AC	CCV CCB CCV CCB	ppb ppb ppb ppb	120.0 120.0 120.0	97.8 % -0.07 98.4 % -0.11	90-110 1 90-110 1	
Selenium	200.8	(STK1932316-001)	MS	ug/L	5.000	110 %	75-125	
			MSD	ug/L	5.000	103 %	75-125	
			MSRPD	ug/L	5.000	6.3%	≤20	
	200.8	02/18/19:202419AC	CCV CCB CCV CCB	ppb ppb ppb ppb	120.0 120.0 120.0	105 % 0.16 105 % 0.02	90-110 1 90-110 1	
Silver	200.8	(STK1932316-001)	MS	ug/L	5.000	107 %	75-125	
			MSD	ug/L	5.000	97.3 %	75-125	
			MSRPD	ug/L	5.000	9.8%	≤20	
	200.8	02/18/19:202419AC	CCV CCB CCV CCB	ppb ppb ppb ppb	120.0 120.0 120.0	99.6 % 0.009 98.3 % 0.006	90-110 1 90-110 1	
Thallium	200.8	(STK1932316-001)	MS	ug/L	5.000	103 %	75-125	
			MSD	ug/L	5.000	93.3 %	75-125	
			MSRPD	ug/L	5.000	9.6%	≤20	
	200.8	02/18/19:202419AC	CCV CCB CCV CCB	ppb ppb ppb ppb	120.0 120.0 120.0	94.0 % 0.007 93.9 % 0.007	90-110 0.2 90-110 0.2	
Vanadium	200.8	(STK1932316-001)	MS	ug/L	5.000	95.2 %	75-125	
			MSD	ug/L	5.000	90.0 %	75-125	
			MSRPD	ug/L	5.000	1.5%	≤20	
	200.8	02/18/19:202419AC	CCV CCB CCV CCB	ppb ppb ppb ppb	120.0 120.0 120.0	94.7 % 0.03 95.2 % 0.02	90-110 2 90-110 2	
Mercury	245.1	02/19/19:201874AC	Blank	ug/L		ND	<0.02	
			LCS	ug/L	0.2000	103 %	85-115	
		(STK1931700-001)	MS	ug/L	0.2000	90.5 %	75-125	
			MSD	ug/L	0.2000	92.7 %	75-125	
			MSRPD	ug/L	0.2000	2.3%	≤20	
	245.1	02/19/19:202463AC	CCV CCB CCV CCB	ppt ppt ppt ppt	200.0 200.0	104 % -10.3 104 % -10.3	90-110 20 90-110 20	

February 22, 2019
Cleath-Harris Geologists

Lab ID : CC 1980547
Customer : 8-514

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Color	2120B	(CC 1980547-001)	Dup	units		0.0	5	
	2120B	02/15/19:202351jmg	CCB CCV	units units	10.00	0.00 100 %	5.0 90-110	
Turbidity	2130B	(CC 1980547-001)	Dup	NTU		1.0%	20	
	2130B	02/15/19:202344jba	CCV	NTU	10.00	107 %	90-110	
			CCB	NTU		0.096	0.1	
			CCV CCB	NTU NTU	10.00	107 % 0.091	90-110 0.1	
Odor	2150B	(CC 1980547-001)	Dup	TON		0.0	1	
Alkalinity (as CaCO ₃)	2320B	02/20/19:202491AMM	CCV	mg/L	234.9	93.3 %	90-110	
			CCV	mg/L	234.9	93.4 %	90-110	
Conductivity	2510B	02/18/19:202312JMG	ICB	umhos/cm		0.07	1	
			ICV	umhos/cm	999.0	104 %	95-105	
			CCV	umhos/cm	999.0	104 %	95-105	
E. C.	2510B	02/18/19:201780jmg (CC 1980528-002)	Blank	umhos/cm		ND	<1	
			Dup	umhos/cm		0.1%	5	
Total Dissolved Solids (TFR)	2540CE	02/18/19:201793CTL (STK1932293-001) (CC 1980548-002)	Blank	mg/L		9.0	20	
			LCS	mg/L	994.8	94.9 %	90-110	
			Dup	mg/L		1.1%	5	
			Dup	mg/L		0.09%	5	
Chloride	300.0	02/15/19:201962MCA (STK1932316-001) (STK1932317-001)	Blank	mg/L		ND	<1	
			LCS	mg/L	25.00	98.9 %	90-110	
			MS	mg/L	50.00	102 %	85-121	
			MSD	mg/L	50.00	101 %	85-121	
			MSRPD	mg/L	10.00	0.8%	≤19	
			MS	mg/L	50.00	97.6 %	85-121	
			MSD	mg/L	50.00	97.7 %	85-121	
			MSRPD	mg/L	10.00	0.04%	≤19	
	300.0	02/15/19:202556MCA	ICB	mg/L		0.00	1	
			ICV	mg/L	25.00	95.7 %	90-110	
			CCB	mg/L		0.10	1	
			CCV	mg/L	25.00	95.8 %	90-110	
Fluoride	300.0	02/15/19:201962MCA (STK1932316-001) (STK1932317-001)	Blank	mg/L		ND	<0.1	
			LCS	mg/L	2.500	95.4 %	90-110	
			MS	mg/L	5.000	101 %	87-120	
			MSD	mg/L	5.000	99.7 %	87-120	
			MSRPD	mg/L	10.00	1.0%	≤16	
			MS	mg/L	5.000	99.2 %	87-120	
			MSD	mg/L	5.000	99.4 %	87-120	
			MSRPD	mg/L	10.00	0.2%	≤16	
	300.0	02/15/19:202556MCA	ICB	mg/L		0.000	0.1	
			ICV	mg/L	2.500	92.2 %	90-110	
			CCB	mg/L		0.000	0.1	
			CCV	mg/L	2.500	92.1 %	90-110	
Nitrate	300.0	02/15/19:201962MCA (STK1932316-001) (STK1932317-001)	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	97.1 %	90-110	
			MS	mg/L	40.00	102 %	85-119	
			MSD	mg/L	40.00	101 %	85-119	
			MSRPD	mg/L	10.00	0.9%	≤19	
			MS	mg/L	40.00	101 %	85-119	
			MSD	mg/L	40.00	101 %	85-119	
			MSRPD	mg/L	10.00	0.0%	≤19	
	300.0	02/15/19:202556MCA	ICB	mg/L		0.000	0.5	
			ICV	mg/L	20.00	93.0 %	90-110	

February 22, 2019
Cleath-Harris Geologists

Lab ID : CC 1980547
Customer : 8-514

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Nitrate	300.0	02/15/19:202556MCA	CCB CCV	mg/L mg/L	20.00	0.000 93.1 %	0.5 90-110	
Nitrate + Nitrite as N	300.0	02/15/19:201962MCA	Blank	mg/L		ND	<0.1	
Nitrate Nitrogen	300.0	02/15/19:201962MCA	Blank	mg/L		ND	<0.1	
Nitrite	300.0	02/15/19:201962MCA	Blank	mg/L		ND	<0.5	
		(STK1932316-001)	LCS MS MSD MSRPD	mg/L mg/L mg/L mg/L	15.00 30.00 30.00 10.00	95.8 % 99.7 % 98.8 % 0.9 %	90-110 74-126 74-126 ≤20	
		(STK1932317-001)	MS MSD MSRPD	mg/L mg/L mg/L	30.00 30.00 10.00	98.5 % 98.8 % 0.3 %	74-126 74-126 ≤20	
	300.0	02/15/19:202556MCA	ICB ICV CCB CCV	mg/L mg/L mg/L mg/L	15.00 15.00 15.00 15.00	0.000 92.8 % 0.000 93.5 %	0.5 90-110 0.5 90-110	
Nitrite Nitrogen	300.0	02/15/19:201962MCA	Blank	mg/L		ND	<0.2	
Sulfate	300.0	02/15/19:201962MCA	Blank	mg/L		ND	<0.5	
		(STK1932316-001)	LCS MS MSD MSRPD	mg/L mg/L mg/L mg/L	50.00 100.0 100.0 10.00	102 % 104 % 104 % 0.6 %	90-110 82-124 82-124 ≤23	
		(STK1932317-001)	MS MSD MSRPD	mg/L mg/L mg/L	100.0 100.0 10.00	104 % 104 % 0.2 %	82-124 82-124 ≤23	
	300.0	02/15/19:202556MCA	ICB ICV CCB CCV	mg/L mg/L mg/L mg/L	50.00 50.00 50.00 50.00	0.000 99.1 % 0.222 99.4 %	0.5 90-110 0.5 90-110	
Perchlorate	314.0	02/15/19:201724MCA	Blank	ug/L		ND	<2	
		(SP 1902013-001)	LCS MS MSD MSRPD	ug/L ug/L ug/L ug/L	25.00 25.00 25.00 25.00	101 % 85.0 % 90.5 % 6.3 %	85-115 80-120 80-120 ≤15	
		(SP 1902013-001)	Dup	ug/L	25.00	0.0	2	
	314.0	02/15/19:202511MCA	ICB ICV CCB CCV	ppb ppb ppb ppb	2.000 2.000 2.000 10.00	0.00 94.7 % 0.00 98.5 %	2.0 85-115 2.0 85-115	
Cyanide	4500CNCE	02/20/19:202524AMM	CCV CCB CCV CCB	mg/L mg/L mg/L mg/L	0.1000 0.1000 0.1000 0.1000	102 % -0.00130 106 % -0.00130	90-110 0.004 90-110 0.004	
Cyanide, Total	4500CNCE	02/20/19:201928AMM	Blank	mg/L		ND	<0.004	
		(SP 1901944-001)	LCS LCS MS MSD MSRPD	mg/L mg/L mg/L mg/L mg/L	0.1000 0.4000 0.05000 0.05000 0.05000	101 % 97.8 % 161 % 158 % 2.1 %	90-110 90-110 26-226 26-226 ≤36	
MBAS	5540C	02/15/19:202349jmg	CCB CCV	mg/L mg/L	0.1000 0.1000	0.000 100 %	0.1 99-101	
MBAS Screen	5540C	(SP 1902129-001)	MS MSD MSRPD	mg/L mg/L mg/L	0.1000 0.1000 0.1000	100 % 100 % 0.0	90-110 90-110 ≤0.1	

February 22, 2019
Cleath-Harris Geologists

Lab ID : CC 1980547
Customer : 8-514

Quality Control - Inorganic

Definition	
ICV	: Initial Calibration Verification - Analyzed to verify the instrument calibration is within criteria.
ICB	: Initial Calibration Blank - Analyzed to verify the instrument baseline is within criteria.
CCV	: Continuing Calibration Verification - Analyzed to verify the instrument calibration is within criteria.
CCB	: Continuing Calibration Blank - Analyzed to verify the instrument baseline is within criteria.
Blank	: Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.
LCS	: Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.
MS	: Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
MSD	: Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.
Dup	: Duplicate Sample - A random sample with each batch is prepared and analyzed in duplicate. The relative percent difference is an indication of precision for the preparation and analysis.
MSRPD	: MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
ND	: Non-detect - Result was below the DQO listed for the analyte.
DQO	: Data Quality Objective - This is the criteria against which the quality control data is compared.
Explanation	
360	: CCV above Acceptance Range (AR). Samples which were non detect for this analyte were accepted.

February 22, 2019

Cleath-Harris Geologists
Attn: Spencer Harris
71 Zaca Lane
Suite 140
San Luis Obispo, CA 93401

Subject: Subcontract Analysis for FGL Lab No. CC 1980547

Enclosed please find results for the following sample(s) which were received by FGL.

- Asbestos

Please note that this analysis was performed by LA Testing

Thank you for using FGL Environmental.

Sincerely,

Cindy Aguirre  Digitally signed by Cindy Aguirre
Title: Customer Service Rep
Date: 2019-02-22

Enclosure



LA Testing

520 Mission Street South Pasadena, CA 91030
Phone/Fax: (323) 254-9960 / (323) 254-9982
<http://www.LATesting.com> / pasadenalab@latesting.com

LA Testing Order ID: 321904102
Customer ID: FGLE25
Customer PO:
Project ID:

Attn: Confirmations Log in
FGL Environmental
853 Corporation St
Santa Paula, CA 93060

Phone: (805) 392-2024
Fax:
Received: 02/15/2019
Analyzed: 02/21/2019

Proj: CC1980547- (8-514)

Test Report: Determination of Asbestos Structures >10µm in Drinking Water Performed by the 100.2 Method (EPA 600/R-94/134)

Sample ID Client / EMSL	Sample Filtration Date/Time	Original Sample Vol. Filtered (ml)	Effective Filter Area (mm²)	Area Analyzed (mm²)	ASBESTOS				
					Asbestos Types	Fibers Detected	Analytical Sensitivity	Concentration	Confidence Limits
					MFL (million fibers per liter)				
1 321904102-0001	2/15/2019 12:30 PM	15	1288	0.2580	None Detected	ND	0.33	<0.33	0.00 - 1.20

Collection Date/Time: 02/14/2019 13:15

Due to excessive particulate the analytical sensitivity of 0.2 MFL as required by the method was not reached.

Analyst(s)

Feng Liang

(1)

Jerry Drapala Ph.D, Laboratory Manager
or Other Approved Signatory

Any questions please contact Jerry Drapala.

Initial report from: 02/22/2019 06:51:13

Sample collection and containers provided by the client, acceptable bottle blank level is defined as ≤ 0.01 MFL > 10µm. ND=None Detected. This report relates only to those items tested. This report may not be reproduced, except in full, without written permission by LA Testing. Samples received in good condition unless otherwise noted.

Samples analyzed by LA Testing South Pasadena, CA CA ELAP 2283

February 22, 2019

Cleath-Harris Geologists
Attn: Spencer Harris
71 Zaca Lane
Suite 140
San Luis Obispo, CA 93401

Subject: Subcontract Analysis for FGL Lab No. CC 1980547

Enclosed please find results for the following sample(s) which were received by FGL.

- Sub Contracted-EPA 507 - Thiobencarb

Please note that this analysis was performed by Weck Laboratories, Inc. (ELAP Certified Laboratory)

Thank you for using FGL Environmental.

Sincerely,

Cindy Aguirre  Digitally signed by Cindy Aguirre
Title: Customer Service Rep
Date: 2019-02-22

Enclosure

Work Orders: 9B15020

Report Date: 2/22/2019

Project: CC1980547 - (8-514)

Received Date: 2/15/2019

Turnaround Time: 4 workdays

Phones: (805) 392-2012

Fax: (805) 525-4172

P.O. #:

Billing Code:

Attn: Cindy Aguirre

Client: FGL Environmental
853 Corporation Street
Santa Paula, CA 93060

Dear Cindy Aguirre,

Enclosed are the results of analyses for samples received 2/15/19 with the Chain-of-Custody document. The samples were received in good condition, at 4.8 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Sample Results

Sample: Strauss CW2

Sampled: 02/14/19 13:15 by Andrea Bage

9B15020-01 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: EPA 525.2	Batch ID: W9B0982	Instr: GCMS16	Prepared: 02/19/19 08:54	Analyst: rmr		
Thiobencarb	ND	0.10	ug/l	1	02/21/19 10:28	
<i>Surrogate(s)</i>						
1,3-Dimethyl-2-nitrobenzene	238%	70-130	Conc: 11.9		02/21/19 10:28	S-GC
Perylene-d12	100%	50-120	Conc: 0.0702		02/21/19 10:28	S-GC
Triphenyl phosphate	108%	70-130	Conc: 5.42		02/21/19 10:28	



WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Quality Control Results

Semivolatile Organic Compounds by GC/MS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W9B0982 - EPA 525.2/SPE										
Blank (W9B0982-BLK1)				Prepared: 02/19/19 Analyzed: 02/21/19						
Thiobencarb	ND	0.10	ug/l							
Surrogate(s)										
1,3-Dimethyl-2-nitrobenzene	5.00		ug/l	5.00		100	70-130			
Perylene-d12	4.55		ug/l	5.00		91	50-120			
Triphenyl phosphate	4.83		ug/l	5.00		97	70-130			
LCS (W9B0982-BS1)				Prepared: 02/19/19 Analyzed: 02/21/19						
Thiobencarb	6.09	0.10	ug/l	5.00		122	70-130			
Surrogate(s)										
1,3-Dimethyl-2-nitrobenzene	4.82		ug/l	5.00		96	70-130			
Perylene-d12	4.92		ug/l	5.00		98	50-120			
Triphenyl phosphate	5.27		ug/l	5.00		105	70-130			
LCS Dup (W9B0982-BSD1)				Prepared: 02/19/19 Analyzed: 02/21/19						
Thiobencarb	5.95	0.10	ug/l	5.00		119	70-130	2	30	
Surrogate(s)										
1,3-Dimethyl-2-nitrobenzene	5.01		ug/l	5.00		100	70-130			
Perylene-d12	4.79		ug/l	5.00		96	50-120			
Triphenyl phosphate	5.27		ug/l	5.00		105	70-130			

Notes and Definitions

Item	Definition
S-GC	Surrogate recovery outside of control limits due to a possible matrix effect. The data was accepted based on valid recovery of the remaining surrogate.
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
Dil	Dilution
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
% Rec	Percent Recovery
Source	Sample that was matrix spiked or duplicated.
MDL	Method Detection Limit
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ) and Detection Limit for Reporting (DLR)
MDA	Minimum Detectable Activity
NR	Not Reportable
TIC	Tentatively Identified Compound (TIC) using mass spectrometry. The reported concentration is relative concentration based on the nearest internal standard. If the library search produces no matches at, or above 85%, the compound is reported as unknown.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

An Absence of Total Coliform meets the drinking water standards as established by the California State Water Resources Control Board (SWRCB)

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS 002.

Reviewed by:



Regina Giancola
Project Manager



ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH # • ISO 17025 #L2457.01 • LACSD #10143 •
NELAP-CA #04229CA • NELAP-OR #4047 • NJ-DEP #CA015 • NV-DEP #NAC 445A • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Appendix E-3

Construction Water Supply Aquifer Letter –
September 2019



September 25, 2019

Mr. Jörg Beland
Strauss Wind, LLC
5901 Priestly Drive, Suite 300
Carlsbad, CA 92008

Subject: Response to comments on construction water supply aquifer for Strauss Wind Energy Project, Lompoc, Santa Barbara County.

Dear Mr. Beland:

As requested, Cleath-Harris Geologists (CHG) has prepared a response to the comments received from Santa Barbara County regarding the proposed construction water supply aquifer for the Strauss Wind Energy Project (Project). The comments received are as follows:

Regarding the hydrology report, please provide a map showing all of the existing wells within the aquifer to be used for construction water, descriptions of well ownership and current use, and technical justification for a reasonable drawdown at each well that would be of sufficient magnitude to adversely affect the water supply delivered by that well. This drawdown will be used in the mitigation measure to trigger cessation of pumping of construction water. Information regarding the extent of this aquifer relative to any potential impact to Frick's Spring is also requested.

The above referenced hydrology report is a description of the construction water supply aquifer provided in correspondence from CHG¹. Additional details and technical justification for mitigation measures have been prepared herein based on the available information.

Limits of Source Aquifer

The source aquifer for construction water wells forms a syncline within siliceous shale of the upper Monterey Formation. The lateral extent of the aquifer is interpreted to be where the limbs of the syncline rise to the water table, encompassing a trough-shaped groundwater storage reservoir. To the east, the effective lateral extent of the reservoir is the San Miguelito Canyon watershed boundary.

Figure 1 shows the limits of the groundwater storage reservoir and associated source aquifer. Construction water wells would tap fractured shale zones within the

¹ CHG, Comments on Draft SEIR for Strauss Wind Energy Project, Lompoc, Santa Barbara County, May 21, 2019



groundwater storage reservoir. Cross-sections showing interpreted hydrogeologic profiles through the groundwater storage reservoir are shown in Figures 2-4.

Existing Wells

Two existing wells have been identified within the limits of the groundwater storage reservoir. These wells are labeled O&M Well (CW2) and Offsite Well A on Figure 1. A third existing well, Offsite Well B, has been located just outside the groundwater storage reservoir limit east of the watershed divide.

Well CW2 is a Project well owned by Signorelli Family Trust and will be used for supplying water to the Operations and Maintenance Building. Offsite Well A is within a small enclosure near the entrance to a ranch along San Miguelito Road. Groundwater from this private domestic well is pumped uphill to a tank near the ranch residence.

A water well log search was performed using the California Department of Water Resources (DWR) database to help identify wells in the vicinity of the groundwater storage reservoir. Two logs were found and are attached. DWR log #40446, dated October 1961, is for a test well “5 miles south of Lompoc in Miguelito Canyon” which plots within the groundwater reservoir area at the approximate location of Offsite Well A. The test well log shows clay through a total depth of 51 feet, and the standing water level is reported as “none”, with no indication of a well being constructed. Therefore, the construction details of Offsite Well A are unknown. A second log, No. E0094758 is labeled Offsite Well B on Figure 1. This well was drilled for irrigation purposes in 2009, and is completed in fractured brown shale to 513 feet depth. Offsite Well B is on property currently owned by The Nature Conservancy and is likely inactive, based on a review of aerial images.

Reasonable Drawdown

The County has requested technical justification for a reasonable drawdown at each well that would be of sufficient magnitude to adversely affect the water supply delivered by that well. Factors to consider when estimating reasonable drawdown include well construction, pump size and flow rate, pump depth setting, and well specific capacity.

Offsite Well A is the only non-Project well within the effective limits of the groundwater storage reservoir, based on the well log search and local driller input. The 1961 test well log (#40446; attached) indicates a well in the vicinity of Offsite Well A would need to be over 50 feet deep to be productive and it is conservatively assumed that the currently active domestic well is at least 100 feet deep and taps fractured shale aquifer zones similar to Project O&M Well CW2.



The technical justification for a reasonable drawdown at Offsite Well A, for which impacts would be measured and mitigation implemented, includes the following assumptions:

- The domestic well is 100 feet deep with the bottom 40 feet screened in the fractured shale groundwater reservoir.
- A 2 horsepower pump is set 10 feet above the well bottom.
- Static water level is 20 feet deep under existing conditions (close to the invert of San Miguelito Creek).
- Aquifer transmissivity and well specific capacity is similar to nearby O&M Well CW2, adjusted for the aquifer thickness tapped by each well.
- A nominal discharge capacity for the well pump of 4-5 gallons per minute (gpm) needs to be maintained to serve the residence. This is more than sufficient to provide a few thousand gallons per day for ranch use.
- Impacts to the producing aquifer zones at the well will be avoided.

Using these assumptions, the 12-hour specific capacity of Offsite Well A is estimated at 0.75 gpm per foot of drawdown, and therefore would require up to 6.7 feet of drawdown during a 12-hour pumping cycle at 5 gpm. In order to avoid impacts to the producing aquifer zone (i.e. maintain pumping water levels above the well screen), the maximum reasonable drawdown before impacts to Offsite Well A occur is estimated to be 30 feet², based on the available information and assumptions.

Monitoring of water level drawdown in the vicinity of Offsite Well A will be performed at a designated monitoring well constructed on Project property across San Miguelito Road, as close as possible to Offsite Well A (Figure 1). The monitoring well will be equipped with a pressure transducer that will provide detailed water level trends and allow the Project applicant (and County) to anticipate impacts at Offsite Well A before they occur.

² Maintaining 40 feet of saturated aquifer thickness + 6.7 feet of anticipated drawdown at 5 gpm = 46.7 feet of minimum water column in the well. The exiting water column is assumed to be 80 feet (100 feet well depth – 20 feet depth static level), therefore a reasonable drawdown of $80 - 46.7 = 33.3$ feet would be estimated (rounded down to a nominal 30 feet). An additional 30 feet of lift would decrease pump discharge by approximately 0.2 gpm, based on the representative performance curve.



Mitigation Measures

Recommendations for mitigation measure MM WAT-1 (Construction Water Source) were provided in previous correspondence³. Based on the comments received from the County, revised mitigation measures are recommended as follows:

- a) Allow use of on-site wells for construction water.
- b) Require the Applicant to construct a monitoring well in order to monitoring water levels within the aquifer. The monitoring well will be equipped with an automatic water level recorder (e.g. pressure transducer).
- c) Water level data from the monitoring well will be reported to the County on a bi-weekly basis during the first six months of construction, and monthly thereafter until three months following the end of construction, or as agreed to between the Applicant and the County. Water level data reported to the County will include an interpretation of water level trends and anticipated construction activity and water use.
- d) If water level trends at the monitoring well indicate a drawdown of 30 feet or more is anticipated at any time during the course of construction water use, the Applicant with concurrence from the County will either:
 - a. Adjust and/or reduce construction well production to the extent feasible to avoid water levels reaching the reasonable drawdown threshold of 30 feet, or
 - b. Provide water of suitable quantity and quality, as needed, to replace any loss in production at the well. The Applicant would be responsible for the costs and transportation of water to the existing tank(s) in order to provide the required quantity of supplemental water.

Note that the recommended mitigation for significant impact to Offsite Well A are acceptable industry practices. These measures would also ensure that the additional impacts of trucking in construction water would be avoided.

Potential Impacts to Frick Springs

Frick Springs consists of developed springs that are part of the water system for the City of Lompoc. These springs are located along the formation contact between the Monterey Formation and the Sacate Formation (Figure 1), approximately $\frac{3}{4}$ miles from the construction water wells. The approximately elevations of the individual springs at Frick Springs range from 900-950 feet above sea level and are 50-100 feet above the adjacent

³ CHG, Comments on Draft SEIR for Strauss Wind Energy Project, Lompoc, Santa Barbara County, May 21, 2019



invert elevation of San Miguelito Creek (i.e. the springs are at greater pressure head than the creek). The geologic structure in the Monterey Formation approaching Frick Springs consists of steeply dipping and tightly folded beds (Figure 4), which would transmit groundwater preferentially along a northwest-southeast direction (parallel to the fold axis) and restrict groundwater flow in the direction of the groundwater storage reservoir shown in Figure 1. Given the distance from the construction water wells, elevation relative to the creek, and geologic structure surrounding Frick Springs, the Project's use of the construction water wells are not expected to impact the Frick Springs water system.

Respectfully submitted,
CLEATH-HARRIS GEOLOGISTS

Spencer J. Harris, HG 633
Senior Hydrogeologist

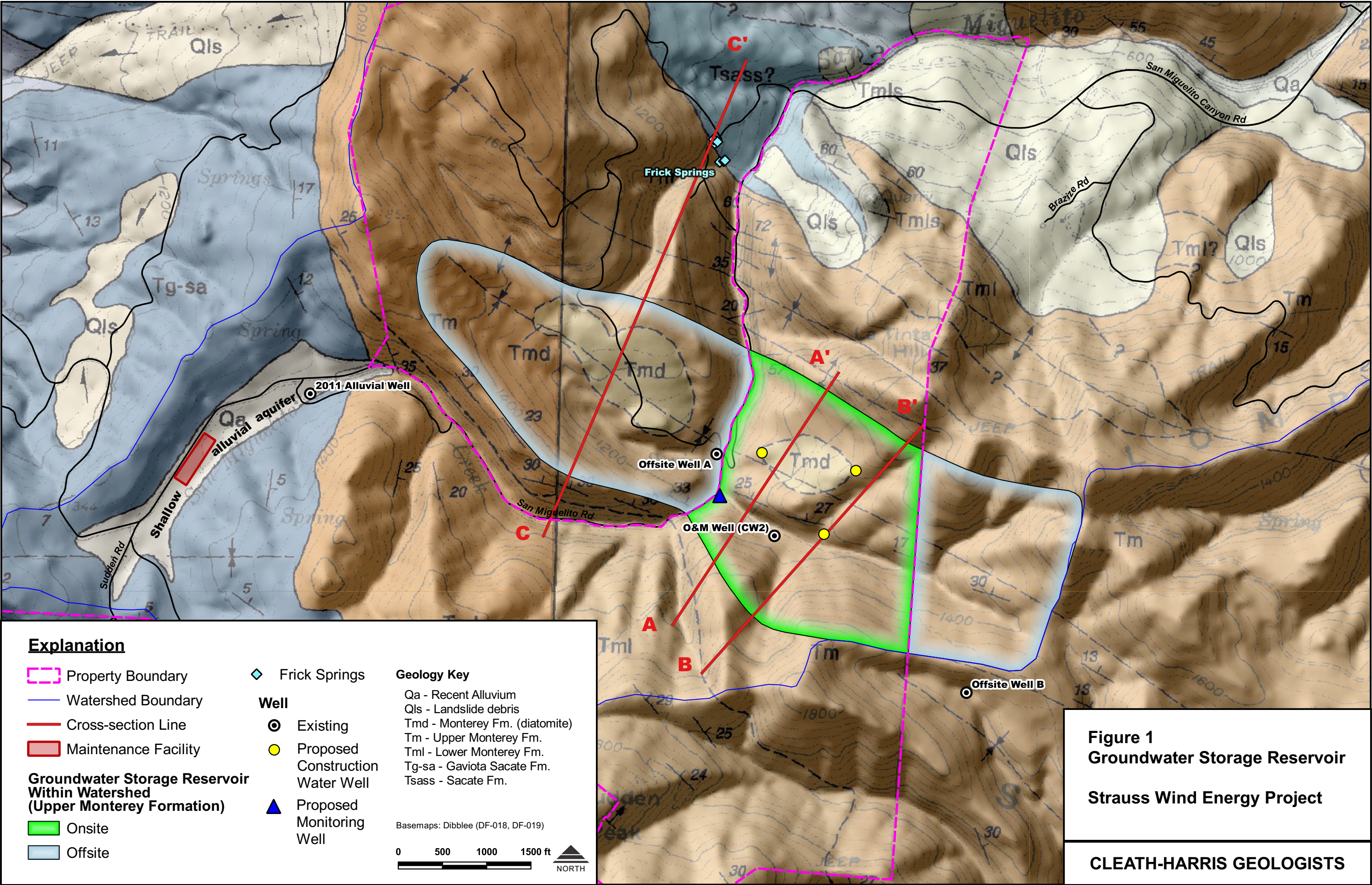


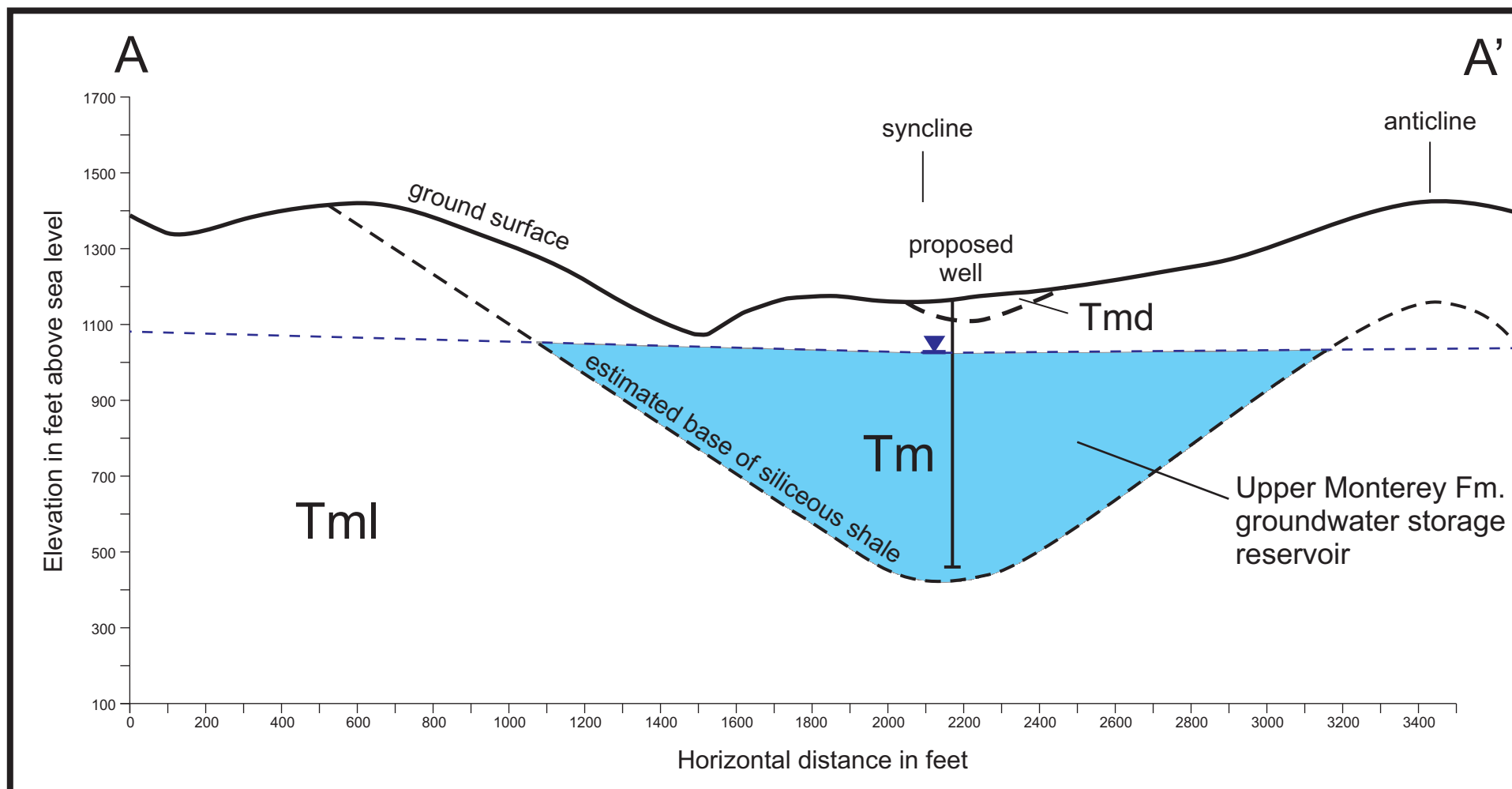
attachments



ATTACHMENTS

Figures 1-4
DWR Well Log #40446
DWR Well Log #E0094758





Explanation

Tmd - Monterey Fm. (diatomite)
Tm - Upper Monterey Formation
Tml - Lower Monterey Formation

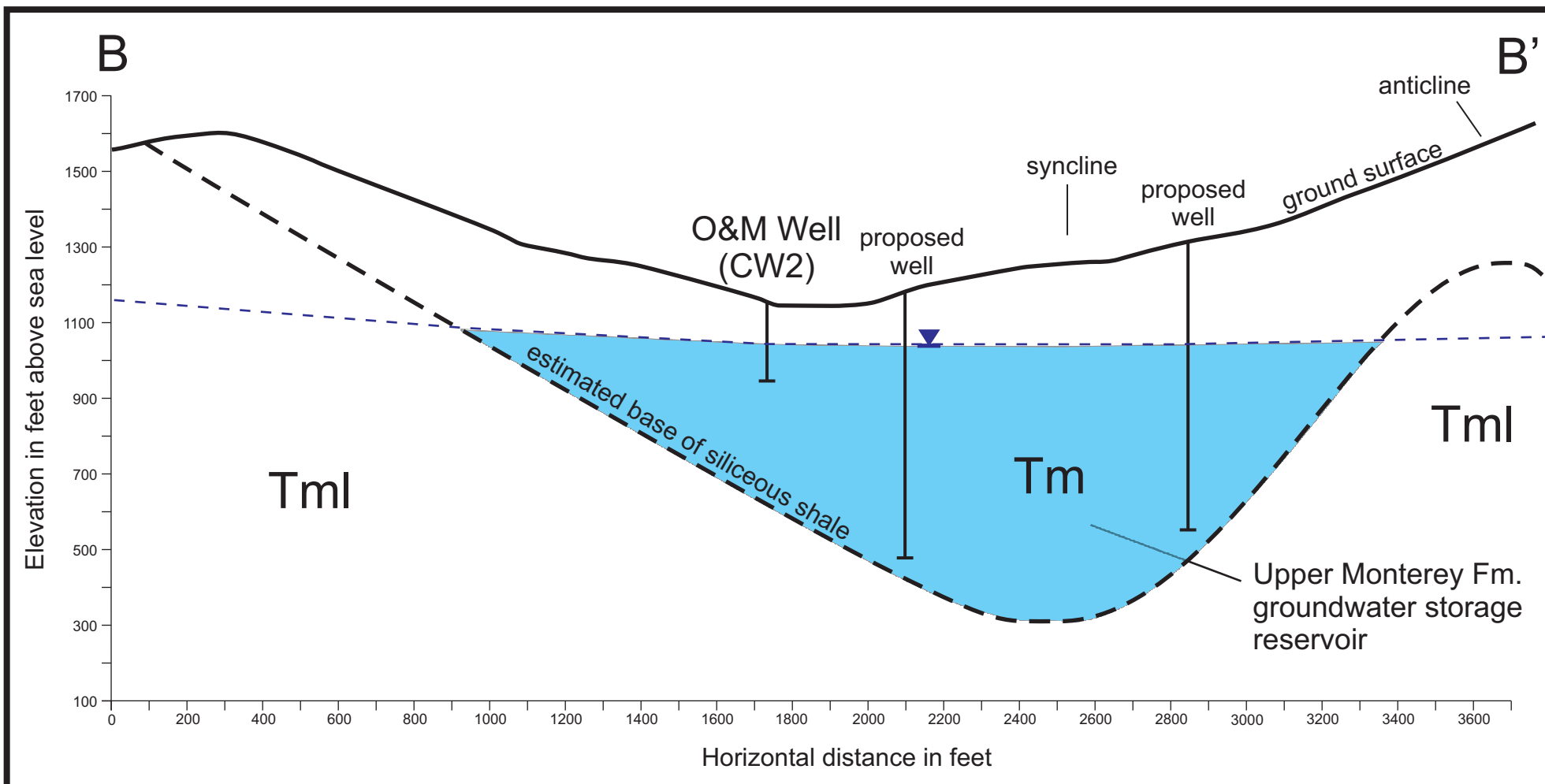
Estimated water level

Cross-section orientation shown on Figure 1

Proposed construction
water well (projected
onto section)

Figure 2
Cross-Section A-A'
Strauss Wind Energy Project

Cleath-Harris Geologists



Explanation

Tm - Upper Monterey Formation
Tml - Lower Monterey Formation

Estimated water level

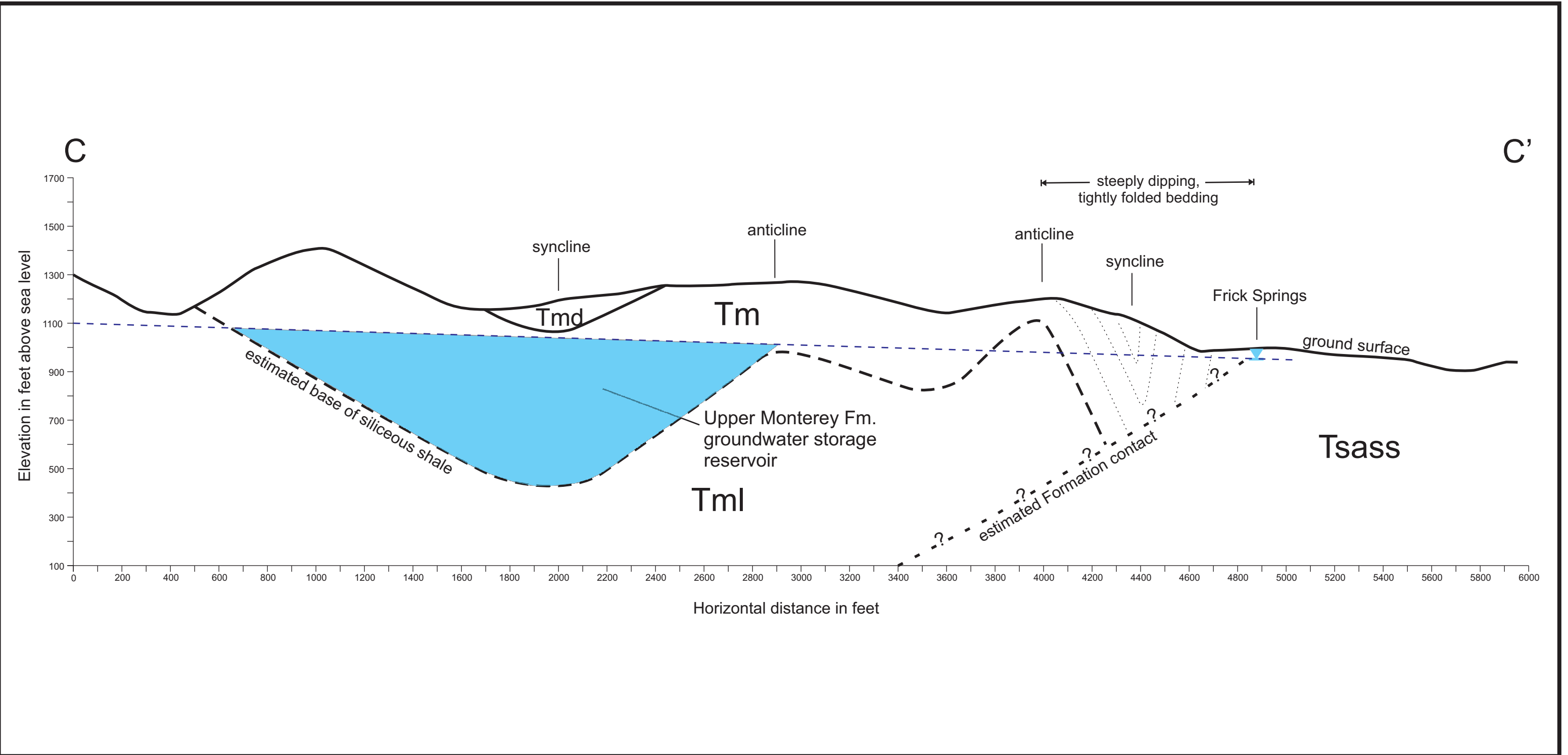
Cross-section orientation shown on Figure 1

Proposed construction
water wells (see Figure 1)

CW2 is existing O&M Well
(projected onto section)

Figure 3
Cross-Section B-B'
Strauss Wind Energy Project

Cleath-Harris Geologists



Explanation

Tmd - Monterey Fm. (diatomite)
Tm - Upper Monterey Formation
Tml - Lower Monterey Formation
Tsass - Sacate Formation


 Estimated water level
Cross-section orientation shown on Figure 1

Figure 4
Cross-Section C-C'
Strauss Wind Energy Project

Cleath-Harris Geologists

DUPLICATE
File Original, Duplicate and Triplicate with the
REGIONAL WATER POLLUTION

CONTROL BOARD No. 3
(Insert appropriate number)

WATER WELL DRILLERS REPORT

(Sections 7076, 7077, 7078, Water Code)

STATE OF CALIFORNIA

6N, 34W-19 579

Do Not Fill In

No. 40446 ?

State Well No. 06N/34W-19

Other Well No. _____

(1) OWNER: plots near location of
Name Offsite "Well A" but no
Address well constructed

(2) LOCATION OF WELL:

County San Bernardino Owner's number, if any—

R. F. D. or Street No. Approximately 5 miles south of
Tempe in Aguilar Canyon in old road north
of Ingle City Rock Plant

(3) TYPE OF WORK (check):

New well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic ☐ Industrial ☐ Municipal ☐

Irrigation ☐ Test Well ☒ Other ☐

(5) EQUIPMENT:

Rotary ☐

Cable ☐

Dug Well ☐

(6) CASING INSTALLED:

SINGLE ☐ DOUBLE ☐

From	ft. to	ft.	Diam.	Gage or Wall
"	"	"	"	"
"	"	"	"	"
"	"	"	"	"
"	"	"	"	"
"	"	"	"	"
"	"	"	"	"

If gravel packed

Diameter of Bore	from ft.	to ft.
"	"	"
"	"	"
"	"	"
"	"	"
"	"	"
"	"	"

Type and size of shoe or well ring

Describe joint

Size of gravel:

(7) PERFORATIONS:

Type of perforator used

Size	of perforations	in., length, by	in.
From	ft. to	ft.	Perf. per row
"	"	"	"
"	"	"	"
"	"	"	"
"	"	"	"
"	"	"	"

(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.

Method of Sealing

(9) WATER LEVELS:

Depth at which water was first found _____ ft.

Standing level before perforating _____ ft.

Standing level after perforating 30.00 ft.

(10) WELL TESTS:

Was a pump test made? ☐ Yes ☐ No If yes, by whom?

Yield: _____ gal./min. with _____ ft. draw down after _____ hrs.

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

Was electric log made of well? ☐ Yes ☐ No

(11) WELL LOG:

Total depth 47 ft. Depth of completed well _____ ft.

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

ft. to	ft.	Formation
0	10	Yellow clay
10	20	Yellow clay
20	30	Yellow clay

CONFIDENTIAL - NOT
FOR PUBLIC RELEASE

Work started _____ 19 _____ Completed _____ 19 _____

WELL DRILLER'S STATEMENT:

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

NAME Robert J. Quinn
(Person, firm, or corporation) (Typed or printed)

Address 225 West 10th St.

[SIGNED] Robert J. Quinn

License No. 111153 Dated Oct 20, 19 61

File Original with DWR 06N34W29

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. **e0094758**

Page 1 of 1

Owner's Well Number TINTA WELL #6

Date Work Began 07/07/2009

Date Work Ended 7/14/2009

Local Permit Agency Santa Barbara County

Permit Number SR # 0106570

Permit Date 7/9/09

DWR Use Only - Do Not Fill In

State Well Number/Site Number									
Latitude									
Longitude									
APN/TRS/Other									

Geologic Log		
Orientation <input checked="" type="radio"/> Vertical <input type="radio"/> Horizontal <input type="radio"/> Angle Specify		
Drilling Method <u>ROTARY</u> Drilling Fluid <u>MUD TO AIR</u>		
Depth from Surface	Feet	Description
0	3	TOP SOIL
3	15	CLAY & GRAVELS
15	18	FIRM LIGHT BROWN CLAY
18	21	BROWN CLAY & SHALE GRAVEL
21	35	BROWN SHALE
35	45	BROWN CLAY & SHALE
45	520	FRACTURED BROWN SHALE
The Air Lift Test is only approximate. A Test Pump is recommended for an accurate account. (WP)		
Total Depth of Boring <u>520</u> Feet		
Total Depth of Completed Well <u>513</u> Feet		

Well Owner	
Well Location	
Address <u>Off Jalama Beach Road - Tinta Well #6</u>	
City <u>Lompoc</u>	County <u>Santa Barbara</u>
Latitude <u>34° 58' 00" N</u>	Longitude <u>120° 34' 00" W</u>
Datum <u>Decimal Lat.</u>	Decimal Long.
APN Book <u>083</u>	Page <u>260</u> Parcel <u>012</u>
Township <u></u>	Range <u></u> Section <u></u>
Location Sketch (Sketch must be drawn by hand after form is printed.) 	
Activity <input checked="" type="radio"/> New Well <input type="radio"/> Modification/Repair <input type="radio"/> Deepen <input type="radio"/> Other <input type="radio"/> Destroy Describe procedures and materials under "GEOLOGIC LOG"	
Planned Uses <input checked="" type="radio"/> Water Supply <input type="checkbox"/> Domestic <input type="checkbox"/> Public <input checked="" type="checkbox"/> Irrigation <input type="checkbox"/> Industrial <input type="radio"/> Cathodic Protection <input type="radio"/> Dewatering <input type="radio"/> Heat Exchange <input type="radio"/> Injection <input type="radio"/> Monitoring <input type="radio"/> Remediation <input type="radio"/> Sparging <input type="radio"/> Test Well <input type="radio"/> Vapor Extraction <input type="radio"/> Other	

Water Level and Yield of Completed Well	
Depth to first water	(Feet below surface)
Depth to Static	
Water Level <u>170</u>	(Feet) Date Measured <u>07/10/2009</u>
Estimated Yield * <u>100</u>	(GPM) Test Type <u>Air Lift</u>
Test Length <u>6.0</u>	(Hours) Total Drawdown <u></u> (Feet)
*May not be representative of a well's long term yield.	

Casings								Annular Material				
Depth from Surface Feet to Feet		Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)	Depth from Surface Feet to Feet		Fill	Description
0	58	18	Conductor	F-480 PVC	SDR 21	12			0	58	CEMENT	
0	233	11	BLANK	F-480 PVC	SDR 21	6			58	513	FILL	Monterey Mix
233	513	11	SCREEN	F-480 PVC	SDR 21	6		0.040				

Attachments	Certification Statement
<input type="checkbox"/> Geologic Log <input type="checkbox"/> Well Construction Diagram <input type="checkbox"/> Geophysical Log(s) <input type="checkbox"/> Soil/Water Chemical Analyses <input type="checkbox"/> Other	I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief Name <u>Filipponi & Thompson Drilling, Inc.</u> Person, Firm or Corporation P.O. Box <u>845</u> Address <u>Atascadero</u> City <u>CA</u> State <u>93423</u> Zip Signed <u>[Signature]</u> Date Signed <u>7-21-09</u> C-57 Licensed Water Well Contractor C-57 License Number <u>432680</u>

08/25/09

Appendix E-4

Construction Water Supply Aquifer Letter –
October 2019



October 28, 2019

Mr. Jörg Beland
Strauss Wind, LLC
5901 Priestly Drive, Suite 300
Carlsbad, CA 92008

Subject: Revised response to comments on construction water supply aquifer for Strauss Wind Energy Project, Lompoc, Santa Barbara County.

Dear Mr. Beland:

Cleath-Harris Geologists (CHG) has prepared a revised response to the comments received from the County of Santa Barbara (County) regarding the proposed construction water supply aquifer for the Strauss Wind Energy Project (Project). The comments received are as follows:

Regarding the hydrology report, please provide a map showing all of the existing wells within the aquifer to be used for construction water, descriptions of well ownership and current use, and technical justification for a reasonable drawdown at each well that would be of sufficient magnitude to adversely affect the water supply delivered by that well. This drawdown will be used in the mitigation measure to trigger cessation of pumping of construction water. Information regarding the extent of this aquifer relative to any potential impact to Frick's Spring is also requested.

The above referenced hydrology report is a description of the construction water supply aquifer provided in correspondence from CHG¹. Additional details and technical justification for mitigation measures have been prepared herein based on new information that updates and revises the response to comments dated September 25, 2019. A discussion of Project water use and the County's Thresholds of Significance is also included herein.

Limits of Source Aquifer

The source aquifer for construction water wells forms a syncline within siliceous shale of the upper Monterey Formation. The lateral extent of the aquifer is interpreted to be where the limbs of the syncline rise to the water table, encompassing a trough-shaped groundwater storage reservoir. To the east, the effective lateral extent of the reservoir is the Miguelito Canyon watershed boundary.

¹ CHG, Comments on Draft SEIR for Strauss Wind Energy Project, Lompoc, Santa Barbara County, May 21, 2019



Figure 1 shows the limits of the groundwater storage reservoir and associated source aquifer. Construction water wells would tap fractured shale zones within the groundwater storage reservoir. Cross-sections showing interpreted hydrogeologic profiles through the groundwater storage reservoir are shown in Figures 2-4.

Existing Wells and Developed Springs

Three existing wells have been identified within the limits of the groundwater storage reservoir. These wells are labeled O&M Well (CW2), Offsite Well A, and Offsite Well B on Figure 1. A fourth existing well, Offsite Well C, has been located just outside the groundwater storage reservoir limit east of the watershed divide. The developed springs identified in the project vicinity are outside of the groundwater storage reservoir, and include Frick Springs (City of Lompoc) and a private Ranch Spring (Figure 1).

Well CW2 is a Project well owned by Signorelli Family Trust and will be used for supplying water to the Operations and Maintenance Building. Offsite Well A, Offsite Well B, and the Ranch Spring serve the adjacent ranch property across San Miguelito Road. Frick Springs is a public water system serving residents of Miguelito canyon.

Information for Offsite Well A (49 feet deep), Offsite Well B (155 feet deep), and the Ranch Spring was obtained from County records. Construction details for the wells are attached. A search of Well Completion Reports was also performed using the California Department of Water Resources (DWR) database to help identify wells in the vicinity of the groundwater storage reservoir. Two logs were found and are attached. DWR log #40446, dated October 1961, is for a test well “5 miles south of Lompoc in Miguelito Canyon” which plots within the groundwater reservoir area at the approximate location of Offsite Well A. The test well log shows clay through a total depth of 51 feet, and the standing water level is reported as “none”, with no indication of a well being constructed. A second log, No. E0094758 is labeled Offsite Well C on Figure 1. This well was drilled for irrigation purposes in 2009, and is completed in fractured brown shale to 513 feet depth. Offsite Well C is on property currently owned by The Nature Conservancy and is likely inactive, based on a review of aerial images.

A source yield test for the Ranch Spring in 2002 reported that the spring source exceeded the minimum continuous flow requirement 1.5 gallons per minute (gpm) for domestic supply from springs (County ordinance 12-4843). Construction of the existing ranch residence was subsequently permitted by the County, and based on the results of this source yield test, the spring is likely the primary water supply for the residence. The Ranch Spring, at an elevation of approximately 1,500 feet above sea level and outside of the limits of the source aquifer for the Project wells, will not be impacted by Project water use.



Reasonable Drawdown

The County has requested technical justification for a reasonable drawdown at each well that would be of sufficient magnitude to adversely affect the water supply delivered by that well. Factors to consider when estimating reasonable drawdown include well construction, pump size and flow rate, pump depth setting, and well specific capacity.

Offsite Well A and Offsite Well B are the only non-Project wells within the effective limits of the groundwater storage reservoir, based on the County records and DWR database search. Offsite Well A (49 feet deep) is approximately 2,400 feet closer to the proposed construction water wells than Offsite Well B (155 feet deep), and has the potential for water level impacts from the Project. Mitigation measures that address water level impacts to Offsite Well A will also mitigate potential water level impacts to Offsite Well B.

The technical justification for a reasonable drawdown at Offsite Well A, for which impacts would be measured and mitigation implemented, includes the following assumptions:

- The well is 49 feet deep with the bottom 20 feet screened in the fractured shale groundwater reservoir.
- The pump is set 5 feet above the well bottom, with an additional 5 feet of water column above the pump required (10 feet minimum water column).
- Static water level is 20 feet deep under existing conditions (close to the invert of San Miguelito Creek).
- Aquifer transmissivity and well specific capacity is similar to nearby O&M Well CW2, adjusted for the aquifer thickness tapped by each well.
- A nominal discharge capacity for the well pump of 1-2 gallon per minute (gpm) needs to be maintained. This is sufficient to provide a few hundred gallons per day, and supplements the developed Ranch Spring, which will not be impacted by Project water use. Additional yield from Offsite Well B would also be available.

Using these assumptions, the 12-hour specific capacity of Offsite Well A is estimated at 0.4 gpm per foot of drawdown, and therefore would require up to 5 feet of drawdown during a 12-hour pumping cycle at 2 gpm. In order to maintain a 1-2 gpm flow rate with adequate water above the pump, the maximum reasonable drawdown due to Project water use before significant impacts to Offsite Well A occur is estimated to be 14 feet².

² The existing water column is assumed to be 29 feet (49 feet well depth – 20 feet depth static level). A reasonable drawdown of 14 feet would reduce the water column to 15 feet (29 feet existing conditions – 14 feet reasonable drawdown = 15 feet). An additional 5 feet of pumping water level drawdown would maintain 10 feet of water column in the well.



Monitoring of water level drawdown in the vicinity of Offsite Well A will be performed at a designated monitoring well to be constructed on Project property across San Miguelito Road, as close as possible to Offsite Well A (Figure 1). The monitoring well will be equipped with a pressure transducer that will provide detailed water level trends and allow the Project applicant (and County) to anticipate impacts at Offsite Well A before they occur.

Mitigation Measures

Recommendations for mitigation measure MM WAT-1 (Construction Water Source) were provided in previous correspondence³. Based on the comments received from the County, revised mitigation measures are recommended as follows:

- a) Allow use of on-site wells for construction water.
- b) Require the Applicant to construct a monitoring well in order to monitoring water levels within the aquifer. The monitoring well will be equipped with an automatic water level recorder (e.g. pressure transducer).
- c) Water levels in the monitoring well will be recorded hourly by the pressure transducer and will be reported to the County on a bi-weekly basis during the first six months of construction, and monthly thereafter until three months following the end of construction, or as agreed to between the Applicant and the County. Water level data reported to the County will include an interpretation of water level trends and anticipated construction activity and water use. The reporting interval would change from bi-weekly to weekly if water level declines in the monitoring well exceed 7 feet (half of the reasonable drawdown threshold).
- d) If water level trends at the monitoring well indicate that a drawdown of 14 feet or more is anticipated at any time during the course of construction water use, the Applicant with concurrence from the County will either:
 - a. Adjust and/or reduce construction well production to the extent feasible to avoid water levels reaching the reasonable drawdown threshold of 14 feet, or
 - b. Provide water of suitable quantity and quality, as needed, to replace any loss in production at the well. The Applicant would be responsible for the costs and transportation of water to the existing tank(s) in order to provide the required quantity of supplemental water.

³ CHG, Comments on Draft SEIR for Strauss Wind Energy Project, Lompoc, Santa Barbara County, May 21, 2019



Note that the recommended mitigation for significant impact to Offsite Well A are acceptable industry practices. These measures would also ensure that the traffic and air quality impacts of trucking in construction water would be avoided.

Potential Impacts to Frick Springs

Frick Springs consists of developed springs that are part of the water system for the City of Lompoc. These springs are located along the formation contact between the Monterey Formation and the Sacate Formation (Figure 1), approximately $\frac{3}{4}$ miles from the construction water wells. The approximate elevations of the individual springs at Frick Springs range from 900-950 feet above sea level and are 50-100 feet above the adjacent invert elevation of San Miguelito Creek (i.e. the springs are at greater pressure head than the creek). The geologic structure in the Monterey Formation approaching Frick Springs consists of steeply dipping and tightly folded beds (Figure 4), which would transmit groundwater preferentially along a northwest-southeast direction (parallel to the fold axis) and restrict groundwater flow in the direction of the groundwater storage reservoir shown in Figure 1. Given the distance from the construction water wells, elevation relative to the creek, and geologic structure surrounding Frick Springs, the Project's use of the construction water wells are not expected to impact the Frick Springs water system.

Thresholds of Significance

The Santa Barbara County Environmental Thresholds and Guidelines Manual, last revised in February 2018, *"has been prepared to assist the public, the applicant, environmental consulting firms, and County decision makers in understanding the use and application of various environmental thresholds as they relate to project proposals"* (pg. 1).

Chapter 2 (Rules for Use and Criteria for Amendment) of the Environmental Thresholds and Guidelines Manual states: *"A project which has no effect above threshold values individually or cumulatively shall be determined not to have any significant effect, and a negative declaration shall be prepared as provided in Article IV. Projects which have a potential effect above a threshold of significance will require an EIR"* (pg. 3). Furthermore, *"Thresholds of significance are intended to supplement provisions in the State Guidelines for determination of significant environmental effect including Sections 15604, 15605, 15382 and Appendix G incorporated herein"* (pg. 2).

In general, thresholds of significance are intended to be used during the Initial Study phase of project review to help determine whether a negative declaration is, or is not, appropriate. Since the Strauss Wind Energy Project is already subject to an environmental impact analysis (no negative declaration), use of thresholds of significance for the intended purpose is not needed.



With respect to groundwater use by the Project, *“The Threshold of Significance for consolidated rock (“bedrock”) aquifers is considered the amount of new pumpage by a proposed project, which would place the aquifer in a state of overdraft”* (pg. 85). A state of overdraft can occur when *“The amount by which the average long term demand on a basin exceeds the safe yield of the basin after allowances are made for return flows”* (page 76). Finally, the safe yield of a basin is defined as *“The maximum amount of water which can be withdrawn from a basin (or aquifer) on an average annual basis without inducing a long-term progressive drop in water level”* (pg. 76). The average long term operating demand for the Project is estimated to be 250 gallons per day, equivalent to 0.28 acre-feet per year. Given the minimal long-term Project water use, and the relatively undeveloped condition of the groundwater reservoir, the threshold of significance for consolidated rock aquifers will not be exceeded under project conditions.

Respectfully submitted,
CLEATH-HARRIS GEOLOGISTS

Spencer J. Harris, HG 633
Senior Hydrogeologist



attachments



ATTACHMENTS

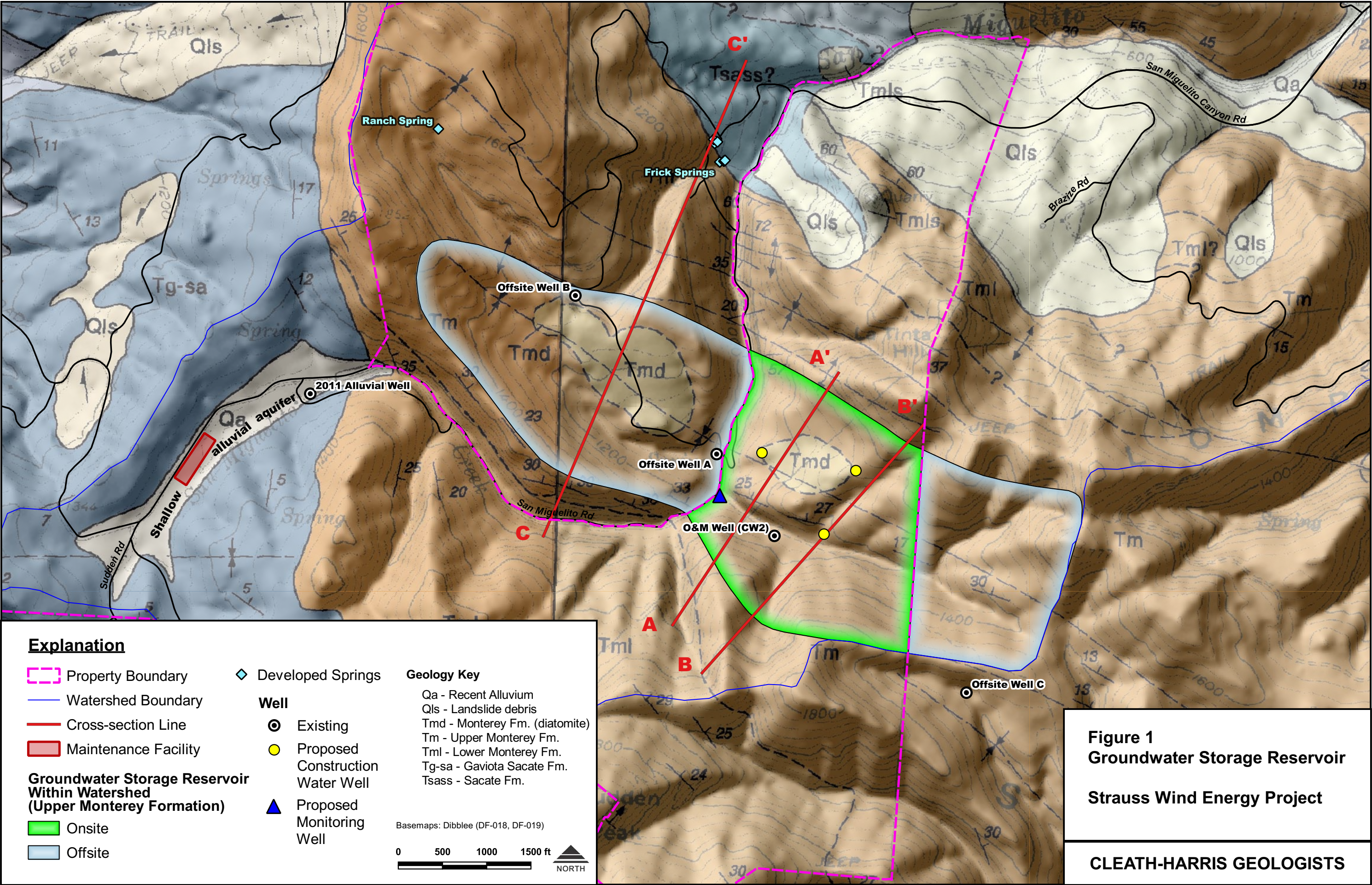
Figures 1-4

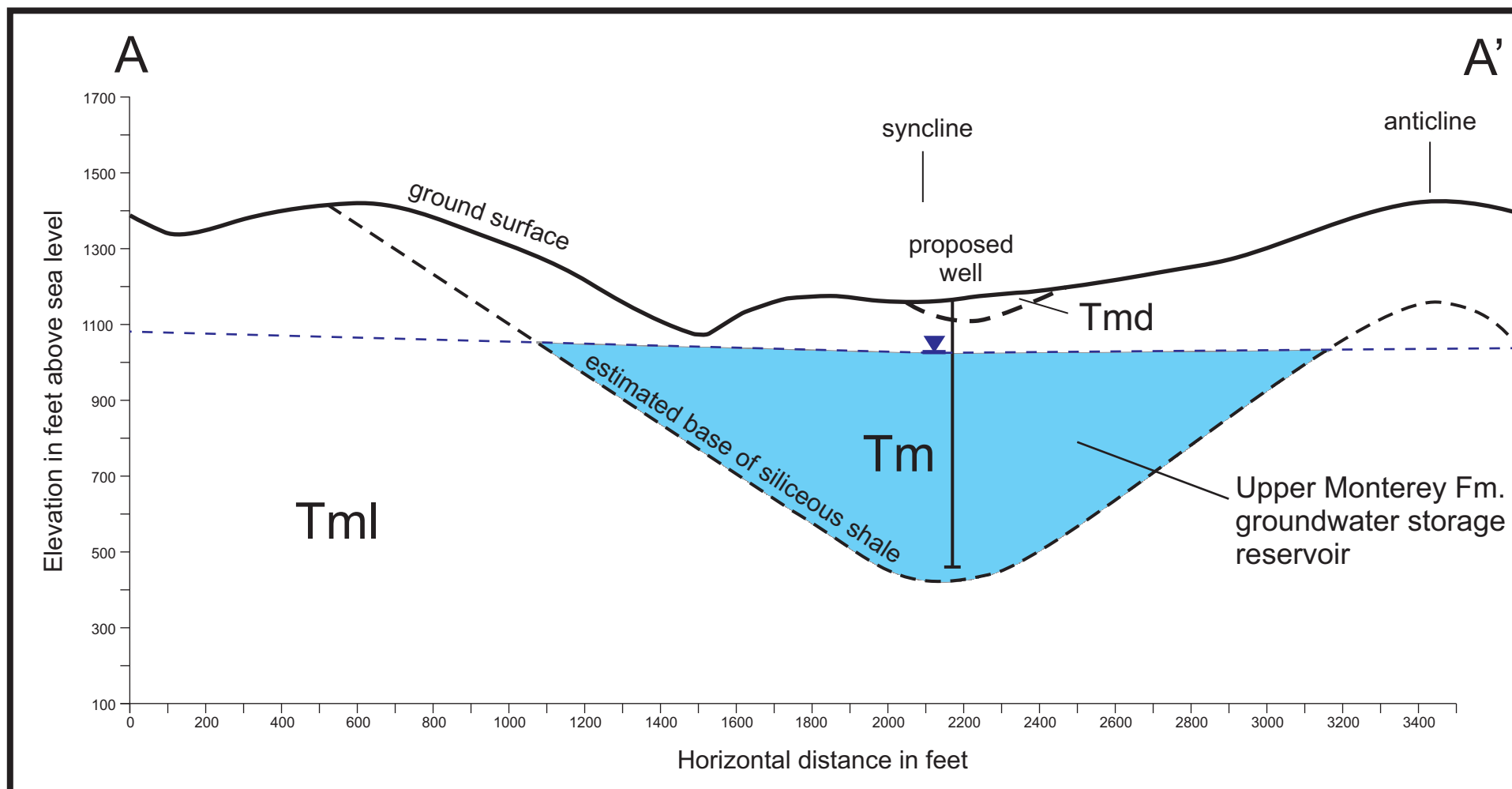
Offsite Well A - Well Permit Field Record

Offsite Well B – Well Permit Field Record

DWR Well Log #40446

DWR Well Log #E0094758





Explanation

Tmd - Monterey Fm. (diatomite)
Tm - Upper Monterey Formation
Tml - Lower Monterey Formation

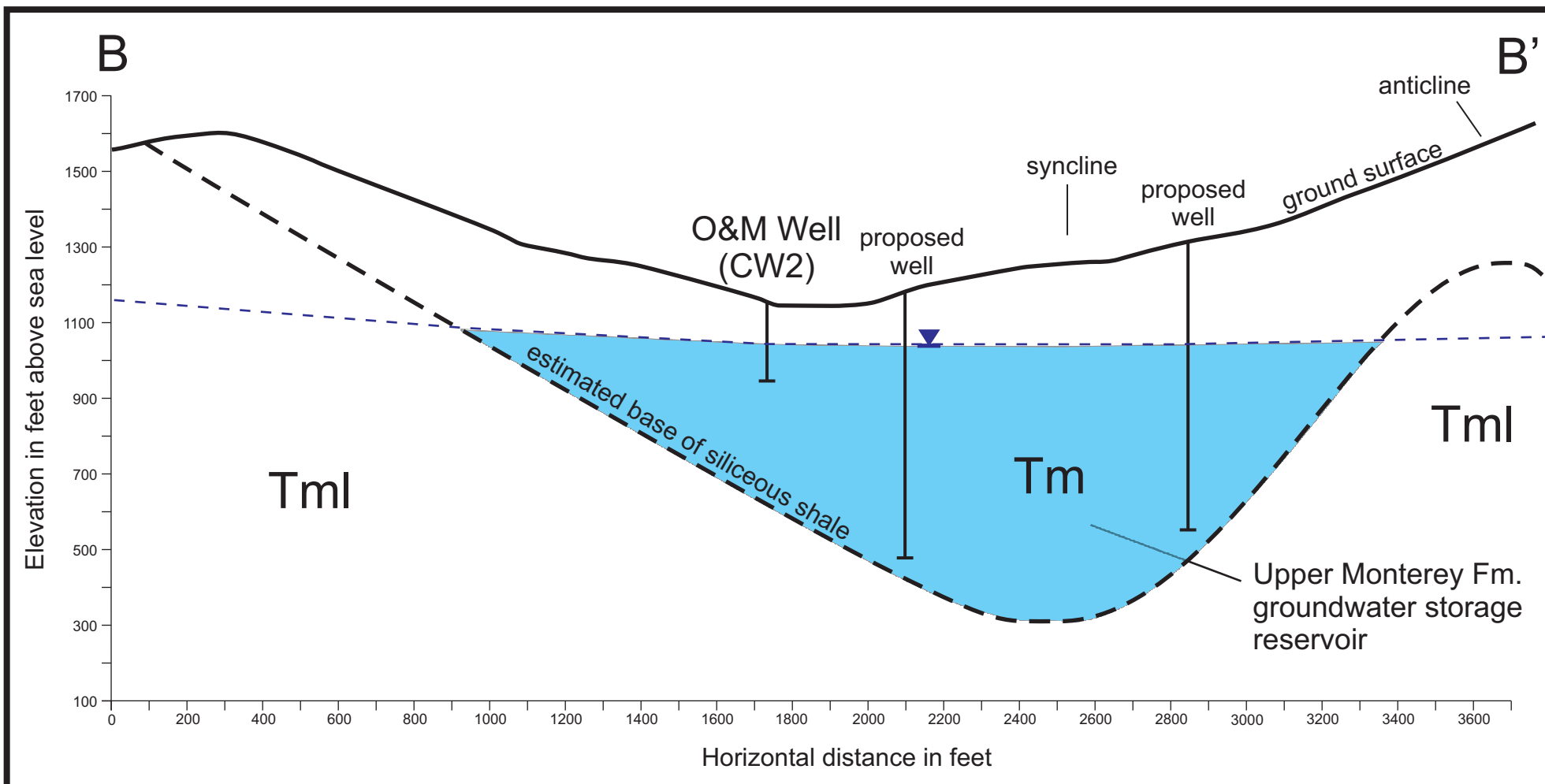
— ▽ — Estimated water level

Cross-section orientation shown on Figure 1

Proposed construction
water well (projected
onto section)

Figure 2
Cross-Section A-A'
Strauss Wind Energy Project

Cleath-Harris Geologists



Explanation

Tm - Upper Monterey Formation
Tml - Lower Monterey Formation

Estimated water level

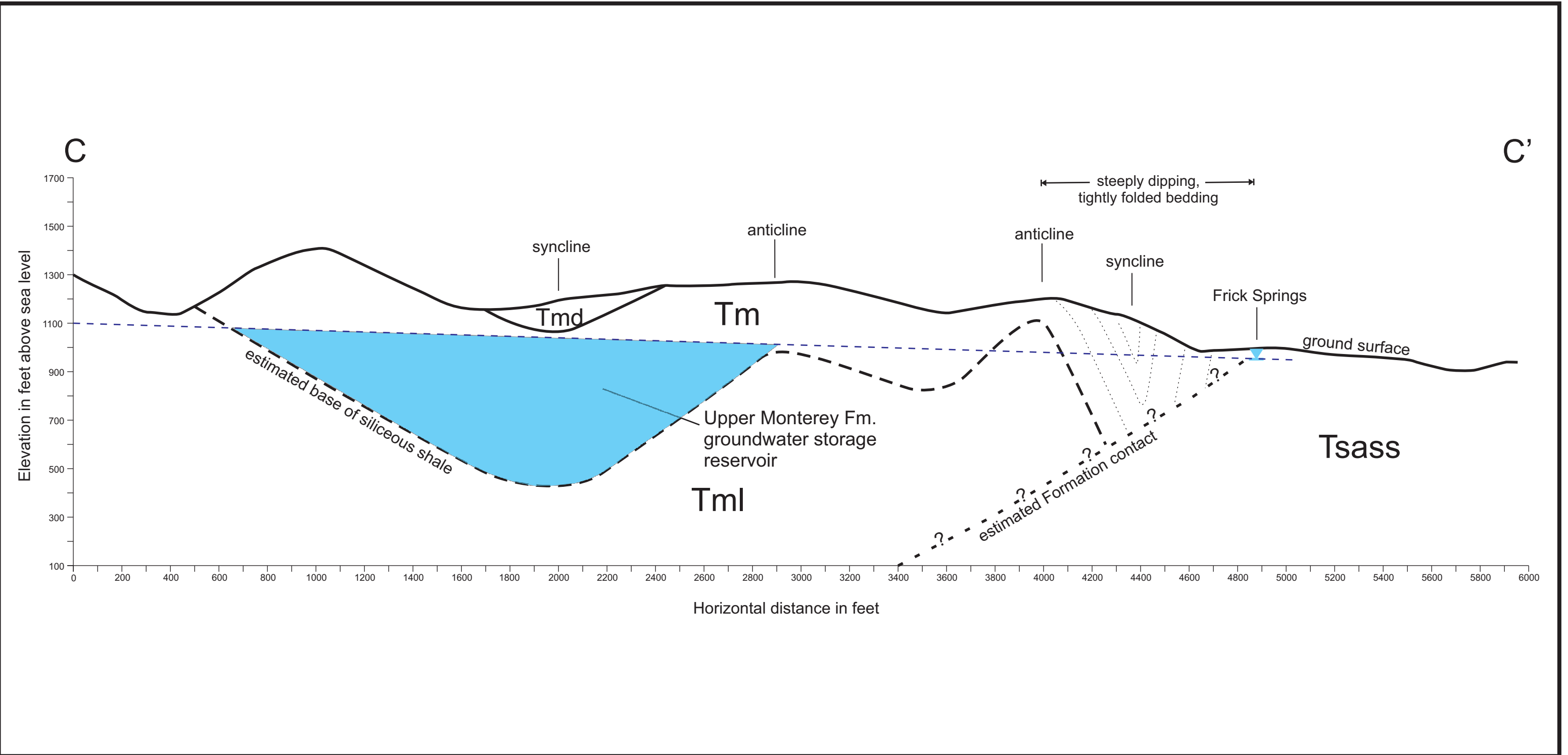
Cross-section orientation shown on Figure 1

Proposed construction
water wells (see Figure 1)

CW2 is existing O&M Well
(projected onto section)

Figure 3
Cross-Section B-B'
Strauss Wind Energy Project

Cleath-Harris Geologists



Explanation

Tmd - Monterey Fm. (diatomite)
Tm - Upper Monterey Formation
Tml - Lower Monterey Formation
Tsass - Sacate Formation


 Estimated water level
Cross-section orientation shown on Figure 1

Figure 4
Cross-Section C-C'
Strauss Wind Energy Project

Cleath-Harris Geologists

Offsite Well A

Permit No. 102766
Page 1 of 1 pages

ENVIRONMENTAL HEALTH DIVISION SANTA BARBARA COUNTY HEALTH CARE SERVICES WELL PERMIT FIELD INVESTIGATION RECORD

Well Permit Application Received: Date 3/27/03

Site Investigation By Kathy Cardiel Date 3/27/03

Findings: (Check applicable boxes and give clearance)

- | | |
|---|---|
| <input type="checkbox"/> Overhead Power Lines | <input type="checkbox"/> Animal Enclosure |
| <input type="checkbox"/> Sewer Lines | <input type="checkbox"/> Creek or Watercourse |
| <input type="checkbox"/> Leach Field | <input type="checkbox"/> Petroleum Tank or Pipeline |
| <input type="checkbox"/> Cesspool/Drywell | <input type="checkbox"/> Other |

AP - OK

Site Check - OK

Application Reviewed and Approved: By KC Date 3/27/03

Work Investigation Record

Date 4/18/03

Well Site #: 2 of 2

Casing Information

Type: Steel ☐ PVC ☒ Other ☐

Borehole

Total Depth of Well: 49'

Class/Gage/NSF: _____

Annular Seal Depth: 22'

ASTM#: _____

Well Bore Diameter: 10"

Diameter: 6" Total Depth: 49'

Sealing Material: 6 sack cement

Casing Schedule

Amount: 2 2 yds.

0' - <u>29'</u>	=	<u>Blank</u>
<u>29</u> - <u>49</u>	=	<u>Reef</u>
_____	=	_____
_____	=	_____
_____	=	_____
_____	=	_____
_____	=	_____

Method of Pour: Gravity

Use of Tremie: NO

Driller(s): Ron Taylor

Drilling

Comments: well
Site #1 Cap on site

Final Inspection and Approval/Denial: By Kathy Cardiel Date 4/18/03

Notice of Work Acceptance/Rejection Sent to Well owner On 4/21/03

Offsite Well B

ENVIRONMENTAL HEALTH DIVISION
SANTA BARBARA COUNTY HEALTH CARE SERVICES
WELL PERMIT FIELD INVESTIGATION RECORD

Well Permit Application Received: Date 4 / 17 / 03

Site Investigation By Kathy Carden Date 3 / 27 / 03

Findings: (Check applicable boxes and give clearance)

- | | |
|---|---|
| <input type="checkbox"/> Overhead Power Lines | <input type="checkbox"/> Animal Enclosure |
| <input type="checkbox"/> Sewer Lines | <input type="checkbox"/> Creek or Watercourse |
| <input type="checkbox"/> Leach Field | <input type="checkbox"/> Petroleum Tank or Pipeline |
| <input type="checkbox"/> Cesspool/Drywell | <input type="checkbox"/> Other |

Site check OK

Application Reviewed and Approved: By Kathy Carden Date 4 / 17 / 03

Work Investigation Record

Date 4 / 18 / 03

Well Site #: 2 of 2

Casing Information

Type: Steel ☐ PVC ☒ Other ☐

Borehole

Class/Gage/NSF: _____

Total Depth of Well: 155'

ASTM#: _____

Annular Seal Depth: 30'

Diameter: 6" Total Depth: 155'

Well Bore Diameter: 11"

Casing Schedule

Sealing Material: 10 sack cement

Amount: 2 yds.

Method of Pour: Gravity

Use of Tremie: NO

Driller(s): Ron Taylor Well

Drilling

Comments: Cap on site

Final Inspection and Approval/Denial: By Kathy Carden Date 4 / 18 / 03

Notice of Work Acceptance/Rejection Sent to Well owner On 4 / 21 / 03

DUPLICATE
File Original, Duplicate and Triplicate with the
REGIONAL WATER POLLUTION

CONTROL BOARD No. 3
(insert appropriate number)

WATER WELL DRILLERS REPORT

(Sections 7076, 7077, 7078, Water Code)

STATE OF CALIFORNIA

6N, 34W-19 579

Do Not Fill In

No. 40446 ?

State Well No. 06N/34W-19

Other Well No. _____

(1) OWNER: plots near location of
Name Offsite "Well A" but no
Address well constructed

(2) LOCATION OF WELL:

County San Bernardino Owner's number, if any—

R. F. D. or Street No. Approximately 5 miles south of
Tempe in Aguila Canyon in old road north
of Ingle City Rock Plant

(3) TYPE OF WORK (check):

New well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

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

(5) EQUIPMENT:

Rotary ☐
Cable ☒
Dug Well ☐

(6) CASING INSTALLED:

SINGLE ☐ DOUBLE ☐

From	ft. to	ft.	Diam.	Gage or Wall
"	"	"	"	"
"	"	"	"	"
"	"	"	"	"
"	"	"	"	"
"	"	"	"	"
"	"	"	"	"

If gravel packed

Diameter of Bore	from ft.	to ft.
"	"	"
"	"	"
"	"	"
"	"	"
"	"	"
"	"	"

Type and size of shoe or well ring

Size of gravel:

Describe joint

(7) PERFORATIONS:

Type of perforator used

Size	of perforations	in., length, by	in.
From	ft. to	ft.	Perf. per row
"	"	"	"
"	"	"	"
"	"	"	"
"	"	"	"
"	"	"	"

(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.

Method of Sealing

(9) WATER LEVELS:

Depth at which water was first found _____ ft.

Standing level before perforating _____ ft.

Standing level after perforating 30.00 ft.

(10) WELL TESTS:

Was a pump test made? ☐ Yes ☐ No If yes, by whom?

Yield: _____ gal./min. with _____ ft. draw down after _____ hrs.

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

Was electric log made of well? ☐ Yes ☐ No

(11) WELL LOG:

Total depth 47 ft. Depth of completed well _____ ft.

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

ft. to	ft.	Formation
0	10	Yellow clay
10	20	Yellow clay
20	30	Yellow clay

CONFIDENTIAL - NOT
FOR PUBLIC RELEASE

Work started _____ 19 _____ Completed _____ 19 _____

WELL DRILLER'S STATEMENT:

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

NAME Robert J. Quinn
(Person, firm, or corporation) (Typed or printed)

Address 225 West 10th St.

[SIGNED] Robert J. Quinn

License No. 111153 Dated Oct 20, 19 61

File Original with DWR 06N34W29

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. **e0094758**

Page 1 of 1
Owner's Well Number TINTA WELL #6

Date Work Began 07/07/2009 Date Work Ended 7/14/2009

Local Permit Agency Santa Barbara County

Permit Number SR # 0106570 Permit Date 7/9/09

DWR Use Only - Do Not Fill In

State Well Number/Site Number									
Latitude									
Longitude									
APN/TRS/Other									

Geologic Log		
Orientation <input checked="" type="radio"/> Vertical <input type="radio"/> Horizontal <input type="radio"/> Angle Specify		
Drilling Method <u>ROTARY</u> Drilling Fluid <u>MUD TO AIR</u>		
Depth from Surface	Feet	Description
0	3	TOP SOIL
3	15	CLAY & GRAVELS
15	18	FIRM LIGHT BROWN CLAY
18	21	BROWN CLAY & SHALE GRAVEL
21	35	BROWN SHALE
35	45	BROWN CLAY & SHALE
45	520	FRACTURED BROWN SHALE
The Air Lift Test is only approximate. A Test Pump is recommended for an accurate account. (WP)		
Total Depth of Boring <u>520</u> Feet		
Total Depth of Completed Well <u>513</u> Feet		

Well Owner	
Well Location	
Address <u>Off Jalama Beach Road - Tinta Well #6</u>	
City <u>Lompoc</u>	County <u>Santa Barbara</u>
Latitude <u>34° 58' 00" N</u>	Longitude <u>120° 34' 00" W</u>
Datum <u>Decimal Lat.</u>	Decimal Long.
APN Book <u>083</u> Page <u>260</u>	Parcel <u>012</u>
Township <u></u> Range <u></u>	Section <u></u>
Location Sketch (Sketch must be drawn by hand after form is printed.) 	
Activity <input checked="" type="radio"/> New Well <input type="radio"/> Modification/Repair <input type="radio"/> Deepen <input type="radio"/> Other <input type="radio"/> Destroy Describe procedures and materials under "GEOLOGIC LOG"	
Planned Uses <input checked="" type="radio"/> Water Supply <input type="checkbox"/> Domestic <input type="checkbox"/> Public <input checked="" type="checkbox"/> Irrigation <input type="checkbox"/> Industrial <input type="radio"/> Cathodic Protection <input type="radio"/> Dewatering <input type="radio"/> Heat Exchange <input type="radio"/> Injection <input type="radio"/> Monitoring <input type="radio"/> Remediation <input type="radio"/> Sparging <input type="radio"/> Test Well <input type="radio"/> Vapor Extraction <input type="radio"/> Other	

Water Level and Yield of Completed Well	
Depth to first water	(Feet below surface)
Depth to Static	
Water Level <u>170</u>	(Feet) Date Measured <u>07/10/2009</u>
Estimated Yield * <u>100</u>	(GPM) Test Type <u>Air Lift</u>
Test Length <u>6.0</u>	(Hours) Total Drawdown (Feet)
*May not be representative of a well's long term yield.	

Casings								Annular Material				
Depth from Surface Feet to Feet		Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)	Depth from Surface Feet to Feet		Fill	Description
0	58	18	Conductor	F-480 PVC	SDR 21	12			0	58	CEMENT	
0	233	11	BLANK	F-480 PVC	SDR 21	6			58	513	FILL	Monterey Mix
233	513	11	SCREEN	F-480 PVC	SDR 21	6		0.040				

Attachments	Certification Statement
<input type="checkbox"/> Geologic Log <input type="checkbox"/> Well Construction Diagram <input type="checkbox"/> Geophysical Log(s) <input type="checkbox"/> Soil/Water Chemical Analyses <input type="checkbox"/> Other	I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief Name <u>Filipponi & Thompson Drilling, Inc.</u> Person, Firm or Corporation P.O. Box <u>845</u> Address <u>Atascadero</u> City <u>CA</u> State <u>93423</u> Zip Signed <u>[Signature]</u> Date Signed <u>7-21-09</u> C-57 Licensed Water Well Contractor C-57 License Number <u>432680</u>

08/25/09