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72-HOUR CONSTANT RATE WELL PUMPING, AQUIFER RECOVERY TEST AND PUMPING IMPACT ASSESSMENT FOR FLORES/PISENTI WELL#1

APN: 103-071-019
577 Monhollan Road
Monterey County, California

March 23, 2011

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&

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For Distribution To:
Monterey County Environmental Health Bureau
&
Monterey Peninsula Water Management District

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BIERMAN Hydrogeologic
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EXECUTIVE SUMMARY

The purpose for this work and associated report is to satisfy the requirements of Monterey Peninsula Water Management District (MPWMD)[1] and Monterey County Environmental Health Bureau (MCEHB)[2] for obtaining a single parcel Water Distribution System (WDS) permit and/or a single parcel, two-connection water system permit respectively.

This report provides; 1) documentation that a regulated, 72-hr constant rate well pumping & aquifer recovery test was completed on Flores/Pisenti Well #1, by Bierman Hydro-Geo-Logic (BHgl) in October, 2010, and followed MCEHB[3]/MPWMD[4] guidelines, adopted from State Waterworks Standards[5] and, 2) a pumping impact assessment which demonstrates the wells is adequate for intended use with less than significant offsite impacts to neighboring wells and Sensitive Environmental Receptors (SERs).

The parcel is situated inside California American (Cal-Am) service area, and MPWMD boundary. The parcel is outside of the Carmel River Watershed boundary and is greater than 1,000 feet from the Carmel Valley Alluvial Aquifer (CVAA) boundary as shown on Inset Map, Figure 1, and therefore, the well is considered a "Carmel Valley Uplands" well with rules applicable to MPWMD Setting #2[6].

Based on MPWMD Well Radius results and DWR Well Completion Report (Appendix A) the well (Well #1) is perforated across the Chamisal Sandstone, a fractured rock aquifer. The well was drilled and completed by Fred Ash and Sons, in March, 2000 with corresponding MCEHB water well permit #98-318. Well Construction Information is tabulated on Table 1.

<u>Site Description:</u>

The site addresses is 577 Monhollan Road, Jacks Peak area, Monterey. The parcel is located in Township 16 South, Range 1 East, Section, 4 as shown on Figure 1. The site's Assessor Parcel Number is (APN) 103-071-019 and is noted as being 4.28 acres.

Site Map[7] (Figure 2) shows the parcel to be a generally flat, with a gentle slope to the north and a steep slope to the east where a north-south orientated ephemeral drainage truncates the parcel into two halves. The parcel is vacant, except for an older well (Well #1) and the new well (Well

[1] Monterey Peninsula Water Management District Rules & Regulations, Most Recent Version.
[2] Monterey County Health Department; Monterey County Code, Title 15.08 Water Wells.
[3] Monterey County Health Department; "*Source Capacity Test Procedures*" dated May, 2008, and were generated from earlier guidelines entitled "*Well Capacity Procedures in Fractured Bedrock Formations*" dated March 1996, revised, January 2002, and March 2008.
[4] Monterey Peninsula Water Management District; *Procedures for Preparation of Well Source and Pumping Impact Assessments*, dated September, 14 2005, Revised May 2006.
[5] State of California Waterworks Standards, Source Capacity Standards, March 2008.
[6] Monterey Peninsula Water Management District; *Procedures for Preparation of Well Source and Pumping Impact Assessments*, dated September, 14 2005, Revised May 2006.
[7] Base Map for Site Map completed by Baseline Land Surveyors Inc, and provided to BHgl by Paul Flores.

#2). The parcel is established with mature Pine, Oak, and other native and non-native shrubs/plants/groundcover.

The site is at an approximate elevation of 330 feet mean sea level (msl) and an elevation difference of not more than 60-feet. The Site Map also shows the existing well, proposed conceptual single family dwelling, conceptual caretaker unit, and existing residence, soon to be remolded guest house along with the necessary setbacks from the well to any 'conceptual' septic tank, seepage pit, leach-field and/or septic lateral or distribution box.

Proposed Project: The proposed project will consist of realigning the existing parcel lines with that of the neighboring parcel APN: 103-071-002. The APN-002 parcel (westerly parcel) currently has a small residence with a Cal-Am connection. The purpose of the parcel line adjustment is to position the parcel lines such that there is one well per parcel.

More specifically, Well #1 will be deeded to APN-002 and Well #2 will remain on APN-019, as shown on Figure 2. It should be noted that the parcels sizes do not change. APN-002 will remain at 3.72 acres and APN-019 will remain at 4.28 acres.

It should also be noted that for the purposes of this report, only Well #1 will be discussed within the remainder of this report in regards to its ability to meet the conceptual water demand for serving APN-002 while meeting MPWMD and MCEHB requirements. Well #2 'conceptual' water demand, groundwater quality, calculated yield, and well adequacy for intended use is discussed in BHgl Report dated 3/22/11, as it has its own 'conceptual' project and water demand for serving APN-019. In summary, the proposed project includes;

- Well #1 is proposed to serve APN-002 with one estate style Single Family Dwelling (SFD) one 'non-family' Care-Taker Unit (CTU) with estate style landscaping and an estimated total water demand of 1.34 af/yr. The existing residence which is on Cal-Am, will be remolded as a Guest House and will remain on Cal-Am.

Water Demand: The water demand for the project was determined by completing MPWMD Residential Fixture Unit Count form for each conceptual structure, and was added to the value derived using MPWMD Non-Potable Water Use Factors form for determining the exterior Estimated Total Water Use (ETWU) for the project.

The Residential Fixture Unit Count was calculated to be 0.58 acre-feet per year (af/yr) which is the combination of the SFD fixture units (0.415 af/yr, which includes pool) and the CTU fixture units (0.164 af/yr).

The ETWU was calculated to be 0.76 af/yr. The ETWU (including adding the Outdoor Water Use Factor of 0.01 af/yr) was confirmed not to exceed the Maximum Applied Water Allowance (MAWA) of 1.15 af/yr (Forms included in Appendix B).

Adding the calculated ETWU to the total Residential Fixture Units gives an annual average water demand of 1.34 af/yr. Supporting documentation for the derivation of each agency's water demand is tabulated on Table 2. It should be noted that treatment losses are only accounted for interior use, not exterior use.

Well Adequacy for Intended Use: In order to assess the wells adequacy for intended use our hydrogeologic investigation involved; 1) completion and evaluation of a 72-hour constant rate well pumping and aquifer recovery test for determining the wells source capacity, and calculated yield and, 2) determination of whether potential onsite and offsite impacts to neighboring wells and SERs exists.

Source capacity testing suggests the wells capacity is adequate for intended use. Specifically; the post-recovery calculated well yield of 32.89 gpm exceeds MPWMD calculated maximum day demand of 2.82 gpm[8] thereby meeting MPWMD requirements for obtaining a WDS permit for a single connection system.

In regards to MCEHB requirements, the post-recovery sustainable pumping rate for the 72hr test was 7.58 gpm exceeding MCEHB requirements for a two-connection water system (6 gpm) as well as, MCEHB maximum day demand of 2.16 gpm[9] and Peak Hourly Demand of 2.80 gpm. *It should be noted that although the final post-recovery pumping rate was 7.58 gpm, the well can produce significant greater quantities, and, the pumping rate during the pump test was manually limited to 8.06 gpm (throttled back with a ball valve) to prevent excessive aquifer drawdown and limit offsite impacts to neighboring wells.* Table 4 shows the variables and technical calculations for deriving the MCEHB post-recovery pumping rate and credited source capacity, and MPWMD post-recovery calculated well yield.

Onsite & Offsite Impact Analysis: The results of Intermittent Pumping, Time-Drawdown Projections (Table 5) indicate there are no significant drawdown impacts on the pumping well during typical operational patterns at the maximum day demand[10].

The results of the Continuous Pumping, Time & Distance Drawdown Projections (Table 6) on neighboring wells suggests (using conservative storage coefficient values, transmissivities, and isotropic aquifer conditions) no significant cumulative offsite impacts to neighboring wells during continuous pumping of the well at the dry season demand. There are no SERs within 1,000 ft of the pumping well. Supporting documentation for both intermittent and continuous pumping drawdown projections are presented in Appendix E, and Tabulated on Tables, 5 and 6.

In addition to calculating offsite impacts to neighboring wells using the dry season demand rate (as per MPWMD requirements) BHgl has completed additional Continuous Pumping, Time & Distance Drawdown Projections specifically on the Beech Well (Table 7) who has expressed to Monterey County Resource Management Agency (MC RMA)[11] that the parcel line adjustment (Application #PLN100560) be denied based on the implication that his well had significant groundwater level impacts from the Flores/Pisenti Wells, October 2010 pump test[12].

Technical calculations (Table 7 and Appendix E) suggest there could have been a maximum of 19-feet of impact to the Beech Well[13] by pumping Flores/Pisenti Well #1, and 12-feet of impact

[8] Based on pumping in equivalent 12-hr cycles and accounting for system and treatment losses. Treatment losses only accounted for interior use.
[9] Based on pumping 24/7 and accounting for system and treatment losses. Treatment losses only accounted for interior use.
[10] Bierman Hydrogeologic recommends monitoring the groundwater level against the operational patterns for a more accurate assessment.
[11] Letter from Judy and David Beech to Monterey County Planning Department, Monterey County RMA – Anna Quenga; Re: File #PLN100560 – Objection to Application for Lot Line Adjustment, February 15, 2011.
[12] The Beech Well was not known to be within 1000 feet of Well #2 during the time of the pump test, otherwise an attempt would have been made to obtain well access for monitoring purposes.
[13] Technical calculations based on using same flow rate and duration as that of the October 2010 test – 6.25 gpm for 72 hours.

from pumping the Flores/Pisenti Well #2 during the 72hr pumping test in October 2010. *However, it should also be noted that the equation*[14] *used to perform the technical calculations assumes isotropic connectivity, does not account for anisotropy conditions typical of fractured rock aquifer, nor, does the equation account for potential groundwater barriers from faulting/fracturing, nor, does it account for flow from different aquifers for wells that are screened independently of each other (as is the case for Well #1 and Beech Well – Figure 4).*

In any event, the calculated drawdown values mentioned above should not likely dewater the Beech well, even if the wells were hydrogeologically linked. However, if the wells were hydrogeologically linked, the cyclic pumping of the Beech Well would have been observed in the recovery data of both Flores/Pisenti Wells, if the Beech Well was being pumped during the six days after Flores/Pisenti Well pumping ceased. The recovery data suggests, as depicted on Figure 6, there was no groundwater level fluctuation/response observed in either of the Flores/Pisenti Wells in relation to other neighboring well pumping, and therefore, based on the data, the Beech Well is not considered to be hydrogeologically connected with Flores/Pisenti Wells. Rather, based on the Beech's well use, which is noted[15] as supplying irrigation water to three estate style parcels (1432, 1436 and 1450 Manor Road, Monterey) and based on Aerial Photographs of the Beech/Anastasia Parcel, it appears that the Beech/Anastasia Parcels are dewatering the Beech Well on their own doing, with no relation to Flores/Pisenti Well pumping.

Based on the data, the Flores/Pisenti Wells, and their associated source capacity should have no bearing on approval of the parcel line adjustment for APN-019 and -002.

Groundwater Quality: The groundwater quality of Well #1 will require treatment for potable use. Although the groundwater will require treatment, it should be noted that NO PRIMARY constituents[16] were detected over their respective Maximum Contaminant Level (MCL). Only Secondary constituents[17] were detected above recommended levels.

It should also be noted that although the well was present for Total Coliform bacteria, E-coli was absent. As with any new water system, it is believed that it can be removed with subsequent well disinfection, as it is a new well/water system that has not yet been entirely disinfected or permanent pump installed. Disinfection should be completed prior to distribution and hook-up to raw-water storage. A detailed discussion of the groundwater quality and treatment system components is presented near the end of this report.

Conclusion: In conclusion, the source capacity of the Flores/Pisenti Well #1 was determined to exceed MPWMD requirements for a single parcel WDS permit, and MCEHB requirements for a single parcel, two-connection Water System permit.

This concludes our executive summary.

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[14] Driscoll, Groundwater and Wells, Second Edition, 1986, pg 219, Modified Nonequilibrium Equation.
[15] Letter from Judy and David Beech to Monterey County Planning Department, Monterey County RMA – Anna Quenga; Re: File #PLN100560 – Objection to Application for Lot Line Adjustment, February 15, 2011.
[16] Primary constituents are contaminants that may cause adverse effects to human health and safety, and are enforceable by regulatory agencies. MPWMD does not regulate groundwater quality, and MCEHB does not regulate single-connection systems.
[17] Secondary constituents are contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. Secondary constituents are non-enforceable; however, Environmental Protection Agency (EPA) recommends secondary standards to water systems but does not require systems to comply. Individual States and/or local counties may choose to adopt them as enforceable standards. Although MCEHB does not enforce these standards for single-connection system, we recommend treating the secondary constituents to the recommended standards.

PURPOSE AND SCOPE

The purpose for this work and associated report is to satisfy the requirements of Monterey Peninsula Water Management District (MPWMD)[18] and Monterey County Environmental Health Bureau (MCEHB)[19] for obtaining a single parcel Water Distribution System (WDS) permit and/or a single connection Water System permit respectively.

Our scope of work included: 1) review of the hydrogeologic setting, 2) completing a well radius search and reviewing well construction details, 3) conducting a 72-hour constant rate well pumping test and aquifer recovery test, 4) calculating available drawdown, total saturated thickness, specific capacity, well yield, and percent recovery, 5) analyzing baseline groundwater data, as well as pumping and recovery test data to estimate aquifer parameters of transmissivity, hydraulic conductivity and storativity, 6) evaluating the water demand, and determining whether the demand exceeds the wells calculated yield, 7) evaluating offsite impacts to neighboring wells, 8) reviewing and discussing groundwater quality, and, 9) preparing this summary report for submittal to MPWMD and MCEHB.

SITE DESCRIPTION

The site addresses is 577 Monhollan Road, Jacks Peak area, Monterey. The parcel is located in Township 16 South, Range 1 East, Section, 4 as shown on Figure 1. The site's Assessor Parcel Number is (APN) 103-071-019 and is noted as being 4.28 acres.

Site Map[20] (Figure 2) shows the parcel to be a generally flat with an elevation of roughly 330 feet mean sea level (msl). Based on the topographic survey of the site the elevation difference is roughly 60-feet (280' msl in the drainage to 340' msl at just south of the well). Well #1 was determined to be at an approximate elevation of 330' msl.

The site slopes gently to the north and contains a steep slope to the east where a north-south orientated ephemeral drainage truncates the parcel into two halves. The parcel is vacant, except for an older well (Well #1) and the new well (Well #2). The parcel is established with mature Pine, Oak, and other native and non-native shrubs/plants/groundcover.

The Site Map also shows the existing well, proposed conceptual single family dwelling and caretaker unit, and existing residence to be re-modeled into a guest house. Site Map also shows the necessary setbacks from the well to any 'conceptual' septic tank, seepage pit, leach-field and/or septic lateral or distribution box.

Based on DWR Well Completion Reports (Appendix A) well #1 was drilled and completed by Fred Ash and Sons in March of 2000, with MCEHB Water Well Permit #98-318 (Appendix A).

Based on DWR Well Completion Reports (Appendix A) well #2 was drilled and completed by Granite Drilling Company in October, 2010, with MCEHB Test Water Well Construction Permit #10-11806 (Appendix A).

[18] Monterey Peninsula Water Management District Rules & Regulations, Most Recent Version.
[19] Monterey County Health Department; Monterey County Code, Title 15.08 Water Wells.
[20] Base Map for Site Map completed by Baseline Land Surveyors Inc, and provided to BHgl by Paul Flores.

REGIONAL HYDROGEOLOGIC SETTING

Regional Geology:

The site is located in what is termed the Salinian Block of the Central Coast Ranges which contains a crystalline basement of granitic and regionally metamorphosed rocks, overlain by multiple sets of Quaternary deposits. The Salinian Block is bounded by two major faults: the San Gregorio and San Andreas Fault. The San Gregorio Fault, which marks the southwestern boundary, is offshore with the main splay striking land at Cypress Point. Several other smaller splays within the San Gregorio fault zone[21] (Palo Colorado Fault, and Sur Fault) strike land at Soberanes, Kaslar, Hurricane Point, and Wildcat Creek? The San Andreas Fault to the east marks the northeastern boundary of the Salinian Block. There are several other normal high-angle faults within the valley which trend northwest-southeast. Many of the faults (Chupines Fault, Laurels Fault, Berwick Canyon Fault, and Hatton Canyon Fault) are discontinuous, except for the Tularcitos fault, which appears to have Holocene movement[22] and is continuous across the entire Carmel Valley and appears to connect with the Navy Fault.

Site Geology:

As shown on Geologic Map, Figure 3, and in Conceptual Geologic Cross Section, Figure 4, the parcel lays atop a thin veneer (~3 ft) of Older Alluvial deposits (Qoa) which is underlain by Monterey Shale (Tm).

The DWR Well Completion Report for Well #1 (Appendix A) supports the geologic sequence described above. Specifically, the Well Completion Report indicates the boring was drilled to 894-feet below ground surface (bgs) and the well was completed to a depth of 894-feet bgs. The geology shows 3-feet of top soil lying atop the Monterey Shale to a depth of 138-ft bgs. Beneath the shale, between 138-ft and 698-ft bgs, the logs describes the formation as upper Chamisal Sandstone (siltstone, clay, fine sand) and from 698-ft to 894-ft bgs the logs implies the lower Chamisal Sandstone (sands and gravels) with Granite at 894-ft bgs.

The DWR Well Completion Report for Well #2 (Appendix A) also supports the geologic sequence described above, except that no Chamisal Sandstone was observed. More, specifically, the Well Completion Report indicates the boring was drilled to 600-feet below ground surface (bgs) and the well was completed to a depth of 600-feet bgs. The geology shown on the log does not acknowledge the soil profile, rather, the log implies that the first 75-feet consists of mudstone and siltstone with sandy clay interbeds interpreted to be highly indurated and weathered Monterey shale. Beneath the highly weathered portion of the shale is the moderately fractured to highly fractured shale to 600-feet bgs with no mention of the Chamisal Sandstone.

Although BHgl understand that well drillers can sometimes be confused with, or misinterpret the subsurface lithology, the difference between sandstone and shale is very easily distinguished and therefore, BHgl assumes that the lithologic description on each of the logs is correct. Therefore, due to the lithoglogic discrepancy between Well #1, and Well #2 additional site mapping was conducted in the ephemeral drainage between APN-002 and APN-019. The geologic mapping suggests that there is a noticeable unconformity between the Older Alluvium and the Monterey Formation in the ephemeral drainage. This unconformity is interpreted to be a lineation of a

[21] Greene and Others, 1973; referenced in Geologic Map of the Monterey and Seaside 7.5 Minute Quadrangles, Monterey County, California, J.C. Clark, W.R. Dupre` and L.I. Rosenberg, 1997.
[22] Geologic Map of the Monterey and Seaside 7.5 minute Quadrangles, Monterey County, California: A Digital Database by Joseph Clark, William Dupre` and Lewis Rosenberg, 1997.

fracture/fissure, or fault-splay of the nearby Navy/Tularcitos Fault that was not previously mapped and/or an upper segment of the Sylvan Thrust Fault that was not previously mapped, or was considered insignificant or a combination of the two. It is our interpretation that the north-south orientated drainage is a relic of historical fracture/faulting which explains the difference in the geology between the two wells, explains the lack of hydrogeologic interference observed between the two wells, and, is perhaps why the wells show a lack of excessive drawdown over 72-hours of pumping during the October 2010 pumping test.

Surface Water:

As shown on Figure 1, there are no perennial creeks within 1,000 feet of the wells. The closest 'mapped' portion of the CVAA[23] was measured to be 1.8 miles south. No other surface water sources or Sensitive Environmental Receptors (SERs) were identified within 1,000 feet of the Flores/Pisenti Wells.

In theory, any precipitation falling on the property and surrounding area will either percolate into the subsurface terrace deposits with deeper percolation reaching the deeper fractures of the Shale and Sandstone formations or, run off to the Pacific Ocean approximately 2.1 miles north of the site.

During our investigation, we did not observe any ephemeral, or seasonal creeks, streams or springs located on the property.

Groundwater:

As shown on the Well Completion Report (Appendix A) Well #1 is perforated between 700-894 feet bgs and yields its groundwater from fractures within the fractured Chamisal Sandstone hard-rock aquifer.

As shown on the Well Completion Report (Appendix A) Well #2 is perforated between 180-420'; 440-460'; 480-500'; 520-540'; and 560-580' and yields its groundwater from fractures within the fractured Monterey Shale hard-rock aquifer.

Hard-rock water is derived from precipitation that eventually seeps into the fractures, joints and matrix of these hard rock formations, either locally from downward seepage out of streams or creeks or regionally from horizontal distribution of longitudinal fracturing of the hardrock formation as they outcrop at the surface.

The amount of groundwater available in fractured rock storage is difficult to quantify. This report does not quantify the amount of groundwater in storage due problems with deciphering the hydraulic connectivity between the fractures, the fracture size, the number of fractures the well screen penetrates, the continuity of the fractures with distance from the pumping well and the uncertainty of the long term yield within the fractured rock. However, a range of storage coefficients were used to help calculate the onsite & offsite impacts to other wells and SERs. Details of this analysis are discussed later in this report.

[23] Monterey Peninsula Water Management District Boundary Map, July, 2005. The Carmel River and its associated aquifer are considered SERs as defined by MPWMD, and therefore impacts to the CVAA is assessed later in the report.

WELL RADIUS SEARCH

MPWMD completed and provided *BHgl* with a Well Radius Search surrounding the Flores/Pisenti Wells[24]. The results of the well radius information is shown on Figure 5, and tabulated on Table 1. The radius search indicates that there are four wells within 1,000 feet radius of Flores/Pisenti Well#1 (Maney, Flores/Pisenti Well #2, Shake, Beech) and three wells within 1,000 feet radius of Flores/Pisenti Well#2 (Flores/Pisenti Well #1, Beech and Maney). More specifically;

Neighboring Wells within 1,000 feet of Well #1, #2:

- Maney Well: This well was measured to be 465 feet from Flores/Pisenti Well #1, and 992 ft from Flores/Pisenti Well #2. The Maney well is considered an 'active' well by MPWMD. Based on data provided by MPWMD, the well was drilled in 2001 to 500 feet bgs, and is screened from 200-500-ft with a static water level of 157-ft (2001) No current static water level or pumping water level information exists, or whether or not the well is a domestic or irrigation well, or an actual assessment of how much is used annually.

- Beech Well: This well was measured to be 907 feet from Flores/Pisenti Well #1, and 647 ft from Flores/Pisenti Well #2. The Beech well is considered an 'active' well by MPWMD. Based on data provided by MPWMD, the well was drilled in 1991 to 573 feet bgs, and is screened from 133-573-ft with no reported static water level. No current static water level or pumping water level information exists, or whether or not the well is a domestic or irrigation well, or an actual assessment of how much is used annually[25].

- Shake Well: This well was measured to be 778 feet from Flores/Pisenti Well #1, and 1,052 ft from Flores/Pisenti Well #2. The Shake well is considered an 'inactive' well by MPWMD. Based on data provided by MPWMD, the well was drilled in 2006 to 330 feet bgs, and is screened from 200-240' with a static water level of 140-ft (2006). No current static water level or pumping water level information exists, or whether or not the well is a domestic or irrigation well, or an actual assessment of how much is used annually.

As part of this report and requirement of MPWMD, all wells identified within 1,000-foot radius of the pumping well will be assessed to determine whether they would be negatively impacted by pumping the Flores/Pisenti Wells at the dry season demand rate proposed for the project.

The Well Radius Map was used to determine the approximate distances between the Flores/Pisenti Well and the neighboring wells for calculating these impacts. Details of this analysis are discussed below.

WATER DEMAND

Recall, only Well #1 will be discussed within the remainder of this report in regards to its ability to meet the conceptual water demand for serving APN-002 while meeting MPWMD and MCEHB requirements. Well #2 'conceptual' water demand, groundwater quality, calculated

[24] MPWMD, Well Radius Search Results, February 22, 2011.
[25] MPWMD reported that the well usage is based on the Land Use Method, which is estimated at 1.81 af/yr (MPWMD, 2011)

yield, and well adequacy for intended use was discussed in BHgl Report 3/22/11, as, Well #2 has its own 'conceptual' project and water demand for serving APN-019.

In determining the annual water demand, it is important to understand that the demand is calculated differently by MPWMD than that of MCEHB. There are three main differences between these agencies calculations, they include:

1) MCEHB assess the water demand based on number of connections (i.e., 3 gpm/connection) and assess whether the well can meet the minimum rate per connection. Whereas, MPWMD assess the water demand by determining the fixture unit count and combining it with the projects non-potable estimated total water use, and assess whether the wells calculated yield[26] exceeds the projects maximum day demand in equivalent 12-hr pumping cycles.

2) MCEHB uses a peaking factor of 2.25[27] (unitless) to determine maximum day demand, whereas, MPWMD uses a peaking factor of 1.5[28] (unitless) to determine maximum day demand.

3) MCEHB uses a System Loss of 7% and a Treatment Loss of 5-15% depending on type of treatment required, whereas, MPWMD uses a System Loss of 5% and a Treatment Loss of 15% (for RO) unless, less than 25% of project water demand is for consumptive use, than no treatment losses are accounted for[29].

Average Annual Water Demand: The 'conceptual' water demand for the project on APN-002 was determined by completing MPWMD Residential Fixture Unit Count form for each structure proposed, and was added to the value derived using MPWMD Non-Potable Water Use Factors form for determining the exterior Estimated Total Water Use (ETWU) for the project.

The Residential Fixture Unit Count was calculated to be 0.58 af/yr (0.415 af/yr for the SFD; which includes an 'conceptual' 800 sq. ft pool and 0.164 af/yr for the proposed Care-Taker Unit). It should be noted that the existing residence (served by Cal-Am) will be remolded to serve as the guest house for the parcel, and will remain on Cal-Am.

The 'conceptual' ETWU was calculated to be 0.76 af/yr, which includes; 2,500 sq.ft of Turf totaling 0.121af/yr; 6,000 sq. ft of Non-Turf on Drip totaling 0.124 af/yr; 0.5 acres of vineyards totaling 0.4 af/yr; 2,000 sq. ft. of garden crops totaling 0.106 af/yr; and the Outdoor Water Use Factor of 0.01 af/yr. The ETWU of 0.76 af/yr was confirmed not to exceed the Maximum Applied Water Allowance (MAWA) of 1.11 af/yr, and furthermore, the 'conceptual' ETWU of 0.76 af/yr allows for a slightly higher use than what may be used on a parcel of this size, giving the existing site conditions and the ability to use drought tolerant native landscapes.

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[26] Calculated yield is computed by multiplying adjusted 24-hr specific capacity with the wells available drawdown. Adjusted 24-hr specific capacity is the product of 24-hr specific capacity and the ratio of late to early time transmissivity. Available drawdown is 1/3 of the wells saturated thickness. Saturated thickness is difference between static water level and base of perforations.
[27] State of California Waterworks Standards, Source Capacity Standards, March 2008.
[28] Monterey Peninsula Water Management District; *Procedures for Preparation of Well Source and Pumping Impact Assessments*, dated September, 14 2005, Revised May 2006.
[29]MPWMD, Memo #6, Re; System and Treatment Losses, August 6, 2009.

Adding the 'conceptual' ETWU to the total Residential Fixture Units gives an annual average water demand of 1.34 af/yr. It should be noted that an increased water demand beyond what has been presented could be requested, although based on the size and orientation of the parcel, and the existing canopy on the parcel, the 'conceptual' water demand presented should be adequate for intended use.

Supporting documentation for the derivation of each agency water demand are included in Appendix B, and tabulated on Table 2.

Average Day Demand:

The average annual water demand was partitioned further to obtain a monthly demand based on monthly demand factors[30] and the monthly water demand was converted to a day demand, and then converted to an average day demand. The average annual demand of 1.34af/yr is equivalent to an average day demand of 0.83 gpm (pumping 24/7) or, 1.66 gpm (pumping 12-hour cycles).

The MPWMD average day demand after system and treatment losses[31] was calculated to be 1.52 af/yr, equivalent to 0.94 gpm (pumping 24/7) or, 1.88 gpm (12-hour cycles). Table 2 documents the derivation of these values using a monthly time-step methodology approach.

Dry Season Day Demand:

The dry season demand (May through October) represents the highest six month demand period with approximately 59.85% of annual demand during this period[32]. The dry season demand was calculated to be 1.59 af/yr equivalent to 0.99 gpm (pumping 24/7), or 1.97 gpm (pumping 12-hour cycles) as shown on Table 2.

Maximum Day Demand:

As discussed previously, the maximum day demand (MDD) is calculated by multiplying the average day demand by the appropriate average day peaking factor for each agency, either 2.25[33], or 1.5[34]. MCEHB uses a more stringent peaking factor than that of MPWMD which was adopted from State standards, whereas, MPWMD uses a less stringent peaking factor which was adopted from Cal-Am records.

MCEHB MDD was calculated to be 3.01 af/yr equivalent to 1.87 gpm (pumping 24/7), or 3.73 gpm (pumping 12-hour cycles).

MPWMD MDD was calculated to be 2.01 af/yr equivalent to 1.24 gpm (pumping 24/7), or 2.49 gpm (pumping 12-hour cycles).

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[30] Monthly Demand Factor: Compilation of data from California-American Water Company monthly production repo3rts from 1992-2003 (MPWMD, October 2, 2003).
[31] MPWMD acceptable S&T losses are 5%/15% respectively. No treatment losses accounted for exterior use.
[32] MPWMD, October 2, 2003; Analysis of Dry Season Demand using data from Cal-American Water Company monthly water production reports from 1992-2003.
[33] Average Day Peaking Factor: California Department of Health Services, Waterworks Standards, March, 2008.
[34] Monterey Peninsula Water Management District; *Procedures for Preparation of Well Source and Pumping Impact Assessments*, dated September, 14 2005, Revised May 2006.

Maximum Day Demands after System and Treatment Losses:

Based on the groundwater analytical results (Appendix F) the groundwater will need to be treated to meet California Drinking Water Standards[35], and therefore, system and treatment losses have been accounted for.

MCEHB MDD after a 7% system loss and a 15% treatment loss was calculated to be 3.48 af/yr, equivalent to 2.16 gpm (pumping 24/7). It should be noted that no treatment losses were accounted for exterior use, only system losses.

MPWMD MDD after a 5% System loss and a 15% treatment loss was calculated to be 2.27 af/yr equivalent to 2.82 gpm pumping in equivalent 12-hr cycles. Again, no treatment losses were accounted for exterior use, only system losses.

Recall that the difference between these demands is not only the average day peaking factor, but the percentage of system losses each agency uses.

HISTORICAL BASELINE WATER PRODUCTION & PRODUCTION LIMIT:

The Flores/Pisenti Well#1 was drilled in March, 200 and has not been used other than former pump testing (2000) and the recent pump-testing (2010) and therefore, there is no historical baseline data for this well.

For this type of project, MPWMD generally sets the production limit at the average annual demand after accounting for system and treatment losses. Therefore, the production limit for the well will likely be equivalent to 1.52 af/yr (Table 2).

PUMPING TEST

Regulatory Guidelines:

As required, MCEHB staff was onsite during the start and stop of the 72-hour pump test to provide documentation that the test was completed correctly and in accordance with MCEHB[36] and MPWMD[37] guidelines. Although Well #1 and Well #2 were being pump-tested simultaneously, only data from Well #1 is discussed herein.

The main difference between these guidelines is that MCHD assess the post recovery pumping rate and whether the post recovery pumping rate exceeds the number of connections and/or, for public water systems, 25% of the lowest post recovery pumping rate. MPWMD will use parameters of the pumping test (difference in early to late time transmissivity, available drawdown, specific capacity) to calculate the well yield, and will assess whether or not the

[35] California Administrative Code, Title 22, Chapter 15, Article 4. Primary Standards – Inorganic Chemicals, Section 64431, Maximum Contaminant Levels – Inorganic Chemicals & Article 16. Secondary Drinking Water Standards, Section 64449, Secondary Maximum Contaminant Levels and Compliance; January, 2011.

[36] Monterey County Health Department; "*Source Capacity Test Procedures*" dated May 2006, and were generated from earlier guidelines entitled "*Well Capacity Procedures in Fractured Bedrock Formations*" dated March 1996, revised, January 2002.

[37] Monterey Peninsula Water Management District; *Procedures for Preparation of Well Source and Pumping Impact Assessments*, dated September, 14, 2005, Revised May, 2006

calculated well yield exceeds the projects maximum day demand based on an equivalent 12-hour pumping cycle.

These guidelines have built-in conservative factors, which have the net effect of reducing the actual well yield to a conservative calculated sustainable well yield. These conservative factors are used because it has been observed that well yields in fractured rock aquifers may decline over time, during droughts, or in response to over-pumping or, cumulative pumping by other wells nearby. The actual pumping yield should be considered a short-term yield, and the calculated well yield is an *estimate* of the wells long term sustainable yield.

Pre-Test Data and Test Preparation:

Prior to the test, the well was equipped with a one-inch sounding tube, a 2.0-hp pump set at 500-ft bgs with 1.25-inch dia. SCH 120 deep-set drop pipe. In line with the wells' discharge line was a 1-inch diameter flow meter[38] with a starting totalizer value of 439,659.5 gallons. Beyond the flow meter were a ball valve, and a gate valve, which was used to regulate discharge and flow rate.

Beyond the ball valve was a 200-foot, 3/4" diameter garden hose which discharged the water to onsite soils. The discharge line was set up so that during the pumping test groundwater pumped from the well would be discharged at a minimum of 200 feet away from the pumping well to ensure no artificial recharge to the pumping well occurred from discharge water during the pumping test. All groundwater pumped from the well during the 72hr test remained onsite.

Prior to any testing, a static groundwater level measurement was obtained. Following static level measurements, a pressure transducer was programmed to record data on a log-time scale which was installed within the wells' sounding tube immediately above the top of the pump to monitor groundwater levels prior to, during, and after the testing period. In addition to continuous electronic monitoring during the test, hand measurements of groundwater levels were obtained. Aquifer Pump Test Data Information Sheets and Pumping and Recovery Transducer Data for this test, is included in Appendix C. A groundwater drawdown and recovery curve is shown on Figure 6.

Prior to start of the 72-hr test, a 2-hour pre-test[39] pumping event was completed at the designed pumping rate for the constant rate test. Information on pre-test pumping is included on Aquifer Pump Test Data Information Sheets in Appendix C.

Flores/Pisenti Well #1:

On October 12, 2010 directly prior to start of test, the static groundwater level was measured to be 131.92 feet below Top of Sounding Tube (bTOSt). At 10:00 am, with presence of MCEHB onsite to witness the test, the 72-hour constant rate well pumping test was started. The groundwater drawdown curve for the Flores/Pisenti Well #1 is depicted on Figure 6. *It should be noted that the Flores/Pisenti Well #2 pump test started 11:15 am, a hour and 15 minutes later, and was run simultaneously with Well #1. The simultaneously testing was completed to save costs on performing pump-testing and was not necessarily regulatory driven.*

[38]The flow meter used for the 72-hour pumping test was a 1" dia. Invensys "Test" Meter SN65420662, supplied by BHgl
[39] State of California Waterworks Standards, Source Capacity Standards, March, 2008.

Within the first 24-hours of the test, the flow rate varied between 8.0 to 8.13 gpm, with less than 5% fluctuation for the remainder of the test. The 24-hr average flow rate was 8.08 gpm giving a 24-hour specific capacity of 0.15 gpm/ft of drawdown. Based on the difference of starting (439,659.5 gallons) and ending (474,498.6 gallons) totalizer readings, the 72-hr average flow rate was 8.06 gpm, and total drawdown was 61.11 feet, giving a 72-hr specific capacity of 0.13 gpm/ft of drawdown. The lowest sustainable flow rate at end of test was 8.06 gpm. The difference in the 24-hr and 72-hr specific capacities suggests there will be a very slight difference in early to late time transmissivity values.

Observation Wells:

Below is a summary of each well within 1,000 foot radius of the pumping well and whether the well was monitored during the Flores/Pisenti Well #1 pumping test.

At the time the pumping test was completed, none of the wells identified in the well radius search were known to exist. The Well Radius Search Data was not supplied until after the pumping test was completed.

- Flores/Pisenti Well #2: This well was measured to be 537 feet from Flores/Pisenti Well #1. This well was being simultaneously tested with that of Well #1. During the test there was no noticeable constructive interference with these wells.

- Maney Well: This well was measured to be 465 feet from Flores/Pisenti Well #1, and 992 ft from Flores/Pisenti Well #2. This well was not monitored during the simultaneous pump testing that was being completed on Flores/Pisenti Wells.

- Beech Well: This well was measured to be 907 feet from Flores/Pisenti Well #1, and 647 ft from Flores/Pisenti Well #2. This well was not monitored during the simultaneous pump testing that was being completed on Flores/Pisenti Wells.

- Shake Well: This well was measured to be 778 feet from Flores/Pisenti Well #1, and 1,052 ft from Flores/Pisenti Well #2. This well was not monitored during the simultaneous pump testing that was being completed on Flores/Pisenti Wells.

Recovery Test:

On October 15, 2010, after 72-hours (4320 minutes) of pumping, the pump was turned off and the groundwater levels were allowed to recover. The previously installed transducer was still recording all groundwater level information for the recovery test. Hand measurements were also collected and were used to cross-reference/calibrate transducer data. Aquifer Pump Test Data Information Sheet for the pumping and recovery test for the pumping and observation well (if applicable) is included in Appendix C, and shown graphically on Figure 6.

It should be noted that MCEHB and MPWMD calculate the groundwater recovery percentage differently. Specifically, MCEHB assess whether the groundwater recovered to 95% or 2-feet from static water level (whichever is more stringent) in one time the pumping period (3 days), whereas, MPWMD assess whether the groundwater recovered to 95% within two times the pumping period (6 days).

Flores/Pisenti Well #1:
Based on transducer data, the groundwater level recovered to 90.82% in three days and 94.37% in six days (Appendix C). Based on the recovery percentages, the Flores/Pisenti Well #1 did not exceed MCEHB, nor MPWMD recovery requirements and therefore, the pumping rate, and calculated yield will require additional reductions due to lack of recovery.

Table 4 shows the variables and technical calculations for deriving the post-recovery pumping rate, credited source capacity and post-recovery calculated well yield and is discussed in further detail below.

AQUIFER TEST ANALYSIS AND CALCULATIONS

Casing Storage Effects:
In conducting any pumping test analysis, it is important for the Hydrogeologist to use the portion of the data set that represents discharge of water from the aquifer, and not the portion of the data set where a relatively high percentage of discharge is from casing storage. The effects of casing storage were accounted for in completing each of the technical calculations performed. Casing storage effects for the pumping well is shown on page 2 of Aquifer Pump Test Data Information Sheets, Appendix C, and was calculated to expire approximately 65 minutes after test start.

For the purposes of our analysis, both early time data (70-700 minutes) and late time data (1000 – 4320 minutes) was analyzed, as early time data represents the typical time period a well would operate during normal pumping cycles (12 hours or less pumping cycle), whereas later time data is more representative of cumulative pumping over time.

Aquifer Test 4.2© Program Analysis:
Aquifer Test©, a program developed by Waterloo Hydrogeologic, was used to evaluate the transducer data from the pump and recovery test, to estimate aquifer properties of Transmissivity (T), Hydraulic Conductivity (K) and Storativity (S). This program covers the full range of possible aquifer hydraulics and physical settings to include unconfined, confined, leaky, and fracture flow/double porosity analysis using several generally accepted methods to include; Cooper-Jacob method; Moench Fracture Flow method; Warren Root, Fracture Flow/Double Porosity method; Neuman Method; and Theis Recovery method.

In conducting these analyses, several variables were input into the program. These variables included pumping rate (gpm), borehole radius (ft), casing radius (ft), aquifer thickness (ft), depth of well (ft), screen length (ft) and whether or not the well is fully penetrating or partial penetrating. This information was obtained either from direct field inspection or DWR well construction logs.

In addition to these variables, several assumptions needed to be made in using these analysis methods. The assumptions listed below are required for several different analytical methods. The assumptions are:

- The aquifer could be either confined, unconfined, fractured, or leaky confined, and has an apparent infinite extent.
- The aquifer is homogeneous, isotropic, and of uniform thickness over the area influenced.

- The groundwater surface was horizontal prior to pumping.
- The well is pumped at a constant rate.
- The well is fully penetrating.
- Groundwater removed from storage is discharged instantaneously with decline in head.
- The well diameter is small so that well storage is negligible.

Aquifer Test© Pumping Test Analysis Reports are presented in Appendix D. Tabulated results of selected methods are presented on Table 3.

Cooper - Jacob Time-Drawdown Method Analysis (Early Time Data):
In conducting the Cooper-Jacob Method Analysis for early time data, generally the data set from post casing storage to 70-700 minutes is used to obtain values of T and K using the "manual-fit" approach, as it represents a typical 12-hour pumping cycles.

- Flores Pisenti Well#1: For this well, the data set between 70-700 minutes was used to obtain values of T and K. The T value was calculated to be 1.58 x 10^2 gpd/ft, and the K value was 2.06 x 10^{-1} gpd/ft^2. (Table 3, and Appendix D, Cooper-Jacob Early-Time Data).

- Flores Pisenti Well#2: For this well, three different slopes of the early time drawdown curve were analyzed (100-300 min; 70-700 min; 300-1000 min) to obtain values of T and K. The K value was 1.95 x 10^0 gpd/ft^2. The 100-300 min T value was calculated to be 1.05 x 10^3 gpd/ft, and the 300-1000 min T value was 4.85 x 10^2 gpd/ft and their average was calculated to be 7.67 x 10^2 gpd/ft. This average T value was compared to the 70-700 minute T value, which was calculated to be 8.52 x 10^2 gpd/ft, which is slightly higher than the average. For the purposes of this analysis, and as a conservative approach, the higher T value was used, as it will account for a greater adjustment in the ratio of late to early time transmissivities, and therefore, account for a smaller adjusted 24-hour specific capacity and lower calculated yield. (Table 3, and Appendix D, Cooper-Jacob Early-Time Data).

Cooper - Jacob Time-Drawdown Method Analysis (Late Time Data):
In conducting the Cooper-Jacob Method Analysis for later time data, generally the data set from 1000 min to 4320 minutes is used from the constant rate test to obtain values of early time T and K using a "Manual-Fit" approach, although, ultimately the data set used will depend on the best fit of the drawdown curve.

- Flores Pisenti Well#1: For this well, the data set between 1000-4320 minutes was used to obtain values of T and K. The T value was calculated to be 1.39 x 10^2 gpd/ft, and the K value was 1.82 x 10^{-1} gpd/ft^2. (Table 3, and Appendix D, Cooper-Jacob Early-Time Data).

- Flores Pisenti Well#2: For this well, the data set between 1200-4320 minutes was used to obtain values of T and K. The T value was calculated to be 1.84 x 10^2 gpd/ft, and the K value was 4.21 x 10^{-1} gpd/ft^2. (Table 3, and Appendix D, Cooper-Jacob Early-Time Data).

Moench Fracture Flow/Double Porosity Method Analysis:

In conducting the Moench Fracture Flow/Double Porosity Method Analysis, post casing storage to 4320 minutes was used from the constant rate test to obtain values of T and K using a "Manual-Fit" approach. The Moench Fracture Flow/Double Porosity Method Analysis accounts not only for delayed yield from the fractures of the 'later' time data, but accounts for delayed yield from fracture skin of the hard rock matrix.

- Flores Pisenti Well#1: For this well, casing storage was calculated to elapse within 65 minutes, and therefore the data set between 70-4320 minutes was used to obtain values of T and K. The T value was calculated to be 1.18 x 10^{2} gpd/ft, and the K value was 1.54 x 10^{-1} gpd/ft^{2}. (Table 3, and Appendix D, Cooper-Jacob Early-Time Data). The storativity (S) value was calculated as 3.61 x10^{-1} (unitless), and is considered fairly high for a fractured rock aquifer and is speculative since the value was generated from pumping well data which generally has a larger storage coefficient during pumping than the subsequent recovery.

- Flores Pisenti Well#2: For this well, casing storage was calculated to elapse within 2 minutes, and therefore the data set between 10-4320 minutes was used to obtain values of T and K. The T value was calculated to be 2.12 x 10^{2} gpd/ft, and the K value was 4.85 x 10^{-1} gpd/ft^{2}. (Table 3, and Appendix D, Cooper-Jacob Early-Time Data). The storativity (S) value was calculated as 3.69 x10^{-1} (unitless), and is considered fairly high for a fractured rock aquifer and is speculative since the value was generated from pumping well data which generally has a larger storage coefficient during pumping than the subsequent recovery.

Storage coefficients from other hard-rock literature[40] suggest that values can vary from 1.0 x 10^{-2} to 1.0 x 10^{-7} with an reasonable average of fractured rock storage values in the range between 1.0 x 10^{-3} or 10^{-5} depending on; degree of weathering, fine or coarse fracturing and orientation, depth to raw bedrock, thickness of overburden and fissured zone, percentage of dike and sills and precipitation degree and intensity among other variables. For the purposes of this assessment, and as a conservative estimate, a range of storage coefficients (10^{-3} to 10^{-5}) was used to assess pumping well and neighboring wells impacts and is discussed in further detail below.

Theis Recovery Method Analysis:

In conducting the Theis Recovery Method Analysis, all of the data from the wells recovery test (> 4320 minutes) was analyzed to obtain values of T and K. This method results in a straight-line plot of the data. Generally, recovery data is most representative of aquifer characteristics as there are no pumping influences.

- Flores Pisenti Well#1: The T value obtained from this method is 1.32 x 10^{2} gpd/ft and the K value obtained from this method is 1.73 x 10^{-1} gpd/ft^{2}.

- Flores Pisenti Well#2: The T value obtained from this method is 2.33 x 10^{2} gpd/ft and the K value obtained from this method is 5.34 x 10^{-1} gpd/ft^{2}.

[40] Krasny and Sharp (2007); Groundwater in Fractured Rocks, International Association of Hydrogeologist Selected Papers.

In summary, all T and K values derived are within a similar range of each other and the values for T and K are typical of a medium to higher range value of a fractured shale and/or igneous rock aquifer[41,42]. The most realistic T and K values are derived from the Theis Recovery Method Analysis, as no pumping influences are potentially interfering with groundwater data.

MCEHB & MPWMD TECHNICAL CALCULATIONS:

Technical calculations and values of saturated aquifer thickness, available drawdown, 24-hour /72-hour specific capacity, ratio of early and late time transmissivity (if applicable), adjusted 24-hour and/or 72 hour specific capacity, pre-recovery pumping rate/calculated well yield, percent well recovery, and post-recovery pumping rate/calculated well yield are shown on Table 4 and discussed below.

MCEHB Technical Calculations:

The 24-hr sustainable pumping rate for the Flores/Pisenti Well #1 was 8.08 gpm, and the 72-hr *average* pumping rate was 8.06 gpm with less than 5% fluctuation between the 24-hr and 72hr flow rate.

As noted previously, the groundwater level for Well #2 recovered to 90.82% within 1 time the pumping period, not meeting MCEHB groundwater level recovery requirement of 2-feet from static level[43], equivalent to 96.73%. Therefore, the pre-recovery pumping rate was reduced according to the following technical calculation;

- % Reduction in Pumping Rate: = 5.91% (96.73% - 90.82% = 5.91%)
- Flow Rate Reduction: = 0.48 gpm (5.91% of 8.06 gpm)
- Post-Recovery Pumping Rate: = 7.58 gpm (8.06 gpm – 0.48 gpm)

MCEHB Technical Calculations Summary:

In summary, after adjusting the pre-recovery pumping rate due to lack of recovery, the post recovery pumping rate was calculated to be 7.58 gpm which exceeds the 6 gpm requirement for a single parcel, two-connection water system permit.

MPWMD Technical Calculations:

MPWMD guidelines[44] indicate that the calculated well yield is determined by multiplying either the 24-hour specific capacity or the adjusted 24-hour specific capacity by the available drawdown. The 24-hour specific capacity is adjusted if there is an apparent difference in late time to early time transmissivity values. As shown on Groundwater Drawdown and Recovery Curve (Figure 6), and in numerical form on Table 3, and graphically in Appendix D, there is very subtle difference in early and late time transmissivity values. Based on the data obtained and reviewed, the calculated yield for the pumping well was determined by multiplying the adjusted 24-hr specific capacity with available drawdown. Results of the technical calculations are derived on Table 4 and discussed below.

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[41] Freeze and Cherry, Groundwater, 1979.
[42] Krasny and Sharp (2007); Groundwater in Fractured Rocks, International Association of Hydrogeologist Selected Papers.
[43] MCHD, Source Capacity Testing Procedures, dated May 2008; & California Waterworks Standard, Source Capacity Standards, March 2008.
[44] Monterey Peninsula Water Management District; *Procedures for Preparation of Well Source and Pumping Impact Assessments*, dated September, 14, 2005, Revised May, 2006.

- The saturated thickness was calculated to be 763.88 feet.
- The available drawdown was calculated to be 254.63 feet.
- The ratio of late to early transmissivity values was calculated to be 0.88 (unitless).
- 24-hour specific capacity was calculated to be 0.15 gpm/ft of drawdown[45].
- The 72-hour specific capacity was calculated to be 0.13 gpm/ft of drawdown[46].
- The adjusted 24-hour specific capacity was calculated to be 0.13 gpm/ft of drawdown.
- The pre-recovery calculated well yield was determined to be 33.10 gpm[47]

As discussed previously, Well #1 groundwater level only recovered to 94.37% within the 2-times the pumping period, again, not meeting MPWMD recovery requirement of 95%, therefore the calculated well yield was reduced according to the following technical calculation;

- % Reduction in Pumping Rate: = 0.63% (95% - 94.37% = 0.63%)
- Flow Rate Reduction: = 0.21 gpm (0.63% of 33.10 gpm)
- Post-Recovery Pumping Rate: = 32.89 gpm (33.10 gpm – 0.21 gpm)

MPWMD Technical Calculations Summary:

In summary, the post-recovery calculated well yield of Well #1 is 32.89 gpm is greater than the MPWMD calculated maximum day demand of 2.82 gpm pumping in equivalent 12-hr cycles (after accounting for system & treatment losses) and therefore meets the requirements for a two-connection WDS permit.

ANALYSIS OF WELL ADEQUACY FOR DOMESTIC AND IRRIGATION USE

In order to confirm the Calculated Well Yield is adequate for intended use, Intermittent, Time/Drawdown calculations were completed on the Well#1 using the aquifer parameters discussed above to determine whether the MDD after system and treatment losses would be greater than the wells available drawdown. Aquifer parameters used in the calculation included the transmissivity value of 132 gpd/ft which was obtained from Theis Recovery Method, and a storage coefficient 1.0×10^{-5} (unitless) was obtained from other published literature[48].

Confirmation of Well Yield and Evaluation of Well Adequacy for Intended Use:

Intermittent, Time/Drawdown calculations completed on the pumping well (Table 5) suggest, there would be 43.90 feet of drawdown after 30-days pumping at the MDD, which is less than the wells available drawdown of 254.63-ft, and therefore the drawdown values calculated are considered less than significant impact.

ANALYSIS OF OFFSITE IMPACTS

As noted previously, offsite impacts analysis requires aquifer parameters and radial distance from the pumping well to known wells within 1,000 of the pumping well. The well radius search conducted by MPWMD staff is included on Figure 5 and was used to calculate radial distances to

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[45] 24-hr specific capacity calculated using 24-hr average flow rate of 8.08 g pm.
[46] 72-hr specific capacity calculated using lowest sustainable 72hr flow rate of 8.06 gpm.
[47] Pre-recovery calculated well yield is product of adjusted 24-hr specific capacity and available drawdown.
[48] Krasny and Sharp (2007); Groundwater in Fractured Rocks, International Association of Hydrogeologist Selected Papers.

neighboring wells as shown on Table 6. The aquifer transmissivity value used in the calculations was 132 gpd/ft and was obtained from Theis Recovery Method (Table 3 and Appendix E) while the aquifer storage coefficient used was 1.0 x 10^{-5} (unitless) which was obtained from other published literature[49].

Calculation of Projected Drawdown on Neighboring Wells:
Calculations of continuous pumping; time and distance/drawdown projections on all neighboring well within 1,000 feet of Well #1 at the dry season demand was completed and is tabulated on Table 6 with supporting calculations in Appendix E.

The calculations indicate that after 183 days of continuous pumping at the dry season demand of 0.99 gpm, and using a reasonable storage coefficient of 1.0 x 10^{-5}, there are no significant cumulative drawdown impacts on any neighboring well out to 1,000 feet from the pumping well. Specifically;

- Maney Well: This well was measured to be 465 ft from Flores/Pisenti Well #1, and is considered by MPWMD as an 'active' well. Although this well was not monitored during the pumping test, technical calculations completed on this well (Appendix E) using a range of storage coefficients (10^{-3} to 10^{-5}) known well construction and groundwater level information (Table 6) suggest a range of drawdown of 4.48-feet to 6.98-feet after 183 days of pumping at the dry season demand of 0.99 gpm. However, both the resultant drawdown values calculated are less than 5% of this wells *calculated* saturated thickness, calculated to be 17.15 feet (Table 6). Assuming a 5% reduction in any neighboring wells' saturated thickness as a reasonable significance "threshold"[50], the drawdown values calculated for this analysis are considered less than significant.

- Beech Well: This well was measured to be 907 ft from Flores/Pisenti Well #1, and is considered by MPWMD as an 'active' well. Although this well was not monitored during the pumping test, technical calculations completed on this well (Appendix E) using a range of storage coefficients (10^{-3} to 10^{-5}) known well construction and *estimated* groundwater level information (Table 6) suggest a range of drawdown of 3.33-feet to 5.83-feet after 183 days of pumping at the dry season demand of 0.99 gpm. Both the resultant drawdown values calculated are less than 5% of this wells *estimated* saturated thickness, calculated to be 24.51 feet (Table 6). Assuming a 5% reduction in any neighboring wells' saturated thickness as a reasonable significance "threshold"[51], the drawdown values calculated for this analysis are considered less than significant.

- Shake Well: This well was measured to be 778 ft from Flores/Pisenti Well #1, and is considered by MPWMD as an 'inactive' well. Although this well was not monitored during the pumping test, and although not required to perform offsite analysis on this well since it is greater than 1,000 feet from the well, technical calculations were still completed to elevate any future concerns. Technical calculations completed on this well (Appendix E) using a range of storage coefficients (10^{-3} to 10^{-5}) known well construction and *estimated* groundwater level information (Table 6) suggest a range of drawdown of 3.60-feet to 6.09-feet after 183 days of pumping at the dry season demand of 0.99 gpm.

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[49] Krasny and Sharp (2007); Groundwater in Fractured Rocks, International Association of Hydrogeologist Selected Papers.
[50] MPWMD peer review on Village Park and Commons Project, July 31, 2009.
[51] MPWMD peer review on Village Park and Commons Project, July 31, 2009.

Both the resultant drawdown values calculated are less than 5% of this wells *estimated* saturated thickness, calculated to be 8.61 feet (Table 6). Assuming a 5% reduction in any neighboring wells' saturated thickness as a reasonable significance "threshold"[52], the drawdown values calculated for this analysis are considered less than significant.

In addition to calculating offsite impacts to neighboring wells using the dry season demand rate (as per MPWMD requirements) BHgl has completed additional Continuous Pumping, Time & Distance Drawdown Projections specifically on the Beech Well (Table 7) who has expressed to Monterey County Resource Management Agency (MC RMA)[53] that the parcel line adjustment (Application #PLN100560) be denied based on the implication that his well had significant groundwater level impacts from the Flores/Pisenti Well #2, October 2010 pump test[54].

Although the Beech Well was not monitored during Well #2 pumping test, technical calculations (Table 7 and Appendix E) suggests there could have been a maximum of 12-feet of impact to the Beech Well[55] by pumping Flores/Pisenti Well #2 during the 72hr pumping test in October 2010. The equation used to perform the technical calculations assumes isotropic connectivity, and does not account for anisotropy of fractured rock aquifers.

In any event, the calculated drawdown value of 12-ft should not likely dewater the Beech well, even if the wells were hydrogeologically linked. However, if the wells were hydrogeologically linked, the cyclic pumping of the Beech Well would have been observed in the recovery data of Well #2, if the Beech Well was pumped during the six days after Well #2 pumping ceased. The data suggests, as depicted on Figure 6, there was no groundwater level fluctuation/response observed in Well #2 in relation to other neighboring well pumping, and therefore, based on the data, the Beech Well is not considered to be hydrogeologically connected with Flores/Pisenti Well #2. Rather, based on the Beech's well use, which is noted[56] as supplying irrigation water to three estate style parcels (1432, 1436 and 1450 Manor Road, Monterey) it is our interpretation that the Beech/Anastasia Parcels have dewatered their own well and has no relation to Flores/Pisenti Wells

Based on the data, Well #2, and is source capacity should have no bearing on approval of the parcel line adjustment.

<u>Calculation of Projected Drawdown on Sensitive Environmental Receptors:</u>

In addition to monitoring the neighboring wells, our analysis considers the effects on Sensitive Environmental Receptors (SERs) in the near vicinity. However, since the project is outside the Carmel River Watershed Boundary, and is greater than 1,000 feet from any SER, there were no calculations to perform.

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[52] MPWMD peer review on Village Park and Commons Project, July 31, 2009.
[53] Letter from Judy and David Beech to Monterey County Planning Department, Monterey County RMA – Anna Quenga; Re: File #PLN100560 – Objection to Application for Lot Line Adjustment, February 15, 2011.
[54] The Beech Well was not known to be within 1000 feet of Well #2 during the time of the pump test, otherwise an attempt would have been made to obtain well access for monitoring purposes.
[55] Technical calculations based on using same flow rate and duration as that of the October 2010 test – 6.25 gpm for 72 hours.
[56] Letter from Judy and David Beech to Monterey County Planning Department, Monterey County RMA – Anna Quenga; Re: File #PLN100560 – Objection to Application for Lot Line Adjustment, February 15, 2011.

Evaluation of Projected Offsite Impacts:

Based on the field data obtained (Appendix C) and technical calculations completed (Table 6, 7 and Appendix E) and using a range of storage coefficients for fractured rock, pumping the Flores/Pisenti Well #1 continuously at the dry season demand (0.99 gpm) does not appear to have any cumulative significant impacts on existing neighboring wells or SERs within 1,000 feet of the pumping well.

WATER QUALITY REVIEW AND DISCUSSION

Prior to the end of each of the pumping test, a groundwater sample is obtained from the pumping well and transported under proper chain of custody for analysis by a certified laboratory, Monterey Bay Analytical Services (MBAS) for the suite of analysis to include; general mineral, general physical and inorganic constituents, along with a presence/absence bacteriological scan.

Bacteriological Analysis:

The bacteriological analysis indicates that the well was detected with the presence of Total Coliform, and absent for E-Coli bacteria. Total-Coliform are bacteria which are naturally present in the environment and are used as an indicator that other, potentially harmful, pathogenic bacteria may be present[57]. Usually, the presence of coliform bacteria is a sign that there is dirt or contamination in the pump column, well column, filter pack, and/or the distribution system (pipes, tanks, booster pump). Detection of Total Coliform bacteria is not uncommon in a new well/water system which has not been completely disinfected. It is recommended that the well be properly disinfected prior to hook-up to any distribution line or storage tank.

Title 22 Analysis – Domestic Water Quality:

Although no primary constituents[58] were detected exceeding State Drinking Water Standards (DWS)[59], the wells groundwater will require treatment to meet recommended standards on secondary constituents[60] exceeding secondary MCL and/or recommended State DWS recommended levels.

Primary Constituents Exceeding the State DWS include:

- There are no primary constituents exceeding State DWS.

Secondary Constituents Exceeding the State DWS include:

- Specific Conductance was detected at 1359 umhos/cm, above the secondary MCL of 900 umhos/cm, although below the secondary upper maximum of 1600 umhos/cm.
- Total Dissolved Solids was detected at 783 ppm, above the secondary MCL of 500 ppm, although below the secondary upper maximum MCL of 1000 ppm.

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[57] Driscoll, Groundwater and Wells, Second Edition, 1986.
[58] Primary constituents are contaminants that may cause adverse effects to human health and safety, and are enforceable by regulatory agencies. MPWMD does not regulate groundwater quality, and MCEHB does not regulate single-connection systems.
[59] California Administrative Code, Title 22, Chapter 15, Article 4. Primary Standards – Inorganic Chemicals, Section 64431, Maximum Contaminant Levels – Inorganic Chemicals, 7th Edition, January, 2011.
[60] Secondary constituents are contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. Secondary constituents are non-enforceable; however, Environmental Protection Agency (EPA) recommends secondary standards to water systems but does not require systems to comply. Individual States and/or local counties may choose to adopt them as enforceable standards. Although MCEHB does not enforce these standards for single-connection system, we recommend treating the secondary constituents to the recommended standards.

Other constituents of significance that were detected, although remain below their respective drinking water standard, induced; include; Chloride, Chromium and Fluoride. No matter what the constituent, all groundwater constituents should be monitored with subsequent sampling as constituent concentrations due change from initial sampling, seasonally, and/or from over-pumping and well disinfection procedures.

Irrigation Water Quality:
The wells groundwater is suitable for irrigation use so long as soil amendments are used over time, as the adjusted Sodium Absorption Ratio (adjSAR) of 37.8 (unitless) is representative of a very-high salinity water based on the conductivity, bicarbonate and carbonate concentrations. If the adjSAR is greater than 9 (unitless), this may suggest potential problems with soil permeability over time unless soil amendments are added[61].

), WATER QUALITY TREATMENT & DISTRIBUTION SYSTEM COMPONENTS

The components listed below is based on serving 1-Single Family Dwelling w/pool and Care-Taker Unit serving a total of 6 people/day with each person using 150 gal/day (over-estimated), which is equivalent to 900 gal/day. It should be noted that irrigation water will not be treated as it would be cost prohibitive. Treatment and system components should consist of;

1) A Flow-Meter and a Flo-Matic check value at the well head,
2) Two, 4,990 gallon above or below ground raw water storage tanks,
3) A 1-Hp Variable Frequency Drive (VFD) Pump (Goulds Model: 1AB21HM1E2D0),
4) A 1.0-Cu-ft. Post-Filter w/Potassium Permanganate & Anthracite w/auto backwashing,
5) A 1.0-Cu/-ft Water Softener with Brine Tank,
6) A 1000 gallon/day Reverse Osmosis System w/TDS & EC Meter,
7) A optional Calcite Neutralizer to correct pH following RO treatment,
8) A optional 30 gal Chlorine Solution Tank/Mixer/Injector (if bacteria cannot be removed)
9) A optional 1.0-Cu-ft. Post-Filter w/Carbon w/auto backwashing for Chlorine Removal,
10) A 1,000 gallon above or below ground fresh water storage tank,
11) A 5-Hp Variable Frequency Drive (VFD) Pump (Goulds Model: 5AB2LCC1J2D0

Water Quality Summary:
In summary, the wells groundwater quality will require treatment to meet secondary, non-enforceable, State Drinking Water Standards[62].

CDF FIRE PROTECTION REQUIREMENTS

Since the parcel is within a Cal-Am service area, Cal-Am will likely provide fire protection service for the structures. However a "Will Serve" letter should be obtained by the applicant from Cal-Am regarding fire protection. The wells storage could serve the proposed structures for fire protection, although if so, BHgl would recommend a minimum of 15,000 gallons of storage.

[61] Suarez, 1981.
[62] California Administrative Code, Title 22, Chapter 15, Article 4. Primary Standards – Inorganic Chemicals, Section 64431, Maximum Contaminant Levels – Inorganic Chemicals, January, 2011.

As shown on Figure 2, the project has proposed roughly 10,000 gallons of raw water storage by using two, 4,990 gallon above ground storage tanks. This storage volume is equal to the projects fire protection requirement (10,000 gallons). Please note that CDF will need to perform an inspection and approve the fire sprinkler system for the structures no matter whether the fire protection is from well water or Cal-Am.

CONCLUSIONS

Based on data gathered, the well pumping and aquifer recovery test, and technical calculations performed on the pumping well (Well #1), neighboring wells and SERs, the following conclusions can be drawn;

- The proposed project includes using the Well #1 to provide potable and non-potable use to one SFDs, with pool and Care-Taker Unit with native/drought tolerant landscaping. The existing residence, which is served by Cal-Am, will be remolded as a Guest House and will continue to be served by Cal-Am.
- Based on DWR Well Completion Report, pumping test data, and calculations of aquifer parameters, Well#1 is perforated within fractured Chamisal Sandstone Formation.
- The proposed ‘conceptual’ interior water demand (including pool demand) was calculated to be 0.58 af/yr.
- The proposed exterior water demand was calculated to be 0.76 af/yr.
- The average annual water demand was calculated to be 1.34 af/yr.
- The lowest sustained pre-recovery pumping rate for the 72hr test was 8.06 gpm.
- The pre-recovery calculated well yield was determined to be 33.10 gpm.
- The groundwater level only recovered to 90.82% in 1-time the pumping period NOT MEETING MCEHB recovery requirement of 96.73%, and therefore, the pre-recovery pumping rate was adjusted, giving at a post-recovery pumping rate of 7.58 gpm.
- The groundwater level only recovered to 94.37% in 2-times the pumping period, NOT MEETING MPWMD recovery requirement of 95%., and therefore, the pre-recovery calculated yield was adjusted, giving a post-recovery calculated yield of 32.89 gpm.
- MCEHB requirement for a Two-Connection Water System permit is 6 gpm which is less than the wells post-recovery pumping rate of 7.58 gpm.
- The MPWMD average annual water demand after system and treatment losses was calculated to be 1.52 af/yr, and the MPWMD maximum day demand after system and treatment losses was calculated to be 2.27 af/yr, equivalent to 2.82 gpm pumping in

equivalent 12-hr cycles, which is less the wells post-recovery calculated well yield of 32.89 gpm.

- Results of technical calculations of projected drawdown impacts on the pumping well during normal cyclic patterns at the maximum day demand (after S&T losses) indicate there are less than significant cumulative drawdown impacts to the pumping well.

- Results of technical calculations of projected drawdown impacts on neighboring wells and sensitive environmental receptors during continuous pumping at the dry season demand indicate there is less than significant cumulative drawdown impacts in any of the neighboring wells, or SERs within 1,000 feet of the pumping well.

- Results of technical calculations of projected drawdown impacts on the Beech Well simulating the conditions of the 2010 pump test, suggest a maximum of 12-feet of drawdown in the Beech Well if the wells were hydrogeologically linked. However, based on recovery data in well #2, there was no observed groundwater level fluctuation in the recovery data therefore, the Beech Well and the Flores/Pisenti Well #2 are not considered to be hydrogeologically connected, nor are well #1 and Beech Well as they are separated by a unmapped historical fault.

- The groundwater from Well #1 will require minor treatment to meet recommended State Drinking Water Standards[63].

RECOMMENDATIONS

We recommend MPWMD permit the well for a single parcel WDS and recommend MCEHB permit the well for a single parcel, two-connection water system permit based on the above conclusions and the following recommendations.

- We recommend the applicant obtain a "Will Serve" letter from Cal-Am regarding fire protection for the project.

- We recommend limiting the water production of the Flores/Pisenti Well #1 to no more than their average annual day demand after system and treatment losses (1.52 af/y) to limit pumping drawdown and potential offsite impacts.

- We recommend the applicant install a groundwater treatment system to reduce or remove constituents from the groundwater to meet recommended State Drinking Water Standards[64].

- We recommend the applicant install a distribution system so that the groundwater meets maximum day and peak hourly demands for the project.

[63] California Administrative Code, Title 22, Chapter 15, Article 4. Primary Standards – Inorganic Chemicals, Section 64431, Maximum Contaminant Levels – Inorganic Chemicals, 7th Edition, January, 2011.
[64] California Administrative Code, Title 22, Chapter 15, Article 4. Primary Standards – Inorganic Chemicals, Section 64431, Maximum Contaminant Levels – Inorganic Chemicals, 7th Edition, January, 2011.

- We recommend the applicant comply with MPWMD rules and regulations relating to water well registration, metering and annual reporting of production (MPWMD Rules 52 and 54).

- We recommend the applicant report water production by the Water Meter Method (MPWMD Rule 56) for the well. Each structure should have its own meter, and each parcel should have its own irrigation meter.

- We recommend the applicant comply with all MPWMD water conservation ordinances that pertain to residential, landscape, and non-potable use.

- We recommend installing a Rain Water Harvesting (RWH) system to offset irrigation needs, and/or encourage recharge to the well-field.

- We recommend installing a small shelter around the well to protect the well from animals and weather. The pump house should be designed so that the roof opens up, and/or sides so that the well head can be accessed for repair or maintenance.

- We recommend sampling the wells groundwater quality annually as groundwater constituents and quality can change seasonally, and/or from over-pumping.

- We recommend preparing a Water System Agreement between all parties involved in the future water system.

LIMITATIONS

Our service consists of professional opinions and recommendations based on the data compiled. *Bierman Hydrogeologic P.C.* bases the conclusions provided upon the tests and measurements, using accepted hydrogeologic principles and practices of the groundwater industry.

Additionally, conditions in water wells are subject to dramatic changes, even in short periods of time. The techniques employed in conducting pump testing may be subject to considerable error due to factors within the well and/or aquifer, which are beyond our immediate control or observation.

Therefore, the data included within this report are valid only as of the date and within the observational limitations of the test or installation conducted. The test conclusions are intended for general comparison of the well and/or aquifer in its present condition against known water well standards and/or guidelines. The analysis and conclusions in this report are based on information reviewed, and field-testing which are necessarily limited. Additional data from future work may lead to modification of the opinions expressed herein.

In accepting this report, the client releases and holds *Bierman Hydrogeologic, P.C.* harmless from liability for consequential or incidental damages arising from any different future pumping rate, calculated well yield or water quality that was expressed herein. Our report is not a guarantee of any water production rate, yield or water quality.

Respectfully submitted,

Aaron Bierman
Certified Hydrogeologist #819

Table 1
Well Construction Information
APN: 103-071-019 & -002
Monterey County, California

Well Identification[1]	Type of Aquifer[1]	USGS BaseMap[2]	Well Completion[1]						Field Parameters[3]				
		Ground Elevation (ft, msl)	Borehole Diameter (in)	Well Completion Depth (ft, bgs / ft, msl)	Well Type & Diameter (in)	Screened Interval (ft, bgs)	Gravel Pack (ft, bgs)	Sanitary Seal (ft, bgs)	Top Of Casing Elevation[4] (ft, msl)	Top Of Sounding Tube[6] (ft, msl)	Static Groundwater Level (ft, bTOS)	Static Groundwater Elevation (ft, msl)	Pump Intake & Type[7] (ft, bTOC)
Flores/Pisenti Well #1	Sandstone	330'	19" to 700' and 10.25" to 894'	894' bgs -564' msl	10" ID Steel to 700' & 5" ID, SDR 21 from 700-894'	700-894"	700-894'	0-700'	331.8'	331.8'	131.92' (BHgl - October, 2010)	199.88'	2hp, Berkley @500'
Flores/Pisenti Well #2	Shale	336'	10.75" to 600'	600' bgs -264' msl	5" ID, SDR 17	180-420' 440-460' 480-500' 520-540' 560-580'	100-425'	0-100'	336.38'	337.33'	143.82' (BHgl - October, 2010)	193.51	1.5hp, Grundfos 5S15-31 @560'
Maney Well	Sandstone Shale?	345'	10.75" (e) to 500'	500' bgs -155' msl	5" ID, SDR 21 (e)	200-500'	75-500'	0-75'	346' (e)	346' (e)	157' (MPWMD - 2001)	189'	?
Beech Well	Shale	275'	10.0" (e) to 573'	573' bgs -298' msl	4.5" ID, SDR 21 (e)	133-573'	50-573'	0-50'	276' (e)	276' (e)	82.82' (e^1) (2011)	193.18'	?
Shake Well	Shale	260'	10.75" (e) to 330'	330' bgs -70' msl	5" ID, SDR 17 (e)	200-240'	70-330'	0-70'	261' (e)	261' (e)	67.82' (e^2) (2011)	193.18'	?

Footnotes:

[1]: Data obtained from Department of Water Resources, Well Completion Report, and/or Monterey Peninsula Water Management District (MPWMD) or Monterey County Health Department (MCHD).
[2]: Ground surface elevations determined using GPS and USGS Map, Figure 1.
[3]: All Static Water Levels obtained by Bierman Hydro-Geo-Logic
[4]: Top of Casing Elevation from ground surface measured in field by Bierman Hydro-Geo-Logic. Elevation reported is not a surveyed elevation.
[5]: Top of Sounding Tube Measurement by Bierman Hydro-Geo-Logic.
[6]: In some instances; Top Of Casing = Top Of Sounding Tube.
[7]: Pump intake and pump type information obtained from field soundings and/or pump installer. In some instances, no data is available. Pump used was a test pump. No pump currently installed.

Notes:

ft = feet
msl = mean sea level
bgs = below ground surface
bTOC = below Top Of Casing
NA = Not applicable or available
Bhgl Bierman Hydrogeologic
(e) = Estimated based on date drilled.
(e^1) = Estimated based on determining the elevation difference between the Flores/Pisenti Well #2 and Beech Well (approx. 61-ft) and subtracting that from the known depth to water in Well #2 (143.82')
(e^2) = Estimated based on determining the elevation difference between the Flores/Pisenti Well #2 and Shake Well (approx. 76-ft) and subtracting that from the known depth to water in Well #2 (143.82')

Table 2

Water Demand

APN: 103-071-002

Monterey County, California

WATER DEMAND VARIABLES	WATER YEAR												ANNUAL TOTALS
	October	November	December	January	February	March	April	May	June	July	August	September	
Monthly Demand Factor[1]	8.98%	7.16%	6.42%	6.38%	5.74%	6.75%	7.70%	9.21%	9.99%	10.75%	10.96%	9.96%	100%
Monthly and Annual Demand (Acre-Feet)[2]	0.120	0.096	0.086	0.085	0.077	0.090	0.103	0.123	0.134	0.144	0.147	0.133	**1.34**
Annual Day Demand (in GPD)[3]	1264.85	1042.11	904.27	898.63	895.11	950.75	1120.71	1297.24	1454.01	1514.16	1543.73	1449.65	
Annual Day Demand (in GPM)[4]	0.88	0.72	0.63	0.62	0.62	0.66	0.78	0.90	1.01	1.05	1.07	1.01	

MCEHB WATER DEMAND CALCULATIONS

Average Annual Demand[5]:	**0.83 gpm**	**(pumping 24/7)**	**equal to**	1.34	**af/year**	**or**	**1.66 gpm (pumping on 12 hour cycles)**
Average Annual Demand after System Loss[6]:	**0.89 gpm**	**(pumping 24/7)**	**equal to**	1.44	**af/year**	**or**	**1.78 gpm (pumping on 12 hour cycles)**
Average Annual Demand after System & Treatment Loss[7]:	**0.96 gpm**	**(pumping 24/7)**	**equal to**	1.55	**af/year**	**or**	**1.92 gpm (pumping on 12 hour cycles)**
Dry Season Demand[8]:	**0.99 gpm**	**(pumping 24/7)**	**equal to**	1.59	**af/year**	**or**	**1.97 gpm (pumping on 12 hour cycles)**
Maximum Day Demand[9]:	**1.87 gpm**	**(pumping 24/7)**	**equal to**	3.01	**af/year**	**or**	**3.73 gpm (pumping on 12 hour cycles)**
Maximum Day Demand after System Loss[6]:	**2.01 gpm**	**(pumping 24/7)**	**equal to**	3.24	**af/year**	**or**	**4.01 gpm (pumping on 12 hour cycles)**
Maximum Day Demand after System & Treatment Loss[7]:	**2.16 gpm**	**(pumping 24/7)**	**equal to**	3.48	**af/year**	**or**	**4.32 gpm (pumping on 12 hour cycles)**
Peak Hourly Demand[10]:	**2.80 gpm**	**or**	**167.99 gph**				

MPWMD WATER DEMAND CALCULATIONS

Average Annual Demand[5]:	**0.83 gpm**	**(pumping 24/7)**	**equal to**	1.34	**af/year**	**or**	**1.66 gpm (pumping on 12 hour cycles)**
Average Annual Demand after System Loss[6]:	**0.87 gpm**	**(pumping 24/7)**	**equal to**	1.41	**af/year**	**or**	**1.75 gpm (pumping on 12 hour cycles)**
Average Annual Demand after System & Treatment Loss[7]:	**0.94 gpm**	**(pumping 24/7)**	**equal to**	**1.52**	**af/year**	**or**	**1.88 gpm (pumping on 12 hour cycles)**
Dry Season Demand[8]:	**0.99 gpm**	**(pumping 24/7)**	**equal to**	1.59	**af/year**	**or**	**1.97 gpm (pumping on 12 hour cycles)**
Maximum Day Demand[9]:	**1.24 gpm**	**(pumping 24/7)**	**equal to**	2.01	**af/year**	**or**	**2.49 gpm (pumping on 12 hour cycles)**
Maximum Day Demand after System Loss[6]:	**1.31 gpm**	**(pumping 24/7)**	**equal to**	2.11	**af/year**	**or**	**2.62 gpm (pumping on 12 hour cycles)**
Maximum Day Demand after System & Treatment Loss[7]:	**1.41 gpm**	**(pumping 24/7)**	**equal to**	2.27	**af/year**	**or**	**2.82 gpm (pumping on 12 hour cycles)**

NOTES:

[1]: Monthly Demand Factor obtained from compilation of data from California-American Water Company monthly production reports from 1992-2003 (Monterey Peninsula Water Management District, October 2, 2003).

[2]: Monthly Demand calculated by dividing Total Use (indoor + outdoor use) by Monthly Demand Factor.

---CONCEPTUAL Indoor Water Demand calculated to be 0.58 af/yr (0.415 af/yr per Conceptual SFD;   0.164 af/yr per Conceptual Caretaker Unit - Appendix B.

---CONCEPTUAL Estimated Total Water Use (ETWU) calculated to be 0.76 af/yr - Appendix B. NOTE: Exterior Water Use IS NOT treated.

---Maximum Allowable Water Allowance (MAWA) was calculated to be 1.15 af/yr which is less than the ETWU of 0.76 af/yr.   MAWA calculations in Appendix B.

--- No Rain Water Harvesting (RWH) was calculated for this project. 1000sq.ft of harvest area with 1-inch of rain could generate roughly 600 gallons of water.

[3]: Monthly Demand converted to Day Demand in gallons per day (gpd). Conversion factors: 325,851 gallons per acre-foot; # day per month (Jan-31; Feb-28; Mrch-31; Apl-30; May-31; June-30; July-31; Aug-31; Sep-30; Oct-31; Nov-30; Dec-31)

[4]: Day Demand (in gpm) calculated by dividing Day Demand (in gpd) by 1440 minutes (1440 minutes per day).

[5]: Average Annual Day Demand (gpm) calculated by dividing sum of Day Demands (in gpm) by 12.

[6]: For MCHD, a 7% System Loss is used and is applied to both interior and exterior use[11]. For MPWMD a 5% System Loss is used and is applied to both interior and exterior use[11].

[7]: A 15% Treatment Loss is used for Reverse Osmosis systems[12], and is only applied to interior water use. **Exterior water use IS NOT treated.**

[8]: Dry Season Demand (May through October) represents highest six month demand period with approximately 59.85% of annual demand during this period[1].

[9]: Maximum Day Demand obtained by multiplying the Average Day Demand by Average Day Peaking Factor.   Peaking Factors vary from agency to agency.

---State and MCEHB use a Peaking Factor of 2.25. (State of CA Code of Regulations, Title 22, Division 4, Chapter 16, Article 2, Section 64554 New and Existing Source Capacity, March, 2008).

---MPWMD uses a Peaking Factor of 1.5. (MPWMD; Procedures for Prepartation of Well Source and Pumping Impact Assessments, September, 2005, Revised May, 2006).

[10]: Peak Hourly Demand determined by calculating the average hourly flow during maximum day demand and multiplying by a peaking factor of 1.5 (State of Califorina Code of Regulations, Title 22, Division 4, Chapter 16, Article 2, Section 64554, March, 2008).

[11]: A 7% System Loss is Based on information for Canada Woods Water Company and Monterra Ranch Mutual Water Systems, Monterey County, 2008. A 5% system loss is based on MPWMD Memo #6, dated August 6, 2009.

[12]: A 15% Treatment Loss is based on treatment device specifications.

Table 3
Aquifer Test Analysis Results
APN: 103-071-019 & -002
Monterey County, California

Well Identification	AQUIFER TEST version 4.2 METHOD ANALYSIS[1] (Waterloo Hydrogeologic Inc.)								
	Cooper-Jacob Time-Drawdown Method Analysis[2]				Moench Fracture Flow Method Analysis			Theis Recovery Method Analysis	
	Early Time Data: (70-700 min)[3]		Later Time Data: (1000 - 4320 min)[4]		Early to Late Time Data (post casing storage - 4320 min)[5]			Recovery Data Only (> 4320 min)[6]	
	Transmissivity (gpd/ft)	Hydraulic Conductivity (gpd/ft^2)	Transmissivity (gpd/ft)	Hydraulic Conductivity (gpd/ft^2)	Transmissivity (gpd/ft)	Hydraulic Conductivity (gpd/ft^2)	Storage Coefficient (unitless)	Transmissivity (gpd/ft)	Hydraulic Conductivity (gpd/ft^2)
Flores/Pisenti Well #1	1.58×10^{2}	2.06×10^{-1}	1.39×10^{2}	1.82×10^{-1}	1.18×10^{2}	1.54×10^{-1}	3.61×10^{-1} 1.0×10^{-5}	1.32×10^{2}	1.73×10^{-1}
Flores/Pisenti Well #2	8.52×10^{2}	1.95×10^{0}	1.84×10^{2}	4.21×10^{-1}	2.12×10^{2}	4.85×10^{-1}	3.69×10^{-1} 1.0×10^{-5}	2.33×10^{2}	5.34×10^{-1}

FOOTNOTES:

1: Aquifer Test v4.2 Method Analysis Pumping Test Reports are presented in Appendix D.
   CooperJacob Time-Drawdown Method Analysis
   Moench Fracture Flow/Warren Root, Double Porosity Method Analysis
   Theis Recovery Method Analysis

2: Effects of casing storage was calculated using the equation by David Schafer, The Johnson Drillers Journal, January-February, 1978; *Casing Storage Can Affect Pumping Test Data.* After 8 iterations, casing storage calculated to expire within 4 minutes after test start.

3: Early time transmissivity values were calculated using data from 30 to 300 minutes, as this early time data would be considered representative of a typical 12-hour pumping cycle.

4: Later time transmissivity values were calculated using data from approximately 100 to 4320 minutes (end of test), as this later time data would be considered representative of cumulitive pumping over time.

5: Moench Fracture Flow Method Analysis accounts for transient and pseudo-state flow of water released from storage to the fracture system and for water released from delayed yield of the matirx block and/or fracture skin. Upper Storage Coefficient from Moench Analysis. Lower Storage Coefficient from Groundwater and Wells Second Edition, Driscoll, 1986. The Driscoll value was used to calculate onsite and offsite impacts to wells saturated thickness and available drawdown.

6: Theis Recovery Method Analysis provides the most accurate values of transmissivity as there are no pumping influences, and all water emerging is a result of true aquifer parameters.

7: The range of hydraulic conductivity values obtained from each method are consistent with low end fractured shale and/or igneous rock aquifer (Freeze and Cherry, 1979).

Conversion Factors:

ft = feet

gpd = gallon per day

bgs = below ground surface

1 gpd/ft = 0.134 ft^2/day

1 ft/day = 7.48 gpd/ft^2

1 cm/sec = 2.83×10^{3} ft/day

Table 4
Well Pumping Rates, Credited Source Capacity and Calculated Well Yields
APN: 103-071-019 & -002
Monterey County, California

Well Identification	Field Parameters[1]				Technical Calculations[2]								
	Saturated Thickness[3] (ft)	Available Drawdown[4] (ft)	24-hour Specific Capacity[5] (gpm/ft)	72-hour Specific Capacity[6] (gpm/ft)	Ratio of Late Time to Early Time Transmissivity[7] (unitless)	Adjusted 24-hour Specific Capacity[8] (gpm/ft)	MCHD Pre-Recovery Pumping Rate[9] (gpm)	MPWMD Pre-Recovery Calculated Well Yield[10] (gpm)	Percent Well Recovery[11] (%)	Amount Reduction in Pumping Rate or Calculated Well Yield due to poor recovery[12] (%)	MCHD Post-Recovery Pumping Rate[13] (gpm)	MCHD Post-Recovery Credited Source Capacity[14] (gpm)	MPWMD Post-Recovery Calculated Well Yield[15] (gpm)
Flores/Pisenti Well #1	763.88	254.63	0.15	0.13	0.88	0.13	8.06	33.10	MCEHB =90.82% MPWMD = 94.37%	MCEHB = 5.91% MPWMD = 0.63%	**7.58**	**NA**	**32.89**
Flores/Pisenti Well #2	437.51	145.83	1.31	0.72	0.216	0.283	6.25	41.27	MCEHB =43.51% MPWMD = 54.42%	MCEHB = 51.49% MPWMD = 40.58%	**3.03**	**NA**	**24.52**

Footnotes:

1: Field Parameters obtained during pumping tests.

2: Technical Calculations follow MPWMD guidelines entilted "*Procedures for Preparation of Well Source and Pumping Impact Assessments*", September 2005, Revised, May, 2006 and/or MCHD guidelines "*Source Capacity Test Procedures*", revised May, 2008.

3: Saturated thickness: Difference between depth to static water level to bottom of perforations.

4: Available Drawdown: One-thrid of the saturated thickness.

5: 24-Hour Specific Capacity: Gallons per minute per foot of drawdown at 24 hours.

6: 72-Hour Specific Capacity: Gallons per minute per foot of drawdown at 72 hours.

7: Ratio of late time to early time transmissivity was calculated as their was an apparent difference in late to early time transmissivity.

8: Adjusted 24-Hour Specific Capacity: If warrented, the product of the ratio of late to early time transmissivity (unitless) and 24-hour Specific Capacity.

9: Pre-Recovery Pumping Rate: As per MCHD guidelines, the minimum pumping rate for the 72-hour test.

10: Pre-Recovery Calculated Well Yield: The product of the adjusted 24-hour specific capacity (if warrented) and available drawdown.

11: Percent Well Recovery:

MCEHB: Percent well recovery after one time the pumping period.

MPWMD: Percent well recovery after two times pumping period.

12: Amount Reduction in Pumping Rate or Calculated Well Yield:

MCEHB: Difference between percent recovery and 95% or, 2-feet of original static level which ever is more stringent.
For Well #1; "2-ft rule" was more stringent. For Well #2, "95%- rule" was more stringent as their was less than 40-ft of drawdown.

MPWMD: Difference between percent recovery and 95%.

13: Post-Recovery Pumping Rate: The difference (if applicable) between the Pre-Recovery Pumping Rate and Amount Reduction in Pumping Rate.

14: Credited Source Capacity: Public Water Systems only receive 25% credit of the lowest sustained pumping rate for the 72hr test. Not applicable to this parcel.

15: Post-Recovery Calculated Well Yield: The difference (if applicalbe) between the Pre-Recovery Calculated Well Yield and Amount Reduction in Calculated Well Yield.

Notes:

ft = Feet
gpm / ft= Gallons per minute per foot of drawdown.
gpm = Gallons per minute.
% = Percent
na not applicable

Table 5

Intermittent Pumping; Time/Drawdown Projections On Pumping Well at the Maximum Day Demand Rates

APN: 103-071-002

Monterey County, California

Pumping Well	Formation Penetrated(1)	Distance from Pumping Well (feet)(2)	Available Drawdown(3)	Range of Storage Coefficients(4)	CALCULATED DRAWDOWN (in feet)(5) MAXIMUM DAY DEMAND6 Rates Using a Range of Storage Coefficients			
					10 days	30 days	90 days	183 days
Flores/Pisenti Well #1	Shale	For Calculation Use 0.5'	**254.63**	0.001	31.23	*32.62*	33.98	34.85
				0.0001	36.87	*38.26*	39.62	40.49
				0.00001	42.51	***43.90***	45.26	46.13

Footnotes:

[1]: Data obtained from either DWR well log, Monterey Peninsula Water Management District (MPWMD), Monterey County Health Department (MCHD) well log, and/or Geologic Map (Figure 3)

[2]: Radial distance of 0.5' used for calculating drawdown at pumping well.

[3]: As per MPWMD, 1/3 of the wells saturated thickness (i.e. difference between static water level and based on perforated interval)

[4]: A range of Storage Coefficients from 10^{-3} to 10^{-5} were used in this analysis and are consistant with other literature-based values for fractured-rock, confined aquifers. Driscoll (1986) Groundwater and Wells, Second Edition; Walton (1987) Groundwater Pumping Tests Design and Analysis.

[5]: Calculated drawdown based on a intermitent pumping cycle of 12 hrs on, 12 hrs off using analytical method described in Groundwater and Wells, Second Edition, Driscoll, 1986, pg 235. Calculations in Appendix E.

[6]: Maximum Day Demand calculated in Table 2 which accounts for system and treatment losses. No groundwater treatement for exterior uses.

Assumptions:

Drawdown calculations assume a worst case scenario, that is;

No aquifer recharge,

Groundwater was obtained solely from aquifer storage,

Pumping well cycles 12 hrs ON, 12 hrs OFF.

A transient cone of depression (i.e. continually expanding in response to pumping) with no aquifer boundaries,

Average transmissivity throughout the aquifer,

All wells screened similarly within the same aquifer.

Table 6

Continuous Pumping; Time & Distance/Drawdown Projections On Neighboring Wells and/or SERs at Dry Season Demand Rates

APN: 103-071-002

Monterey County, California

Pumping Well	Neighboring Well or SER[1]	Formation Penetrated[1]	Raidal Distance from Pumping Well (feet)[2]	Field Parameters[3]			Neighboring Well Saturated Thickness (feet)[4]	5% of Neighboring Well Saturated Thickness (feet)[5]	Storage Coefficient used in Calculation[6]	CALCULATED DRAWDOWN (in feet)[7]			
										DRY SEASON DEMAND[8]			
				Ground Elevation (ft, msl)	Screened Interval (ft, bgs)	Static Groundwater Level (ft, bTOSt)				10 Days	30 Days	90 Days	183 Days
Flores/Pisenti Well #1	Flores/Pisenti Well #2 (Inactive Well)	Sandstone	537'	336'	180-420' 440-460' 480-500' 520-540' 560-580'	143.82	437.51	**21.8755**	1.0×10^{-5}	4.23	5.18	6.12	**6.73** [9]
	Beech Well (Active Well)	Shale	907'	275'	133-573'	82.82' (e)	490.18	**24.509**	1.0×10^{-5}	3.33	4.28	5.22	**5.83** [9]
	Maney Well (Active Well)	Shale Sandstone?	465'	345'	200-500'	157' (2001)	343	**17.15**	1.0×10^{-5}	4.48	5.43	6.37	**6.98** [9]
	Shake Well (Inactive Well)	Shale	778'	260'	200-240'	67.82' (e)	172.18	**8.609**	1.0×10^{-5}	3.60	4.54	5.48	**6.09** [9]

Footnotes:

[1]: Data obtained from MPWMD, and/or MCHD records. If applicable, thickness of Alluvium based on USGS Water Resources Investigation Report 83-4280.

[2]: Radial distances from pumping well to neighboring wells and SERs obtained from a combination of; MPWMD, and/or USGS Water Resources Investigation Report 83-4280.

[3]: Ground Elevation obtained from USGS Quad, and Garmin III, GPS; Screened Interval either obtained from MPWMD, or Estimated (e) from neighboring wells screened interval; Static Groundwater Level based on Field Measurement or Estimated (e) based on neighboring well data.

[4]: Data derived from field observations and MPWMD and MCHD records.

[5]: A reasonable significance threshold of 5% of neighboring wells saturated thickness is used in this analysis and is based on MPWMD peer review of Village Park and Commons Project, July 31, 2009.

[6]: A range of Storage Coefficients (10^{-3} to 10^{-5}) was used in this analysis (Appendix E) and are consistant with literature-based values for fractured-rock. Driscoll (1986) Groundwater and Wells, Second Edition; Walton (1987) Groundwater Pumping Tests Design and Analysis. Although a storage coefficient of 10^{-4} was derived using Aquifer Test, for conservative purposes, a storage coefficient of 10^{-5} was used for this analysis.

[7]: Calculated Drawdown based on a continuous pumping cycle (pumping 24/7) using analytical method described in Groundwater and Wells, Second Edition, Driscoll, 1986, pg 235. Drawdown calculations incldued in Appendix E

[8]: Dry Season Demand calculated at 0.94 gpm (Table 2) and represents highest six month demand period; May through October of any given year.

[9]: Technical calculations suggest that there could be measuarable drawdown in the any of the wells 1,000 feet away from Flores/Pisenti Well #1, pumping at 0.99 gpm 24/7/183. However, the drawdown value calculated is less than 5% of any of the neighboring wells saturated thickness and therefore there are less than Significant Impacts to the neighboring wells. Additionally, Flores/Pisenti Well #2 and Flores/Pisenti Well #1, both of which were pumped simultaneously, did not exhibit constructive interferece. More so, the technical calculation used assumes hydrogeologic connectivity, and it is our opninon that no hydrogeolgoic connection exists between any of the wells due to their horizonal separation.

(e) = Static Groundwater Elevations estimated based on determining the elevation difference between the Flores/Pisenti Well #2 and Beech and Shake Well (approx. 61-ft; 76-ft respectively) and subtracting that from the known depth to water in Well #2 (143.82').

Assumptions:

Drawdown calculations assume a worst case scenario, that is;

No aquifer recharge,

Groundwater was obtained solely from aquifer storage,

Constant groundwater pumping rates for the entire interim period, pumping 24 hr/day at both Average Day and Peak Day Demand flow rates for four time frames (10, 30, 60, 180 days) within the peak demand period.
The peak demand period is defined as the six month dry season from May through October (defined by MPWMD).

A transient cone of depression (i.e. continually expanding in response to pumping) with no aquifer boundaries,

Average transmissivity throughout the aquifer,

All wells screened similarly within the same aquifer.

Flores\Tables\T&D_DD.xls; sheet 'ContinuousPump T&D Ddtble'

Table 7

Continuous Pumping; Time & Distance/Drawdown Projections On Beech Well Using Flow Rates Identical to 2010 Pump-Test

APN: 103-071-019

Monterey County, California

Pumping Well	Neighboring Well or SER[(1)]	Formation Penetrated[(1)]	Raidal Distance from Pumping Well (feet)[(2)]	Field Parameters[3]			Neighboring Well Saturated Thickness (feet)[(4)]	5% of Neighboring Well Saturated Thickness (feet)[(5)]	Storage Coefficient used in Calculation[(6)]	CALCULATED DRAWDOWN (in feet)[(7)]
				Ground Elevation (ft, msl)	Screened Interval (ft, bgs)	Static Groundwater Level (ft, bTOSt)				
Flores/Pisenti Well #1	Beech Well (Active Well)	Shale	907'	275'	133-573'	82.82' (e)	490.18	**24.509**	1.0×10^{-5}	**18.69** [8]
Flores/Pisenti Well #2	Beech Well (Active Well)	Shale	647'	275'	133-573'	82.82' (e)	490.18	**24.509**	1.0×10^{-5}	**12.04** [9]

Footnotes:

[1]: Data obtained from MPWMD, and/or MCHD records. If applicable, thickness of Alluvium based on USGS Water Resources Investigation Report 83-4280.

[2]: Radial distances from pumping well to neighboring wells and SERs obtained from a combination of; MPWMD, and/or USGS Water Resources Investigation Report 83-4280.

[3]: Ground Elevation obtained from USGS Quad, and Garmin III, GPS; Screened Interval either obtained from MPWMD, or Estimated (e) from neighboring wells screened interval; Static Groundwater Level based on Field Measurement or Estimated (e) based on neighboring well data.

[4]: Data derived from field observations and MPWMD and MCHD records.

[5]: A reasonable significance threshold of 5% of neighboring wells saturated thickness is used in this analysis and is based on MPWMD peer review of Village Park and Commons Project, July 31, 2009.

[6]: A range of Storage Coefficients (10^{-3} to 10^{-5}) was used in this analysis (Appendix E) and are consistant with literature-based values for fractured-rock. Driscoll (1986) Groundwater and Wells, Second Edition; Walton (1987) Groundwater Pumping Tests Design and Analysis. Although a storage coefficient of 10^{-4} was derived using Aquifer Test, for conservative purposes, a storage coefficient of 10^{-5} was used for this analysis.

[7]: Calculated Drawdown based on a continuous pumping cycle (pumping 24/7) using analytical method described in Groundwater and Wells, Second Edition, Driscoll, 1986, pg 219 to 235. Drawdown calculations incldued in Appendix E.

[8]: Technical calculations suggest that there could be measuarable drawdown in the Beech Well, 907 feet away from Flores/Pisenti Well #1, pumping at the same flow rate as pumped during the pumping-test (8.06 gpm) for 3-days. However, the range of drawdown values calcuclated; 2 to 18-ft depending on storage coefficient used (Appendix E) is not enough drawdown to dewater the Beech Well and is also less than 5% of the Beech Wells estimated saturated thickness and therefore there are less than significant impacts to the Beech Well.

[9]: Technical calculations suggest that there could be measuarable drawdown in the Beech Well, 647 feet away from Flores/Pisenti Well #2, pumping at the same flow rate as pumped during the pumping-test (6.25 gpm) for 3-days. However, the range of drawdown values calcuclated; 0 to 12-ft depending on storage coefficient used (Appendix E) is not enough drawdown to dewater the Beech Well and is also less than 5% of the Beech Wells estimated saturated thickness and therefore there are less than significant impacts to the Beech Well.

(e) = Beech Static Groundwater Elevation, estimated based on determining the elevation difference between the Flores/Pisenti Well #2 and Beech Well (76-ft) and subtracting that from the known depth to water in Well #2 (143.82').

Assumptions:

Drawdown calculations assume a worst case scenario, that is;

No aquifer recharge,

Groundwater was obtained solely from aquifer storage,

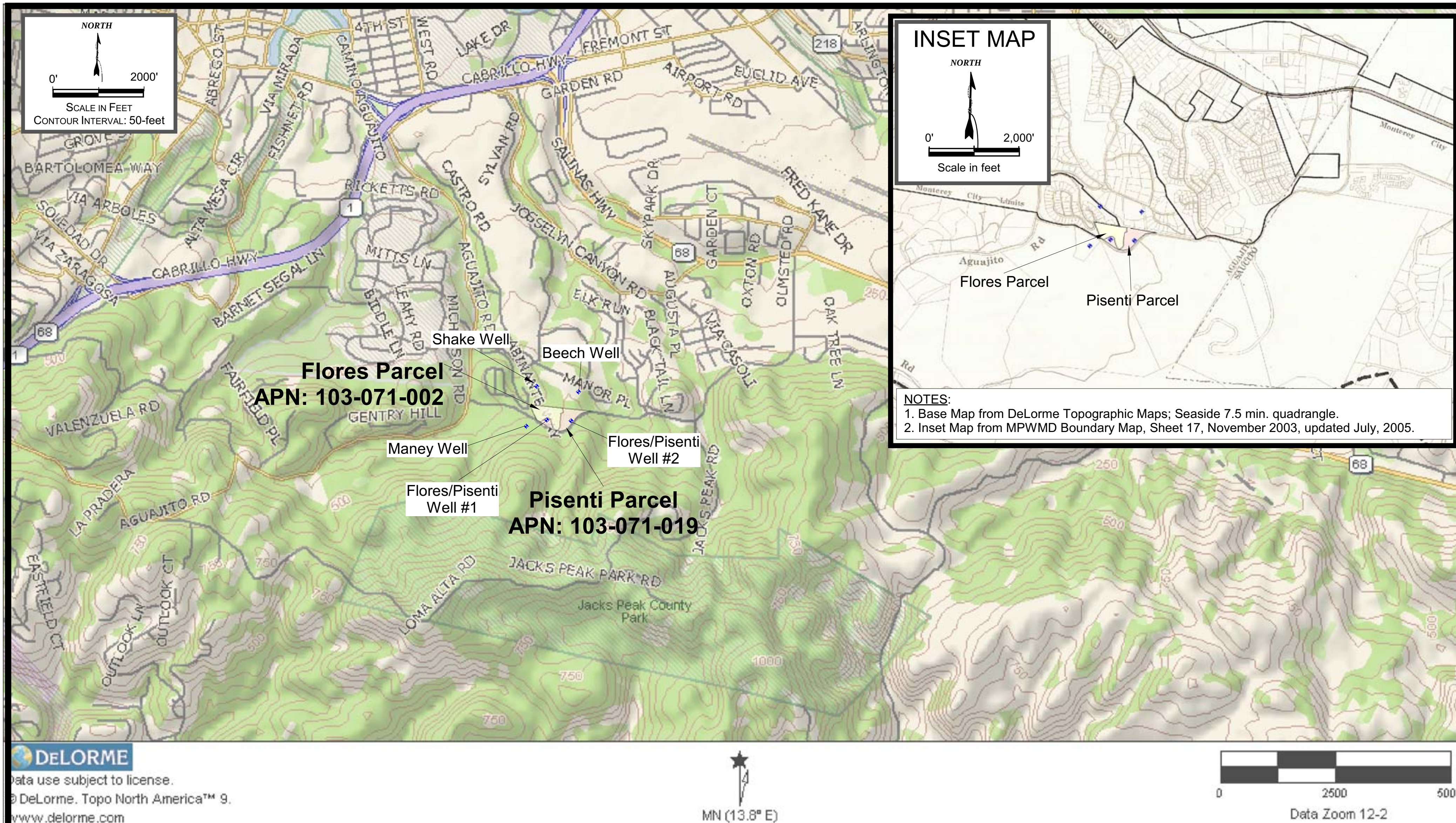
Constant groundwater pumping rates for the entire interim period, pumping 24 hr/day at both Average Day and Peak Day Demand flow rates for four time frames (10, 30, 60, 180 days) within the peak demand period.
The peak demand period is defined as the six month dry season from May through October (defined by MPWMD).

A transient cone of depression (i.e. continually expanding in response to pumping) with no aquifer boundaries,

Average transmissivity throughout the aquifer,

All wells screened similarly within the same aquifer.

Flores\Tables\T&D_DD.xls; sheet 'Beech Well for 3-days'



NOTES:
1. Base Map from DeLorme Topographic Maps; Seaside 7.5 min. quadrangle.
2. Inset Map from MPWMD Boundary Map, Sheet 17, November 2003, updated July, 2005.

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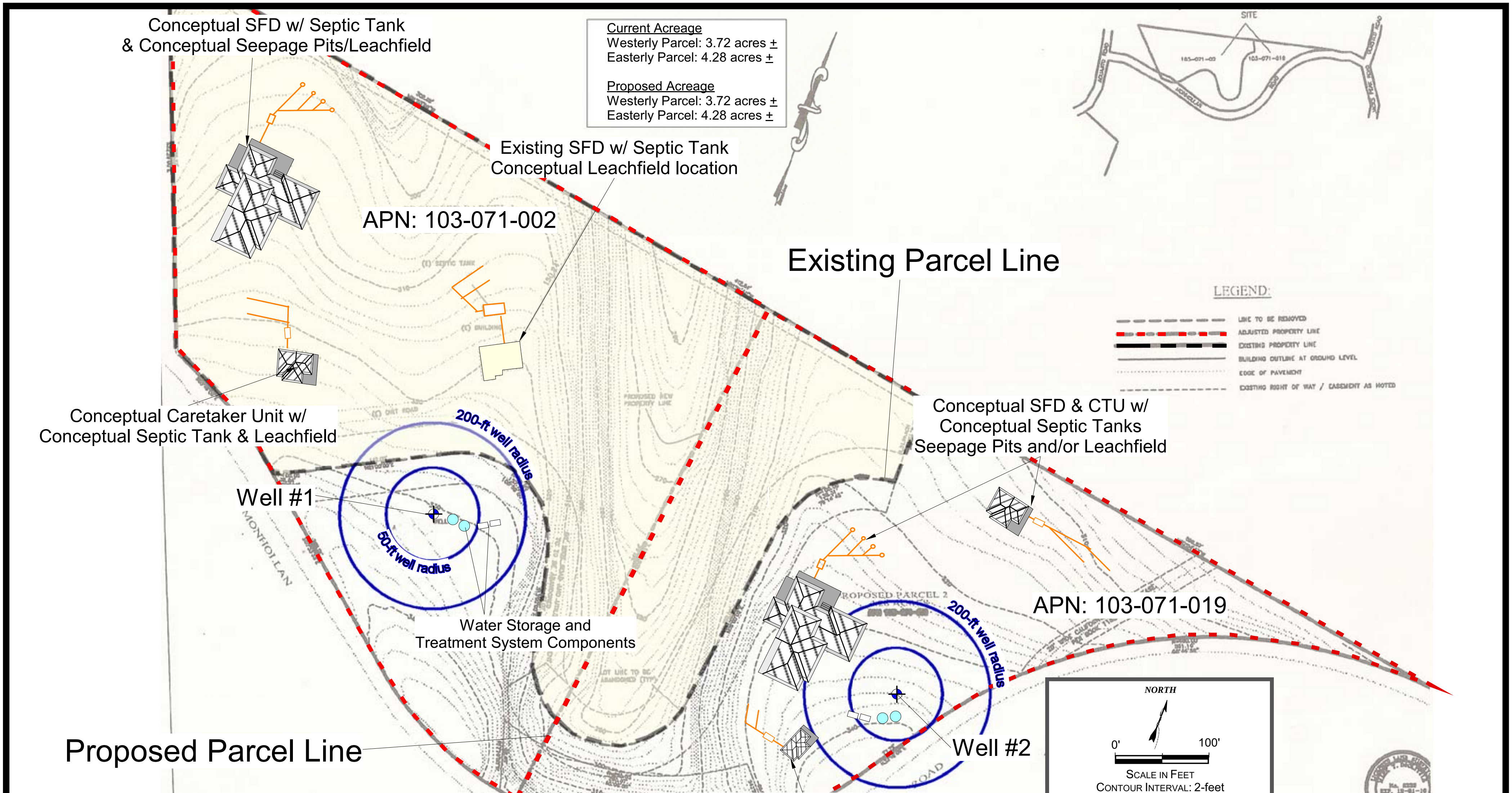
LOCATION MAP
APN:103-071-019 & -002
T16S, R1E, Section 4
Monterey County, California

FIGURE 1

By: A. Bierman, 3/4/2011
File: Garcia/Figures/location.cvx



NOTES:
1) Base Map Provided by Paul Flores; Survey supplied by Land Surveyer - Mark Doolittle
2) Well Locations are based on MPWMD Well Radius Search Data - Figure 5, and Garmin III GPS.

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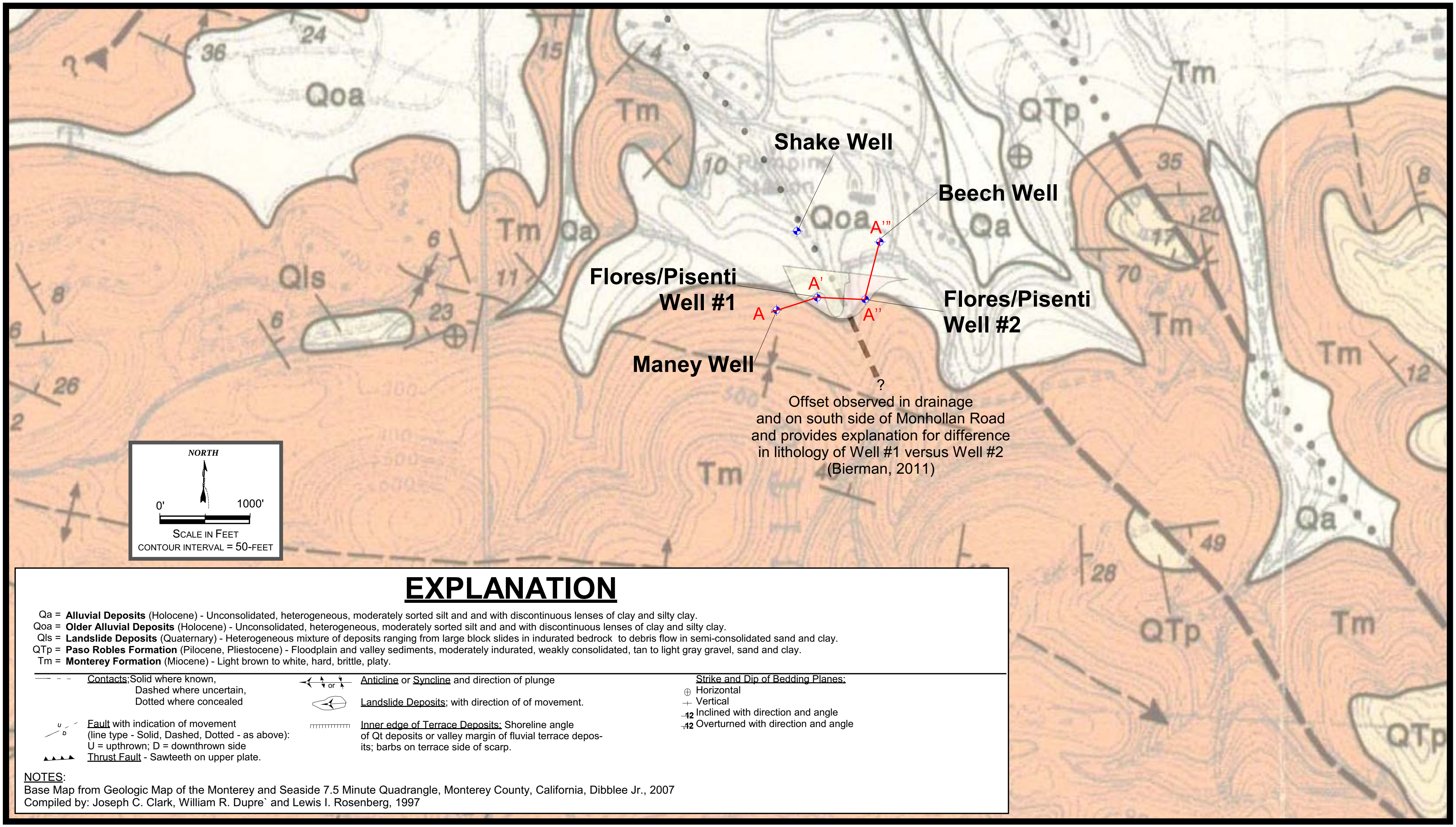
SITE MAP
APN: 103-071-019 & -002
Monterey County, California

FIGURE 2

By: A. Bierman, March, 14, 2011
File: Flores/Figures/Site Map.cvx



EXPLANATION

Qa = **Alluvial Deposits** (Holocene) - Unconsolidated, heterogeneous, moderately sorted silt and and with discontinuous lenses of clay and silty clay.
Qoa = **Older Alluvial Deposits** (Holocene) - Unconsolidated, heterogeneous, moderately sorted silt and and with discontinuous lenses of clay and silty clay.
Qls = **Landslide Deposits** (Quaternary) - Heterogeneous mixture of deposits ranging from large block slides in indurated bedrock to debris flow in semi-consolidated sand and clay.
QTp = **Paso Robles Formation** (Pilocene, Pliestocene) - Floodplain and valley sediments, moderately indurated, weakly consolidated, tan to light gray gravel, sand and clay.
Tm = **Monterey Formation** (Miocene) - Light brown to white, hard, brittle, platy.

Contacts; Solid where known, Dashed where uncertain, Dotted where concealed

Fault with indication of movement (line type - Solid, Dashed, Dotted - as above): U = upthrown; D = downthrown side

Thrust Fault - Sawteeth on upper plate.

Anticline or Syncline and direction of plunge

Landslide Deposits; with direction of of movement.

Inner edge of Terrace Deposits: Shoreline angle of Qt deposits or valley margin of fluvial terrace deposits; barbs on terrace side of scarp.

Strike and Dip of Bedding Planes:
Horizontal
Vertical
12 Inclined with direction and angle
12 Overturned with direction and angle

NOTES:
Base Map from Geologic Map of the Monterey and Seaside 7.5 Minute Quadrangle, Monterey County, California, Dibblee Jr., 2007
Compiled by: Joseph C. Clark, William R. Dupre` and Lewis I. Rosenberg, 1997

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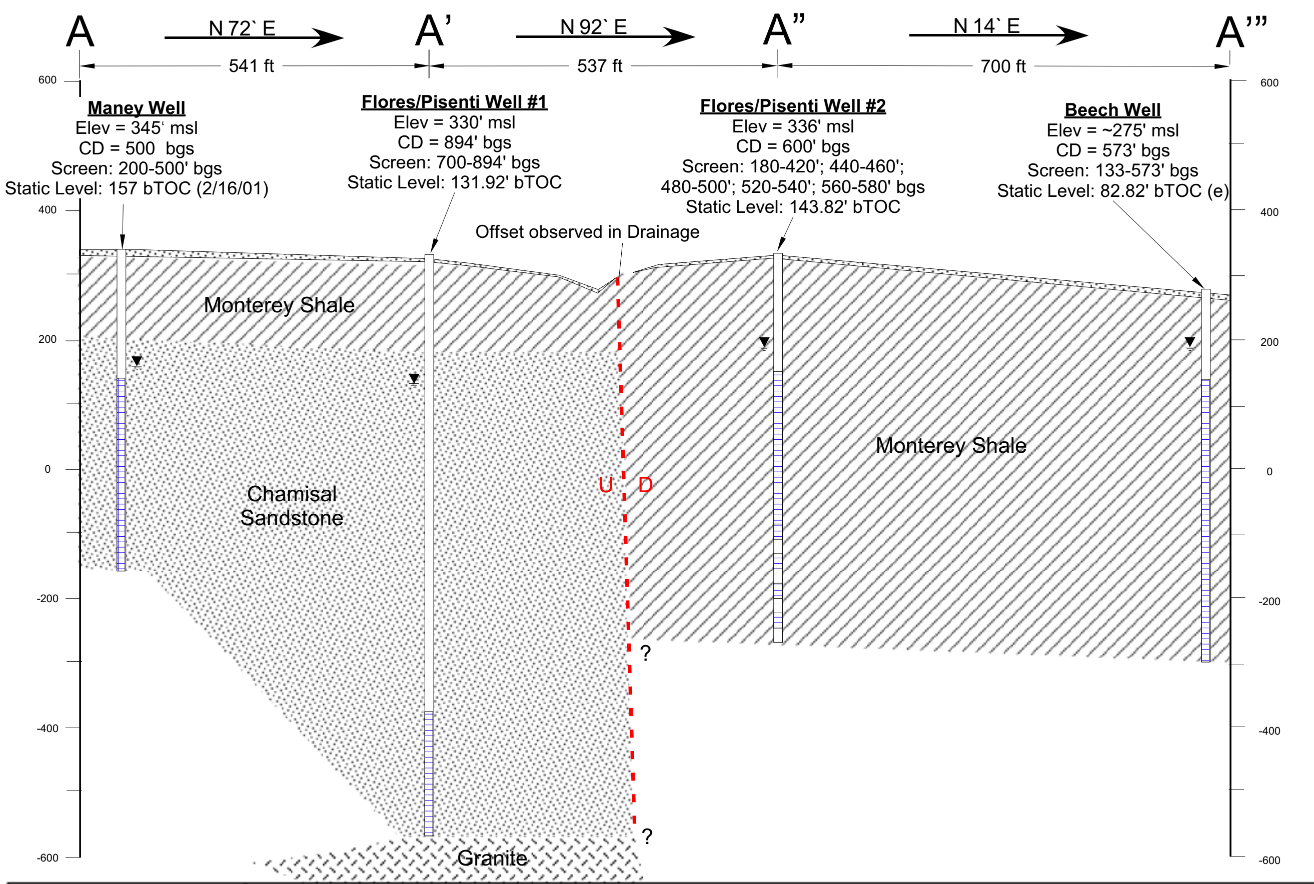
Geologic Map

APN:103-071-019 & -002
T16S, R1E, Section 4
Monterey County, California

Figure 3

By: A. Bierman, 3/14, 18/2011
Flores/Figures/Geologic Map.cvx



EXPLANATION

0' 200' 200'

HORIZONTAL SCALE IN FEET
VERTICAL SCALE IN FEET
NO VERTICAL EXAGG.

Qa = **Alluvial Deposits** (Holocene) - Unconsolidated, heterogeneous, moderately sorted silt and and with discontinuous lenses of clay and silty clay.
Qoa = **Older Alluvial Deposits** (Holocene) - Unconsolidated, heterogeneous, moderately sorted silt and and with discontinuous lenses of clay and silty clay.
Tm = **Monterey Formation** - (Miocene) - Light brown to white, hard, brittle, platy.
Tus = **Chamisal Sandstone** (Miocene) - Marine deposition; buff to light-gray, poorly to well sorted arkosic sandstone, locally friable, locally conglomeratic.
Kgd = Fractured Granite

This geologic cross section is a graphical representation only.
Data used to create this cross section was obtained from Geologic Map (Figure 3) and Department of Water Resources Well Completion Report (Appendix A).
Faults (if applicable): Faults offset, dip and motion inferred from Geologic Map, Figure 3 and Department of Water Resources (DWR) Well Completion Reports.

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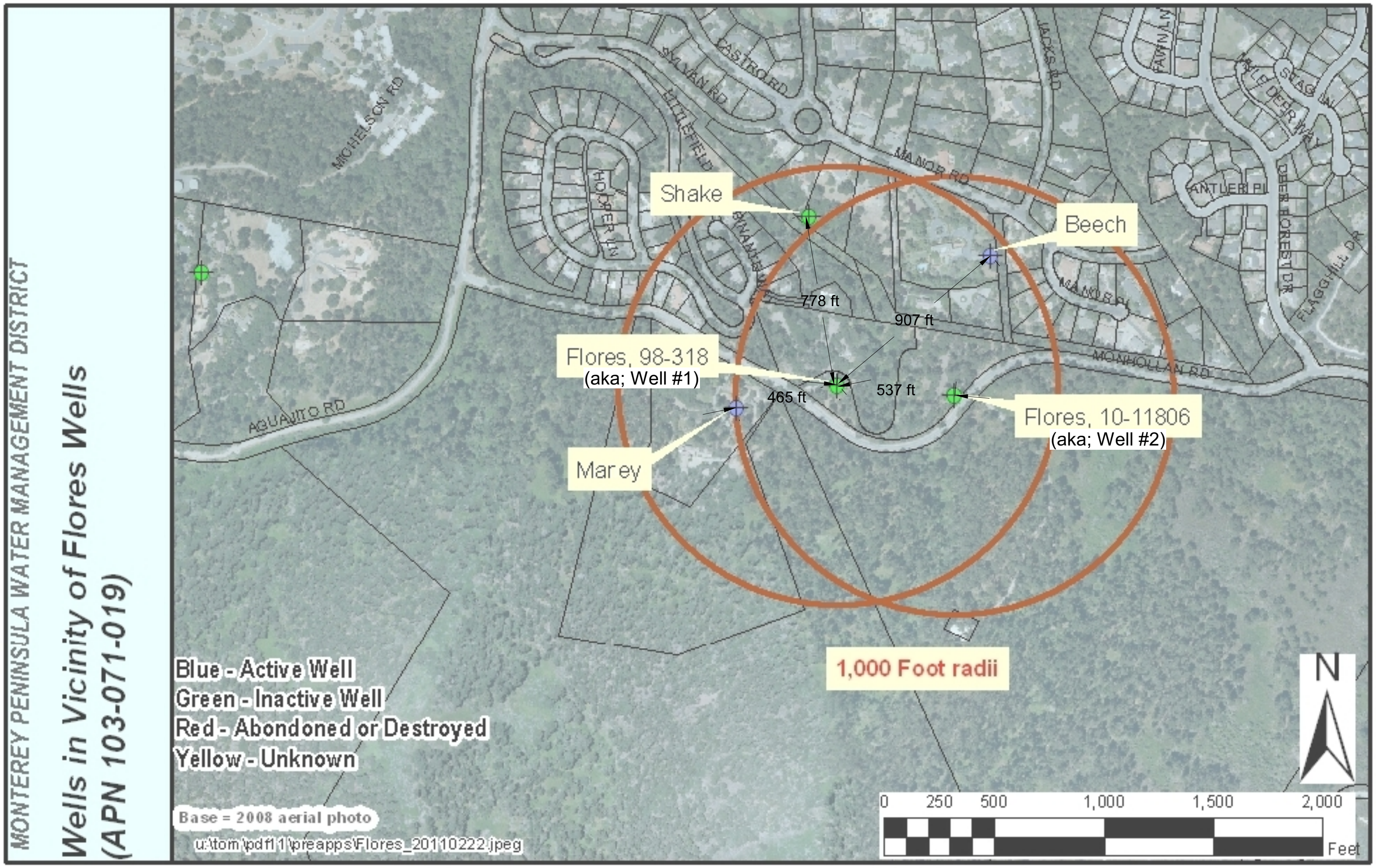
CONCEPTUAL GEOLOGIC CROSS SECTION A-A'-A"-A'"

APN: 103-071-019 & -002
Carmel Valley, Monterey County, California

FIGURE 4

By: Ab: 3/19/11
File: Flores/Figures/A-A'.cvx



NOTES:
1) Base Map from Monterey Peninsula Water Management District (MPWMD), 2/22/11.

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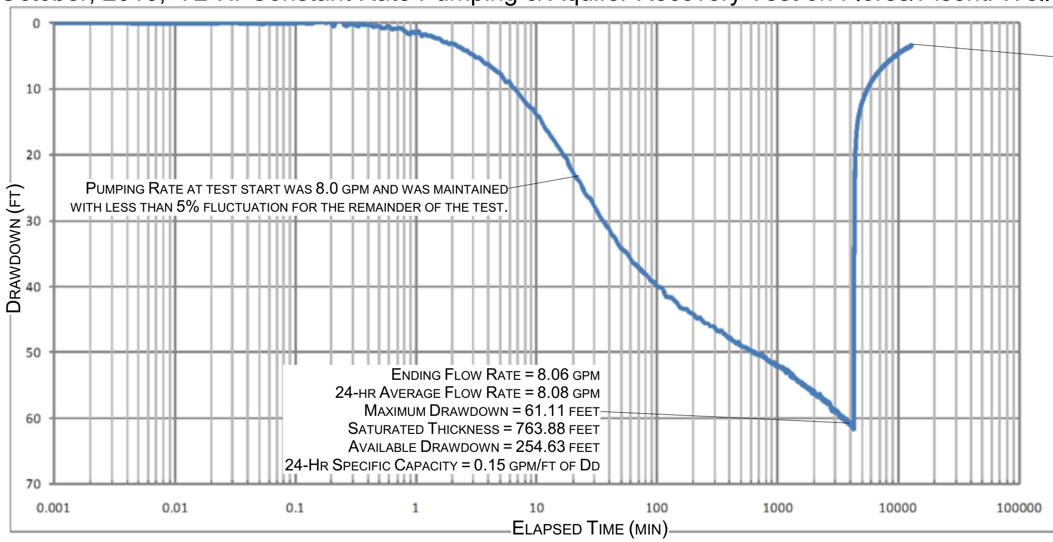
WELL RADIUS MAP

APN: 103-071-019 & -002
Monterey County, California

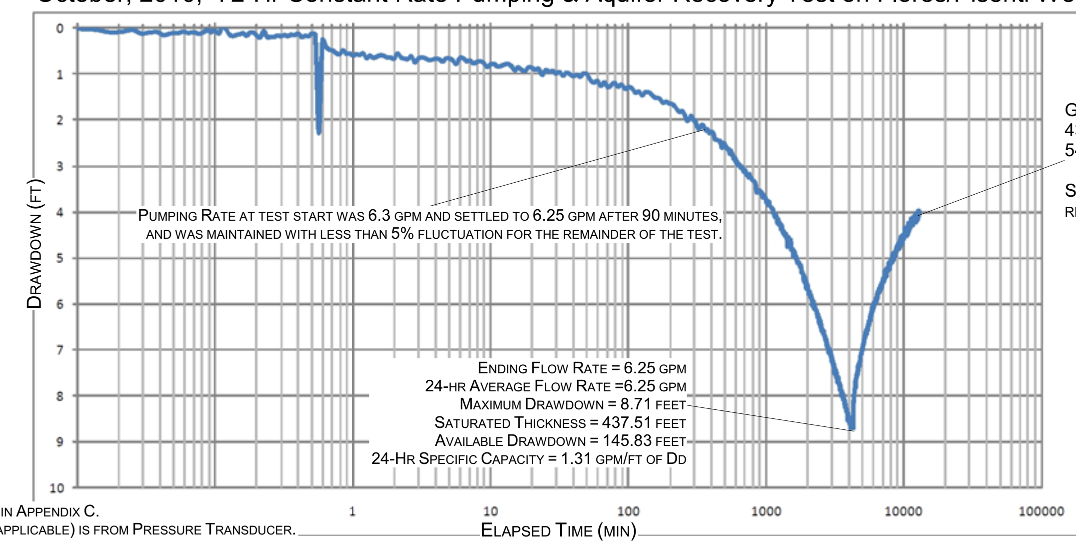
FIGURE 5

By: AB; March 14, 2011
Flores/Figures/WellRadiusMap.cvx

October, 2010; 72-Hr Constant Rate Pumping & Aquifer Recovery Test on Flores/Pisenti Well #1



October, 2010; 72-Hr Constant Rate Pumping & Aquifer Recovery Test on Flores/Pisenti Well #2



Notes: Data used to create graph is included in Appendix C.
Pumping Well and Observation Well Data (if applicable) is from Pressure Transducer.

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Groundwater Drawdown & Recovery Curves

APN: 103-071-019 & -002

Monterey County, California

Figure 6

By: AB, 3/16; 19/11
Flores/Figures/GWDd&R.cvx

APPENDIX A

MCEHB WATER WELL CONSTRUCTION PERMIT #98-318 (WELL #1)
DWR WELL COMPLETION REPORT NO: 527042 (WELL #1)
MCEHB WATER WELL CONSTRUCTION PERMIT #10-11806 (WELL #2)
DWR WELL COMPLETION REPORT NO: E069163 (WELL #2)

MONTEREY COUNTY

DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
1270 Natividad Road
Salinas, CA 93906
(408) 755-4507

MONTEREY COUNTY CALIFORNIA • 1850 •

WATER WELL PERMIT

WELL PERMIT NO. 98-318

ISSUED: 12-23-98
EXPIRES: 12-23-99
RECEIPT: 6329
APN: 103-071-019

SITE LOCATION: 564 Monhollan Road
TYPE: Domestic - Single Connection Only
OWNER: Jack Paquin
ADDRESS: 496 Aguajito Rd.
CITY: Carmel, CA 93923
PHONE: 624-4559
DRILLING CONTRACTOR: Fred Ash/Lynch Pump
LICENSE: 408285

ISSUED BY: E. Kane

CONDITIONS OF APPROVAL:

1. The well shall be at least 100 feet from any septic tank; any portion of any leachfield; any sewer; and 150 feet from any seepage pit. If type of absorption field is unknown, the distance shall be 150 feet.
2. Location of the well shall not prevent the installation, relocation or expansion of the septic system on any adjoining lot.
3. Notify the Health Department prior to moving on site.
4. Water well permit shall be kept on site at all times while work is in progress.
5. Notify the Health Department 24 hours prior to the time you expect to place any seal.
6. Sanitary seal shall be placed 10 feet into the first SIGNIFICANT impermeable layer (as evidenced by logging) beyond 50 feet. The exact location of sanitary and strata seals shall be approved by the Health Department after review of logs.
8. Surface construction features of the completed well shall be in accordance with Bulletin 74-81 (including all supplements), "Water Well Standards: State of California."
10. Any water well on the premises which is to be abandoned, or which has been abandoned already, shall be properly destroyed within six months of the completion of this well.
11. If the seal(s) cannot be witnessed by the Health Department, a detailed, written description of the seal(s) shall be submitted to the Health Department within ten (10) days.
12. Contact the Health Department when the well is ready to use and request a final inspection of the completed well.
13. Owner shall comply with all Monterey Peninsula Water Management District conditions (attached).
14. Owner shall comply with Title 17 of California Code of Regulations and any California-American Water Company requirements pertaining to backflow protection (contact Cal-Am at 646-3213).

Important Information From Monterey Peninsula Water Management District:

Issuance of this well construction permit does not guarantee a water right for its use. Water rights for certain areas within the Monterey Peninsula Water Management District, particularly the Carmel River and its associated alluvial aquifer, are under the jurisdiction of the California State Water Resources Control Board (SWRCB). If your planned well is proposed to extract water from this supply source, it is recommended that you contact the SWRCB at (916) 657-1364 for additional information prior to initiating well construction. The well owner bears sole responsibility for operating this well pursuant to a lawful water right

END

ACKNOWLEDGED RECEIPT ←

TRIPLICATE ______ DATE ______
Owner's Copy ______ DATE ______
Page ___ of ___
Owner's Well No. ______
Date Work Began 4-15-99 Ended 3/1/00
Local Permit Agency MONTEREY COUNTY
Permit No. 98-318 Permit Date 12/23/98

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 527042

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

GEOLOGIC LOG

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

DEPTH TO FIRST WATER 202 (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft. to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0 3	TOPSOIL
3 138	FRACTURED SHALE w/clay stks
138 698	UPPER CHAMISAL FORMATION (SILTSTONES & CLAYS
698 894	LOWER CHAMISAL SANDSTONES SANDS & GRAVELS
894	GRANITE

TOTAL DEPTH OF BORING 894 (Feet)
TOTAL DEPTH OF COMPLETED WELL 894 (Feet)

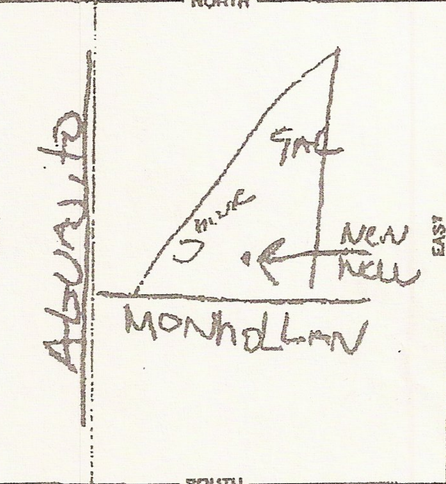
WELL OWNER

Name JACK PAQUIN
Mailing Address 564 AGUAJITO RD
CARMEL CA 93923

WELL LOCATION

Address 564 MONHOLLAN
City CARMEL CA
County MONTEREY
APN Book 103 Page 071 Parcel 019
Township ___ Range ___ Section ___
Latitude ___ NORTH Longitude ___ WEST
DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH



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

ACTIVITY (✓)

___ NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

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

PLANNED USE(S) (✓)

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

DRILLING METHOD Rotary mud/air hammer FLUID MUD/FOAM

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 155 (Ft.) & DATE MEASURED 3/1/00
ESTIMATED YIELD* 26 (GPM) & TEST TYPE PUMP
TEST LENGTH 24 (Hrs.) TOTAL DRAWDOWN 180.5 (Ft.)

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

CASING(S)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA (Inches)	TYPE: BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL/GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0 700	19			X		Mild steel	10 3/4	.025	
700 894	10		X			PVC Sch	5	SCH 200	.032

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0 700	X			
700 894			X	8x16 Lapis

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other

CERTIFICATION STATEMENT

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

NAME FRED AGHT & SONS LYNCH PUMP CO
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

13245 MONTEREY RD SAN MARTIN CA 95046
ADDRESS CITY STATE ZIP

MONTEREY COUNTY

DEPARTMENT OF HEALTH
ENVIRONMENTAL HEALTH BUREAU
1270 Natividad Road
Salinas, CA 93906
(831) 755-4507

WATER WELL CONSTRUCTION PERMIT

WELL PERMIT # 10-11806 **ISSUED: 9-24-10**

EXPIRES: 9-24-11

SITE LOCATION: Monhollan Road (577) **APN: 103-071-019**

OWNER: Pisenti Louise Etal **PHONE: 408-605-8871**

ADDRESS: 317 Montclair Road

CITY: Los Gatos

DRILLING CONTRACTOR: Granite Drilling **LICENSE: 279262**

ISSUED BY: ______________________

CONDITIONS OF APPROVAL:

1. All requirements set forth in Monterey Code Chapter 15.08 and Bulletins 7481 and 74-90, shall be complied with at all times.
2. The well shall be at least 100 feet from any septic tank; any portion of any leach field ornimal enclosure; 50 feet from any sewer main, line or lateral; and 150 feet from any seepage pit. If type of absorption field is unknown, the distance shall be 150 feet.
3. Location of the well shall not prevent the installation, relocation or expansion ofhe septic system on any adjoining lot.
4. Water well permit shall be kept on site at all times while work is in progress.
5. The well shall be drilled in the approved location delineated on the attached map, Exhibit A. The well cannot be drilled in anyother location without prior approval from EHB and receipt of an amended permit.
6. Any water well on the premises which is to be abandoned, or which has been abandoned shall be properly destroyed within six months of the completion of this well.
7. Notify the Monterey County Health Department, Environmental HealthBureau (EHB) at least 24 hours prior to moving on site.
8. Notify the EHB 24 hours prior to the time you expect to place any seal.
9. If the seal(s) cannot be witnessed by theEHB, a detailed, written description of the seal(s) shall be submitted to the EHB within ten days.
10. Surface construction features of the completed well shall be in accordance with the California Well Standards Bulletin 74-81 and Bulletin 74-90 Section 10.

11. The permit applicants shall indemnify and hold harmless the County and its officers, agents, and employees from actions or claims of any description brought on account of any injury or damages sustained, by any person or property resulting from the issuance of the permit and theconduct of the activities authorized under said permit.

12. Issuance of this permit to construct a water well does not create, transfer, assign or acknowledge any legal rights to water associated with this property.

13. Issuance of this permit to construct a water well does not guarantee that the well can be approved for domestic use.

14. A geologic log shall be performed and it shall be submitted to the EHB before the well is sealed. Interpretation of the geologic log shall be provided by the contractor indicatingthe best location(s) for sealing off poor quality water and the proposed seal depth. The exact location of sanitary and strata seals shall be approved by the EHB in consultation with any appropriate water management agency before the well is sealed. The permit applicant may request review of the approved seal depth by a 3rd party licensed hydrogeologist at the applicant's expense if the applicant disagrees with EHB's decision.

15. The well shall be properly disinfected before use.

16. In the event there shall be a chemical injector installed on the discharg line of this well, an approved backflow prevention device shall be installed between the well and the injection port.

17. Monterey City Ordinance requires that construction operations take place between the hours of 7:00 AM & 7:00 PM.

PLEASE NOTE THE FOLLOWING:

1. Monterey Peninsula Water Management Requirements(MPWMD): The proposed well is located within the MPWMD boundary and will be subject to MPWMD requirements. Information onMPWMD requirements are listed below and a copy of the forms have also beenattached. It is recommended you reviewMPWMD requirements prior to construction

Requirements for new water wells within the MPWMD
http://www.mpwmd.dst.ca.us/pae/wds/wds.htm
MPWMD Water Well Registration Form
http://www.mpwmd.dst.ca.us/wrd/wells/forms/2007reg/regform_and_instr07.pdf
Water Meter Installation Standards and Guidelines
http://www.mpwmd.dst.ca.us/pae/wds/WellMetering/WMISG20060525.pdf
Pre-Application for a Water Distribution System Permit
http://www.mpwmd.dst.ca.us/pae/wds/WDSPermits/WDS_PreAppForm_20100720.pdf
Application for a Water DistributionSystem Permit(must do pre-application first)
http://www.mpwmd.dst.ca.us/pae/wds/WDSPermits/Webcoverpage_application_HS040108.htm

2. Hard rock wells draw water from smaller, less productive areas and water levels or yields may drop rapidly as fractures go dry. The experience of declining and failing yields in hard rock wells is due to the meager ability of fractured rock to store and transmit water. Altough this well permit is issued based on set back requirements being met, a well completed in hard rock formation may not be a longterm sustainable water supply.

3 Issuance of this well construction permit does not guarantee a water right for its use Water rights for certain areas within the Monterey Peninsula Water Management District, particularly the Carmel River and its associated alluvial aquifer, are under the jurisdiction of the California State Water Resources Control Board (SWRCB). If your planned well is proposed to extract water from this supply source, it is recommended that you contact the SWRCB at (916) 657-1364 for additional information prior to initiating well construction. The well owner bears sole responsibility for operating this well pursuant to a lawful water right.

END

ORIGINAL
File with DWR

Page 1 of 3

Owner's Well No. 1

Date Work Began 10/5/2010, Ended 10/7/2010

Local Permit Agency Monterey Health Department

Permit No. 10-11806 Permit Date 9/24/2010

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. e069163

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

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

DRILLING METHOD AIR FLUID AIR/MUD

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
0	75	Mudstone and siltstone with sandy clay
		interbeds light brown to orange - white
75	600	Monterey shale; dark gray with interbedded
		sandstone through out
		SCREEN LOG
0	180	BLANK 5" SDR 17 CERTA-LOK
180	420	.032 SCREEN 5" SDR 17 CERTA-LOK
420	440	BLANK 5" SDR 17 CERTA-LOK
440	460	.032 SCREEN 5" SDR 17 CERTA-LOK
460	480	BLANK 5" SDR 17 CERTA-LOK
480	500	.032 SCREEN 5" SDR 17 CERTA-LOK
500	520	BLANK 5" SDR 17 CERTA-LOK
520	540	.032 SCREEN 5" SDR 17 CERTA-LOK
540	560	BLANK 5" SDR 17 CERTA-LOK
560	580	.032 SCREEN 5" SDR 17 CERTA-LOK
580	600	BLANK 5" SDR 17 CERTA-LOK, END CAP

TOTAL DEPTH OF BORING 600 (Feet)

TOTAL DEPTH OF COMPLETED WELL 600 (Feet)

WELL OWNER

Name Pisenti Louise Etal

Mailing Address 317 Montclair Road

Los Gatos CA 95032

CITY STATE ZIP

WELL LOCATION

Address 577 Monhollan Road

City Monterey CA 93940

County Monterey

APN Book 103 Page 071 Parcel 019

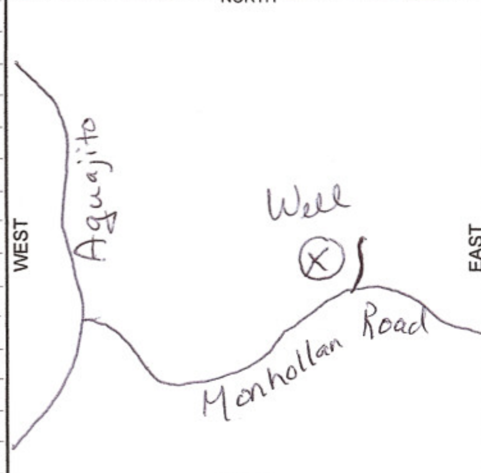
Township ___ Range ___ Section ___

Latitude ___ DEG. MIN. SEC. Longitude ___ DEG. MIN. SEC.

LOCATION SKETCH

NORTH

WEST



EAST

SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

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

PLANNED USES (✓)

WATER SUPPLY
✓ Domestic ___ Public
___ Irrigation ___ Industrial

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

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 180 (Ft.) BELOW SURFACE 1

DEPTH OF STATIC WATER LEVEL 143.5 (Ft.) & DATE MEASURED 10/7/2010

ESTIMATED YIELD * 30 (GPM) & TEST TYPE AIR LIFT

TEST LENGTH 8 (Hrs.) TOTAL DRAWDOWN N/A (Ft.)

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

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	16	17"			✓		STEEL	10 3/4"	.188	
280		10"	✓				PLASTIC	5"	SDR 17	
320		10"		✓			PLASTIC	5"	SDR 17	.032

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	100	✓			10 SACK
0	425			✓	1/4" GRAVEL

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

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

NAME GRANITE DRILLING CO.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

P.O. BOX 6038 SALINAS CA 93912
ADDRESS CITY STATE ZIP

Signed Kim T Kardel 10/08/10 279262
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

APPENDIX B

RESIDENTIAL FIXTURE UNIT COUNT
APN:-002: SINGLE FAMILY DWELLING
APN:-002: CARETAKER UNIT

NON-POTABLE WATER USE FACTORS & ESTIMATED TOTAL WATER USE

MAXIMUM APPLIED WATER ALLOWANCE (MAWA)

Monterey Peninsula Water Management District

5 Harris Court, Bldg. G - P.O. Box 85 - Monterey, CA 93942-0085 - (831) 658-5601 - Fax (831) 644-9558 – www.mpwmd.dst.ca.us

HOW ARE NEW WATER CONNECTION FEES COMPUTED?

Effective July 1, 2010, the Monterey Peninsula Water Management District (MPWMD) will be using the following fee structures to assess fees for water permits. Fees are related to the project's estimated water usage and the need to finance new water supply projects. Inquiries related to fee calculations may be made to the District's permit office at (831) 658-5601. Using Table I, residential connection fees are assessed on the number of water-using fixtures and landscaping on the property, multiplied by a fixture unit value, which is then multiplied by a dollar value per fixture unit. "Fixtures" are simply those devices that use water in the home--sinks, bathtubs, dishwashers, toilets, etc. Hot water heaters are not included. The "unit value" is a rating based on the Uniform Plumbing Code and appears below:

TABLE I: RESIDENTIAL FIXTURE UNIT COUNT

Revisions effective December 14, 2009 by Resolution 2009-10

Westerly Parcel 'Conceptual' SFD Design

TYPE OF FIXTURE	NO. OF FIXTURES	FIXTURE UNIT VALUE		FIXTURE UNIT COUNT
Washbasins	4	x 1.0		4.0
Two Washbasins in the Master Bathroom	1	x 1.0	=	1.0
Toilet, Ultra Low Flush (1.6 gallons-per-flush)	5	x 1.7	=	8.5
Toilet, High Efficiency (HET) (1.3 gallons maximum)*		x 1.3	=	
Urinal (1.0 gallon-per-flush)		x 1.0	=	
Urinal, High Efficiency (0.5 gallon-per-flush)		x 0.5	=	
Urinal, Zero Water Consumption		x 0.0	=	
Bathtub (may be Large with Showerhead above) & Separate Shower in the Master Bathroom Bathtub may be Large & Separate Shower		x 3.0	=	
Large Bathtub (may have Showerhead above)	2	x 3.0	=	6.0
Standard Bathtub (may have Showerhead above)	2	x 2.0	=	4.0
Shower, Separate Stall (one Showerhead)	1	x 2.0	=	2.0
Shower, each additional fixture (including additional Showerheads, Body Spray Nozzles, etc.)		x 2.0	=	
Shower System, Rain Bars, or Custom Shower (varies according to specifications)		x 2.0	=	
Kitchen Sink (including optional adjacent Dishwasher)	1	x 2.0	=	2.0
Kitchen Sink with adjacent High Efficiency Dishwasher*		x 1.5	=	
Dishwasher, each additional (including optional adjacent sink)		x 2.0	=	
Dishwasher, High Efficiency each additional (including optional adjacent sink)*		x 1.5	=	
Laundry Sink/Utility Sink (one Sink per Residential Site)	1	x 2.0	=	2.0
Clothes Washer	1	x 2.0	=	2.0
Clothes Washer, High Efficiency (HEW) with a water factor of 5.0 or less.*		x 1.0	=	
Bidet		x 2.0	=	
Bar Sink	1	x 1.0	=	1.0
Entertainment Sink -sink outside	1	x 1.0	=	1.0
Vegetable Sink		x 1.0	=	
Swimming Pool (each 100 square-feet of pool surface area); 800 sq. ft pool	8	x 1.0	=	8.0
Outdoor Water Uses (new Connection only) – (Lot size of 10,000 sq-ft or less)		x 1.0	=	
(1) 50% total interior fixture units		x 1.0	=	
(2) 25% interior fixture units (required by Jurisdiction for native Landscaping)*		x 1.0	=	

For New Connection Outdoor water use on lots over 10,000 sq-ft, see the Water Budget Information handout before proceeding

~~Outdoor Water Uses (new Connection only) – (Lot size exceeding 10,000 sq-ft)~~ = 41.5 or 0.415 af/yr

~~(1) 50% total interior fixture units, or MAWA, whichever is greater~~

(2) 25% interior fixture units (required by Jurisdiction for native Landscaping)*

TOTAL FIXTURE UNIT COUNT

See MPWMD Non-Potable Water Use Factors in Appendix B for Estimated Total Water Use (ETWU) and for calculations of Maximum Allowable Water Allowance (MAWA).

**** Requires Deed Restriction***

To calculate exterior water use (NEW CONSTRUCTION ONLY): To estimate permit fees for new construction, multiply the total fixture unit count by 1.5 for the overall number of fixture units. A MAWA calculation and landscape plans must be included for those properties that are over 10,000 square feet. Multiply the total number of fixture units including landscaping by the connection fee as established by the MPWMD. As of July 1, 2009, this amount is $235.67 per fixture unit in the CAW main system; in addition, an administrative processing fee of $210 per dwelling unit.

Total Fixture Count________ x 0.01=________Acre Feet of water needed x Connection Charge = ________________

Processing Fee = ________________

Total Fees ________________

To be paid at time of permit issuance

NOTE: All residential new construction must meet the following District requirements:

- Toilets must be designed to use not more than 1.6 gallons-per-flush
- Showerheads must flow at no more than 2.0 gallons-per-minute
- Faucets must flow at no more than 2.2 gallons-per-minute
- On-demand hot water system (instant-access)
- Rain Sensor & Soil Moisture Sensors on automatic Irrigation Systems
- Drip irrigation where appropriate

Monterey Peninsula Water Management District

5 Harris Court, Bldg. G - P.O. Box 85 - Monterey, CA 93942-0085 - (831) 658-5601 - Fax (831) 644-9558 – www.mpwmd.dst.ca.us

HOW ARE NEW WATER CONNECTION FEES COMPUTED?

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TABLE I: RESIDENTIAL FIXTURE UNIT COUNT

Revisions effective December 14, 2009 by Resolution 2009-10

Westerly Parcel 'Conceptual' Caretaker Unit Design

TYPE OF FIXTURE	NO. OF FIXTURES	FIXTURE UNIT VALUE		FIXTURE UNIT COUNT
Washbasins	2	x 1.0		2.0
Two Washbasins in the Master Bathroom		x 1.0	=	
Toilet, Ultra Low Flush (1.6 gallons-per-flush)	2	x 1.7	=	3.4
Toilet, High Efficiency (HET) (1.3 gallons maximum)*		x 1.3	=	
Urinal (1.0 gallon-per-flush)		x 1.0	=	
Urinal, High Efficiency (0.5 gallon-per-flush)		x 0.5	=	
Urinal, Zero Water Consumption		x 0.0	=	
Bathtub (may be Large with Showerhead above) & Separate Shower in the Master Bathroom		x 3.0	=	
Bathtub may be Large & Separate Shower				
Large Bathtub (may have Showerhead above)	1	x 3.0	=	3.0
Standard Bathtub (may have Showerhead above)		x 2.0	=	
Shower, Separate Stall (one Showerhead)	1	x 2.0	=	2.0
Shower, each additional fixture (including additional Showerheads, Body Spray Nozzles, etc.)		x 2.0	=	
Shower System, Rain Bars, or Custom Shower (varies according to specifications)		x 2.0	=	
Kitchen Sink (including optional adjacent Dishwasher)	1	x 2.0	=	2.0
Kitchen Sink with adjacent High Efficiency Dishwasher*		x 1.5	=	
Dishwasher, each additional (including optional adjacent sink)	1	x 2.0	=	2.0
Dishwasher, High Efficiency each additional (including optional adjacent sink)*		x 1.5	=	
Laundry Sink/Utility Sink (one Sink per Residential Site)		x 2.0	=	
Clothes Washer	1	x 2.0	=	2.0
Clothes Washer, High Efficiency (HEW) with a water factor of 5.0 or less.*		x 1.0	=	
Bidet		x 2.0	=	
Bar Sink		x 1.0	=	
Entertainment Sink		x 1.0	=	
Vegetable Sink		x 1.0	=	
Swimming Pool (each 100 square-feet of pool surface area)		x 1.0	=	
Outdoor Water Uses (new Connection only) – (Lot size of 10,000 sq-ft or less)		x 1.0	=	
(1) 50% total interior fixture units				
(2) 25% interior fixture units (required by Jurisdiction for native Landscaping)*				

For New Connection Outdoor water use on lots over 10,000 sq-ft, see the Water Budget In

Outdoor Water Uses (new Connection only) – (Lot size exceeding 10,000 sq-ft)
(1) 50% total interior fixture units, or MAWA, whichever is greater.
(2) 25% interior fixture units (required by Jurisdiction for native Landscaping)*
TOTAL FIXTURE UNIT COUNT = 16.4 or 0.164 af/yr

See MPWMD Non-Potable Water Use Factors in Appendix B for Estimated Total Water Use (ETWU) and for calculations of Maximum Allowable Water Allowance (MAWA).

**** Requires Deed Restriction***

To calculate exterior water use (NEW CONSTRUCTION ONLY): To estimate permit fees for new construction, multiply the total fixture unit count by 1.5 for the overall number of fixture units. A MAWA calculation and landscape plans must be included for those properties that are over 10,000 square feet. Multiply the total number of fixture units including landscaping by the connection fee as established by the MPWMD. As of July 1, 2009, this amount is $235.67 per fixture unit in the CAW main system; in addition, an administrative processing fee of $210 per dwelling unit.

Total Fixture Count________ x 0.01=________Acre Feet of water needed x Connection Charge = ________________
Processing Fee = ________________
Total Fees ________________

To be paid at time of permit issuance

NOTE: All residential new construction must meet the following District requirements:

- Toilets must be designed to use not more than 1.6 gallons-per-flush
- Showerheads must flow at no more than 2.0 gallons-per-minute
- Faucets must flow at no more than 2.2 gallons-per-minute
- On-demand hot water system (instant-access)
- Rain Sensor & Soil Moisture Sensors on automatic Irrigation Systems
- Drip irrigation where appropriate

U:\demand\Work\Forms\Hand Outs\Residential Factor New Construction Revised 20100701.doc

Non Potable Water Use Factors
&
Estimated Total Water Use (ETWU)

APN: 103-071-019 & -002

Monterey County, California

Type of Use		Landscape Area (acres)	Annual Usage (per area or animal)	Annual Use af/yr
Irrigation	Turf (lawn) - 2,500 sq. ft	0.057	2.1	0.121
	Non-Turf on Sprinker	0	1.8	0.000
	Non-Turf on Drip - 6,000 sq. ft	0.138	0.9	0.124
	Pasture / Alfalfa	0	4.3	0.000
	Pasture / Grazing	0	2.1	0.000
	Vineyard - 21,780 sq. ft.	0.5	0.8	0.400
	Orchard	0	4.4	0.000
	Garden Crops - 2,000 sq. ft	0.046	2.3	0.106
	Plant Nursery	0	3.92	0.000
Hot Tub/Pool	Surface Area (sq. ft):	0	0.00026	0.000
Farm Animals	Cattle/Horses (# of animals/parcel)	0	0.05	0.000
	Goats, Hogs, Sheep (# of animals)	0	0.01	0.000
Other Use		0	0	0.000

Outdoor Water Use Factor/parcel[7]:	0.01	af/yr
Estimated Applied Water Use (EAWU):	0.750	af/yr
Estimated Total Water Use[8]:	0.76	af/yr

Notes:

1) This form was modified from MPWMD Water Use Factors for Land Use Reporting Method form worksheet. The difference is the footnote numbers, all conversion values remain the same.

2) 1-acre-foot = 325,851 gallons

3) 1 acre = 43,560 ft^2

4) Revisions in 1992 included the addition of a new category, "Pasture / Grazing" to account for irrigated pasture that is not harvested for a crop, but serves as pasture for large animals to graze. The reduced facotr of 2.2 af/yr is based on site inspections and is equivalent to the factor used for "Turf". Actual water usage on grazing land will vary. the factor for irrigated "Pasture / Alfalfa" or other pasture that may be harvested more than once a year remains at 4.3 af/yr.

5) Revisions in 1992 also included a reduction in the factor for "Vineyard" from 2.8 af/yr to 0.8 af/yr, based on site inspections and on measured crop applied water data from Bulletin 113-4 of the California Department of Water Resources, "Crop Water Use in California" (1986).

6) Revisions in 1993 include changes to Turf and Non-Turf, and the addition of Plant Nursery in order to be consistent with the Calculated Average Consumptions: Commerciual Uses Report prepared by the Demand Management Office of the MPWMD, updated June, 1992.

7) Revisions in 2010 follow State Model Water Efficient Landscape Oridnance and is adopted by MPWMD in Rule 24-A-5a & 5b, Dec, 2010. Revisions include the addition of Outdoor Water Use Factor of 0.01 af/yr and revised Evapotranspiration values for Special*, New and Existing landscape Areas (0.3; 0.7; and 0.8 respectively). *Special Landscape Areas are Gardens, Ponds.

8) The combination of EAWU and the Outdoor Water Use Factor.

Maximum Allowable Water Allowance

APN: 103-071-019 & -002

Monterey, Monterey County, California

$$MAWA = \frac{(Et_o) \times (0.62) \times \{ Et_{adj} \times LA_{existing} \} + \{ Et_{adj} \times LA_{new} \} + \{ Et_{adj} \times Special\ LA \}}{325{,}851\ gal/af}$$

$$MAWA = \frac{46.3 \times 0.62 \times \{ 0.8 \times 0 \} + \{ 0.7 \times 8{,}500 \} + \{ 0.3 \times 23{,}780 \}}{325{,}851\ gal/af}$$

$$MAWA = \frac{46.3 \times 0.62 \times 13{,}084.00}{325{,}851}$$

$$MAWA = \frac{375{,}589.30}{325{,}851}$$

MAWA = 1.15 af/yr

In Summary:

ETWU	**<**	**MAWA**
0.76 af/yr	**<**	**1.15 af/yr**

Notes:

Revisions to the MAWA Formula follow State Model Water Efficient Landscape Oridance and is adopted by MPWMD in Rule 24-A-5a & 5b, Dec, 2010. Revisions include the addition of Outdoor Water Use Factor of 0.01 af/yr and revised Evapotranspiration values for Special*, New and Existing landscape Areas (0.3; 0.7; and 0.8 respectively).
*Special Landscape Areas are Gardens, Ponds.

MAWA	=	Maximum Allowable Water Allowance (af/yr)
EAWU	=	Estimated Applied Water Use determined from MPWMD Non-Potable Water Use Factors (af/yr)
ETWU	=	Estimated Total Water Use (af/yr) = EAWU + 0.01 af/yr
Et_o	=	Zone 3 Reference Evapotranspiration (46.3 inches per year)
0.62	=	Conversion Factor for inches to gallons
Et_{adj}	=	Evapotranspiration Factor (unitless)
		0.8 for Existing Landscapes
		0.7 for New Landscapes
		0.3 for Special Landscapes (Graden, Orchard)
$LA_{existing}$	=	Existing Landscaped Area (in sq. ft)
LA_{new}	=	New Landscaped Area (in sq. ft) to consist of having 2,500 sq.ft of turf, and 6,000 sq.ft of non-turf on drip.
SLA	=	Special Landscaped Area (in sq. ft) to consist of having 0.5 acres of vineyards and 2,000 sq. ft. of garden crops.
325,851	=	Conversion for gallons to acre-feet

APPENDIX C

AQUIFER PUMP TEST DATA INFORMATION SHEETS

A) WELL #1 HAND AND ELECTRONIC PRESSURE TRANSDUCER DATA

AQUIFER PUMP TEST DATA INFORMATION SHEET

PROJECT AND SITE INFORMATION

Project Name & Number: FLORES WELL #1 72HR & P/A
Date: 10/11/10
Pumping Test Period: 10/12 - 10/15
Recovery Test Period: 10/15 - 10/21/10
Pump Test Consultant: BIERMAN HYDRO-GEO-LOGIC
Recorded By: A.B.
APN: 103-071-019
Well Identification: #1 (564)
(Pumping Well) OR Observation Well
Township, Range & Section: T16S R1E, SECTION 4
Latitude: N36.57433
Groundsurface @ (ft, msl): ~~330~~ 330' (AB)
Source: GARMIN III GPS
DWR Well Number: 527042 MCHD# 98-318
Longitude: W121.86804

WELL CONSTRUCTION INFORMATION

Borehole Dia. & Depth (in & ft): 19" Ø TO 700'
Conductor Casing Dia. & Depth (in & ft): 10 1/4" Ø TO 700'
Well Type, Dia (ID), & Completion Depth (ft, bgs): 5" Ø PVC FROM 700' - 894'
Well Perforations Interval (ft, bgs): 700-894'
Fully or Partially Penetrated Well; Total Length (ft): PARTIAL PENETRATED
Sanitary Seal Depth & Condition: 0-700'
Top of Casing (ft, ags): ~~0.38~~ 1.8
Sounding Tube (ft, aTOC): ~~0.95~~ 0.0 - SOUNDING TUBE FLUSH BENEATH TOP PLATE
Sounding Tube (ft, ags): ~~1.33~~ 1.8

PUMP TEST EQUIPMENT INFORMATION

Drop Pipe Type and Diameter (OD in inches): SCH 120; 1.25" OD
Pump Type and Horsepower: 2HP BERKLEY, 1PH, 240V
Depth to Pump Intake (ft, bTOC): 500'
Head on Pump (ft): 368.08
Pump Savor: ON (OFF)
Client Informed of Pump Savor: (YES) NO
Flow Meter Type & S/N: TEST METER SN: 65420662
Totalizer Value (gal): 439,659.5
Xd Type & S/N: LT 700 PRO
Xd Start Time: 10 AM
Method: Linear, (Log), Event (circle)
Head on Xd (ft): 218.36
Depth to Xd (ft, bTOC): 350.28

TECHNICAL CALCULATIONS OF SATURATED THICKNESS, AVAILABLE DRAWDOWN + MISC. PUMP TEST INFORMATION

Depth to Static Groundwater (ft, below top of sounding tube): 131.92
Depth to Static Groundwater (ft, bgs): 131.92-1.8 = 130.12
Height of Water Column / Total Saturated Thickness (ft): 894-130.12 = 763.88
Available Drawdown (ft): 763.88 ÷ 3 = 254.63
Discharge Area: ≈200' FROM WELL TO RAVINE ON PROPERTY
Targeted Flow Rate: 8GPM
5-Gallon Bucket Check Calibration Performed (YES) or NO (circle one); MCHD Onsite to Witness (YES) or NO (circle one) WHO? SANDY AYALA

Date	Time (24 hour)	Elapsed Time (min)	Flow Rate (gpm)	Totalizer Value (gallons)	Depth to Groundwater (ft, bTOC)	Drawdown (ft)	Specific Capacity (GPM)	Comments
10/11/10	1515	0	10	438,641	131.06	0		START 2HR PRE-TEST
	1535	20	8	438,837	158.91	27.85		
	1615	60	7.9	439,153	167.95	36.89		
10/11/10	1715	120	8.10	439,639.3	172.64	41.58		STOP 2HR PRE-TEST.
10/12/10	1000	0	8	439,659.5	131.92	0		START 72HR CONSTANT RATE TEST W/ PRESENCE OF MCHD.
	1002	2	8	-	135.22	3.3		
	1004	4	8	-	139.92	7.8		
	1006	6	8	-	141.90	9.98		
	1008	8	8	-	144.3	12.38		
	1010	10	7.9	439,738.5	146-	14.08		MINOR ADJUSTMENTS
	1015	15	8	-	151.51	19.59		
	1020	20	8.1	-	155.09	23.17		INCREASE SLIGHTLY
	1025	25	8.0	-	157.74	25.82		
	1030	30	8.0	439,899.0	160.27	28.35		MINOR ADJUSTMENTS.
	1040	40	8.1	439,980.8	163.64	31.72		
	1050	50	8.0	-	166.11	34.19		
	1100	60	8	440,141	167.84	35.92		
	~~1138~~ 1138	~~98~~ 98	7.97	440,444.0	171.93	40.01		
	1150	110	8.0	-	172.5	40.58		
	1155	115	7.95	440,579.2	-	~~41.17~~		
	1200	120	8.04	440,618.4	173.09	41.17		
	1230	150	8.05	440,861.6	174.45	42.53		MCHD LEAVES SITE
	1300	180	8.03	441,101.9	175.74	43.82		
	1330	210	8.07	441,344.1	176.98	45.06		
	1400	240	8.04	441,585.2	177.27	45.35		
	~~1415~~ 1430	270	8.04	441,826.3	177.82	45.90		
	1500	300	8.07	442,068.5	178.44	46.52		
	1530	330	8.07	442,310.6	178.95	47.03		
	1600	360	8.05	442,552.3	179.23	47.31		INCREASE SLIGHTLY
	1630	390	8.1	442,796.3	179.70	47.78		
	1700	420	8.13	443,040.2	180.13	48.21		
	1800	480	8.11	443,527.1	180.45	48.53		
	1900	540	8.11	444,013.6	181.32	49.40		
10/12/10	2000	600	8.10	444,500-	181.82	49.90		MINOR ADJUSTMENTS
10/13/10	0530	1170	8.10	-	184.69	52.77		STABLE; W/ MINOR ADJUSTMENTS
	0600	1200	8.10	449361.6	184.82	52.9		
	0700	1260	8.05	449,844.5	185.03	53.11		INCREASE SLIGHTLY.
	0800	1320	8.1	450,330.5	185.56	53.64		
	1000	1440	8.08	451,299.6	186.15	54.23	0.15	24HR AVG FLOW RATE = 8.08 GPM
	1200	1560	8.1	452,271.4	186.63	54.71		
	1400	1680	8.08	453,241.1	186.97	55.05		
	1600	1800	8.09	454,212.0	187.36	55.44		
10/13/10	1800	1920	8.08	455,181.6	187.78	55.86		NO ADJUSTMENTS.
10/14/10	0600	2640	8.04	460,974.7	189.6	57.68		
	0800	2760	8.01	461,936.4	190.15	58.23		MINOR INCREASE IN FLOW
	1000	2880	8.12	462,911.2	190.88	58.96	0.1368	48HR AVG FLOW RATE = 8.07 GPM
	1400	3130	8.08	464,932.9	191.27	59.35		
10/14/10	1800	3360	8.09	466,793.9	191.72	59.8		STABLE
10/15/10	600	4080	8.03	472,575.3	192.87	60.95		
	1000	4320	8.06	474,498.6	193.03	61.11		

AQUIFER PUMP TEST DATA INFORMATION SHEET

PROJECT AND SITE INFORMATION

Project Name & Number: RECOVERY
Date:
Pumping Test Period: ———
Recovery Test Period: 10/15 → 10/21
Pump Test Consultant:
Recorded By:
APN:
Well Identification: WELL #1
Pumping Well OR Observation Well
Township; Range & Section:
Latitude:
Groundsurface @ (ft, msl):
Source:
DWR Well Number:
Longitude:

WELL CONSTRUCTION INFORMATION

Borehole Dia. & Depth (in & ft):
Conductor Casing Dia. & Depth (in & ft):
Well Type, Dia (ID), & Completion Depth (ft, bgs):
Well Perforations Interval (ft, bgs):
Fully or Partially Penetrated Well; Total Length (ft):
Sanitary Seal Depth & Condition:
Top of Casing (ft, ags):
Sounding Tube (ft, aTOC):
Sounding Tube (ft, ags):

See Pg 1

PUMP TEST EQUIPMENT INFORMATION

Drop Pipe Type and Diameter (OD in inches):
Pump Type and Horsepower:
Depth to Pump Intake (ft, bTOC):
Head on Pump (ft):
Pump Savor: ON OFF
Client Informed of Pump Savor: YES NO
Flow Meter Type & S/N:
Totalizer Value (gal):
Xd Type & S/N:
Xd Start Time:
Method: Linear, Log, Event (circle)
Head on Xd (ft):
Depth to Xd (ft, bTOC):

SEE PG 1

TECHNICAL CALCULATIONS OF SATURATED THICKNESS, AVAILABLE DRAWDOWN + MISC. PUMP TEST INFORMATION

Depth to Static Groundwater (ft, below top of sounding tube): 131.92
Depth to Static Groundwater (ft, bgs):
Height of Water Column / Total Saturated Thickness (ft):
Available Drawdown (ft):
Discharge Area:
Targeted Flow Rate:
5-Gallon Bucket Check Calibration Performed: YES or NO (circle one); MCHD Onsite to Witness: YES or NO (circle one) WHO?

Date	Time (24 hour)	Elapsed Time (min)	Flow Rate (gpm)	Totalizer Value (gallons)	Depth to Groundwater (ft, bTOC)	Drawdown (ft)	Specific Capacity (GPM)	Comments
10/15/10	1000	4320	8 → 0	474,498.6	193.03	61.11		- START RECOVERY TEST -
	1002		0	-	189.2			
	1003		-	-	187.52			
	1004		-	-	186.18			
	1005		-	-	184.59			
	1006		-	-	183.1			
	1007		-	-	182.16			
	1008		-	-	181.0			
	1009		-	-	179.75			
	1010		-	-	178.63			
	1015		-	-	173.13			
	1020		-	-	170.24			
	1030		-	-	165.16			
	1040		-	-	161.56			
	1050		-	-	159.06			
10/15/10	1100	4380	-	-	157.2	25.28		193.03 - 157.2 = 35.83/61.11 = 58.63%
10/16/10	1000	5760	-	-	141.49	9.57		
10/17/10	1000	7200	-	-	139.02	7.10		
⊗1 10/18/10	1000	8640	-	-	137.53	5.61		193.03 - 137.53 = 55.5/61.11 = 90.82% ①
10/19/10	1000	10,080	-	-	136.65	4.73		
10/20/10	1000	11,520	-	-	135.82	3.90		
⊗2 10/21/10	1000	12,960	-	-	135.36	3.44		193.03 - 135.36 = 57.67/61.11 = 94.37% ②

① 96.73% REQUIRED – WELL RECOVERED TO 90.82% IN 1⊗ PUMPING PERIOD. REDUCE SOURCE CAPACITY
96.73% − 90.82% = 5.91% AND 5.91% OF 8.06 GPM = 0.48 GPM, SO 8.06 − 0.48 = 7.58 GPM

② MPWMD REQUIREMENT OF 95% AFTER 2x PUMPING PERIOD NOT MET! REDUCE CAL. WELL YIELD.
.95% − 94.37% = 0.63% OR 0.0063 ~~AND 0.63% OF 8.06 gpm = 0.05 gpm, SO~~ AB

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
0	131.92	0	8.06	1) 72-Hr Test Starts on 'Flores/Pisenti' Well #1
0.004	131.974	0.054	8.06	2) Three Other Neighboring Wells witin 1,000 feet of Well #1 (See Figure 5).
0.008	132.019	0.099	8.06	3) Well #2 pumped simultaneously during pumping of Well #1
0.013	132.043	0.123	8.06	4) Flow rate at start of test was 8.0 gpm which stabilized to 8.08 gpm within 24 hours and
0.017	132.045	0.125	8.06	maintained that rate with less than 5% fluctuation for remainder of test.
0.021	132.017	0.097	8.06	5) 24-hr average flow rate was 8.08 gpm
0.025	131.949	0.029	8.06	6) 48-hr average flow rate was 8.07 gpm
0.029	131.949	0.029	8.06	7) 72-hr average flow rate was 8.06 gpm
0.033	131.973	0.053	8.06	8) Lowest Sustainable flow rate was 8.06 gpm
0.037	132.008	0.088	8.06	9) Starting Totalizer Reading was 439,659.5 gal ("Test" Meter)
0.042	132.053	0.133	8.06	10) Ending Totalizer Reading was 474,498.6 gal ("Test" Meter)
0.046	132.034	0.114	8.06	11) Saturated Thickness was 763.88 feet
0.05	132.039	0.119	8.06	12) Available Drawdown was 254.63 feet
0.054	132.083	0.163	8.06	13) 24-Hour Specific Capacity = 0.15 gpm/ft of Drawdown
0.058	131.961	0.041	8.06	
0.063	132.027	0.107	8.06	
0.067	132.01	0.09	8.06	
0.071	132.048	0.128	8.06	
0.075	131.999	0.079	8.06	
0.079	131.981	0.061	8.06	
0.083	132.017	0.097	8.06	
0.088	131.99	0.07	8.06	
0.092	131.945	0.025	8.06	
0.096	132.046	0.126	8.06	
0.1	131.976	0.056	8.06	
0.106	131.95	0.03	8.06	
0.112	131.964	0.044	8.06	
0.119	131.95	0.03	8.06	
0.126	132.017	0.097	8.06	
0.133	132.077	0.157	8.06	
0.141	131.901	-0.019	8.06	
0.154	131.786	-0.134	8.06	
0.158	131.812	-0.108	8.06	
0.172	131.772	-0.148	8.06	
0.178	131.913	-0.007	8.06	
0.19	131.837	-0.083	8.06	
0.199	131.915	-0.005	8.06	
0.211	132.397	0.477	8.06	
0.224	130.182	-1.738	8.06	
0.237	129.744	-2.176	8.06	
0.251	132.015	0.095	8.06	
0.266	132.38	0.46	8.06	
0.282	132.066	0.146	8.06	
0.298	132.137	0.217	8.06	
0.316	132.187	0.267	8.06	
0.335	132.403	0.483	8.06	
0.355	132.067	0.147	8.06	
0.376	132.25	0.33	8.06	
0.398	132.225	0.305	8.06	
0.422	132.205	0.285	8.06	
0.447	132.494	0.574	8.06	
0.473	132.388	0.468	8.06	
0.501	132.445	0.525	8.06	
0.531	132.758	0.838	8.06	
0.562	132.654	0.734	8.06	
0.596	132.44	0.52	8.06	
0.631	132.852	0.932	8.06	
0.668	132.805	0.885	8.06	
0.708	132.753	0.833	8.06	
0.75	132.697	0.777	8.06	
0.794	133.016	1.096	8.06	
0.841	133.379	1.459	8.06	
0.891	133.635	1.715	8.06	
0.944	133.235	1.315	8.06	
1	133.475	1.555	8.06	
1.06	133.245	1.325	8.06	
1.12	133.915	1.995	8.06	
1.19	133.645	1.725	8.06	
1.26	133.888	1.968	8.06	
1.33	133.879	1.959	8.06	
1.41	134.118	2.198	8.06	
1.5	134.281	2.361	8.06	
1.58	134.336	2.416	8.06	
1.68	134.791	2.871	8.06	
1.78	134.812	2.892	8.06	
1.88	135.111	3.191	8.06	
1.99	135.045	3.125	8.06	
2.11	135.151	3.231	8.06	
2.24	135.504	3.584	8.06	
2.37	135.678	3.758	8.06	
2.51	136.067	4.147	8.06	
2.66	136.13	4.21	8.06	
2.82	136.556	4.636	8.06	
2.98	136.765	4.845	8.06	
3.16	137.163	5.243	8.06	
3.35	137.21	5.29	8.06	
3.553	137.619	5.699	8.05	Flow rate gradually falls with increasing head
3.76	138.09	6.17	8.05	
3.98	138.186	6.266	8.05	
4.22	138.624	6.704	8.04	
4.47	138.965	7.045	8.04	
4.73	139.317	7.397	8.03	
5.01	139.609	7.689	8.02	
5.31	140.235	8.315	8.02	
5.62	140.909	8.989	8.01	
5.96	140.839	8.919	8.01	
6.31	141.637	9.717	8	

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
6.68	141.961	10.041	8	
7.08	142.588	10.668	8	
7.5	143.186	11.266	8	
7.94	143.776	11.856	8	
8.41	144.324	12.404	7.98	
8.91	144.778	12.858	7.95	
9.44	145.081	13.161	7.92	
10	145.874	13.954	7.9	Maintain 8+ gpm; Increase flow rate
10.6	146.236	14.316	8	
11.2	147.149	15.229	8	
11.9	147.999	16.079	8	
12.6	148.546	16.626	8	
13.302	149.217	17.297	8	
14.1	149.851	17.931	8	
15	150.596	18.676	8	
15.802	151.186	19.266	8	
16.801	152.004	20.084	8	
17.801	152.51	20.59	8	
18.801	153.725	21.805	8	Maintain 8+ gpm; Increase flow rate
19.9	154.439	22.519	8.1	
21.1	155.262	23.342	8.1	
22.4	155.793	23.873	8.1	
23.7	156.606	24.686	8	
25.1	157.713	25.793	8	
26.6	158.274	26.354	8	
28.2	158.667	26.747	8	
29.8	159.566	27.646	8	
31.6	160.357	28.437	8	
33.5	161.292	29.372	8	
35.5	161.91	29.99	8	
37.6	162.618	30.698	8	
39.8	163.135	31.215	8	
42.2	164.054	32.134	8	
44.7	164.538	32.618	8	
47.3	165.436	33.516	8	
50.1	166.075	34.155	8	
53.1	166.486	34.566	8	
56.2	166.865	34.945	8	
59.6	167.605	35.685	8	
63.1	168.308	36.388	8	
66.8	168.644	36.724	8	Stable - maintain.
70.8	169.125	37.205	8	
75	169.562	37.642	8	
79.4	170.036	38.116	8	
84.1	170.364	38.444	8	
89.1	171.027	39.107	8	
94.4	171.201	39.281	8	
100	171.857	39.937	7.97	
106	172.035	40.115	8.06	
112	172.242	40.322	7.95	
119	173.388	41.468	8.1	**Flow rate generally stabilized at 8.0 gpm with less than 5% fluctuation for**
126	173.556	41.636	8.04	**remainder of the test.**
133	173.61	41.69	8.04	
141	174.059	42.139	8.04	
150	174.615	42.695	8.05	
158	175.163	43.243	8.05	
168	175.333	43.413	8.05	
178.003	175.38	43.46	8.05	
188	175.872	43.952	8.03	
198	176.044	44.124	8.03	
208	176.431	44.511	8.07	
218	176.786	44.866	8.06	
228	176.657	44.737	8.05	
238	177.092	45.172	8.04	
248	177.405	45.485	8.04	
258	177.625	45.705	8.04	
268	177.62	45.7	8.04	Increase slightly
278	178.012	46.092	8.06	
288	177.991	46.071	8.07	
298	178.036	46.116	8.07	
308	178.466	46.546	8.07	
318	178.657	46.737	8.07	
328	178.852	46.932	8.07	
338	178.712	46.792	8.07	
348	178.757	46.837	8.06	
358	179.148	47.228	8.06	
368	179.22	47.3	8.06	
378	179.463	47.543	8.05	
388	179.708	47.788	8.05	
398	179.879	47.959	8.1	Increase slightly
408	179.765	47.845	8.1	
418	180.13	48.21	8.1	
428	180.177	48.257	8.13	
438	180.347	48.427	8.11	
448	180.429	48.509	8.11	
458	180.679	48.759	8.11	
468	180.591	48.671	8.11	
478	180.449	48.529	8.11	
488	180.926	49.006	8.11	
498	180.928	49.008	8.11	
508	181.046	49.126	8.11	
518	181.173	49.253	8.11	
528	181.158	49.238	8.11	
538	181.194	49.274	8.11	
548	181.323	49.403	8.11	
558	181.299	49.379	8.11	
568	181.5	49.58	8.11	

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)		Comments
578	181.547	49.627	8.11		
588	181.632	49.712	8.11		
598	181.66	49.74	8.1		Maintaining
608	181.823	49.903	8.1		
618	181.794	49.874	8.1		
628	182.049	50.129	8.1		
638	181.855	49.935	8.1		
648	181.992	50.072	8.1		
658	182.273	50.353	8.1		
668	182.167	50.247	8.1		
678	182.297	50.377	8.1		
688	182.36	50.44	8.1		
698	182.301	50.381	8.1		
708	182.294	50.374	8.1		
718	182.497	50.577	8.1		
728	182.384	50.464	8.1		
738	182.393	50.473	8.1		
748	182.393	50.473	8.1		
758	182.708	50.788	8.1		
768	182.622	50.702	8.1		
778	182.61	50.69	8.1		
788	182.906	50.986	8.1		
798	182.724	50.804	8.1		
808	183.062	51.142	8.1		
818	182.967	51.047	8.1		
828	183.033	51.113	8.1		
838	183.265	51.345	8.1		
848	183.274	51.354	8.1		
858	183.265	51.345	8.1		
868	183.525	51.605	8.1		
878	183.45	51.53	8.1		
888	183.592	51.672	8.1		
898	183.646	51.726	8.1		
908	183.521	51.601	8.1		
918	183.632	51.712	8.1		
928	183.71	51.79	8.1		
938	183.48	51.56	8.1		
948	183.861	51.941	8.1		
958	183.847	51.927	8.1		
968	183.892	51.972	8.1		
978	184.155	52.235	8.1		
988	184.013	52.093	8.1		
998	183.918	51.998	8.1		
1008	184.221	52.301	8.1		
1018	183.982	52.062	8.1		
1028	184.129	52.209	8.1		
1038	184.261	52.341	8.1		
1048	184.252	52.332	8.1		
1058	184.243	52.323	8.1		
1068	184.235	52.315	8.1		
1078	184.396	52.476	8.1		
1088	184.299	52.379	8.1		
1098	184.342	52.422	8.1		
1108	184.231	52.311	8.1		
1118	184.3	52.38	8.1		
1128	184.669	52.749	8.1		
1138	184.477	52.557	8.1		
1148	184.759	52.839	8.1		
1158	184.698	52.778	8.1		
1168	184.695	52.775	8.1		Maintaining 8.10 overnight
1178	184.944	53.024	8.1		
1188	185.152	53.232	8.1		
1198	184.665	52.745	8.1		
1208	184.646	52.726	8.1		
1218	184.681	52.761	8.07		
1228	184.852	52.932	8.07		
1238	184.928	53.008	8.05		
1248	185.113	53.193	8.05		
1258	185.037	53.117	8.05		
1268	185.011	53.091	8.05		
1278	185.425	53.505	8.05		
1288	185.654	53.734	8.05		
1298	185.435	53.515	8.05		
1308	185.653	53.733	8.05		Increase flow rate slightly to maintain average above 8 gpm.
1318	185.819	53.899	8.1		
1328	185.462	53.542	8.1		
1338	185.296	53.376	8.1		
1348	185.623	53.703	8.1		
1358	185.594	53.674	8.1		
1368	185.943	54.023	8.1		
1378	185.729	53.809	8.1		
1388	185.777	53.857	8.1		
1398	185.864	53.944	8.1		
1408	185.902	53.982	8.1		
1418	185.992	54.072	8.1		
1428	185.94	54.02	8.1		
1438	186.139	54.219	8.08	0.15	24-Hr Specific Capacity = 0.15 gpm/ft of Dd (calculated using lowest flow)
1448	186.21	54.29	8.08		24-hr average flow rate = 8.08 gpm
1458	186.149	54.229	8.08		Lowest sustainable 24-hr flow rate 8.06 gpm
1468	186.364	54.444	8.08		Flow rate maintained with less than 5% fluctuation for remainder of test.
1478	186.511	54.591	8.08		24-hr totalizer Reading = 451,299.6 gallons
1488	186.424	54.504	8.08		
1498	186.469	54.549	8.08		
1508	186.325	54.405	8.08		
1518	186.389	54.469	8.08		
1528	186.339	54.419	8.08		
1538	186.462	54.542	8.08		

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
1548	186.467	54.547	8.08	
1558	186.513	54.593	8.1	Increase to maintain 8.08 gpm average.
1568	186.772	54.852	8.1	
1578	186.594	54.674	8.1	
1588	186.578	54.658	8.1	
1598	186.623	54.703	8.1	
1608	186.587	54.667	8.1	
1618	186.777	54.857	8.1	
1628	186.992	55.072	8.08	
1638	187.098	55.178	8.08	
1648	186.777	54.857	8.08	
1658	187.009	55.089	8.08	
1668	186.919	54.999	8.08	
1678	187.131	55.211	8.08	
1688	187.132	55.212	8.09	
1698	186.915	54.995	8.09	
1708	187.092	55.172	8.09	Flow rate very stable.
1718	187.241	55.321	8.09	
1728	187.329	55.409	8.09	
1738	187.409	55.489	8.09	
1748	187.402	55.482	8.09	
1758	187.3	55.38	8.09	
1768	187.346	55.426	8.09	
1778	187.253	55.333	8.09	
1788	187.376	55.456	8.09	
1798.002	187.516	55.596	8.09	
1808	187.533	55.613	8.09	
1818	187.455	55.535	8.08	
1828	187.527	55.607	8.08	
1838	187.714	55.794	8.08	
1848	187.599	55.679	8.08	
1858	187.403	55.483	8.08	
1868	187.673	55.753	8.08	
1878	187.756	55.836	8.08	
1888	187.617	55.697	8.08	
1898	187.907	55.987	8.08	
1908	187.731	55.811	8.08	
1918	187.613	55.693	8.08	
1928	187.92	56	8.08	No Adjustments
1938	188.172	56.252	8.08	
1948	187.752	55.832	8.08	
1958	187.941	56.021	8.08	
1968	187.925	56.005	8.08	
1978	188.15	56.23	8.08	
1988	187.966	56.046	8.08	
1998	188.301	56.381	8.08	
2008	188.079	56.159	8.08	
2018	187.853	55.933	8.08	
2028	188.221	56.301	8.08	
2038	188.054	56.134	8.08	
2048	188.14	56.22	8.08	
2058	188.114	56.194	8.08	
2068	188.117	56.197	8.08	
2078	188.449	56.529	8.08	
2088	188.247	56.327	8.08	
2098	188.447	56.527	8.08	
2108	188.408	56.488	8.08	
2118	188.372	56.452	8.08	
2128	188.401	56.481	8.08	
2138	188.491	56.571	8.08	
2148	188.745	56.825	8.08	
2158	188.474	56.554	8.08	
2168	188.74	56.82	8.08	
2178	188.695	56.775	8.08	
2188	188.815	56.895	8.08	
2198	188.735	56.815	8.08	
2208	188.823	56.903	8.08	
2218	188.725	56.805	8.08	
2228	188.676	56.756	8.08	
2238	188.78	56.86	8.08	
2248	188.725	56.805	8.08	
2258	188.353	56.433	8.08	
2268	188.505	56.585	8.08	
2278	188.751	56.831	8.08	
2288	188.934	57.014	8.08	
2298	189.038	57.118	8.08	
2308	188.989	57.069	8.08	
2318	188.856	56.936	8.08	
2328	188.948	57.028	8.08	
2338	188.991	57.071	8.08	
2348	188.798	56.878	8.08	
2358	189.256	57.336	8.08	
2368	189.071	57.151	8.08	
2378	188.934	57.014	8.08	
2388	189.138	57.218	8.08	
2398	189.105	57.185	8.08	
2408	189.1	57.18	8.08	
2418	189.064	57.144	8.08	
2428	189.158	57.238	8.08	
2438	189.47	57.55	8.08	
2448	189.315	57.395	8.08	
2458	189.32	57.4	8.08	
2468	189.486	57.566	8.08	
2478	189.369	57.449	8.08	
2488	189.163	57.243	8.08	
2498	189.334	57.414	8.08	
2508	189.436	57.516	8.08	

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)		Comments
2518	189.581	57.661	8.08		
2528	189.45	57.53	8.08		
2538	189.484	57.564	8.08		
2548	189.631	57.711	8.08		
2558	189.6	57.68	8.08		
2568	189.431	57.511	8.08		
2578	189.353	57.433	8.08		
2588	189.492	57.572	8.08		
2598	189.464	57.544	8.08		
2608	189.869	57.949	8.06		
2618	189.729	57.809	8.06		
2628	189.609	57.689	8.06		
2638	189.651	57.731	8.06		
2648	189.753	57.833	8.04		
2658	189.585	57.665	8.04		
2668	189.641	57.721	8.04		
2678	189.551	57.631	8.04		
2688	189.909	57.989	8.04		
2698	189.598	57.678	8.02		
2708	189.912	57.992	8.02		
2718	190.007	58.087	8.02		
2728	189.871	57.951	8.01		
2738	190.011	58.091	8.01		
2748	189.957	58.037	8.01		
2758	189.939	58.019	8.01		Increase flow slightly.
2768	190.141	58.221	8.12		
2778	190.241	58.321	8.12		
2788	190.495	58.575	8.12		
2798	190.573	58.653	8.12		
2808	190.606	58.686	8.12		
2818	190.553	58.633	8.12		
2828	190.615	58.695	8.12		
2838	190.665	58.745	8.12		
2848	190.928	59.008	8.12		
2858	190.712	58.792	8.1		
2868.004	190.816	58.896	8.1		
2878	190.862	58.942	8.07	0.137	48-hr Specific Capacity = 0.137 gpm/ft of Dd
2888	190.724	58.804	8.08		48-hr Specific Capacity calculated using 8.07 gpm.
2898	190.587	58.667	8.09		48-hr Average Flow Rate = 8.07 gpm
2908	190.9	58.98	8.09		48-hr totalizer Reading = 462,911.2 gallons
2918	190.767	58.847	8.09		
2928	190.594	58.674	8.09		
2938	190.786	58.866	8.09		
2948	190.757	58.837	8.09		
2958	190.774	58.854	8.09		
2968	190.767	58.847	8.09		
2978	190.925	59.005	8.09		
2988	190.71	58.79	8.09		
2998	191.056	59.136	8.09		
3008	190.953	59.033	8.09		
3018	191.035	59.115	8.09		
3028	191.075	59.155	8.09		
3038	191.165	59.245	8.09		
3048	191.013	59.093	8.09		
3058	190.747	58.827	8.09		
3068	191.103	59.183	8.09		
3078	190.859	58.939	8.09		
3088	191.091	59.171	8.09		
3098	191.096	59.176	8.09		
3108	191.098	59.178	8.09		
3118	191.041	59.121	8.09		
3128	191.214	59.294	8.09		
3138	191.006	59.086	8.09		
3148	190.904	58.984	8.09		
3158	191.278	59.358	8.09		
3168	191.25	59.33	8.09		
3178	191.219	59.299	8.09		
3188	191.172	59.252	8.09		
3198	191.302	59.382	8.09		
3208	191.21	59.29	8.09		
3218	191.361	59.441	8.09		
3228	191.461	59.541	8.09		
3238	191.364	59.444	8.09		
3248	191.255	59.335	8.09		
3258	191.414	59.494	8.09		
3268	191.56	59.64	8.09		
3278	191.62	59.7	8.09		
3288	191.674	59.754	8.09		
3298	191.819	59.899	8.09		
3308	191.698	59.778	8.09		
3318	191.624	59.704	8.09		
3328	191.798	59.878	8.09		
3338	191.724	59.804	8.09		
3348	191.588	59.668	8.09		
3358	191.666	59.746	8.09		
3368	191.65	59.73	8.09		
3378	191.574	59.654	8.09		
3388	191.892	59.972	8.09		
3398	191.833	59.913	8.09		
3408	192.068	60.148	8.09		
3418	191.764	59.844	8.09		
3428	191.831	59.911	8.09		
3438	192.027	60.107	8.09		
3448	191.738	59.818	8.09		
3458	191.992	60.072	8.09		
3468	191.807	59.887	8.09		
3478	191.918	59.998	8.09		

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)		Comments
3488	191.975	60.055	8.09		
3498	192.037	60.117	8.09		
3508	192.046	60.126	8.09		
3518	192.072	60.152	8.09		
3528	191.954	60.034	8.09		
3538	191.966	60.046	8.09		
3548	192.087	60.167	8.09		
3558	191.821	59.901	8.09		
3568	192.255	60.335	8.09		
3578	192.124	60.204	8.09		
3588	191.989	60.069	8.09		
3598	192.304	60.384	8.09		
3608	192.217	60.297	8.09		
3618	192.193	60.273	8.09		
3628	192.335	60.415	8.09		
3638	192.055	60.135	8.09		
3648	192.478	60.558	8.09		
3658	192.231	60.311	8.09		
3668	192.217	60.297	8.09		
3678	192.551	60.631	8.09		
3688	192.387	60.467	8.09		
3698	192.314	60.394	8.09		
3708	192.359	60.439	8.09		
3718	192.188	60.268	8.09		Flow rate gradually falls.
3728	192.138	60.218	8.07		
3738	192.164	60.244	8.07		
3748	192.489	60.569	8.07		
3758	192.245	60.325	8.07		
3768	192.352	60.432	8.07		
3778	192.561	60.641	8.07		
3788	192.577	60.657	8.07		
3798	192.627	60.707	8.07		
3808	192.551	60.631	8.07		
3818	192.494	60.574	8.07		
3828	192.658	60.738	8.07		
3838	192.598	60.678	8.07		
3848	192.47	60.55	8.07		
3858	192.703	60.783	8.07		
3868	192.843	60.923	8.07		
3878	192.515	60.595	8.07		
3888	192.641	60.721	8.07		
3898	192.852	60.932	8.05		
3908	192.67	60.75	8.05		
3918	192.565	60.645	8.05		
3928	192.738	60.818	8.05		
3938	192.784	60.864	8.05		
3948	192.938	61.018	8.05		
3958	192.767	60.847	8.05		
3968	192.843	60.923	8.05		
3978	193.007	61.087	8.05		
3988	192.864	60.944	8.05		
3998	192.957	61.037	8.03		
4008	193.09	61.17	8.03		
4018	192.681	60.761	8.03		
4028	192.871	60.951	8.03		
4038	192.98	61.06	8.03		
4048	192.869	60.949	8.03		
4058	192.84	60.92	8.03		
4068	192.774	60.854	8.03		
4078	192.952	61.032	8.03		increase flow to maintain average at 8.06 gpm
4088	192.966	61.046	8.06		
4098	193.035	61.115	8.06		
4108	192.921	61.001	8.06		
4118	193.09	61.17	8.06		
4128	193.367	61.447	8.06		
4138	193.315	61.395	8.06		
4148	193.263	61.343	8.06		
4158	193.13	61.21	8.06		
4168	193.106	61.186	8.06		
4178	193.147	61.227	8.06		
4188	193.28	61.36	8.06		
4198	193.386	61.466	8.06		
4208	193.429	61.509	8.06		
4218	193.356	61.436	8.06		
4228	193.493	61.573	8.06		
4238	193.367	61.447	8.06		
4248	193.453	61.533	8.06		
4258	193.36	61.44	8.06		
4268	193.439	61.519	8.06		
4278	193.496	61.576	8.06		
4288	193.439	61.519	8.06		
4298	193.669	61.749	8.06		
4308	193.583	61.663	8.06		Adjust upward to 46 gpm.
4318.006	193.406	61.486	8.06		
4320	193.03	61.11	8.06 to 0	0.13	72-hr Test Stops at 4320 min.
4328	181.583	49.663	0		72-hr Specific Capacity = 0.13 gpm/ft of Dd.
4338	172.281	40.361	0		72-hr Specific Capacity calculated using 8.06 gpm.
4348	166.417	34.497	0		72-hr Average Flow Rate = 8.06 gpm.
4358	162.627	30.707	0		72-hr totalizer Reading = 30,248.2 gallons
4368	159.905	27.985	0		Recovery Test Starts
4378	157.945	26.025	0		
4388	156.37	24.45	0		
4398	155.138	23.218	0		
4408	154.178	22.258	0		
4418	153.336	21.416	0		
4428	152.661	20.741	0		
4438	152.02	20.1	0		

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
4448	151.523	19.603	0	
4458	151.051	19.131	0	
4468	150.687	18.767	0	Based on Transducer Data;
4478	150.282	18.362	0	58.63% Groundwater recovery after one hour.
4488	149.94	18.02	0	
4498	149.628	17.708	0	
4508	149.375	17.455	0	
4518	149.079	17.159	0	
4528	148.919	16.999	0	Recovery continues
4538	148.653	16.733	0	
4548	148.42	16.5	0	
4558	148.225	16.305	0	
4568	148.042	16.122	0	
4578	147.887	15.967	0	
4588	147.716	15.796	0	
4598	147.642	15.722	0	
4608	147.512	15.592	0	
4618	147.291	15.371	0	
4628	147.104	15.184	0	
4638	147.027	15.107	0	
4648	146.882	14.962	0	
4658	146.856	14.936	0	
4668	146.676	14.756	0	
4678	146.484	14.564	0	
4688	146.479	14.559	0	
4698	146.339	14.419	0	
4708	146.268	14.348	0	
4718	146.128	14.208	0	
4728	146.083	14.163	0	
4738	146.045	14.125	0	
4748	145.903	13.983	0	
4758	145.772	13.852	0	
4768	145.673	13.753	0	
4778	145.623	13.703	0	
4788	145.549	13.629	0	
4798	145.531	13.611	0	
4808	145.417	13.497	0	
4818	145.365	13.445	0	
4828	145.298	13.378	0	
4838	145.135	13.215	0	
4848	145.099	13.179	0	
4858	145.126	13.206	0	
4868	144.976	13.056	0	
4878	144.889	12.969	0	
4888	144.927	13.007	0	
4898	144.856	12.936	0	
4908	144.742	12.822	0	
4918	144.643	12.723	0	
4928	144.598	12.678	0	
4938	144.539	12.619	0	
4948	144.504	12.584	0	
4958	144.47	12.55	0	
4968	144.394	12.474	0	
4978	144.338	12.418	0	
4988	144.207	12.287	0	
4998	144.281	12.361	0	
5008	144.189	12.269	0	
5018	144.099	12.179	0	
5028	144.073	12.153	0	
5038	144.088	12.168	0	
5048	143.919	11.999	0	
5058	143.969	12.049	0	
5068	143.849	11.929	0	
5078	143.861	11.941	0	
5088	143.819	11.899	0	
5098	143.771	11.851	0	
5108	143.793	11.873	0	
5118	143.603	11.683	0	
5128	143.617	11.697	0	
5138	143.542	11.622	0	
5148	143.538	11.618	0	
5158	143.54	11.62	0	
5168	143.493	11.573	0	
5178	143.334	11.414	0	
5188	143.374	11.454	0	
5198	143.244	11.324	0	
5208	143.295	11.375	0	
5218	143.264	11.344	0	
5228	143.146	11.226	0	
5238	143.091	11.171	0	
5248	143.094	11.174	0	
5258	143.015	11.095	0	
5268	143.092	11.172	0	
5278	143.031	11.111	0	
5288	142.943	11.023	0	
5298	142.924	11.004	0	
5308	142.896	10.976	0	
5318	142.801	10.881	0	
5328	142.802	10.882	0	
5338	142.756	10.836	0	
5348	142.757	10.837	0	
5358	142.678	10.758	0	
5368	142.715	10.795	0	
5378	142.639	10.719	0	
5388	142.526	10.606	0	
5398	142.54	10.62	0	
5408	142.53	10.61	0	

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
5418	142.561	10.641	0	
5428	142.51	10.59	0	
5438	142.439	10.519	0	
5448	142.401	10.481	0	
5458	142.425	10.505	0	
5468	142.332	10.412	0	
5478	142.283	10.363	0	
5488	142.212	10.292	0	
5498	142.243	10.323	0	
5508	142.235	10.315	0	
5518	142.272	10.352	0	
5528	142.161	10.241	0	
5538	142.135	10.215	0	
5548	142.116	10.196	0	
5558	142.024	10.104	0	
5568	142.055	10.135	0	
5578	142.024	10.104	0	
5588	141.915	9.995	0	
5598	141.845	9.925	0	
5608	141.926	10.006	0	
5618	141.94	10.02	0	
5628	141.886	9.966	0	
5638	141.86	9.94	0	
5648	141.791	9.871	0	
5658	141.773	9.853	0	
5668	141.78	9.86	0	
5678	141.699	9.779	0	
5688	141.706	9.786	0	
5698	141.669	9.749	0	
5708	141.722	9.802	0	
5718	141.672	9.752	0	
5728	141.613	9.693	0	
5738	141.509	9.589	0	
5748	141.578	9.658	0	
5758	141.545	9.625	0	
5768	141.497	9.577	0	
5778	141.445	9.525	0	
5788	141.471	9.551	0	
5798	141.453	9.533	0	
5808	141.346	9.426	0	
5818	141.296	9.376	0	
5828	141.348	9.428	0	
5838	141.343	9.423	0	
5848	141.271	9.351	0	84.33% Groundwater recovery after one day
5858	141.317	9.397	0	
5868	141.258	9.338	0	
5878	141.278	9.358	0	
5888	141.161	9.241	0	
5898	141.154	9.234	0	
5908	141.209	9.289	0	
5918	141.153	9.233	0	
5928	141.029	9.109	0	
5938	141.024	9.104	0	
5948	141.025	9.105	0	
5958	141.039	9.119	0	
5968	140.98	9.06	0	
5978	140.926	9.006	0	
5988	140.912	8.992	0	
5998	140.921	9.001	0	
6008	140.794	8.874	0	
6018	140.932	9.012	0	
6028	140.916	8.996	0	
6038	140.836	8.916	0	
6048	140.807	8.887	0	
6058	140.758	8.838	0	
6068	140.748	8.828	0	
6078	140.753	8.833	0	
6088	140.673	8.753	0	
6098	140.711	8.791	0	
6108	140.647	8.727	0	
6118	140.586	8.666	0	
6128	140.711	8.791	0	
6138	140.642	8.722	0	
6148	140.585	8.665	0	
6158	140.583	8.663	0	
6168	140.64	8.72	0	
6178	140.528	8.608	0	
6188	140.536	8.616	0	
6198	140.495	8.575	0	
6208	140.476	8.556	0	
6218	140.472	8.552	0	
6228	140.476	8.556	0	
6238	140.523	8.603	0	
6248	140.4	8.48	0	
6258	140.433	8.513	0	
6268	140.384	8.464	0	
6278	140.421	8.501	0	
6288	140.32	8.4	0	
6298	140.329	8.409	0	
6308	140.301	8.381	0	
6318	140.223	8.303	0	
6328	140.259	8.339	0	
6338	140.238	8.318	0	
6348	140.2	8.28	0	
6358	140.136	8.216	0	
6368	140.207	8.287	0	
6378	140.206	8.286	0	

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
6388	140.19	8.27	0	
6398	140.182	8.262	0	
6408	140.142	8.222	0	
6418	140.109	8.189	0	
6428	140.098	8.178	0	
6438	140.145	8.225	0	
6448	140.024	8.104	0	
6458	139.989	8.069	0	
6468	139.939	8.019	0	
6478	139.944	8.024	0	
6488	140.028	8.108	0	
6498	139.963	8.043	0	
6508	139.934	8.014	0	
6518	139.974	8.054	0	
6528	139.918	7.998	0	
6538	139.946	8.026	0	
6548	139.901	7.981	0	
6558	139.856	7.936	0	
6568	139.807	7.887	0	
6578	139.873	7.953	0	
6588	139.842	7.922	0	
6598	139.87	7.95	0	
6608	139.793	7.873	0	
6618	139.745	7.825	0	
6628	139.839	7.919	0	
6638	139.771	7.851	0	
6648	139.668	7.748	0	
6658	139.627	7.707	0	
6668	139.663	7.743	0	
6678	139.67	7.75	0	
6688	139.668	7.748	0	
6698	139.651	7.731	0	
6708	139.658	7.738	0	
6718	139.639	7.719	0	
6728	139.58	7.66	0	
6738	139.599	7.679	0	
6748	139.561	7.641	0	
6758	139.5	7.58	0	
6768	139.53	7.61	0	
6778	139.549	7.629	0	
6788	139.511	7.591	0	
6798	139.514	7.594	0	
6808	139.485	7.565	0	
6818	139.49	7.57	0	
6828	139.431	7.511	0	
6838	139.372	7.452	0	
6848	139.421	7.501	0	
6858	139.391	7.471	0	
6868	139.398	7.478	0	
6878	139.36	7.44	0	
6888	139.341	7.421	0	
6898	139.299	7.379	0	
6908	139.395	7.475	0	
6918	139.271	7.351	0	
6928	139.282	7.362	0	
6938	139.252	7.332	0	
6948	139.346	7.426	0	
6958	139.301	7.381	0	
6968	139.268	7.348	0	
6978	139.284	7.364	0	
6988	139.242	7.322	0	
6998	139.256	7.336	0	
7008	139.225	7.305	0	
7018	139.169	7.249	0	
7028	139.192	7.272	0	
7038	139.204	7.284	0	
7048	139.202	7.282	0	
7058	139.204	7.284	0	
7068	139.119	7.199	0	
7078	139.1	7.18	0	
7088	139.162	7.242	0	
7098	139.1	7.18	0	
7108	139.152	7.232	0	
7118	139.048	7.128	0	
7128	139.041	7.121	0	
7138	139.081	7.161	0	
7148	139.131	7.211	0	
7158	139.053	7.133	0	
7168	139.001	7.081	0	
7178	139.074	7.154	0	
7188	139.041	7.121	0	
7198	138.982	7.062	0	
7208	139.029	7.109	0	
7218	138.926	7.006	0	
7228	138.954	7.034	0	88.38% Groundwater recovery after two days.
7238	138.968	7.048	0	
7248	138.968	7.048	0	
7258	138.989	7.069	0	
7268	138.904	6.984	0	
7278	138.949	7.029	0	
7288	138.932	7.012	0	
7298	138.867	6.947	0	
7308	138.893	6.973	0	
7318	138.85	6.93	0	
7328	138.845	6.925	0	
7338	138.89	6.97	0	
7348	138.81	6.89	0	

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
7358	138.798	6.878	0	
7368	138.794	6.874	0	
7378	138.786	6.866	0	
7388	138.746	6.826	0	
7398	138.732	6.812	0	
7408	138.661	6.741	0	
7418	138.699	6.779	0	
7428	138.668	6.748	0	
7438	138.652	6.732	0	
7448	138.581	6.661	0	
7458	138.642	6.722	0	
7468	138.64	6.72	0	
7478	138.623	6.703	0	
7488	138.621	6.701	0	
7498	138.588	6.668	0	
7508	138.605	6.685	0	
7518	138.607	6.687	0	
7528	138.536	6.616	0	
7538	138.567	6.647	0	
7548	138.536	6.616	0	
7558	138.494	6.574	0	
7568	138.451	6.531	0	
7578	138.423	6.503	0	
7588	138.498	6.578	0	
7598	138.447	6.527	0	
7608	138.43	6.51	0	
7618	138.421	6.501	0	
7628	138.428	6.508	0	
7638	138.411	6.491	0	
7648	138.388	6.468	0	
7658	138.397	6.477	0	
7668	138.348	6.428	0	
7678	138.348	6.428	0	
7688	138.444	6.524	0	
7698	138.449	6.529	0	
7708	138.465	6.545	0	
7718	138.371	6.451	0	
7728	138.35	6.43	0	
7738	138.289	6.369	0	
7748	138.317	6.397	0	
7758	138.338	6.418	0	
7768	138.355	6.435	0	
7778	138.343	6.423	0	
7788	138.314	6.394	0	
7798	138.263	6.343	0	
7808	138.31	6.39	0	
7818	138.291	6.371	0	
7828	138.317	6.397	0	
7838	138.199	6.279	0	
7848	138.256	6.336	0	
7858	138.246	6.326	0	
7868	138.26	6.34	0	
7878	138.225	6.305	0	
7888	138.216	6.296	0	
7898	138.201	6.281	0	
7908	138.208	6.288	0	
7918	138.168	6.248	0	
7928	138.26	6.34	0	
7938	138.251	6.331	0	
7948	138.135	6.215	0	
7958	138.178	6.258	0	
7968	138.208	6.288	0	
7978	138.152	6.232	0	
7988	138.142	6.222	0	
7998	138.128	6.208	0	
8008	138.076	6.156	0	
8018	138.095	6.175	0	
8028	138.088	6.168	0	
8038	138.008	6.088	0	
8048	138.036	6.116	0	
8058	138.01	6.09	0	
8068	138.079	6.159	0	
8078	138.062	6.142	0	
8088	138.083	6.163	0	
8098	138.022	6.102	0	
8108	137.94	6.02	0	
8118	137.966	6.046	0	
8128	137.958	6.038	0	
8138	137.968	6.048	0	
8148	137.989	6.069	0	
8158	137.98	6.06	0	
8168	137.961	6.041	0	
8178	137.878	5.958	0	
8188	137.892	5.972	0	
8198	137.956	6.036	0	
8208	137.914	5.994	0	
8218	137.864	5.944	0	
8228	137.916	5.996	0	
8238	137.881	5.961	0	
8248	137.852	5.932	0	
8258	137.876	5.956	0	
8268	137.895	5.975	0	
8278	137.845	5.925	0	
8288	137.815	5.895	0	
8298	137.782	5.862	0	
8308	137.812	5.892	0	
8318	137.756	5.836	0	

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
8328	137.772	5.852	0	
8338	137.763	5.843	0	
8348	137.739	5.819	0	
8358	137.68	5.76	0	
8368	137.699	5.779	0	
8378	137.782	5.862	0	
8388	137.744	5.824	0	
8398	137.742	5.822	0	
8408	137.779	5.859	0	
8418	137.746	5.826	0	
8428	137.751	5.831	0	
8438	137.678	5.758	0	
8448	137.704	5.784	0	
8458	137.73	5.81	0	
8468	137.702	5.782	0	
8478	137.669	5.749	0	
8488	137.638	5.718	0	
8498	137.556	5.636	0	
8508	137.636	5.716	0	
8518	137.607	5.687	0	
8528	137.643	5.723	0	
8538	137.666	5.746	0	
8548	137.596	5.676	0	
8558	137.704	5.784	0	
8568	137.589	5.669	0	
8578	137.584	5.664	0	
8588	137.551	5.631	0	
8598	137.607	5.687	0	
8608	137.607	5.687	0	
8618	137.556	5.636	0	
8628	137.572	5.652	0	
8638	137.53	5.61	0	
8648	137.534	5.614	0	
8658	137.496	5.576	0	
8668	137.52	5.6	0	
8678	137.537	5.617	0	
8688	137.57	5.65	0	
8698	137.452	5.532	0	
8708	137.48	5.56	0	90.82% Groundwater Recovery in three days,
8718	137.496	5.576	0	which ***DOES NOT EXCEED*** MCEHB recovery requirements of 96.73%
8728	137.485	5.565	0	*Therefore, the well's source capacity was adjusted (see Table 4)*
8738	137.456	5.536	0	96.73% - 90.82% = 5.91%
8748	137.433	5.513	0	And, 5.91% of 8.06 gpm = 0.48 gpm
8758	137.454	5.534	0	*So; 8.06 gpm - 0.48 gpm = 7.58 gpm*
8768	137.412	5.492	0	
8778	137.419	5.499	0	
8788	137.402	5.482	0	
8798	137.424	5.504	0	
8808	137.43	5.51	0	
8818	137.355	5.435	0	
8828	137.336	5.416	0	
8838	137.327	5.407	0	
8848	137.341	5.421	0	
8858	137.395	5.475	0	
8868	137.386	5.466	0	
8878	137.31	5.39	0	
8888	137.32	5.4	0	
8898	137.363	5.443	0	
8908	137.329	5.409	0	
8918	137.431	5.511	0	
8928	137.374	5.454	0	
8938	137.311	5.391	0	
8948	137.299	5.379	0	
8958	137.287	5.367	0	
8968	137.292	5.372	0	
8978	137.167	5.247	0	
8988	137.28	5.36	0	
8998	137.273	5.353	0	
9008	137.228	5.308	0	
9018	137.311	5.391	0	
9028	137.254	5.334	0	
9038	137.221	5.301	0	
9048	137.181	5.261	0	
9058	137.183	5.263	0	
9068	137.186	5.266	0	
9078	137.183	5.263	0	
9088	137.124	5.204	0	
9098	137.117	5.197	0	
9108	137.207	5.287	0	
9118	137.141	5.221	0	
9128	137.146	5.226	0	
9138	137.113	5.193	0	
9148	137.195	5.275	0	
9158	137.153	5.233	0	
9168	137.153	5.233	0	
9178	137.082	5.162	0	
9188	137.066	5.146	0	
9198	137.098	5.178	0	
9208	137.044	5.124	0	
9218	137.077	5.157	0	
9228	137.051	5.131	0	
9238	137.113	5.193	0	
9248	137.051	5.131	0	
9258	137.13	5.21	0	
9268	137.066	5.146	0	
9278	137.042	5.122	0	
9288	137.049	5.129	0	

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
9298	137.063	5.143	0	
9308	137.021	5.101	0	
9318	136.981	5.061	0	
9328	137.037	5.117	0	
9338	136.955	5.035	0	
9348	136.978	5.058	0	
9358	137.078	5.158	0	
9368	137.028	5.108	0	
9378	137.014	5.094	0	
9388	137.075	5.155	0	
9398	136.993	5.073	0	
9408	137.045	5.125	0	
9418	137.005	5.085	0	
9428	136.986	5.066	0	
9438	136.931	5.011	0	
9448	136.943	5.023	0	
9458	136.981	5.061	0	
9468	136.908	4.988	0	
9478	136.979	5.059	0	
9488	136.872	4.952	0	
9498	137.052	5.132	0	
9508	136.903	4.983	0	
9518	136.915	4.995	0	
9528	136.976	5.056	0	
9538	136.91	4.99	0	
9548	136.868	4.948	0	
9558	136.913	4.993	0	
9568	136.901	4.981	0	
9578	136.852	4.932	0	
9588	136.854	4.934	0	
9598	136.873	4.953	0	
9608	136.852	4.932	0	
9618	136.842	4.922	0	
9628	136.847	4.927	0	
9638	136.861	4.941	0	
9648	136.804	4.884	0	
9658	136.79	4.87	0	
9668	136.821	4.901	0	
9678	136.811	4.891	0	
9688	136.856	4.936	0	
9698	136.807	4.887	0	
9708	136.802	4.882	0	
9718	136.8	4.88	0	
9728	136.823	4.903	0	
9738	136.781	4.861	0	
9748	136.802	4.882	0	
9758	136.762	4.842	0	
9768	136.722	4.802	0	
9778	136.727	4.807	0	
9788	136.715	4.795	0	
9798	136.68	4.76	0	
9808	136.712	4.792	0	
9818	136.684	4.764	0	
9828	136.677	4.757	0	
9838	136.651	4.731	0	
9848	136.67	4.75	0	
9858	136.651	4.731	0	
9868	136.651	4.731	0	
9878	136.715	4.795	0	
9888	136.64	4.72	0	
9898	136.72	4.8	0	
9908	136.642	4.722	0	
9918	136.675	4.755	0	
9928	136.557	4.637	0	
9938	136.656	4.736	0	
9948	136.599	4.679	0	
9958	136.583	4.663	0	
9968	136.581	4.661	0	
9978	136.583	4.663	0	
9988	136.646	4.726	0	
9998	136.536	4.616	0	
10008	136.628	4.708	0	
10018	136.606	4.686	0	
10028	136.592	4.672	0	
10038	136.559	4.639	0	
10048	136.559	4.639	0	
10058	136.637	4.717	0	
10068	136.555	4.635	0	
10078	136.652	4.732	0	
10088	136.621	4.701	0	
10098	136.597	4.677	0	
10108	136.569	4.649	0	92.25% Groundwater Recovery in four days.
10118	136.567	4.647	0	
10128	136.567	4.647	0	
10138	136.586	4.666	0	
10148	136.567	4.647	0	
10158	136.586	4.666	0	
10168	136.564	4.644	0	
10178	136.571	4.651	0	
10188	136.539	4.619	0	
10198	136.553	4.633	0	
10208	136.543	4.623	0	
10218	136.501	4.581	0	
10228	136.595	4.675	0	
10238	136.48	4.56	0	
10248	136.506	4.586	0	
10258	136.456	4.536	0	

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
10268	136.487	4.567	0	
10278	136.517	4.597	0	
10288	136.428	4.508	0	
10298	136.418	4.498	0	
10308	136.249	4.329	0	
10318	136.451	4.531	0	
10328	136.39	4.47	0	
10338	136.44	4.52	0	
10348	136.428	4.508	0	
10358	136.371	4.451	0	
10368	136.357	4.437	0	
10378	136.374	4.454	0	
10388	136.376	4.456	0	
10398	136.287	4.367	0	
10408	136.338	4.418	0	
10418	136.338	4.418	0	
10428	136.319	4.399	0	
10438	136.338	4.418	0	
10448	136.305	4.385	0	
10458	136.345	4.425	0	
10468	136.338	4.418	0	
10478	136.334	4.414	0	
10488	136.294	4.374	0	
10498	136.308	4.388	0	
10508	136.315	4.395	0	
10518	136.294	4.374	0	
10528	136.317	4.397	0	
10538	136.289	4.369	0	
10548	136.27	4.35	0	
10558	136.296	4.376	0	
10568	136.298	4.378	0	
10578	136.327	4.407	0	
10588	136.334	4.414	0	
10598	136.294	4.374	0	
10608	136.28	4.36	0	
10618	136.296	4.376	0	
10628	136.247	4.327	0	
10638	136.216	4.296	0	
10648	136.327	4.407	0	
10658	136.235	4.315	0	
10668	136.199	4.279	0	
10678	136.207	4.287	0	
10688	136.249	4.329	0	
10698	136.275	4.355	0	
10708	136.173	4.253	0	
10718	136.226	4.306	0	
10728	136.264	4.344	0	
10738	136.233	4.313	0	
10748	136.271	4.351	0	
10758	136.141	4.221	0	
10768	136.237	4.317	0	
10778	136.181	4.261	0	
10788	136.296	4.376	0	
10798	136.214	4.294	0	
10808	136.245	4.325	0	
10818	136.254	4.334	0	
10828	136.183	4.263	0	
10838	136.174	4.254	0	
10848	136.157	4.237	0	
10858	136.233	4.313	0	
10868	136.223	4.303	0	
10878	136.233	4.313	0	
10888	136.186	4.266	0	
10898	136.153	4.233	0	
10908	136.181	4.261	0	
10918	136.2	4.28	0	
10928	136.153	4.233	0	
10938	136.117	4.197	0	
10948	136.108	4.188	0	
10958	136.129	4.209	0	
10968	136.15	4.23	0	
10978	136.054	4.134	0	
10988	136.139	4.219	0	
10998	136.115	4.195	0	
11008	136.12	4.2	0	
11018	136.115	4.195	0	
11028	136.103	4.183	0	
11038	136.153	4.233	0	
11048	136.085	4.165	0	
11058	136.125	4.205	0	
11068	136.087	4.167	0	
11078	136.068	4.148	0	
11088	136.082	4.162	0	
11098	136.068	4.148	0	
11108	136	4.08	0	
11118	136.061	4.141	0	
11128	136.023	4.103	0	
11138	136.035	4.115	0	
11148	136.054	4.134	0	
11158	135.979	4.059	0	
11168	136.026	4.106	0	
11178	136.009	4.089	0	
11188	135.931	4.011	0	
11198	135.983	4.063	0	
11208	135.946	4.026	0	
11218	135.908	3.988	0	
11228	135.969	4.049	0	

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
11238	135.967	4.047	0	
11248	135.981	4.061	0	
11258	136.002	4.082	0	
11268	135.922	4.002	0	
11278	135.917	3.997	0	
11288	135.894	3.974	0	
11298	135.92	4	0	
11308	135.946	4.026	0	
11318	135.939	4.019	0	
11328	135.931	4.011	0	
11338	135.946	4.026	0	
11348	135.924	4.004	0	
11358	135.924	4.004	0	
11368	135.901	3.981	0	
11378	135.946	4.026	0	
11388	135.988	4.068	0	
11398	135.91	3.99	0	
11408	135.891	3.971	0	
11418	135.937	4.017	0	
11428	135.896	3.976	0	
11438	135.898	3.978	0	
11448	135.931	4.011	0	
11458	135.979	4.059	0	
11468	135.908	3.988	0	
11478	135.84	3.92	0	
11488	135.816	3.896	0	
11498	135.934	4.014	0	
11508	135.877	3.957	0	
11518	135.821	3.901	0	
11528	135.932	4.012	0	
11538	135.851	3.931	0	
11548	135.891	3.971	0	93.62% Groundwater Recovery in five days.
11558	135.92	4	0	
11568	135.87	3.95	0	
11578	135.941	4.021	0	
11588	135.792	3.872	0	
11598	135.816	3.896	0	
11608	135.809	3.889	0	
11618	135.865	3.945	0	
11628	135.788	3.868	0	
11638	135.792	3.872	0	
11648	135.771	3.851	0	
11658	135.963	4.043	0	
11668	135.83	3.91	0	
11678	135.838	3.918	0	
11688	135.831	3.911	0	
11698	135.771	3.851	0	
11708	135.762	3.842	0	
11718	135.757	3.837	0	
11728	135.843	3.923	0	
11738	135.809	3.889	0	
11748	135.836	3.916	0	
11758	135.783	3.863	0	
11768	135.771	3.851	0	
11778	135.805	3.885	0	
11788	135.817	3.897	0	
11798	135.725	3.805	0	
11808	135.819	3.899	0	
11818	135.85	3.93	0	
11828	135.765	3.845	0	
11838	135.751	3.831	0	
11848	135.758	3.838	0	
11858	135.651	3.731	0	
11868	135.687	3.767	0	
11878	135.737	3.817	0	
11888	135.739	3.819	0	
11898	135.737	3.817	0	
11908	135.748	3.828	0	
11918	135.734	3.814	0	
11928	135.765	3.845	0	
11938	135.737	3.817	0	
11948	135.732	3.812	0	
11958	135.706	3.786	0	
11968	135.661	3.741	0	
11978	135.685	3.765	0	
11988	135.671	3.751	0	
11998	135.76	3.84	0	
12008	135.69	3.77	0	
12018	135.73	3.81	0	
12028	135.727	3.807	0	
12038	135.687	3.767	0	
12048	135.635	3.715	0	
12058	135.723	3.803	0	
12068	135.654	3.734	0	
12078	135.581	3.661	0	
12088	135.645	3.725	0	
12098	135.715	3.795	0	
12108	135.616	3.696	0	
12118	135.746	3.826	0	
12128	135.694	3.774	0	
12138	135.673	3.753	0	
12148	135.678	3.758	0	
12158	135.664	3.744	0	
12168	135.671	3.751	0	
12178	135.666	3.746	0	
12188	135.718	3.798	0	
12198	135.645	3.725	0	

Well #1 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
12208	135.664	3.744	0	
12218	135.647	3.727	0	
12228	135.68	3.76	0	
12238	135.621	3.701	0	
12248	135.6	3.68	0	
12258	135.725	3.805	0	
12268	135.588	3.668	0	
12278	135.661	3.741	0	
12288	135.647	3.727	0	
12298	135.647	3.727	0	
12308	135.6	3.68	0	
12318	135.638	3.718	0	
12328	135.614	3.694	0	
12338	135.572	3.652	0	
12348	135.586	3.666	0	
12358	135.61	3.69	0	
12368	135.619	3.699	0	
12378	135.586	3.666	0	
12388	135.631	3.711	0	
12398	135.616	3.696	0	
12408	135.621	3.701	0	
12418	135.607	3.687	0	
12428	135.567	3.647	0	
12438	135.555	3.635	0	
12448	135.567	3.647	0	
12458	135.56	3.64	0	
12468	135.567	3.647	0	
12478	135.586	3.666	0	
12488	135.555	3.635	0	
12498	135.631	3.711	0	
12508	135.577	3.657	0	
12518	135.508	3.588	0	
12528	135.506	3.586	0	
12538	135.581	3.661	0	
12548	135.53	3.61	0	
12558	135.515	3.595	0	
12568	135.499	3.579	0	
12578	135.508	3.588	0	
12588	135.438	3.518	0	
12598	135.468	3.548	0	
12608	135.461	3.541	0	
12618	135.459	3.539	0	
12628	135.48	3.56	0	
12638	135.473	3.553	0	
12648	135.525	3.605	0	
12658	135.489	3.569	0	
12668	135.372	3.452	0	
12678	135.407	3.487	0	
12688	135.435	3.515	0	
12698	135.374	3.454	0	
12708	135.492	3.572	0	
12718	135.407	3.487	0	
12728	135.372	3.452	0	
12738	135.393	3.473	0	
12748	135.523	3.603	0	
12758	135.485	3.565	0	
12768	135.448	3.528	0	
12778	135.497	3.577	0	
12788	135.391	3.471	0	
12798	135.434	3.514	0	
12808	135.497	3.577	0	
12818	135.507	3.587	0	
12828	135.455	3.535	0	
12838	135.308	3.388	0	
12848	135.393	3.473	0	
12858	135.388	3.468	0	
12868	135.388	3.468	0	
12878	135.402	3.482	0	
12888	135.453	3.533	0	
12898	135.348	3.428	0	
12908	135.379	3.459	0	
12918	135.423	3.503	0	
12928	135.455	3.535	0	94.37% Groundwater Recovery in six days.
12938	135.453	3.533	0	which ***DOES NOT EXCEED*** MPWMD recovery requirements.
12948	135.381	3.461	0	*Therefore, there will be adjustments to well's Calculated Yield (see Table 4).*
12958	135.36	3.44	0	95% - 94.37% = 0.63% reduction in the wells Calculated Yield

APPENDIX D

AQUIFER TEST 4.2© PUMPING TEST ANALYSIS REPORTS

WELL #1

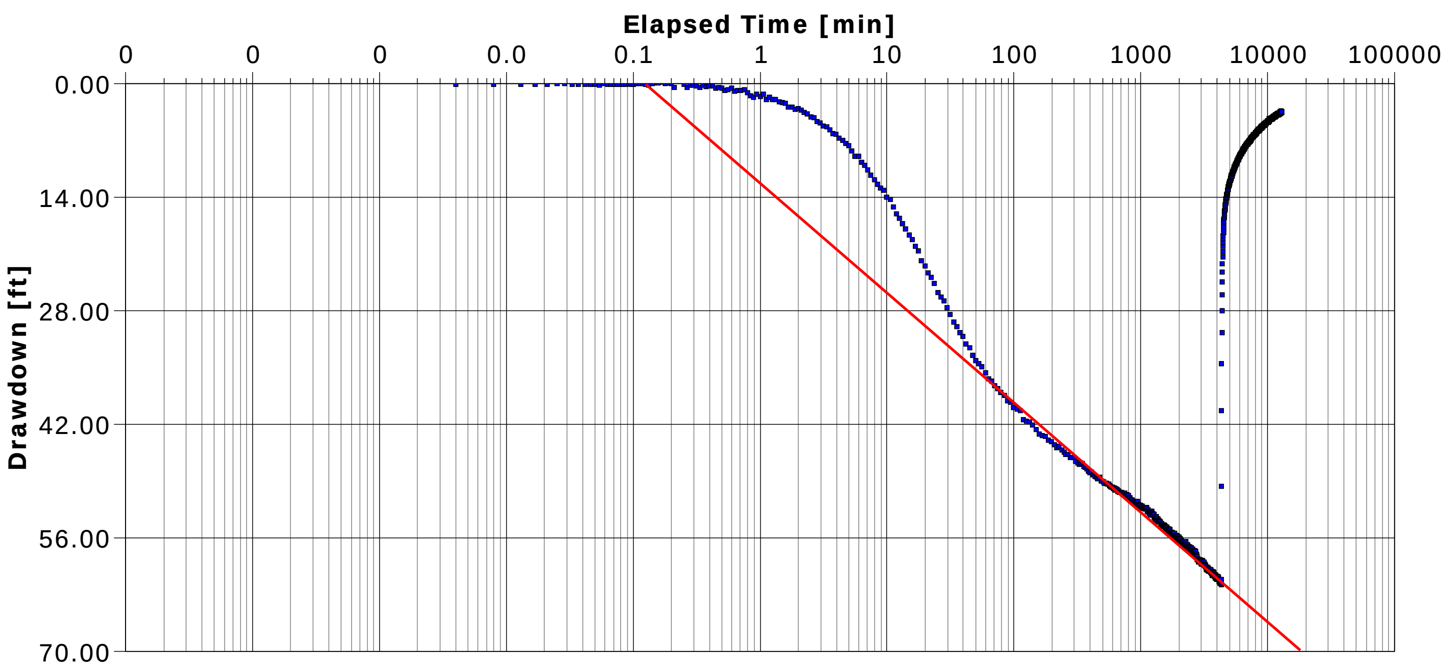
A) COOPER - JACOB TIME DRAWDOWN METHOD ANALYSIS (EARLY TIME DATA)
B) COOPER - JACOB TIME DRAWDOWN METHOD ANALYSIS (LATE TIME DATA)
C) MOENCH FRACTURE FLOW/DOUBLE POROSITY METHOD ANALYSIS
D) THEIS RECOVERY METHOD ANALYSIS

WELL #2

A) COOPER - JACOB TIME DRAWDOWN METHOD ANALYSIS (EARLY TIME DATA)
B) COOPER - JACOB TIME DRAWDOWN METHOD ANALYSIS (LATE TIME DATA)
C) MOENCH FRACTURE FLOW/DOUBLE POROSITY METHOD ANALYSIS
D) THEIS RECOVERY METHOD ANALYSIS

Bierman Hydrogeologic **A Professional Corporation** **3153 Redwood Drive** **Aptos, CA 95003**	**Pumping Test Analysis Report**	Appendix D
	Project: Flores/Pisenti Pumping Impact Assessment	
	Number: APN: 103-071-019	
	Client: Flores	

Location: 564 & 577 Monhollan Road	Pumping Test: 72hr Constant Rate Pumping Test	Pumping Well: Well 1
Test Conducted by: A. Bierman		Test Date: 10/12/2010
Analysis Performed by: A. Bierman	Cooper & Jacob Time Drawdown (Early Time Data)	Analysis Date: 3/19/2011
Aquifer Thickness: 763.88 ft	Discharge Rate: 8.06 [U.S. gal/min]	



Calculation after Cooper & Jacob

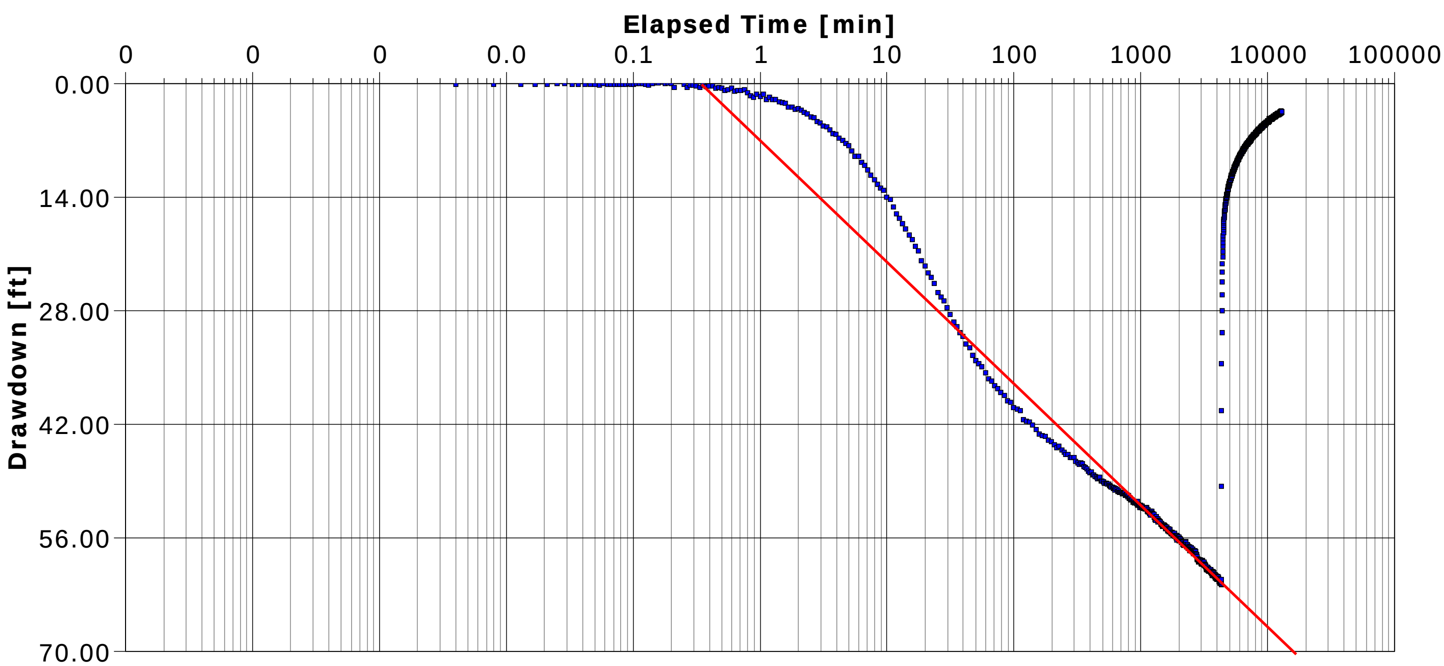
Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Storage coefficient	Radial Distance to PW [ft]	
Well 1	1.58×10^{2}	2.06×10^{-1}	6.90×10^{-4}	0.21	

After 8-iterations, casing storage was calculated to expire within 64 minutes after test start.

The Early Time Transmissivity was obtained using data between 70-700 minutes using manual fit of the drawdown curve, and for the purposes of this analysis, it represents a typical 12-hour pumping cycle, with no significant change in the slope of the drawdown curve out to 4320 minutes (72 hours), and therefore there is no need to assess the ratio of early to late time transmissivities for calculated adjusted 24-hour specific capacity.

Bierman Hydrogeologic **A Professional Corporation** **3153 Redwood Drive** **Aptos, CA 95003**	**Pumping Test Analysis Report**	Appendix D
	Project: Flores/Pisenti Pumping Impact Assessment	
	Number: APN: 103-071-019	
	Client: Flores	

Location: 564 & 577 Monhollan Road	Pumping Test: 72hr Constant Rate Pumping Test	Pumping Well: Well 1
Test Conducted by: A. Bierman		Test Date: 10/12/2010
Analysis Performed by: A. Bierman	Cooper & Jacob Time-Drawdown (Later Time Data)	Analysis Date: 3/19/2011
Aquifer Thickness: 763.88 ft	Discharge Rate: 8.06 [U.S. gal/min]	



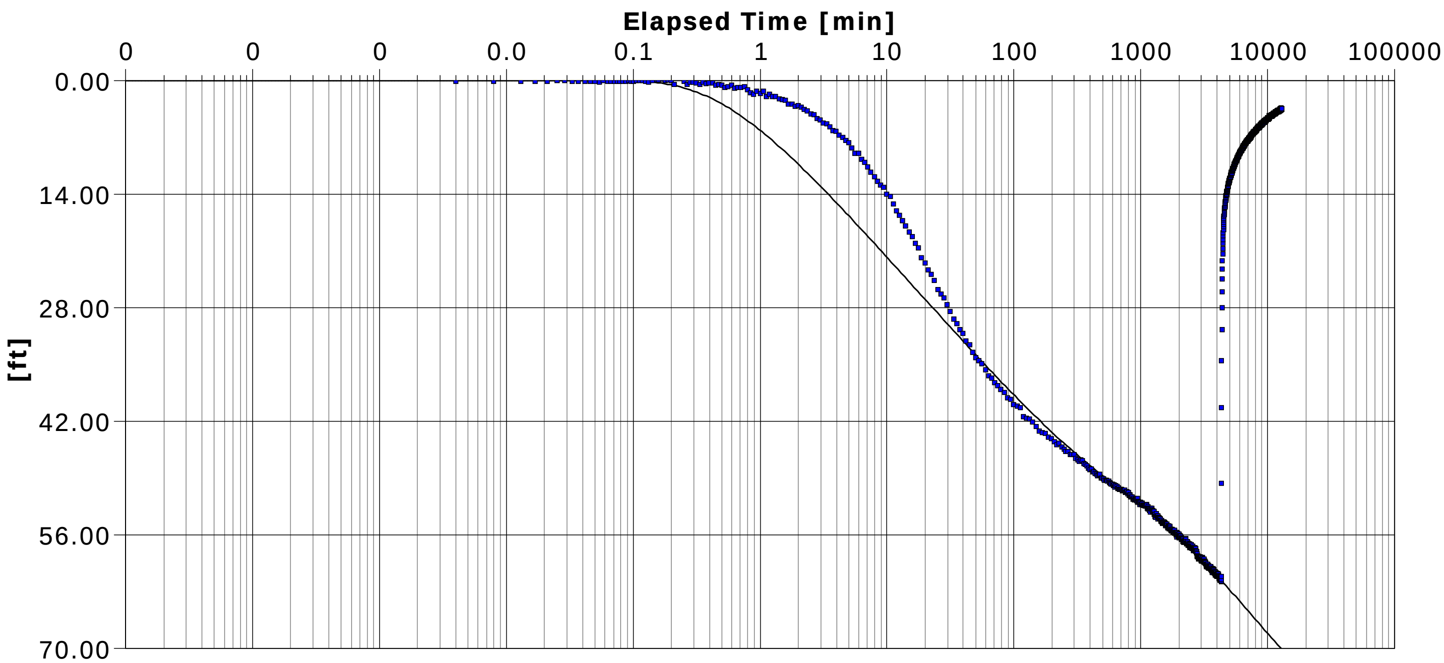
Calculation after Cooper & Jacob

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Storage coefficient	Radial Distance to PW [ft]	
Well 1	1.39×10^{2}	1.82×10^{-1}	3.62×10^{-2}	0.21	

Later time Transmissivity obtained from data between 1000-4320 minutes using the manual-fit approach of the drawdown curve which represents cumulative pumping over-time. Only a slight change from early time slope of the drawdown curve.

Bierman Hydrogeologic **A Professional Corporation** **3153 Redwood Drive** **Aptos, CA 95003**	**Pumping Test Analysis Report**	Appendix D
	Project: Flores/Pisenti Pumping Impact Assessment	
	Number: APN: 103-071-019	
	Client: Flores	

Location: 564 & 577 Monhollan Road	Pumping Test: 72hr Constant Rate Pumping Test	Pumping Well: Well 1
Test Conducted by: A. Bierman		Test Date: 10/12/2010
Analysis Performed by: A. Bierman	Moench Fracture Flow Method	Analysis Date: 3/19/2011
Aquifer Thickness: 763.88 ft	Discharge Rate: 8.06 [U.S. gal/min]	



Calculation after Double Porosity

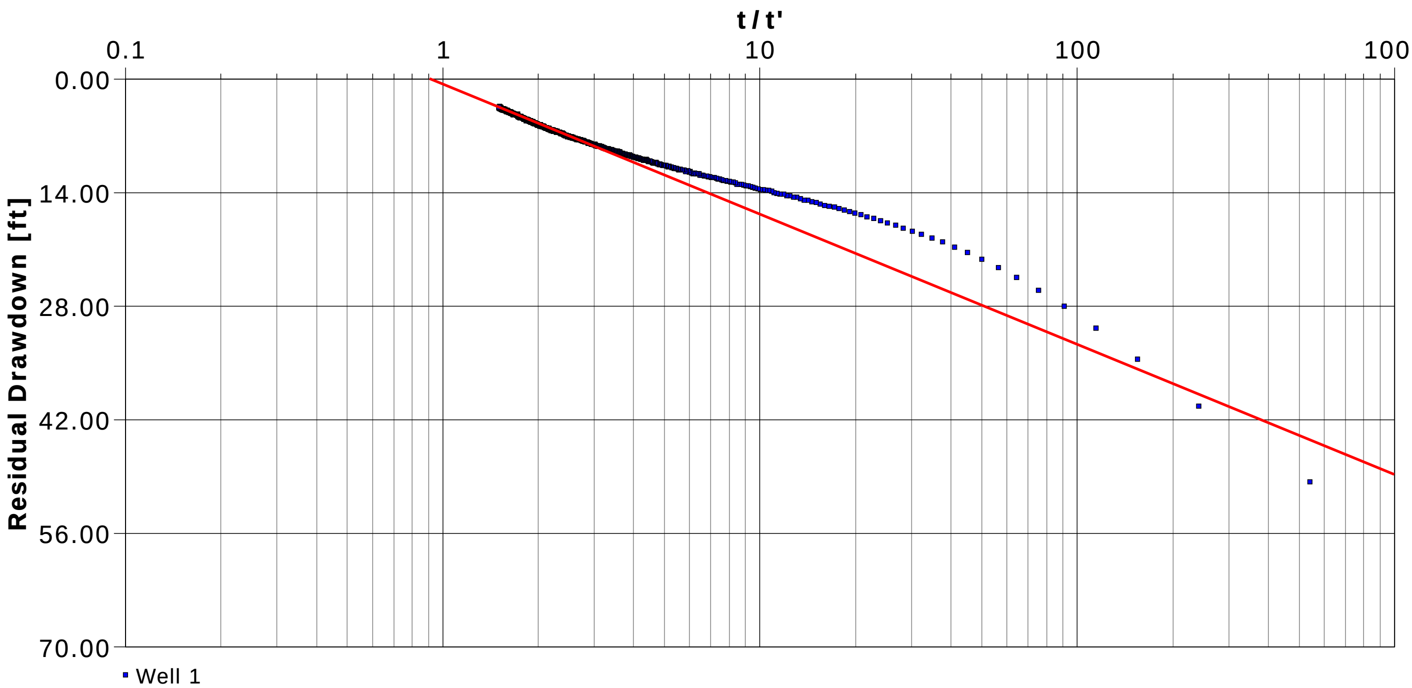
Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Specific storage	Sigma	Lambda	Radial Distance to PW [ft]
Well 1	1.18×10^{2}	1.54×10^{-1}	3.61×10^{-1}	1.61×10^{0}	1.78×10^{-3}	0.21

All data post-casing storage was used to determine values of T and K using the manual-fit approach. This method analysis accounts not only for analysis of storage coefficient using pumping well data, but accounts for delayed yield from the factures of the later time data and potentially from the hard-rock matrix, or fracture skin of the hard-rock matrix.

Higher values of Lamda (interporosity flow coefficient) as compared to Sigma (Ratio of: Matrix/Fissure)indicate that water will drain from the main fractures quickly, then originate from the fracture skin or the hard rock matrix. The fracture skin is a thin skin of low permeability material that deposits at the surface of the fracture/block interface, which impedes the free exchange of fluid between the block fissures and the main fracture system. For this fractured aquifer system, and based on the lack of drawdown, the fracture system did not dewater during the test.

Bierman Hydrogeologic **A Professional Corporation** **3153 Redwood Drive** **Aptos, CA 95003**	**Pumping Test Analysis Report** Appendix D Project: Flores/Pisenti Pumping Impact Assessment Number: APN: 103-071-019 Client: Flores

Location: 564 & 577 Monhollan Road	Pumping Test: 72hr Constant Rate Pumping Test	Pumping Well: Well 1
Test Conducted by: A. Bierman		Test Date: 10/12/2010
Analysis Performed by: A. Bierman	Theis Recovery Analysis	Analysis Date: 3/19/2011
Aquifer Thickness: 763.88 ft	Discharge: variable, average rate 8.06 [U.S. gal/min]	



Calculation after Theis & Jacob

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Radial Distance to PW [ft]	
Well 1	1.32×10^{2}	1.73×10^{-1}	0.21	

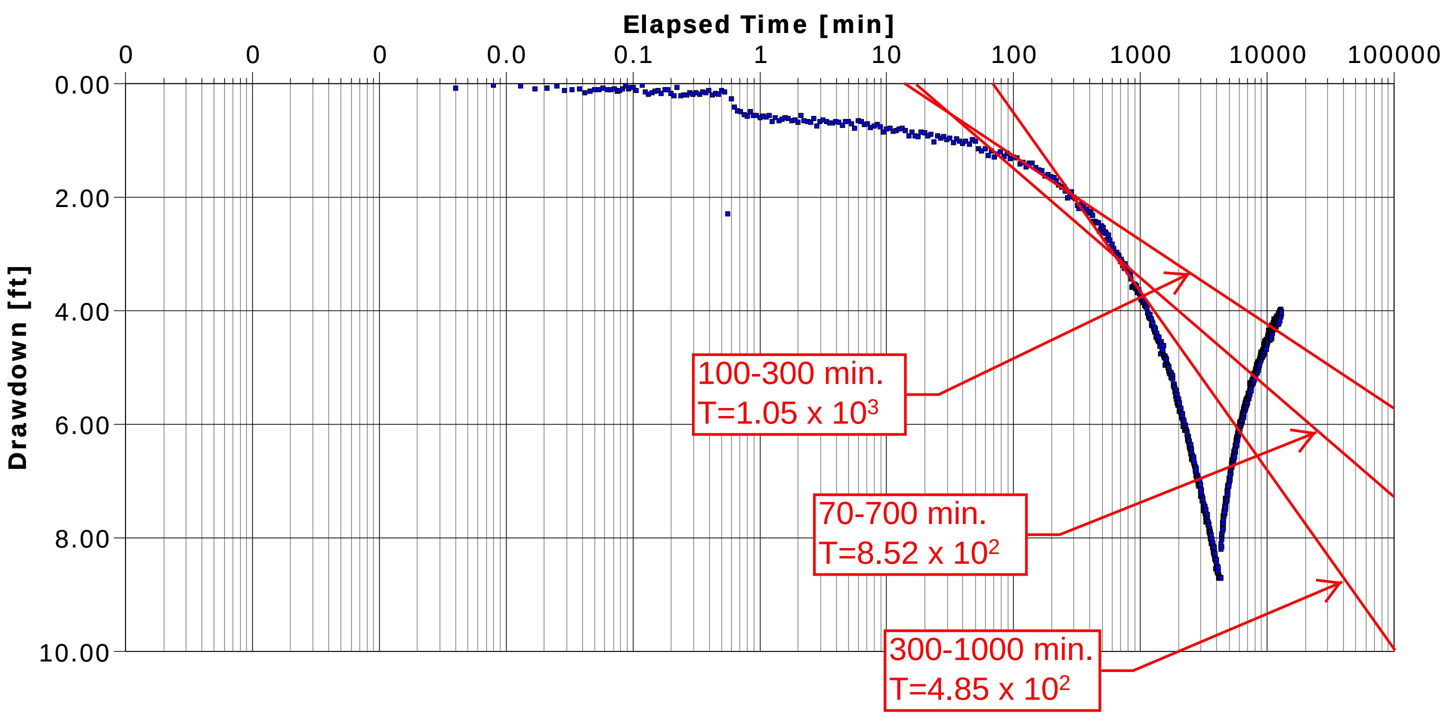
Theis Recovery Analysis provides the best values of T and K values as their are no pumping influences that could alter aquifer parameters.

After 3-days the recovery was 90.82%.
After 6-days, the recovery was 94.37%.

These values, coupled with this analysis and the extrapolation of recovery curve as residual drawdown approaches 1.0 suggest a fairly elastic aquifer with nearly complete recovery in the well.

	Bierman Hydrogeologic A Professional Corporation 3153 Redwood Drive Aptos, CA 95003	**Pumping Test Analysis Report** Appendix D Project: Flores/Pisenti Pumping Impact Assessment Number: APN: 103-071-019 Client: Flores

Location: 564 & 577 Monhollan Road	Pumping Test: Well #2; 72hr Constant Rate Test	Pumping Well: Well 2
Test Conducted by: A. Bierman		Test Date: 10/12/2010
Analysis Performed by: A. Bierman	Cooper & Jacob Early Time Data	Analysis Date: 3/15/2011
Aquifer Thickness: 437.51 ft	Discharge Rate: 6.25 [U.S. gal/min]	



Calculation after Cooper & Jacob

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Storage coefficient	Radial Distance to PW [ft]	
Well 2	8.52×10^2	1.95×10^0		0.21	

After 8-iterations, casing storage was calculated to expire within 2 minutes after test start.

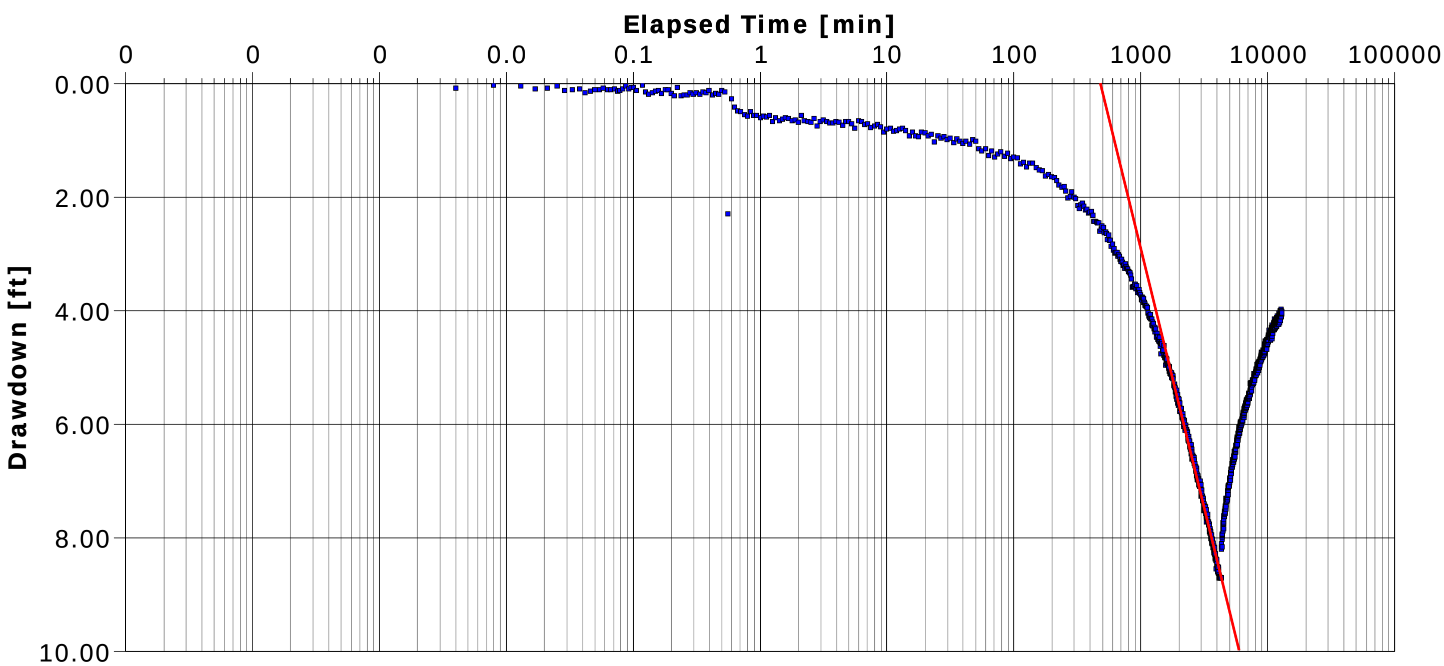
The Early Time Transmissivity was obtained using data between 70-700 minutes and was compared to the transmissivity between 100-1000 min (7.67 x E2), which was obtained from the average of the slopes of the drawdown curve between 100-300 min (1.05 x E3) and 300-1000 min (4.85 x E2) as shown above.

As noted, the average Transmissivity using manual fit of the drawdown curve was calculated to be (7.67 x E2, and is comparable to the Transmissivity obtained using data between 70-700 minutes (8.52 x E2).

For the purposes of this analysis, the data between 70-700 minutes was used as the Early Time Transmissivity as it represents a typical 12-hour pumping period.

Bierman Hydrogeologic **A Professional Corporation** **3153 Redwood Drive** **Aptos, CA 95003**	**Pumping Test Analysis Report**	Appendix D
	Project: Flores/Pisenti Pumping Impact Assessment	
	Number: APN: 103-071-019	
	Client: Flores	

Location: 564 & 577 Monhollan Road	Pumping Test: Well #2; 72hr Constant Rate Test	Pumping Well: Well 2
Test Conducted by: A. Bierman		Test Date: 10/12/2010
Analysis Performed by: A. Bierman	Cooper & Jacob Time Drawdown (Later Time Data)	Analysis Date: 3/15/2011
Aquifer Thickness: 437.51 ft	Discharge Rate: 6.25 [U.S. gal/min]	



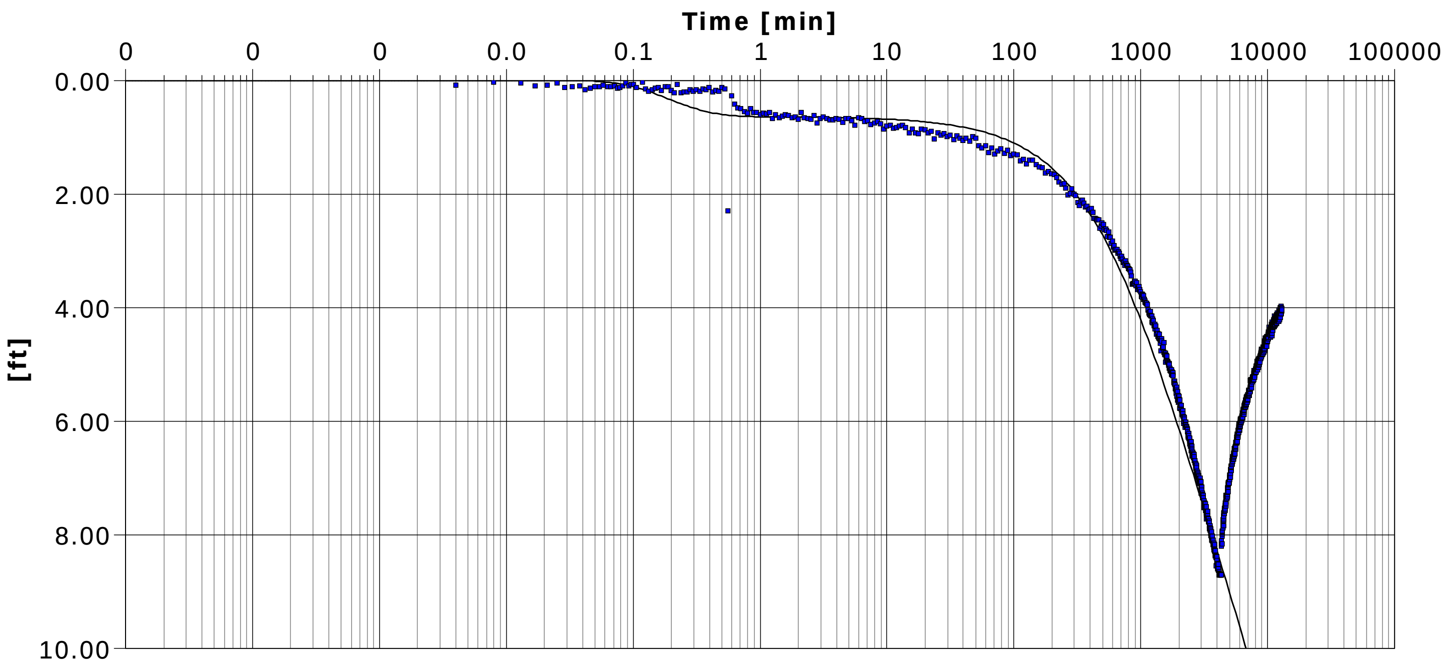
Calculation after Cooper & Jacob

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Storage coefficient	Radial Distance to PW [ft]	
Well 2	1.84×10^{2}	4.21×10^{-1}		0.21	

Later time Transmissivity obtained from data between 1200-4320 minutes using the manual-fit approach of the drawdown curve which represents cumulative pumping over-time.

Bierman Hydrogeologic A Professional Corporation 3153 Redwood Drive Aptos, CA 95003	**Pumping Test Analysis Report** Appendix D Project: Flores/Pisenti Pumping Impact Assessment Number: APN: 103-071-019 Client: Flores

Location: 564 & 577 Monhollan Road	Pumping Test: Well #2; 72hr Constant Rate Test	Pumping Well: Well 2
Test Conducted by: A. Bierman		Test Date: 10/12/2010
Analysis Performed by: A. Bierman	Double Porosity - Fracture Flow	Analysis Date: 3/15/2011
Aquifer Thickness: 437.51 ft	Discharge Rate: 6.25 [U.S. gal/min]	



Calculation after Double Porosity

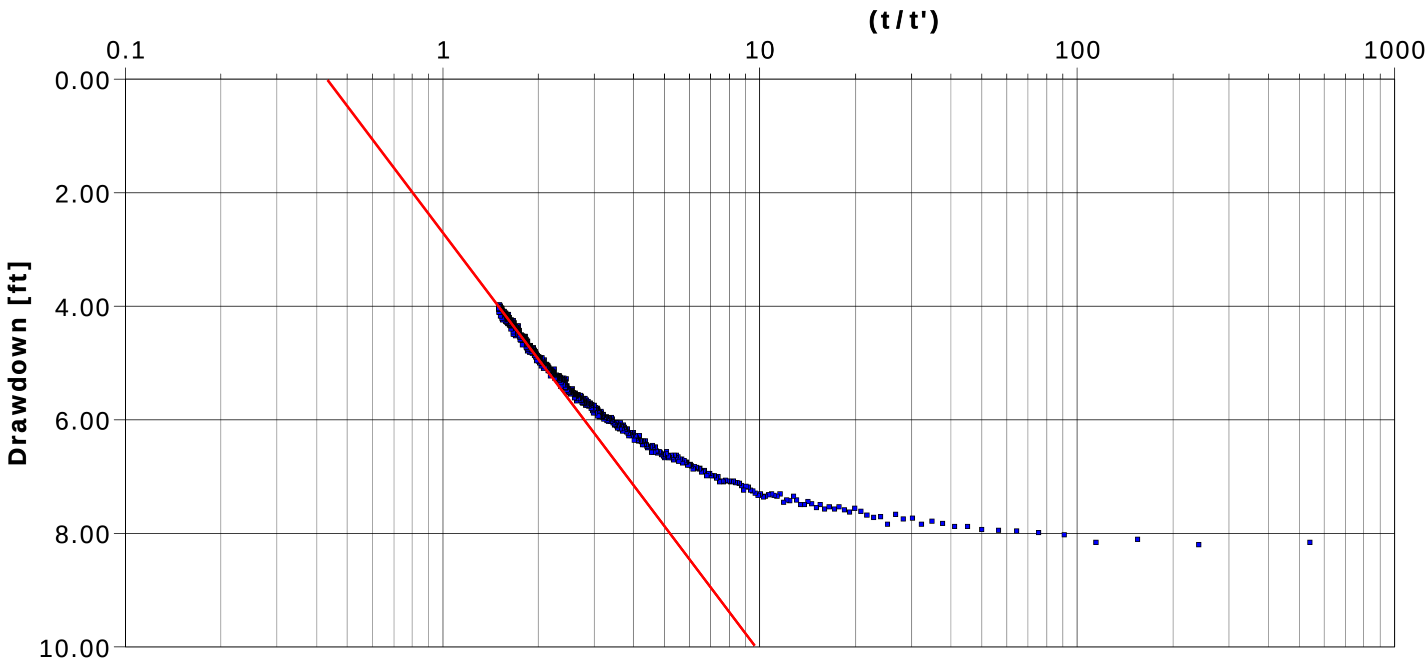
Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Specific storage	Sigma	Lambda	Radial Distance to PW [ft]
Well 2	2.12×10^{2}	4.85×10^{-1}	3.69×10^{-1}	1.00×10^{3}	4.67×10^{0}	0.21

All data post-casing storage was used to determine values of T and K using the manual-fit approach. This method analysis accounts not only for analysis of storage coefficient using pumping well data, but accounts for delayed yield from the factures of the later time data and potentially from the hard-rock matrix, or fracture skin of the hard-rock matrix.

Higher values of Lamda (interporosity flow coefficient) as compared to Sigma (Ratio of: Matrix/Fissure)indicate that water will drain from the main fractures quickly, then originate from the fracture skin or the hard rock matrix. The fracture skin is a thin skin of low permeability material that deposits at the surface of the fracture/block interface, which impedes the free exchange of fluid between the block fissures and the main fracture system. For this fracured aquifer system, and although a negative boundary was encountered, based on the lack of drawdown, the fracture system did not dewater during the test.

Bierman Hydrogeologic A Professional Corporation 3153 Redwood Drive Aptos, CA 95003	**Pumping Test Analysis Report** Appendix D
	Project: Flores/Pisenti Pumping Impact Assessment
	Number: APN: 103-071-019
	Client: Flores

Location: 564 & 577 Monhollan Road	Pumping Test: Well #2; 72hr Constant Rate Test	Pumping Well: Well 2
Test Conducted by: A. Bierman		Test Date: 10/12/2010
Analysis Performed by: A. Bierman	Theis Recovery	Analysis Date: 3/15/2011
Aquifer Thickness: 437.51 ft	Discharge Rate: 6.25 [U.S. gal/min]	



Calculation after Theis & Jacob

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Radial Distance to PW [ft]	
Well 2	2.33×10^{2}	5.34×10^{-1}	0.21	

Theis Recovery Analysis provides the best values of T and K values as their are no pumping influences that could alter aquifer parameters.

After 3-days the recovery was 43.51%.
After 6-days, the recovery was 54.42%.

These values, coupled with this analysis and the extrapolation of recovery curve as residual drawdown approaches 1.0 suggest that there is incomplete recovery in the well due to limited extent of fracture system and the encounter of a negative boundary.

APPENDIX E

SUPPORTING DOCUMENTATION FOR CALCULATING:
INTERMITTENT PUMPING; TIME/DRAWDOWN PROJECTION ON PUMPING WELL

CONTINUOUS PUMPING; TIME & DISTANCE/DRAWDOWN PROJECTIONS ON NEIGHBORING WELLS AND SENSITIVE ENVIRONMENTAL RECEPTORS

APPENDIX E
COVER SHEET

Below Equation[1] Used to Analyze Intermintent Pumping Time/Drawdown Projections for Pumping Well (IF APPLICABLE)

$$s = \frac{264\, Q_{IW\#1}}{T} \log \frac{(0.3)(T)(t_{IW\#1})}{(r^2)\, S} + \frac{264\, Q_{IW\#2}}{T} \log \frac{(0.3)(T)(t_{IW\#2})}{(r^2)\, S}$$

Where: s = Calculated drawdown (in feet)

Q = Maximum Day Demand = 1.41 gpm (Pumping 24/7) or 2.82 gpm (Pumping 12-hr cycles).

$Q_{IW\#1}$ = 1.41 gpm (Imaginary Well #1 Pumping Rate). Pumped continuously at a rate that would produce a *volume* equal to the volume produced by the cycled well).

$Q_{IW\#2}$ = 1.41 gpm (Imaginary Well #2 Pumping Rate). Pumped at a rate equal to the difference between the cyclic pumping rate (2.82 gpm) and that of imaginary well #1 (1.41 gpm).

T = Transmissivity[2] is 132 gpd/ft.

$t_{IW\#1}$ = Time since pumping started for Imaginary Well #1 (in days) using 9.5, 29.5, 89.5, 182.5 days.

$t_{IW\#2}$ = Time since pumping started for Imaginary Well #2 (in days) using 0.5 days (last cycle of the pumping cycle).

r = radial distance[3] (in feet) from pumping well to wells potentially influenced by pumping well.

S = For this assessment a storage coefficient of 1.0×10^{-5} was used. Driscoll, Groundwater and Wells, 1986.

Footnotes for the above equation:

1: Equation derived and described in Groundwater and Wells, Second Edition, Driscoll, 1986, page 235.

2: Transmissivity values obtained from AquiferTest© 4.2 Theis Recovery Method Analysis, (Table 3).

3: Radial distance of 0.5' used for calculating drawdown at pumping well.

Below Equation[1] Used to Analyze Continuous Pumping; Time/Drawdown Projections on Neighboring Wells and CVAA

$$s = \frac{264\, Q}{T} \log \frac{0.3\, T\, t}{r^2\, S}$$

Where: s = Calculated drawdown (in feet)

Q = Average Day Demand[2] = 0.83 gpm. Dry Season Demand[2] = 0.99 gpm

T = Transmissivity[3] = 132 gpd/ft.

r = radial distance[4] (in feet) from pumping well to wells and SERs potentially influenced by pumping well.

S = For this assessment a storage coefficient of 1.0×10^{-5} was used. Driscoll, Groundwater and Wells, 1986.

Footnotes:

1: Modeified Theis Nonequilibrium Well Equation described in Groundwater and Wells, Second Edition, Driscoll, 1986, page 219.

2: Average Day and Dry Season Demand calculated in Table 2.

3: Transmissivity value obtained from AquiferTest© 4.2 Cooper & Jacob Method Analysis based on Observation Well Data (Table 3).

4: Radial distances from pumping well to neighboring wells and SERs obtained from maps supplied by MPWMD.

APPENDIX E

Intermittent Pumping; Time/Drawdown Calculations On Pumping Well (Flores/Pisenti Well#1)
Using Maximum Day Demand Rates and a Range of Storage Coefficients

Maximum Day Demand w/ 1.0 x 10^{-3} Storage Coefficient

10 days of Intermittent pumping for pumping well (12hr ON, 12hr OFF)

$$s = 2.82\ \mathrm{LOG}\ \frac{376.2}{0.00025} + 2.82\ \mathrm{LOG}\ \frac{19.8}{0.00025}$$

$$s = 2.82\ \mathrm{LOG}\ 1504800 + 2.82\ \mathrm{LOG}\ 79200$$

$$s = 2.82 \quad 6.177478783 + 2.82 \quad 4.898725182$$

$$s = 17.42049 + 13.814405$$

$$s = 31.234895$$

$Q_{IW\#1}$ = 1.410, $Q_{IW\#2}$ = 1.410, T = 132.00, $IW\#1_t$ = 9.5, $IW\#2_t$ = 0.5, r = 0.5, S = 0.001

30 days of Intermittent pumping for pumping well (12hr ON, 12hr OFF)

$$s = 2.82\ \mathrm{LOG}\ \frac{1168.2}{0.00025} + 2.82\ \mathrm{LOG}\ \frac{19.8}{0.00025}$$

$$s = 2.82\ \mathrm{LOG}\ 4672800 + 2.82\ \mathrm{LOG}\ 79200$$

$$s = 2.82 \quad 6.669577193 + 2.82 \quad 4.898725182$$

$$s = 18.808208 + 13.814405$$

$$s = 32.622613$$

$Q_{IW\#1}$ = 1.410, $Q_{IW\#2}$ = 1.410, T = 132.00, $IW\#1_t$ = 29.5, $IW\#2_t$ = 0.5, r = 0.5, S = 0.001

90 days of Intermittent pumping for pumping well (12hr ON, 12hr OFF)

$$s = 2.82\ \mathrm{LOG}\ \frac{3544.2}{0.00025} + 2.82\ \mathrm{LOG}\ \frac{19.8}{0.00025}$$

$$s = 2.82\ \mathrm{LOG}\ 14176800 + 2.82\ \mathrm{LOG}\ 79200$$

$$s = 2.82 \quad 7.151578213 + 2.82 \quad 4.898725182$$

$$s = 20.167451 + 13.814405$$

$$s = 33.981856$$

$Q_{IW\#1}$ = 1.410, $Q_{IW\#2}$ = 1.410, T = 132.00, $IW\#1_t$ = 89.5, $IW\#2_t$ = 0.5, r = 0.5, S = 0.001

183 days of Intermittent pumping for pumping well (12hr ON, 12hr OFF)

$$s = 2.82\ \mathrm{LOG}\ \frac{7227}{0.00025} + 2.82\ \mathrm{LOG}\ \frac{19.8}{0.00025}$$

$$s = 2.82\ \mathrm{LOG}\ 28908000 + 2.82\ \mathrm{LOG}\ 79200$$

$$s = 2.82 \quad 7.461018046 + 2.82 \quad 4.898725182$$

$$s = 21.040071 + 13.814405$$

$$s = 34.854476$$

$Q_{IW\#1}$ = 1.410, $Q_{IW\#2}$ = 1.410, T = 132.00, $IW\#1_t$ = 182.5, $IW\#2_t$ = 0.5, r = 0.5, S = 0.001

Maximum Day Demand w/ 1.0 x 10^{-4} Storage Coefficient

10 days of Intermittent pumping for pumping well (12hr ON, 12hr OFF)

$$s = 2.82\ \mathrm{LOG}\ \frac{376.2}{0.000025} + 2.82\ \mathrm{LOG}\ \frac{19.8}{0.000025}$$

$$s = 2.82\ \mathrm{LOG}\ 15048000 + 2.82\ \mathrm{LOG}\ 792000$$

$$s = 2.82 \quad 7.177478783 + 2.82 \quad 5.898725182$$

$$s = 20.24049 + 16.634405$$

$$s = 36.874895$$

$Q_{IW\#1}$ = 1.410, $Q_{IW\#2}$ = 1.410, T = 132.00, $IW\#1_t$ = 9.5, $IW\#2_t$ = 0.5, r = 0.5, S = 0.0001

30 days of Intermittent pumping for pumping well (12hr ON, 12hr OFF)

$$s = 2.82\ \mathrm{LOG}\ \frac{1168.2}{0.000025} + 2.82\ \mathrm{LOG}\ \frac{19.8}{0.000025}$$

$$s = 2.82\ \mathrm{LOG}\ 46728000 + 2.82\ \mathrm{LOG}\ 792000$$

$$s = 2.82 \quad 7.669577193 + 2.82 \quad 5.898725182$$

$$s = 21.628208 + 16.634405$$

$$s = 38.262613$$

$Q_{IW\#1}$ = 1.410, $Q_{IW\#2}$ = 1.410, T = 132.00, $IW\#1_t$ = 29.5, $IW\#2_t$ = 0.5, r = 0.5, S = 0.0001

90 days of Intermittent pumping for pumping well (12hr ON, 12hr OFF)

$$s = 2.82\ \mathrm{LOG}\ \frac{3544.2}{0.000025} + 2.82\ \mathrm{LOG}\ \frac{19.8}{0.000025}$$

$$s = 2.82\ \mathrm{LOG}\ 141768000 + 2.82\ \mathrm{LOG}\ 792000$$

$$s = 2.82 \quad 8.151578213 + 2.82 \quad 5.898725182$$

$$s = 22.987451 + 16.634405$$

$$s = 39.621856$$

$Q_{IW\#1}$ = 1.410, $Q_{IW\#2}$ = 1.410, T = 132.00, $IW\#1_t$ = 89.5, $IW\#2_t$ = 0.5, r = 0.5, S = 0.0001

183 days of Intermittent pumping for pumping well (12hr ON, 12hr OFF)

$$s = 2.82\ \mathrm{LOG}\ \frac{7227}{0.000025} + 2.82\ \mathrm{LOG}\ \frac{19.8}{0.000025}$$

$$s = 2.82\ \mathrm{LOG}\ 289080000 + 2.82\ \mathrm{LOG}\ 792000$$

$$s = 2.82 \quad 8.461018046 + 2.82 \quad 5.898725182$$

$$s = 23.860071 + 16.634405$$

$$s = 40.494476$$

$Q_{IW\#1}$ = 1.410, $Q_{IW\#2}$ = 1.410, T = 132.00, $IW\#1_t$ = 182.5, $IW\#2_t$ = 0.5, r = 0.5, S = 0.0001

Maximum Day Demand w/ 1.0 x 10^{-5} Storage Coefficient

10 days of Intermittent pumping for pumping well (12hr ON, 12hr OFF)

$$s = 2.82\ \mathrm{LOG}\ \frac{376.2}{2.5E-06} + 2.82\ \mathrm{LOG}\ \frac{19.8}{2.5E-06}$$

$$s = 2.82\ \mathrm{LOG}\ 1.5E+08 + 2.82\ \mathrm{LOG}\ 7920000$$

$$s = 2.82 \quad 8.177478783 + 2.82 \quad 6.898725182$$

$$s = 23.06049 + 19.45441$$

$$s = 42.5149$$

$Q_{IW\#1}$ = 1.410, $Q_{IW\#2}$ = 1.410, T = 132.00, $IW\#1_t$ = 9.5, $IW\#2_t$ = 0.5, r = 0.5, S = 0.00001

30 days of Intermittent pumping for pumping well (12hr ON, 12hr OFF)

$$s = 2.82\ \mathrm{LOG}\ \frac{1168.2}{2.5E-06} + 2.82\ \mathrm{LOG}\ \frac{19.8}{2.5E-06}$$

$$s = 2.82\ \mathrm{LOG}\ 4.67E+08 + 2.82\ \mathrm{LOG}\ 7920000$$

$$s = 2.82 \quad 8.669577193 + 2.82 \quad 6.898725182$$

$$s = 24.44821 + 19.45441$$

$$s = 43.90261$$

$Q_{IW\#1}$ = 1.410, $Q_{IW\#2}$ = 1.410, T = 132.00, $IW\#1_t$ = 29.5, $IW\#2_t$ = 0.5, r = 0.5, S = 0.00001

90 days of Intermittent pumping for pumping well (12hr ON, 12hr OFF)

$$s = 2.82\ \mathrm{LOG}\ \frac{3544.2}{2.5E-06} + 2.82\ \mathrm{LOG}\ \frac{19.8}{2.5E-06}$$

$$s = 2.82\ \mathrm{LOG}\ 1.42E+09 + 2.82\ \mathrm{LOG}\ 7920000$$

$$s = 2.82 \quad 9.151578213 + 2.82 \quad 6.898725182$$

$$s = 25.80745 + 19.45441$$

$$s = 45.26186$$

$Q_{IW\#1}$ = 1.410, $Q_{IW\#2}$ = 1.410, T = 132.00, $IW\#1_t$ = 89.5, $IW\#2_t$ = 0.5, r = 0.5, S = 0.00001

183 days of Intermittent pumping for pumping well (12hr ON, 12hr OFF)

$$s = 2.82\ \mathrm{LOG}\ \frac{7227}{2.5E-06} + 2.82\ \mathrm{LOG}\ \frac{19.8}{2.5E-06}$$

$$s = 2.82\ \mathrm{LOG}\ 2.89E+09 + 2.82\ \mathrm{LOG}\ 7920000$$

$$s = 2.82 \quad 9.461018046 + 2.82 \quad 6.898725182$$

$$s = 26.68007 + 19.45441$$

$$s = 46.13448$$

$Q_{IW\#1}$ = 1.410, $Q_{IW\#2}$ = 1.410, T = 132.00, $IW\#1_t$ = 182.5, $IW\#2_t$ = 0.5, r = 0.5, S = 0.00001

APPENDIX E

Continuous Pumping; Time and Distance Drawdown Calculations On Flores/Pisenti Well #2 at 537 feet away from Flores/Pisenti Well #1 Using Dry Season Demand Rates and a Range of Storage Coefficients

1.0 x 10^{-3} Storage Coefficient	1.0 x 10^{-4} Storage Coefficient	1.0 x 10^{-5} Storage Coefficient
10 days of continuous pumping s = 1.98 LOG 396 / 288.369 s = 1.98 LOG 1.373240536 s = 1.98 0.137746615 s = 0.2727383 Q = 0.99 T = 132.00 t = 10 = 30 = 90 = 183 r = 537 S = 0.001	10 days of continuous pumping s = 1.98 LOG 396 / 28.8369 s = 1.98 LOG 13.73240536 s = 1.98 1.137746615 s = 2.2527383 Q = 0.99 T = 132 t = 10 = 30 = 90 = 183 r = 537 S = 0.0001	10 days of continuous pumping s = 1.98 LOG 396 / 2.88369 s = 1.98 LOG 137.3241 s = 1.98 2.137746615 s = 4.232738 Q = 0.99 T = 132 t = 10 = 30 = 90 = 183 r = 537 S = 0.00001
30 days of continuous pumping s = 1.98 LOG 1188 / 288.369 s = 1.98 LOG 4.119721607 s = 1.98 0.614867869 s = 1.2174384	30 days of continuous pumping s = 1.98 LOG 1188 / 28.8369 s = 1.98 LOG 41.19721607 s = 1.98 1.614867869 s = 3.1974384	30 days of continuous pumping s = 1.98 LOG 1188 / 2.88369 s = 1.98 LOG 411.9722 s = 1.98 2.614867869 s = 5.177438
90 days of continuous pumping s = 1.98 LOG 3564 / 288.369 s = 1.98 LOG 12.35916482 s = 1.98 1.091989124 s = 2.1621385	90 days of continuous pumping s = 1.98 LOG 3564 / 28.8369 s = 1.98 LOG 123.5916482 s = 1.98 2.091989124 s = 4.1421385	90 days of continuous pumping s = 1.98 LOG 3564 / 2.88369 s = 1.98 LOG 1235.916 s = 1.98 3.091989124 s = 6.122138
183 days of continuous pumping s = 1.98 LOG 7246.8 / 288.369 s = 1.98 LOG 25.1303018 s = 1.98 1.400197704 s = 2.7723915	183 days of continuous pumping s = 1.98 LOG 7246.8 / 28.8369 s = 1.98 LOG 251.303018 s = 1.98 2.400197704 s = 4.7523915	183 days of continuous pumping s = 1.98 LOG 7246.8 / 2.88369 s = 1.98 LOG 2513.03 s = 1.98 3.400197704 s = 6.732391

APPENDIX E

Continuous Pumping; Time and Distance Drawdown Calculations On Beech Well at 907 feet away from Flores/Pisenti Well #1 Using Dry Season Demand Rates and a Range of Storage Coefficients

1.0×10^{-3} Storage Coefficient		1.0×10^{-4} Storage Coefficient		1.0×10^{-5} Storage Coefficient	
10 days of continuous pumping		10 days of continuous pumping		10 days of continuous pumping	
s = 1.98 LOG 396	Q = 0.99	s = 1.98 LOG 396	Q = 0.99	s = 1.98 LOG 396	Q = 0.99
822.649	T = 132.00	82.2649	T = 132.00	8.22649	T = 132.00
	t = 10		t = 10		t = 10
s = 1.98 LOG 0.481371764	= 30	s = 1.98 LOG 4.813717637	= 30	s = 1.98 LOG 48.13718	= 30
	= 90		= 90		= 90
s = 1.98 -0.317519388	= 183	s = 1.98 0.682480612	= 183	s = 1.98 1.682480612	= 183
	r = 907		r = 907		r = 907
s = -0.628688	S = 0.001	s = 1.3513116	S = 0.0001	s = 3.331312	S = 0.00001
30 days of continuous pumping		30 days of continuous pumping		30 days of continuous pumping	
s = 1.98 LOG 1188		s = 1.98 LOG 1188		s = 1.98 LOG 1188	
822.649		82.2649		8.22649	
s = 1.98 LOG 1.444115291		s = 1.98 LOG 14.44115291		s = 1.98 LOG 144.4115	
s = 1.98 0.159601867		s = 1.98 1.159601867		s = 1.98 2.159601867	
s = 0.3160117		s = 2.2960117		s = 4.276012	
90 days of continuous pumping		90 days of continuous pumping		90 days of continuous pumping	
s = 1.98 LOG 3564		s = 1.98 LOG 3564		s = 1.98 LOG 3564	
822.649		82.2649		8.22649	
s = 1.98 LOG 4.332345873		s = 1.98 LOG 43.32345873		s = 1.98 LOG 433.2346	
s = 1.98 0.636723121		s = 1.98 1.636723121		s = 1.98 2.636723121	
s = 1.2607118		s = 3.2407118		s = 5.220712	
183 days of continuous pumping		183 days of continuous pumping		183 days of continuous pumping	
s = 1.98 LOG 7246.8		s = 1.98 LOG 7246.8		s = 1.98 LOG 7246.8	
822.649		82.2649		8.22649	
s = 1.98 LOG 8.809103275		s = 1.98 LOG 88.09103275		s = 1.98 LOG 880.9103	
s = 1.98 0.944931702		s = 1.98 1.944931702		s = 1.98 2.944931702	
s = 1.8709648		s = 3.8509648		s = 5.830965	

Flores\Table\T&D_Ddtable.xls\"Beech Well"

APPENDIX E

Continuous Pumping; Time and Distance Drawdown Calculations On
Maney Well at 465 feet away from Flores/Pisenti Well #1
Using Dry Season Demand Rates and a Range of Storage Coefficients

1.0×10^{-3} Storage Coefficient	1.0×10^{-4} Storage Coefficient	1.0×10^{-5} Storage Coefficient
10 days of continuous pumping s = 1.98 LOG $\frac{396}{216.225}$ s = 1.98 LOG 1.831425598 s = 1.98 0.26278928 s = 0.5203228 Q = 0.99 T = 132.00 t = 10 = 30 = 90 = 183 r = 465 S = 0.001	10 days of continuous pumping s = 1.98 LOG $\frac{396}{21.6225}$ s = 1.98 LOG 18.31425598 s = 1.98 1.26278928 s = 2.5003228 Q = 0.99 T = 132.00 t = 10 = 30 = 90 = 183 r = 465 S = 0.0001	10 days of continuous pumping s = 1.98 LOG $\frac{396}{2.16225}$ s = 1.98 LOG 183.1426 s = 1.98 2.26278928 s = 4.480323 Q = 0.99 T = 132.00 t = 10 = 30 = 90 = 183 r = 465 S = 0.00001
30 days of continuous pumping s = 1.98 LOG $\frac{1188}{216.225}$ s = 1.98 LOG 5.494276795 s = 1.98 0.739910535 s = 1.4650229	30 days of continuous pumping s = 1.98 LOG $\frac{1188}{21.6225}$ s = 1.98 LOG 54.94276795 s = 1.98 1.739910535 s = 3.4450229	30 days of continuous pumping s = 1.98 LOG $\frac{1188}{2.16225}$ s = 1.98 LOG 549.4277 s = 1.98 2.739910535 s = 5.425023
90 days of continuous pumping s = 1.98 LOG $\frac{3564}{216.225}$ s = 1.98 LOG 16.48283039 s = 1.98 1.21703179 s = 2.4097229	90 days of continuous pumping s = 1.98 LOG $\frac{3564}{21.6225}$ s = 1.98 LOG 164.8283039 s = 1.98 2.21703179 s = 4.3897229	90 days of continuous pumping s = 1.98 LOG $\frac{3564}{2.16225}$ s = 1.98 LOG 1648.283 s = 1.98 3.21703179 s = 6.369723
183 days of continuous pumping s = 1.98 LOG $\frac{7246.8}{216.225}$ s = 1.98 LOG 33.51508845 s = 1.98 1.52524037 s = 3.0199759	183 days of continuous pumping s = 1.98 LOG $\frac{7246.8}{21.6225}$ s = 1.98 LOG 335.1508845 s = 1.98 2.52524037 s = 4.9999759	183 days of continuous pumping s = 1.98 LOG $\frac{7246.8}{2.16225}$ s = 1.98 LOG 3351.509 s = 1.98 3.52524037 s = 6.979976

APPENDIX E

Continuous Pumping; Time and Distance Drawdown Calculations On Shake Well at 778 feet away from Flores/Pisenti Well #1 Using Dry Season Demand Rates and a Range of Storage Coefficients

1.0 x 10^{-3} Storage Coefficient

10 days of continuous pumping

s = 1.98 LOG 396 / 605.284

s = 1.98 LOG 0.654238341

s = 1.98 -0.184264008

s = -0.364843

Q = 0.99
T = 132.00
t = 10
= 30
= 90
= 183
r = 778
S = 0.001

30 days of continuous pumping

s = 1.98 LOG 1188 / 605.284

s = 1.98 LOG 1.962715023

s = 1.98 0.292857247

s = 0.5798573

90 days of continuous pumping

s = 1.98 LOG 3564 / 605.284

s = 1.98 LOG 5.888145069

s = 1.98 0.769978501

s = 1.5245574

183 days of continuous pumping

s = 1.98 LOG 7246.8 / 605.284

s = 1.98 LOG 11.97256164

s = 1.98 1.078187082

s = 2.1348104

1.0 x 10^{-4} Storage Coefficient

10 days of continuous pumping

s = 1.98 LOG 396 / 60.5284

s = 1.98 LOG 6.54238341

s = 1.98 0.815735992

s = 1.6151573

Q = 0.99
T = 132.00
t = 10
= 30
= 90
= 183
r = 778
S = 0.0001

30 days of continuous pumping

s = 1.98 LOG 1188 / 60.5284

s = 1.98 LOG 19.62715023

s = 1.98 1.292857247

s = 2.5598573

90 days of continuous pumping

s = 1.98 LOG 3564 / 60.5284

s = 1.98 LOG 58.88145069

s = 1.98 1.769978501

s = 3.5045574

183 days of continuous pumping

s = 1.98 LOG 7246.8 / 60.5284

s = 1.98 LOG 119.7256164

s = 1.98 2.078187082

s = 4.1148104

1.0 x 10^{-5} Storage Coefficient

10 days of continuous pumping

s = 1.98 LOG 396 / 6.05284

s = 1.98 LOG 65.42383

s = 1.98 1.815735992

s = 3.595157

Q = 0.99
T = 132.00
t = 10
= 30
= 90
= 183
r = 778
S = 0.00001

30 days of continuous pumping

s = 1.98 LOG 1188 / 6.05284

s = 1.98 LOG 196.2715

s = 1.98 2.292857247

s = 4.539857

90 days of continuous pumping

s = 1.98 LOG 3564 / 6.05284

s = 1.98 LOG 588.8145

s = 1.98 2.769978501

s = 5.484557

183 days of continuous pumping

s = 1.98 LOG 7246.8 / 6.05284

s = 1.98 LOG 1197.256

s = 1.98 3.078187082

s = 6.09481

APPENDIX E

Continuous Pumping; Time and Distance Drawdown Calculations On Shake Well at 778 feet away from Flores/Pisenti Well #1 Using Dry Season Demand Rates and a Range of Storage Coefficients

1.0 x 10^{-3} Storage Coefficient

Q = 0.99
T = 132.00
t = 10
= 30
= 90
= 183
r = 778
S = 0.001

10 days of continuous pumping

s = 1.98 LOG $\frac{396}{605.284}$

s = 1.98 LOG 0.654238341

s = 1.98 -0.184264008

s = -0.364843

30 days of continuous pumping

s = 1.98 LOG $\frac{1188}{605.284}$

s = 1.98 LOG 1.962715023

s = 1.98 0.292857247

s = 0.5798573

90 days of continuous pumping

s = 1.98 LOG $\frac{3564}{605.284}$

s = 1.98 LOG 5.888145069

s = 1.98 0.769978501

s = 1.5245574

183 days of continuous pumping

s = 1.98 LOG $\frac{7246.8}{605.284}$

s = 1.98 LOG 11.97256164

s = 1.98 1.078187082

s = 2.1348104

1.0 x 10^{-4} Storage Coefficient

Q = 0.99
T = 132.00
t = 10
= 30
= 90
= 183
r = 778
S = 0.0001

10 days of continuous pumping

s = 1.98 LOG $\frac{396}{60.5284}$

s = 1.98 LOG 6.54238341

s = 1.98 0.815735992

s = 1.6151573

30 days of continuous pumping

s = 1.98 LOG $\frac{1188}{60.5284}$

s = 1.98 LOG 19.62715023

s = 1.98 1.292857247

s = 2.5598573

90 days of continuous pumping

s = 1.98 LOG $\frac{3564}{60.5284}$

s = 1.98 LOG 58.88145069

s = 1.98 1.769978501

s = 3.5045574

183 days of continuous pumping

s = 1.98 LOG $\frac{7246.8}{60.5284}$

s = 1.98 LOG 119.7256164

s = 1.98 2.078187082

s = 4.1148104

1.0 x 10^{-5} Storage Coefficient

Q = 0.99
T = 132.00
t = 10
= 30
= 90
= 183
r = 778
S = 0.00001

10 days of continuous pumping

s = 1.98 LOG $\frac{396}{6.05284}$

s = 1.98 LOG 65.42383

s = 1.98 1.815735992

s = 3.595157

30 days of continuous pumping

s = 1.98 LOG $\frac{1188}{6.05284}$

s = 1.98 LOG 196.2715

s = 1.98 2.292857247

s = 4.539857

90 days of continuous pumping

s = 1.98 LOG $\frac{3564}{6.05284}$

s = 1.98 LOG 588.8145

s = 1.98 2.769978501

s = 5.484557

183 days of continuous pumping

s = 1.98 LOG $\frac{7246.8}{6.05284}$

s = 1.98 LOG 1197.256

s = 1.98 3.078187082

s = 6.09481

APPENDIX E

Continuous Pumping; Time and Distance Drawdown Calculations On
Beech Well at 907 feet away from Flores/Pisenti Well #1
Using the Flow Rate Used During Pump-Testing in October, 2010 and a Range of Storage Coefficients

1.0×10^{-3} Storage Coefficient

10 days of continuous pumping

s =	16.12 LOG	118.8	Q =	8.06
		822.649	T =	132.00
			t =	3
s =	16.12 LOG	0.144411529	=	
			=	
s =	16.12	-0.840398133	=	
			r =	907
s =	-13.54722		S =	0.001

1.0×10^{-4} Storage Coefficient

10 days of continuous pumping

s =	16.12 LOG	118.8	Q =	8.06
		82.2649	T =	132.00
			t =	3
s =	16.12 LOG	1.444115291		
s =	16.12	0.159601867		
			r =	907
s =	2.5727821		S =	0.0001

1.0×10^{-5} Storage Coefficient

10 days of continuous pumping

s =	16.12 LOG	118.8	Q =	8.06
		8.22649	T =	132.00
			t =	3
s =	16.12 LOG	14.44115		
s =	16.12	1.159601867		
			r =	907
s =	18.69278		S =	0.00001

Flores\Table\T&D_Ddtable.xls\"Beech Well for 3-Days"

APPENDIX E

Continuous Pumping; Time and Distance Drawdown Calculations On
Beech Well at 647 feet away from Flores/Pisenti Well #2
Using the Flow Rate Used During Pump-Testing in October, 2010 and a Range of Storage Coefficients

1.0×10^{-3} Storage Coefficient

10 days of continuous pumping

s =	7.0815451 LOG	209.7	Q =	6.25
		418.609	T =	233.00
			t =	3
s =	7.0815451 LOG	0.500944796	=	
			=	
s =	7.0815451	-0.300210131	=	
			r =	647
s =	-2.125952		S =	0.001

1.0×10^{-4} Storage Coefficient

10 days of continuous pumping

s =	7.0815451 LOG	209.7	Q =	6.25
		41.8609	T =	233
			t =	3
s =	7.0815451 LOG	5.009447957		
s =	7.0815451	0.699789869		
			r =	647
s =	4.9555935		S =	0.0001

1.0×10^{-5} Storage Coefficient

10 days of continuous pumping

s =	7.081545 LOG	209.7	Q =	6.25
		4.18609	T =	233
			t =	3
s =	7.081545 LOG	50.09448		
s =	7.081545	1.699789869		
			r =	647
s =	12.03714		S =	0.00001

Flores\Table\T&D_Ddtable.xls\"Beech Well for 3-Days"

APPENDIX F

MONTEREY BAY ANALYTICAL SERVICES ANALYTICAL RESULTS

A) **FLORES/PISENTI WELL #1 ANALYTICAL RESULTS**

MONTEREY BAY ANALYTICAL SERVICES
PRECISION ● ACCURACY ● DEPENDABILITY
4 Justin Court Suite D, Monterey, CA 93940
831.375.MBAS
montereybayanalytical@usa.net
ELAP Certification Number: 2385

Friday, November 05, 2010

Hydrogeologic Consult & Water Resource
Aaron Bierman
3153 Redwood Dr
Aptos, CA 95003

Lab Number: **AA70276**

Collection Date/Time: 10/14/2010 10:15 Sample Collector: BIERMAN, A
Submittal Date/Time: 10/14/2010 11:30 Sample ID

Sample Description: Flores-564 Monholland, Well #1; APN 103-071-019

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	**506**		2		10/15/2010
Aluminum, Total	EPA200.8	ug/L	**Not Detected**		10	1000	10/18/2010
Antimony, Total	EPA200.8	ug/L	**Not Detected**		1	6	10/18/2010
Arsenic, Total	EPA200.8	ug/L	**Not Detected**		1	10	10/18/2010
Barium, Total	EPA200.8	ug/L	**22**		10	1000	10/18/2010
Beryllium, Total	EPA200.8	ug/L	**Not Detected**		1	4	10/18/2010
Bicarbonate (as HCO3-)	2320B	mg/L	**617**		10		10/15/2010
Bromide	EPA300.0	mg/L	**0.14**		0.05		10/14/2010
Cadmium, Total	EPA200.8	ug/L	**Not Detected**		0.5	5	10/18/2010
Calcium	EPA200.7	mg/L	**3**		0.5		11/3/2010
Carbonate as CaCO3	2320B	mg/L	**10**		10		10/15/2010
Chloride	EPA300.0	mg/L	**141**		1	250	10/14/2010
Chromium, Total	EPA200.8	ug/L	**12**		2	50	10/18/2010
Coliform E coli	9223	#/100ml	**Absent**		1	1	10/14/2010
Coliform Total	9223	#/100ml	**Present**		1	1	10/14/2010
Color, Apparent (Unfiltered)	2120B	Color Units	**4**		3	15	10/14/2010
Copper, Total	EPA200.8	ug/L	**7**		4	1300	10/18/2010
Cyanide	QuikChem 10-204	ug/L	**Not Detected**		10	200	10/18/2010
Fluoride	EPA300.0	mg/L	**1.74**		0.10	2.0	10/14/2010
Hardness (as CaCO3)	2340B	mg/L	**10**		10		10/26/2010
Hydroxide	2320B	mg/L	**Not Detected**		5		10/15/2010
Iron	EPA 200.7	ug/L	**52**		10		11/3/2010
Langlier Index (15 deg. C)	2330B		**0.30**				11/3/2010
Langlier Index (60 deg. C)	2330B		**0.88**				11/3/2010

mg/L: Milligrams per liter (=ppm) ug/L : Micrograms per liter (=ppb) PQL : Practical Quantitation Limit
H = Analyzed ouside of hold time E = Analysis performed by External Laboratory; See External Laboratory Report attachments.
D = Method deviates from standard method due to insufficient sample for MS/MSD

MONTEREY BAY ANALYTICAL SERVICES
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ELAP Certification Number: 2385

Friday, November 05, 2010

Hydrogeologic Consult & Water Resource
Aaron Bierman
3153 Redwood Dr
Aptos, CA 95003

Lab Number: **AA70276**

Collection Date/Time:	10/14/2010	10:15	Sample Collector:	BIERMAN, A
Submittal Date/Time:	10/14/2010	11:30	Sample ID	

Sample Description: Flores-564 Monholland, Well #1; APN 103-071-019

Analyte	Method	Unit	**Result**	Qual	PQL	MCL	Date Analyzed
Lead, Total	EPA200.8	ug/L	**Not Detected**		5	15	10/18/2010
Magnesium	EPA200.7	mg/L	**0.6**		0.5		11/3/2010
Manganese, Total	EPA200.8	ug/L	**Not Detected**		10	50	10/18/2010
MBAS (Surfactants)	5540C	mg/L	**Not Detected**		0.05	0.50	10/15/2010
Mercury, Total	EPA200.8	ug/L	**Not Detected**		0.5	2	10/18/2010
Nickel, Total	EPA200.8	ug/L	**Not Detected**		10	100	10/18/2010
Nitrate as NO3	EPA300.0	mg/L	**Not Detected**		1	45	10/14/2010
Nitrite as Nitrogen	EPA300.0	mg/L	**Not Detected**		0.05	1.00	10/14/2010
Odor Threshold at 60 C	2150B	TON	**1**		1	3	10/14/2010
o-Phosphate-P	EPA300.0	mg/L	**0.29**		0.05		10/14/2010
pH (Laboratory)	4500-H+B	STD. Units	**8.7**				10/14/2010
Potassium	EPA200.7	mg/L	**1.4**		0.1		11/3/2010
QC Anion Sum x 100	Calculaltion	%	**104%**				11/3/2010
QC Anion-Cation Balance	Calculaltion	%	**0**				11/3/2010
QC Cation Sum x 100	Calculaltion	%	**104%**				11/3/2010
QC Ratio TDS/SEC	Calculation		**0.58**				10/21/2010
SAR (Sodium Adsorption Ratio)	Suarez, 1981		**43.8**				11/3/2010
SAR, Adjusted	Suarez, 1981		**37.8**				11/3/2010
Selenium, Total	EPA200.8	ug/L	**2**		2	50	10/18/2010
Silver, Total	EPA200.8	ug/L	**Not Detected**		10		10/18/2010
Sodium	EPA200.7	mg/L	**318**		0.5		11/3/2010
Specific Conductance (E.C)	2510B	umhos/cm	**1359**		1	900	10/14/2010
Sulfate	EPA300.0	mg/L	**2**		1	250	10/14/2010
Thallium, Total	EPA200.8	ug/L	**Not Detected**		1	2	10/18/2010
Total Diss. Solids	2540C	mg/L	**783**		10	500	10/21/2010
Turbidity	180.1	NTU	**0.40**		0.05	5.0	10/14/2010
Zinc, Total	EPA200.8	ug/L	**Not Detected**		10	5000	10/18/2010

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Analyte	Method	Unit	**Result**	Qual	PQL	MCL	Date Analyzed

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

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