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September 25, 2023

Jim Sullivan
6825 Long Canyon Road
Santa Maria, CA 93454

SUBJECT: Review of Groundwater Supply Information for the Moriarty Holdings Cannabis Cultivation Project, APN 101-070-069, 7015 Long Canyon Road, Santa Barbara County, California

Dear Mr. Sullivan:

Cleath-Harris Geologists (CHG) has reviewed the groundwater supply information provided by the applicant for the Moriarty Holdings Cannabis Cultivation Project and the County of Santa Barbara Planning Department findings and herein presents additional new information and our findings on the adequacy of the evaluation regarding the groundwater supply impacts, sufficiency and reliability.

The groundwater information provided by the applicant for the project is contained in a report prepared by Kear Groundwater Consultants: 6/18/2021, Single Parcel Domestic Water System Source Yield Assessment, 40-Acre Agricultural Parcel in Cat Canyon, Santa Barbara County, California. Subsequent to that report, Agrosource Group prepared a report (2/17/2022) that determined the water requirement for the proposed entire project (Phases I and II).

GROUNDWATER DEVELOPMENT HISTORY AT PROPERTY AND VICINITY

In order to evaluate water availability and understand the potential impacts of new water supply wells, knowledge of historic groundwater development efforts on and immediately adjacent to the property is important.

Successful development of groundwater resources underlying the property for irrigation or shared domestic wells has been limited to the alluvial aquifer of Cat Canyon. There have been several water well drilling efforts and groundwater development investigations on and adjacent to the subject parcel over the past 23 years. Known wells and test hole locations within 1,000 feet of the project well are shown on the attached Figures 1 and 2.

Investigations

Cleath & Associates (currently Cleath-Harris Geologists) has performed several pumping tests and water resources studies on the existing property and the adjoining properties to the east. For review of these investigations, a request can be made to CHG. These include the following documents:

Proposed Well Site NW corner Moriarty

Katherman "recent test hole"

Old test hole 6

Old test hole 4

Well 4 2000 Taylor

Well 3 2000 Taylor

Test Hole B-3 2006 FT

Old testhole 5

Well 1 2000 Cascade

Well B-5 2006 FT

Well 5 2000 Taylor capped

Well 2 2000 Taylor

Test Hole B-4 2006 FT

Project Well B-2 2006 FT

Shared Well B

Irrigation Well

Capped well in field

Domestic Well

USGS Well 009N032W33M001S gps coord

200 0 200 400 ft

N

Basemaps:
Topographic Base Map (LIDAR 2018)
Coordinate System:
State Plane Zone V, ft - NAD83

Explanation

- Project Well
- Proposed Well
- Test Hole (Abandoned)
- Other Wells
- Proposed Well 1000 ft radius
- Project Well 1000 ft radius
- Property Boundary

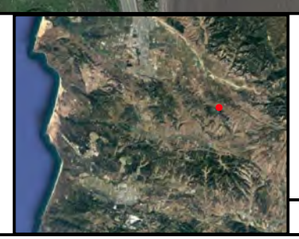

Figure 1

Regional Map
Moriarty Properties Project Review

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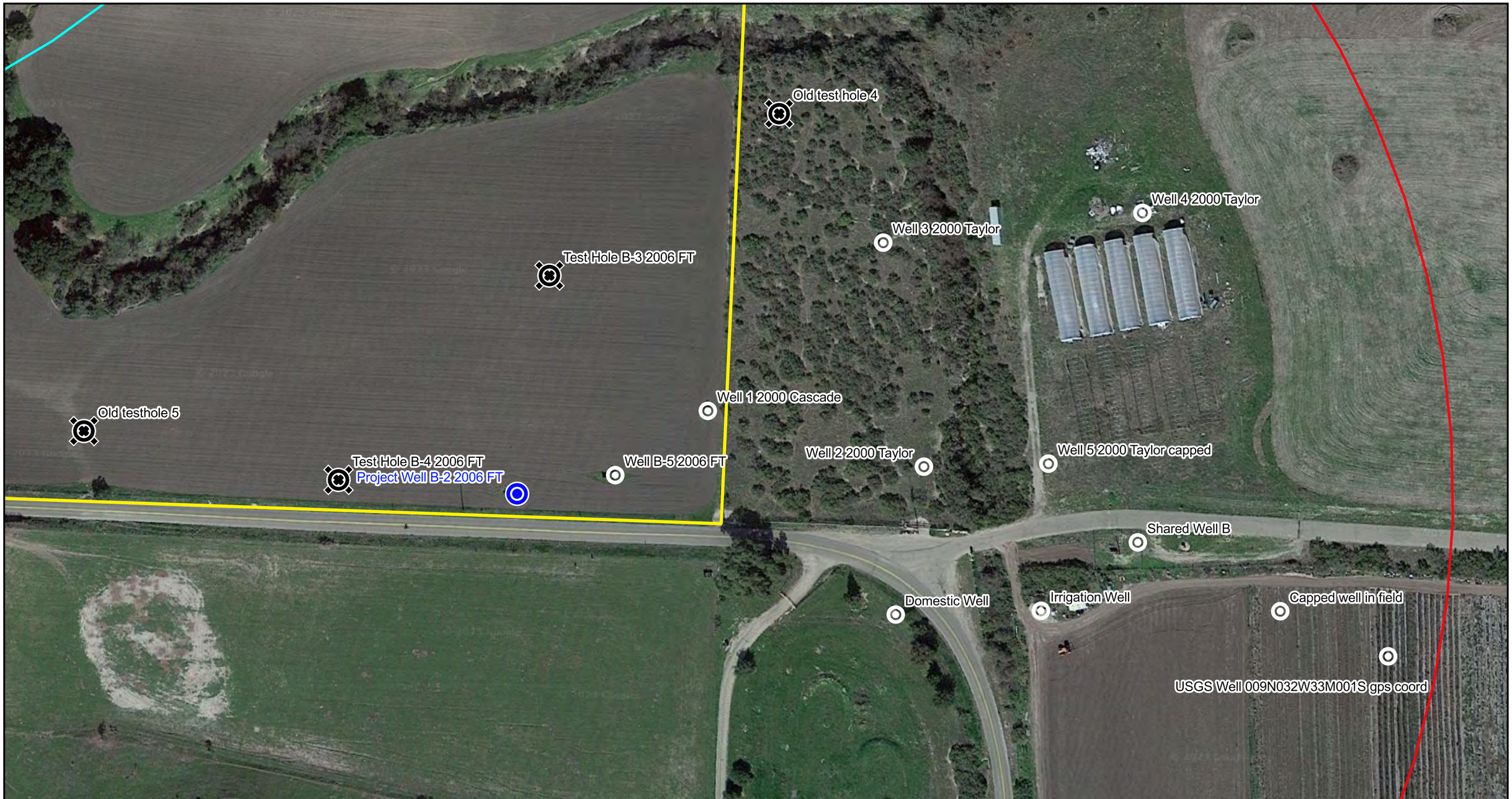

100 0 100 200 ft

N

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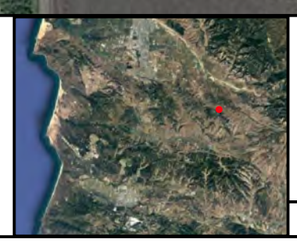

Figure 2

Project Well Vicinity
Moriarty Properties Project Review

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Cleath & Associates prepared a few reports in 2005-2007 for Michael Brand and his civil engineer, Bill Sommermeyer:

"Pumping Test for Well #1 at Long Canyon, Santa Barbara County, California", June 14, 2005;

"Pumping Test for Well "B" at Long Canyon, Santa Barbara County, California", June 14, 2005;

"Geohydrological Evaluation of Cat Canyon Aquifer", July 28, 2005 (a summary of regulatory requirements regarding wells serving water systems);

"Ground Water Supply Study for Small Water Supply System, Cat Canyon/Long Canyon Area, Santa Barbara County, California", September 29, 2005;

"Ground Water Study for 4-Service Connection Small Water Supply System, Cat Canyon/Long Canyon Area, Santa Barbara County, California", December 27, 2005;

"Ground Water Availability for 7 Residences", Cat Canyon, October 13, 2007.

One important regional geologic report that was not referenced by the project hydrogeologist (Jordan Kear) is the United States Geological Survey Professional Paper 222, "Geology and Paleontology of the Santa Maria District, California" by T. W. Woodring and M. N. Bramlette (1950). This report describes the geologic formations underlying the subject parcel and maps the Graciosa and Cebada members of the Careaga Formation.

Wells and Test Holes

There are three wells on the property. The proposed project well (referred to as B-2 in the Kear text or "source well" on the map) is currently not equipped and has not been used. The one equipped well (referred to as the "observation well" on the Kear map or B-5 in the Kear text) serves an adjacent parcel. The "6-inch dia. PVC Irrigation Well" identified on the Kear map is currently not equipped. Well Completion Reports are available for these wells, as are pumping tests, and water quality tests.

In addition to the three wells on the property shown on the Kear Groundwater aerial map, at least four test holes have been drilled on the property in the area south of Cat Canyon Creek. The two test holes drilled by Filipponi & Thompson Well Drilling (F&T) did not encounter sufficient productive water-bearing sediments to justify well completions. While there isn't information on the older test holes in our files, we do know that they

were not completed into wells. Drilling of the test holes and water wells occurred prior to 2000, in 2000, and in 2006. Attached is a map showing the approximate locations of the wells/test holes. All of the available drilling logs indicate that there were no sand and gravel aquifers encountered below a depth of 97 feet.

There are other wells and test holes located within 1,000 feet of the proposed project well on the parcels to the east, southeast, and southwest of the subject parcel. At least one of these wells is used for irrigation and at least one of the wells is used to serve multiple parcels.

We have no records of any water wells or test holes on the subject parcel north of Cat Canyon Creek.

Table 1
Wells
Vicinity of Moriarty Cannabis Cultivation Project Property
Sites shown on Map

Well/Test Hole	Driller	Year	Total Depth (Feet)	Casing Diameter (Inches)	Status	Seal (Feet)
1	Cascade	2000	145	6	capped	20
2	Taylor	2000	125	6	Unknown	50
3	Taylor	2000	95.6	6	Unknown	40
4	Taylor	2000	92	6	Equipped	36
5	Taylor	2000	98	6	Capped	47
33M001	Unknown	Unknown	89		Equipped, USGS monitored well	
33M002 (Shared Well B)	Taylor	2000	96	6	Equipped, USGS monitored well	35
B-2	Filipponi & Thompson	2006	140	5	Capped	52
B-3	Filipponi & Thompson	2006	100	Test hole only	Abandoned	
B-4	Filipponi & Thompson	2006	100	Test hole only	Abandoned	
B-5	Filipponi & Thompson	2006	140	5	Equipped	52

Easements

There is a deeded easement for at least one of these wells to serve off-parcel properties (Grant of Water Well and Easements, APN: 101-070-069; 101-070-050, dated 8/20/09). The deed stipulates that the well produce 15 gpm. The deed of easements allows for another well to be drilled on the subject parcel at another location should the well included in the easement fail.

PROJECT REVIEW/FINDINGS BY COUNTY OF SANTA BARBARA PLANNING DEPARTMENT AND APPROVAL BY PLANNING COMMISSION

Santa Barbara County Planning Department staff has reviewed the information from the applicant regarding groundwater supply. Upon reviewing the staff findings, the Director of Planning and Development approved the proposed project (LUP Case No. 19LUP-00000-00273) on March 10, 2022 subject to Conditions outlined in the approved permit. The conditions included the requirement that an approved water system permit be obtained prior to issuance of building permits for the project. No other conditions pertaining to the groundwater supply wells were included in the approved project permit.

An appeal to the Planning Commission of the Planning Department Director's approval was filed on March 21, 2022. The appellants provided "Grounds for the Appeal" for consideration of this appeal.

The Planning Commission held a hearing on an appeal of the project on January 25, 2023 and approved the proposed project. The staff report dated January 10, 2023 for this hearing stated that "the Project will not create any new significant effects or a substantial increase in the severity of previously identified significant effects on the environment, and there is no new information of substantial importance under State CEQA Guidelines Section 15162 warranting the preparation of a new environmental document for the project.".

The Planning Department staff response to the submitted information from the appellant found that the appeal of the project (including groundwater impacts) were "without merit" mentioning that the information, and that the groundwater source yield assessment (including the new well) provided from a licensed hydrogeologist was substantial and sufficient evidence to demonstrate the adequacy of the water resources for the project and to show that no significant impact to groundwater resources would result. The staff response does not state that there would be no adverse impact to the production and functioning of neighboring existing domestic water supply wells. The staff report does not address the Executive Order issued on March 28, 2022 by the Governor on drought condition permitting of new wells.

PROPOSED PROJECT WATER SUPPLY SOURCES

The proposed project identifies one existing well (Well "B-2" as identified by Filipponi and Thompson Drilling) and one proposed well as the supply sources. The existing well produces water from the Cat Canyon alluvium. The proposed well would produce water from the Careaga Formation. This review comments on the findings reached by the project's hydrogeologist.

Well "B-2"

The only published document assessing the yield from the existing project well (Kear, 2021) is for a different project on the same parcel. This former project was a "single parcel domestic water system" that could include up to four residential service connections. The well for this type of project must have the tested capacity to provide 3 gallons per minute (gpm) per connection and be capable of providing water quality that meets Title 22 drinking water standards. Further details on this previously proposed project such as the actual number of connections it would be serving, where they would be located, and the demand for water at each connection were not provided. The proposed cannabis cultivation project is very different than the single parcel domestic water system project assessed in this report.

This previous assessment included a pumping test (and interpretation of the pumping test) on the project well that was referenced for the project. The well was tested for 24 hours and 30 minutes (exceeding the 24 hours per County requirements) at 16 gallons per minute. 2.06 feet of drawdown was noted at the nearest adjacent well at the end of the test. The report concluded that well "can sustain a long-term pumping rate of around its current capacity of 16 gpm".

Our review of the test results leads to the following observations and conclusions:

During the test, the static water level was at a depth of 66.8 feet and dropped to a depth of 79.39 feet. The producing sand and gravel interval within the well, according to the geologic log is between 70 and 95 feet depth although the perforated interval is from 60-140 feet. The well perforations from 95 to 140 feet are opposite brown clay and silty grey clay and are probably not productive. During the 1470 minute test, 9.39 feet of the 25 feet (37.5 percent) of producing interval was being dewatered. The plotted water level versus time curve shows that the log cycle of time change in drawdown is increasing at the end of the test. This increasing change is clear evidence of this dewatering. As groundwater level declines during continuous use, the aquifer becomes further dewatered and production will decrease. Therefore, this source will not be sufficient to provide the 24.39 acre-feet per year (approximately 15.1 gpm continuous flow) of water to the project during similar (dry year) climatic conditions.

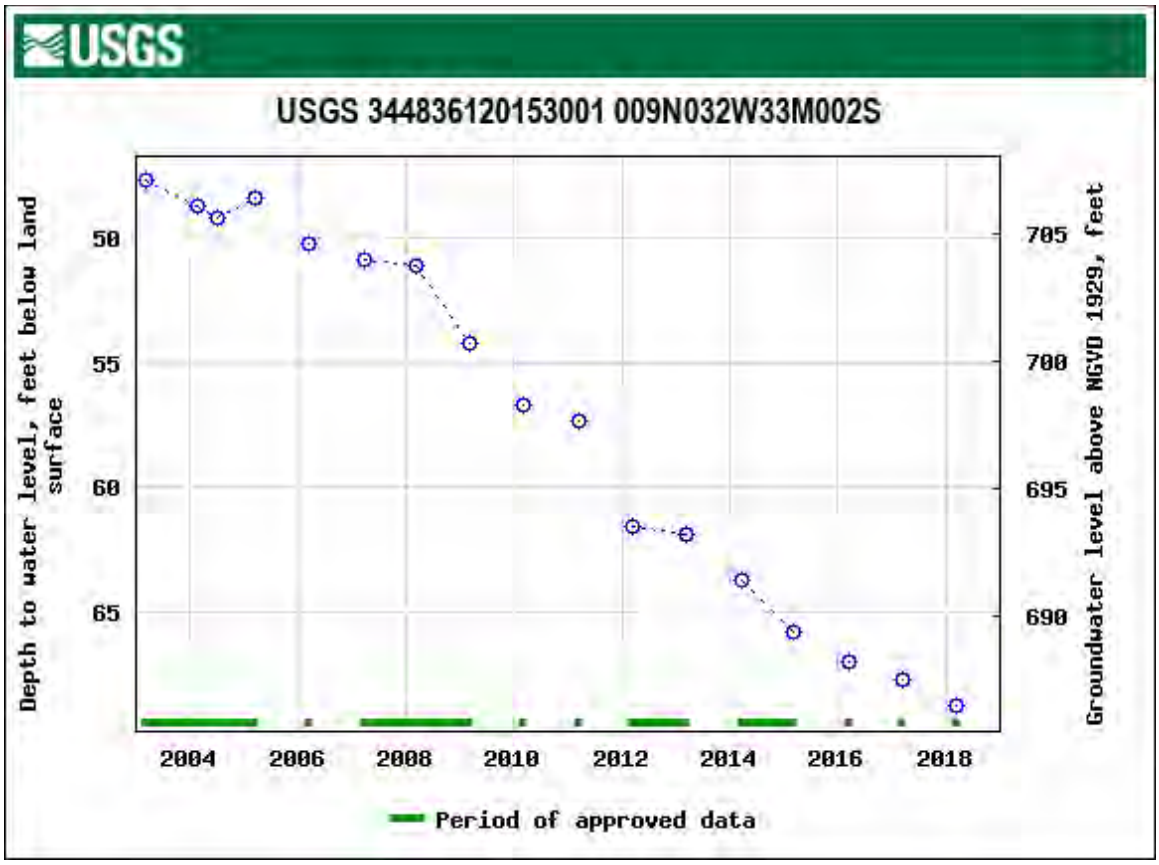
Interference drawdown at the closest "Observation" well was at 2.06 feet at the end of the test (static water level at 67.16 feet and the drawn down water level was at 69.22 feet). The sand and gravel zone within this observation well is between 70 and 97 feet. The saturated depth to the base of the aquifer zone is about 30 feet. The loss of saturated depth above the aquifer zone during the test was 6.8 percent. This would continue to increase for a longer term production. CHG considers a loss of more than five percent to be significant. Further evaluation of this impact by the applicant's hydrogeologist or the County (similar to that required in the Governor's Order) should be performed.

There are other wells to the east of the property (within 1,000 feet distance) that have not been evaluated for impact from pumping the project well. At least one of these serves to provide domestic water to multiple connections. The following review of data from a shared well about 800 feet from the proposed well provides basis for evaluating the impact.

The groundwater level in the alluvial aquifer declined steadily at a rate of 2.8 feet per year from 2002 to 2022, from about 46 feet to 74 feet depth (see Figure 3). At this water level decline rate (without the increased pumpage resulting from the project), the 96-foot deep shared well about 800 feet to the east of the project well would go dry in about 20 years. As a result of the declining water level, pumping rates in wells producing from the alluvial aquifer have declined. In this shared well, the pumping rate has declined from 14 gpm (on 6/13/2017, with a depth to static level of 70 feet and a depth to pumping level at 4 hours of 82 feet) to 10.2 gpm (on 6/2/2022, with a depth to static level of 74 feet and a depth to pumping level at 4 hours of 87 feet). The project well will experience the same decline in water level and production as this shared well. Therefore, the project's alluvial well should not be considered a reliable source of water for the project and it's use would result in an increase in the dewatering of the aquifer and impact the production of groundwater from existing wells.

The water quality requirement was identified but not discussed in this report. A water quality test for water from the proposed project well, performed in 2006, reported a total dissolved solids concentration of 2,300 milligrams per liter (mg/l) and a hardness of 1,200 mg/l. This water quality information on the project well indicates that the water does not meet primary drinking water standards and would require some treatment for irrigation systems. When the water supply for the permitted water system is applied for, the treatment of the water will need to be addressed. This could involve an increase in production to compensate for water lost during the treatment process.

Figure 3
Groundwater Level Hydrograph
USGS 344836129153001
9N/32W-33M002S



Proposed Well in Northwest Corner of Property

The potential for finding sufficient water from a well at the northwestern corner of the property (Figure 1) was considered likely by Kear Groundwater in their 2021 report based on their characterization of the Careaga Formation. They did not differentiate between the two members of the Careaga Formation which have very different hydrogeologic properties. The upper member of the Careaga Formation, the Graciosa member, is very permeable while the lower member of the Careaga Formation has a much lower permeability. The proposed 650-foot deep well is likely to drill into Cebada member of the Careaga, not the Graciosa member and at depth into the Sisquoc Formation that is comprised of low permeability clayey silt beds.

The closest exploratory oil well log (Preisker 2) is less than 500 feet to the west of the proposed well site. The induction electric log for that well identifies the upper 628 feet to be comprised of moderately low resistivity formations (between 8 and 18 ohms) Foxen mudstone/fine grained silty sandstone. The base of freshwater was identified at 628 feet depth. The more recent mapping of the geology refers to this unit as the Cebada member of the Careaga Formation. This overlies the Sisquoc Formation claystone (with a typical resistivity of less than 5 ohms). These beds dip to the northwest at about 6 degrees. Wells in the valley bottom out in gray clay-most likely of the Sisquoc Formation. Typically, productive water-bearing sedimentary beds (such as the Graciosa member of the Careaga Formation) have a resistivity of 20 ohms or greater.

Charlie Katherman, a geologist who has studied the area at and around the project property states “in this area of Cat Canyon as you are aware, subsurface water is hard to come by and to date all of the groundwater located on the Clay properties has been from shallow alluvial sediments at less than 100 ft.” (Katherman, 11/1/2000).

The nearest deep well to this proposed site (located on the immediately adjacent parcel to the north, APN 101-070-050), drilled to 500 feet depth/completed to 450 feet depth with a depth to static water level of 325 feet, is reported to produce one gallon per minute on a 4-hour pumping test (Well Completion Report e036658). A deep well on parcel 101-070-046, about ½ mile north of the subject parcel was drilled to 645 feet depth and completed to 525 feet depth is reported to produce 4 gallons per minute with 126 feet of drawdown below a static water level of 300 feet (WCR 762250). Both of these wells were drilled through the Paso Robles Formation and into the Careaga Formation, with production coming from the Careaga Formation.

Since wells tapping the Foxen mudstone/Cebada member of the Careaga Formation can be expected to yield very limited amounts of water, it would not be prudent to assume that a deep, larger diameter well tapping the Cebada member of the Careaga Formation

will produce sufficient water for the project without a pumping test from a constructed well. A well needs to be drilled, constructed and tested to verify the yield and quality.

The proposed well was permitted at this location but that permit (Permit WP-0004781) is no longer active. The initial permit, issued in on 3/23/2021 and was valid for one year. The permit was renewed for a second year. This permit lapsed on 3/23/2023 and is not allowed to be renewed again (per County Health policy). Should a new application be filed for the same location, the procedure required by the County Health Department will include an impact/subsidence assessment evaluation per the Governor's Order. If the impact is significant a well permit would not be issued by County Health.

CONCLUSION

A finding of sufficient water production and quality should consider the available information. This information indicates that the alluvial well proposed for the project will not be a reliable source and groundwater production from the well is likely to impact the existing domestic wells.

- The yield and quality for the proposed project water supply should be validated by pumping tests and water quality tests for constructed wells as required in County ordinances.
- Groundwater impacts at adjacent wells should be determined and be found to be in accord with the County Environmental Health permitting requirements and the Governor's Order.

The proposed deep well's permit application and renewal one year extension have expired. If a new application is submitted, it should be accompanied by an interference and subsidence analysis. Hydrogeologic information and deep well information indicate that a well at this proposed location would not be capable of producing sufficient water for the proposed project.

Very truly yours,
CLEATH-HARRIS GEOLOGISTS

Timothy S. Cleath
State of California Certified Hydrogeologist #81