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72-HOUR CONSTANT RATE WELL PUMPING, AQUIFER RECOVERY TEST AND PUMPING IMPACT ASSESSMENT FOR FLORES/PISENTI WELL#2

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

March 22, 2011

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

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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 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 #2, 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 #2) is perforated across the Monterey Formation, a fractured rock aquifer. The well was drilled and completed by Granite Drilling Company in October 2010 with corresponding MCEHB water well permit #10-11806. 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

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[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, caretaker unit, guest house and 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 #2 will be discussed within the remainder of this report in regards to its ability to meet the conceptual water demand for serving APN-019 while meeting MPWMD and MCEHB requirements. Well #1 'conceptual' water demand, groundwater quality, calculated yield, and well adequacy for intended use, will be discussed within a different report, as, Well #1 will have its own 'conceptual' project and water demand for serving APN-002. In summary, the proposed project includes;

- Well #2 will serve APN-019 with one, estate style Single Family Dwelling (SFD) and Guest House (GH) with estate style landscaping and an estimated total water demand of 1.27 af/yr.

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 0.51 acre-feet per year (af/yr) which is the combination of the SFD fixture units (0.415 af/yr) and the GH fixture units (0.097 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 1.27 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 24.52 gpm exceeds MPWMD calculated maximum day demand of 2.66 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 3.03 gpm exceeding MCEHB requirements for a single-connection water system (3 gpm) as well as, MCEHB maximum day demand of 2.04 gpm[9] and Peak Hourly Demand of 2.66 gpm. *It should be noted that although the final post-recovery pumping rate was 3.03 gpm (barley exceeding MCEHB requirements) the well can produce significant greater quantities, and that the pumping rate during the pump test was manually limited to 6.25 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 from pumping the Flores/Pisenti Well #2 during the 72hr pumping test in October 2010.

[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.

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 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 and E-coli bacteria, 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 later in this report.

Conclusion:

In conclusion, the source capacity of the Flores/Pisenti Well #2 was determined to exceed MPWMD requirements for a single parcel WDS permit, and MCEHB requirements for a single 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 #2 was determined to be at an approximate elevation of 336' 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, caretaker unit, guest house and 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).

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[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;

<u>Neighboring Wells within 1,000 feet of Well #1, #2:</u>

- 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 #2 will be discussed within the remainder of this report in regards to its ability to meet the conceptual water demand for serving APN-019 while meeting MPWMD and MCEHB requirements. Well #1 '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, will be discussed within a different report, as, Well #1 will have its own 'conceptual' project and water demand for serving APN-002.

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].

<u>Average Annual Water Demand:</u> The 'conceptual' water demand for the project on APN-019 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 0.51 af/yr (0.415 af/yr for the SFD; which includes an 'conceptual' 800 sq. ft pool and 0.097 af/yr for the Guest House). It should be noted that no Care Taker Unit is proposed, as the final post-recovery pumping rate of 3.03 gpm did not support another 'non-family' connection. However, the well could be re-tested to demonstrate a post-recovery pumping rate in excess of 6 gpm, now that there is a understanding of the aquifer/well characteristics.

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 1.27 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 1.27 af/yr is equivalent to an average day demand of 0.79 gpm (pumping 24/7) or, 1.57 gpm (pumping 12-hour cycles).

The MPWMD average day demand after system and treatment losses[31] was calculated to be 1.43 af/yr, equivalent to 0.89 gpm (pumping 24/7) or, 1.78 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 1.51 af/yr equivalent to 0.94 gpm (pumping 24/7), or 1.87 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 2.86 af/yr equivalent to 1.77 gpm (pumping 24/7), or 3.54 gpm (pumping 12-hour cycles).

MPWMD MDD was calculated to be 1.91 af/yr equivalent to 1.18 gpm (pumping 24/7), or 2.36 gpm (pumping 12-hour cycles).

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[30] Monthly Demand Factor: Compilation of data from California-American Water Company monthly production reports 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 3.29 af/yr, equivalent to 2.04 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 2.15 af/yr equivalent to 2.66 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#2 was drilled in October, 2010 and has not been used other than the recent pump-testing 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 1.43 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 #2 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 calculated well yield exceeds the projects maximum day demand based on an equivalent 12-hour pumping cycle.

[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

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 1.5hp pump set at 560-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 3154.0 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 #2:

On October 12, 2010 directly prior to start of test, the static groundwater level was measured to be 143.82 feet below Top of Sounding Tube (bTOSt). At 11:15 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 #2 is depicted on Figure 6. *It should be noted that the Flores/Pisenti Well #1 was being pump tested simultaneously as that of Well #2, and started at 10 am, a hour and 15 minutes sooner than the test described herein. The simultaneously testing was completed to save costs on performing pump-testing and was not necessarily regulatory driven.*

Within the first 24-hours of the test, the flow rate varied between 6.25 to 6.23 gpm, with less than 5% fluctuation for the remainder of the test. The 24-hr average flow rate was 6.25 gpm

[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.

giving a 24-hour specific capacity of 1.31 gpm/ft of drawdown. Based on the difference of starting (3,154.0 gallons) and ending (30,248.2 gallons) totalizer readings, the 72-hr average flow rate was 6.27 gpm, and total drawdown was 8.71 feet, giving a 72-hr specific capacity of 0.72 gpm/ft of drawdown. The lowest sustainable flow rate at end of test was 6.25 gpm. The difference in the 24-hr and 72-hr specific capacities suggests there will be a 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 #2 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 #1: This well was measured to be 537 feet from Flores/Pisenti Well #2. This well was being simultaneously tested with that of Well #2. 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 #2:

Based on transducer data, the groundwater level recovered to 43.51% in three days and 54.42% in six days (Appendix C). Based on the recovery percentages, the Flores/Pisenti Well #2 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 less than 2 minutes after test start.

For the purposes of our analysis, both early time data (70-700 minutes) and late time data (1200 – 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.

<u>Cooper - Jacob Time-Drawdown Method Analysis (Early Time Data):</u>
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.

- <u>Flores Pisenti Well#1:</u> 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).

- <u>Flores Pisenti Well#2:</u> 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).

<u>Cooper - Jacob Time-Drawdown Method Analysis (Late Time Data):</u>
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.

- <u>Flores Pisenti Well#1:</u> 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).

- <u>Flores Pisenti Well#2:</u> 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).

<u>Moench Fracture Flow/Double Porosity Method Analysis:</u>
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 1.18×10^2 gpd/ft, and the K value was 1.54×10^{-1} gpd/ft^2. (Table 3, and Appendix D, Cooper-Jacob Early-Time Data). The storativity (S) value was calculated as 3.61×10^{-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 2.12×10^2 gpd/ft, and the K value was 4.85×10^{-1} gpd/ft^2. (Table 3, and Appendix D, Cooper-Jacob Early-Time Data). The storativity (S) value was calculated as 3.69×10^{-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 1.0×10^{-2} to 1.0×10^{-7} with an reasonable average of fractured rock storage values in the range between 1.0×10^{-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 1.32×10^2 gpd/ft and the K value obtained from this method is 1.73×10^{-1} gpd/ft^2.

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

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

[40] Krasny and Sharp (2007); Groundwater in Fractured Rocks, International Association of Hydrogeologist Selected Papers.
[41] Freeze and Cherry, Groundwater, 1979.
[42] Krasny and Sharp (2007); Groundwater in Fractured Rocks, International Association of Hydrogeologist Selected Papers.

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.

<u>MCEHB Technical Calculations:</u>
The 24-hr sustainable pumping rate for the Flores/Pisenti Well #2 was 6.25 gpm, and the 72-hr *average* pumping rate was 6.27 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 43.51% within 1 time the pumping period, not meeting MCEHB groundwater level recovery requirement[43] of 95%. Therefore, the pre-recovery pumping rate was reduced according to the following technical calculation;

- % Reduction in Pumping Rate: = 51.49% (95% - 43.51% = 51.49%)
- Flow Rate Reduction: = 3.21 gpm (51.49% of 6.25 gpm)
- Post-Recovery Pumping Rate: = 3.03 gpm (6.25 gpm – 3.21 gpm)

<u>MCEHB Technical Calculations Summary:</u>
In summary, after adjusting the pre-recovery pumping rate due to lack of recovery, the post recovery pumping rate was calculated to be 3.03 gpm which exceeds the 3 gpm requirement for a single connection water system permit.

<u>MPWMD Technical Calculations:</u>
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 an apparent 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.

- The saturated thickness was calculated to be 437.51 feet.
- The available drawdown was calculated to be 145.83 feet.
- The ratio of late to early transmissivity values was calculated to be 0.216 (unitless).

[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.

- 24-hour specific capacity was calculated to be 1.31 gpm/ft of drawdown[45].
- The 72-hour specific capacity was calculated to be 0.72 gpm/ft of drawdown[46].
- The adjusted 24-hour specific capacity was calculated to be 0.283 gpm/ft of drawdown.
- The pre-recovery calculated well yield was determined to be 41.27 gpm[47]

As discussed previously, Well #2 groundwater level only recovered to 54.42% 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: = 40.58% (95% - 54.42% = 40.58%)
- Flow Rate Reduction: = 16.74 gpm (40.58% of 41.27 gpm)
- Post-Recovery Pumping Rate: = 24.52 gpm (41.27 gpm – 16.74 gpm)

MPWMD Technical Calculations Summary:

In summary, the post-recovery calculated well yield of Well #2 is 24.52 gpm is greater than the MPWMD calculated maximum day demand of 2.66 gpm pumping in equivalent 12-hr cycles (after accounting for system & treatment losses) and therefore meets the requirements for a single-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#2 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 233 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 24.20 feet of drawdown after 30-days pumping at the MDD, which is less than the wells available drawdown of 145.83-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 neighboring wells as shown on Table 6. The aquifer transmissivity value used in the calculations was 233 gpd/ft and was obtained from Theis Recovery Method (Table 3 and Appendix E) while

[45] 24-hr specific capacity calculated using 24-hr average flow rate of 6.25 g pm.
[46] 72-hr specific capacity calculated using lowest sustainable 72hr flow rate of 6.25 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.

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 #2 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 0.94 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 992 ft from Flores/Pisenti Well #2, 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 1.97-feet to 3.32-feet after 183 days of pumping at the dry season demand of 0.94 gpm. Both the lower and larger 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 647 ft from Flores/Pisenti Well #2, 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 2.37-feet to 3.71-feet after 183 days of pumping at the dry season demand of 0.94 gpm. Both the lower and larger 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 1,052 ft from Flores/Pisenti Well #2, 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 1.92-feet to 3.26-feet after 183 days of pumping at the dry season demand of 0.94 gpm.

[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 lower and larger 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.

Calculation of Projected Drawdown on Sensitive Environmental Receptors:

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 continuously at the dry season demand (0.94 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 E-Coli bacteria. Although E-Coli was detected, it does not necessarily mean that it is permanent within the well, although should be addressed as soon as possible. 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:

- Hardness was detected at 500 ppm, while household water is generally 80-120 ppm.
- Iron was detected at 310 ppb, above the secondary MCL of 300 ppb.
- Manganese was detected at 74 ppb, above the secondary MCL of 50 ppb.

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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.

- Specific Conductance was detected at 1342 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 870 ppm, above the secondary MCL of 500 ppm, although below the secondary upper maximum MCL of 1000 ppm.

Other constituents of significance that were detected, although remain below their respective drinking water standard, induced; include; Arsenic, Chloride, Chromium, Fluoride, Selenium and Sulfate. 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 as the adjusted Sodium Absorption Ratio (adjSAR) of 2.8 (unitless) is representative of a low to medium-low 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[61] unless soil amendments are added.

WATER QUALITY TREATMENT & DISTRIBUTION SYSTEM COMPONENTS

The components listed below is based on serving 1-Single Family Dwelling w/pool and Guest House, serving a total of 5 people/day with each person using 150 gal/day, which is equivalent to 750 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 Apex Series 1 Ozone Generator (1 g/hr with dry air input) w/ ceramic filter bubbler,
4) A 1-Hp Variable Frequency Drive (VFD) Pump (Goulds Model: 1AB21HM1E2D0),
5) A 1.0-Cu-ft. Post-Filter w/Potassium Permanganate & Anthracite w/auto backwashing,
6) A 1.0-Cu/-ft Water Softener with Brine Tank,
7) A 750 gallon/day Reverse Osmosis System w/TDS & EC Meter,
8) A Calcite Neutralizer (if necessary) to correct pH following RO treatment,
9) A 30 gal Chlorine Solution Tank/Mixer/Injector (if bacteria cannot be removed)
10) A Optional 1.0-Cu-ft. Post-Filter w/Carbon w/auto backwashing for Chlorine Removal,
11) A 1,000 gallon above or below ground fresh water storage tank,
12) 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].

[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.

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.

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 #2), neighboring wells and SERs, the following conclusions can be drawn;

- The proposed project includes using the Well #2 to provide potable and non-potable use to one SFDs, with pool and Guest House with native/drought tolerant landscaping.
- Based on DWR Well Completion Report, pumping test data, and calculations of aquifer parameters, Well#2 is perforated within fractured Monterey Shale.
- The proposed 'conceptual' interior water demand (including pool demand) was calculated to be 0.51 af/yr.
- The proposed exterior water demand was calculated to be 0.76 af/yr.
- The average annual water demand was calculated to be 1.27 af/yr.
- The lowest sustained pre-recovery pumping rate for the 72hr test was 6.25 gpm.
- The pre-recovery calculated well yield was determined to be 41.27 gpm.
- The groundwater level only recovered to 43.51% in 1-time the pumping period NOT MEETING MCEHB recovery requirement of 95%, and therefore, the pre-recovery pumping rate was adjusted, giving at a post-recovery pumping rate of 3.03 gpm.
- The groundwater level only recovered to 54.42% 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 of24.52 gpm.
- MCEHB requirement for a Single-Connection Water System permit is 3 gpm which is less than the wells post-recovery pumping rate of 3.03 gpm.

- The MPWMD average annual water demand after system and treatment losses was calculated to be 1.43 af/yr, and the MPWMD maximum day demand after system and treatment losses was calculated to be 2.15 af/yr, equivalent to 2.66 gpm pumping in equivalent 12-hr cycles, which is less the wells post-recovery calculated well yield of 24.52 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.

- The groundwater will require 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 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 #2 to no more than their average annual day demand after system and treatment losses (1.43 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].

[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 install a distribution system so that the groundwater meets maximum day and peak hourly demands for the project.

- 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[6])	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: 103-071-019

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]	0.114	0.091	0.082	0.081	0.073	0.086	0.098	0.117	0.127	0.137	0.139	0.127	**1.27**
Annual Day Demand (in GPD)[3]	1200.66	989.23	858.38	853.03	849.69	902.50	1063.84	1231.41	1380.23	1437.32	1465.40	1376.08	
Annual Day Demand (in GPM)[4]	0.83	0.69	0.60	0.59	0.59	0.63	0.74	0.86	0.96	1.00	1.02	0.96	

MCEHB WATER DEMAND CALCULATIONS

Average Annual Demand[5]:	**0.79 gpm**	**(pumping 24/7)**	**equal to**	1.27	**af/year**	**or**	**1.57**	**gpm (pumping on 12 hour cycles)**
Average Annual Demand after System Loss[6]:	**0.85 gpm**	**(pumping 24/7)**	**equal to**	1.37	**af/year**	**or**	**1.69**	**gpm (pumping on 12 hour cycles)**
Average Annual Demand after System & Treatment Loss[7]:	**0.91 gpm**	**(pumping 24/7)**	**equal to**	1.46	**af/year**	**or**	**1.81**	**gpm (pumping on 12 hour cycles)**
Dry Season Demand[8]:	**0.94 gpm**	**(pumping 24/7)**	**equal to**	1.51	**af/year**	**or**	**1.87**	**gpm (pumping on 12 hour cycles)**
Maximum Day Demand[9]:	**1.77 gpm**	**(pumping 24/7)**	**equal to**	2.86	**af/year**	**or**	**3.54**	**gpm (pumping on 12 hour cycles)**
Maximum Day Demand after System Loss[6]:	**1.91 gpm**	**(pumping 24/7)**	**equal to**	3.07	**af/year**	**or**	**3.81**	**gpm (pumping on 12 hour cycles)**
Maximum Day Demand after System & Treatment Loss[7]:	**2.04 gpm**	**(pumping 24/7)**	**equal to**	3.29	**af/year**	**or**	**4.08**	**gpm (pumping on 12 hour cycles)**
Peak Hourly Demand[10]:	**2.66 gpm**	**or**	**159.47 gph**					

MPWMD WATER DEMAND CALCULATIONS

Average Annual Demand[5]:	**0.79 gpm**	**(pumping 24/7)**	**equal to**	1.27	**af/year**	**or**	**1.57**	**gpm (pumping on 12 hour cycles)**
Average Annual Demand after System Loss[6]:	**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 & Treatment Loss[7]:	**0.89 gpm**	**(pumping 24/7)**	**equal to**	1.43	**af/year**	**or**	**1.78**	**gpm (pumping on 12 hour cycles)**
Dry Season Demand[8]:	**0.94 gpm**	**(pumping 24/7)**	**equal to**	1.51	**af/year**	**or**	**1.87**	**gpm (pumping on 12 hour cycles)**
Maximum Day Demand[9]:	**1.18 gpm**	**(pumping 24/7)**	**equal to**	1.91	**af/year**	**or**	**2.36**	**gpm (pumping on 12 hour cycles)**
Maximum Day Demand after System Loss[6]:	**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 & Treatment Loss[7]:	**1.33 gpm**	**(pumping 24/7)**	**equal to**	2.15	**af/year**	**or**	**2.66**	**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 0.51 af/yr (0.415 af/yr per Conceptual SFD;   0.097 af/yr per Conceptual Guest House - 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: 103-071-019

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 DEMAND[6] Rates Using a Range of Storage Coefficients			
					10 days	30 days	90 days	183 days
Flores/Pisenti Well #2	Shale	For Calculation Use 0.5'	**145.83**	0.001	17.44	*18.18*	18.90	19.37
				0.0001	20.45	*21.19*	21.92	22.38
				0.00001	23.46	***24.20***	24.93	25.40

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.

Flores\Tables\T&D_DD.xls, sheet 'IntermitPumpT&D Ddtable'

Table 6

Continuous Pumping; Time & Distance/Drawdown Projections On Neighboring Wells and/or SERs at Dry Season Demand Rates
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] 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 #2	Flores/Pisenti Well #1 (Irrigation Well)	Sandstone	537'	330'	700-894'	131.92'	763.88	**38.194**	1.0 x 10^{-5}	2.54	3.05	3.56	**3.88** [9]
	Beech Well (Active Well)	Shale	647'	275'	133-573'	82.82' (e)	490.18	**24.509**	1.0 x 10^{-5}	2.37	2.88	3.38	**3.71** [9]
	Maney Well (Active Well)	Shale Sandstone?	992'	345'	200-500'	157' (2001)	343	**17.15**	1.0 x 10^{-5}	1.97	2.48	2.99	**3.32** [9]
	Shake Well (Inactive Well)	Shale	1052'	260'	200-240'	67.82' (e)	172.18	**8.609**	1.0 x 10^{-5}	1.92	2.43	2.93	**3.26** [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 #2, pumping at 0.94 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 #1 and Flores/Pisenti Well #2, both of which were pumped simultaneously, did not exhibit constructive interference. 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] Ground Elevation (ft, msl)	Screened Interval (ft, bgs)	Static Groundwater Level (ft, bTOSt)	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)]
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,

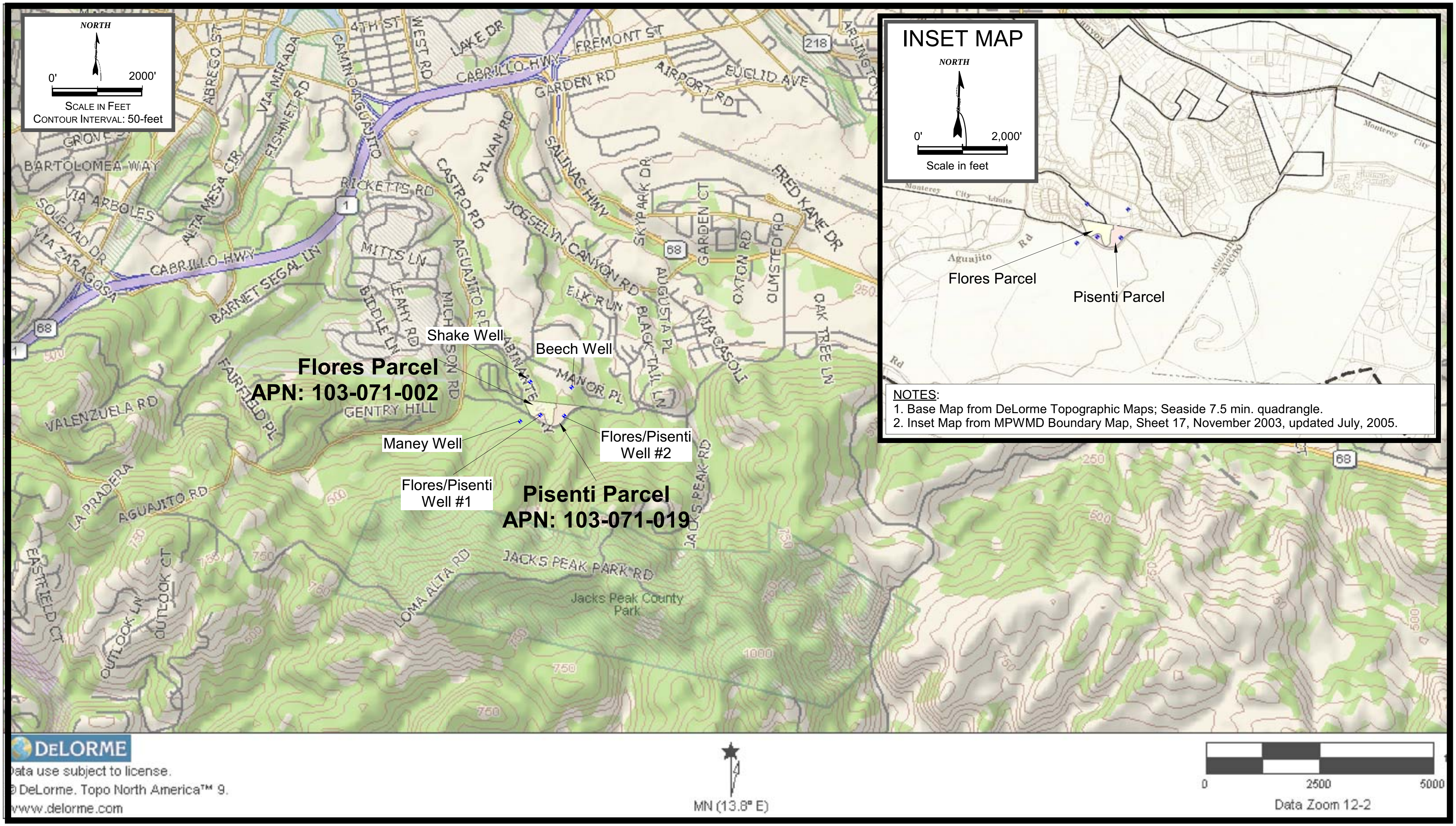
Constant groundwater pumping rates for the entire interim period, pumping 24 hr/day at both Average Day and Peak Day Demand flow rates for four time frames (10, 30, 60, 180 days) within the peak demand period.
The peak demand period is defined as the six month dry season from May through October (defined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



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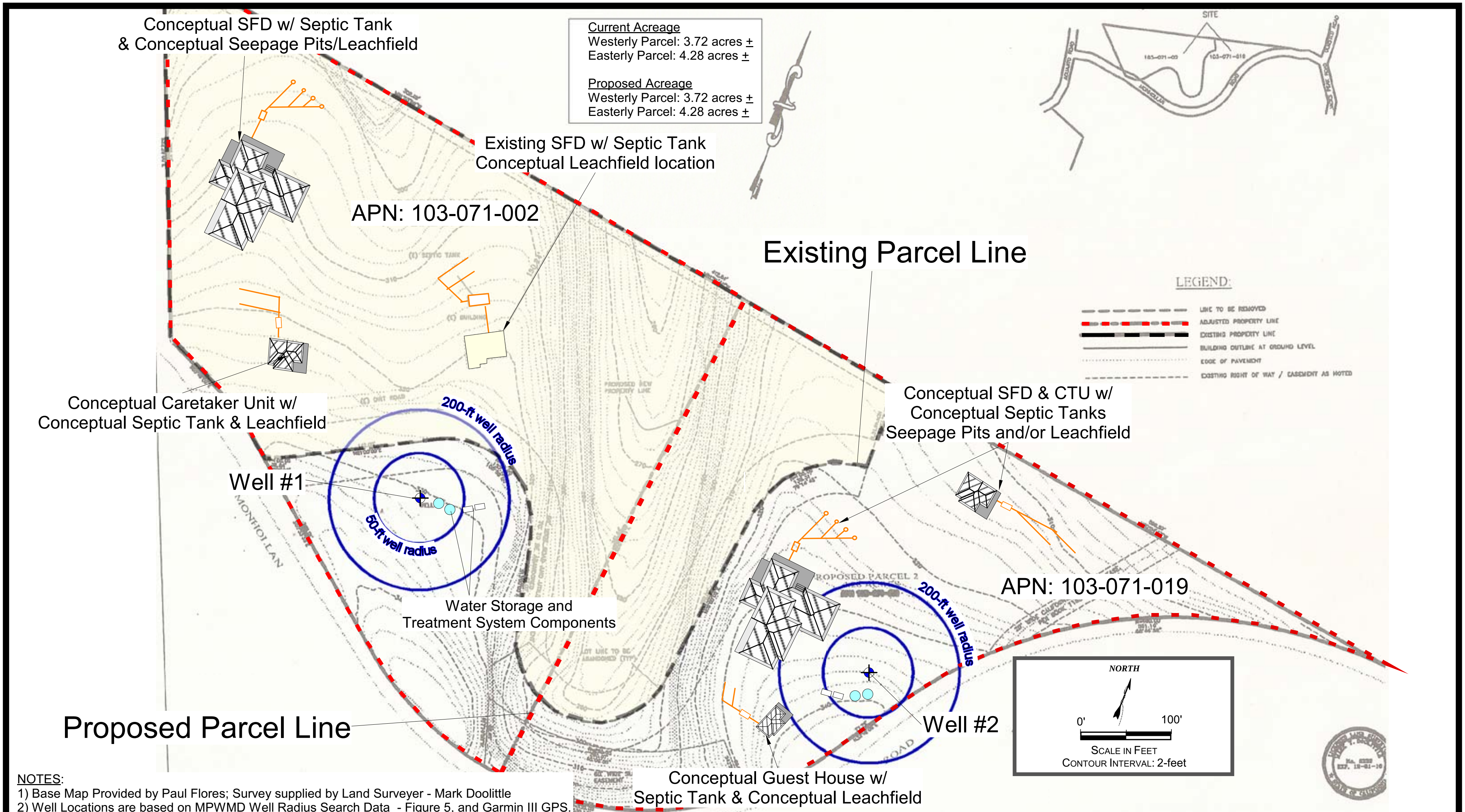
LOCATION MAP

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



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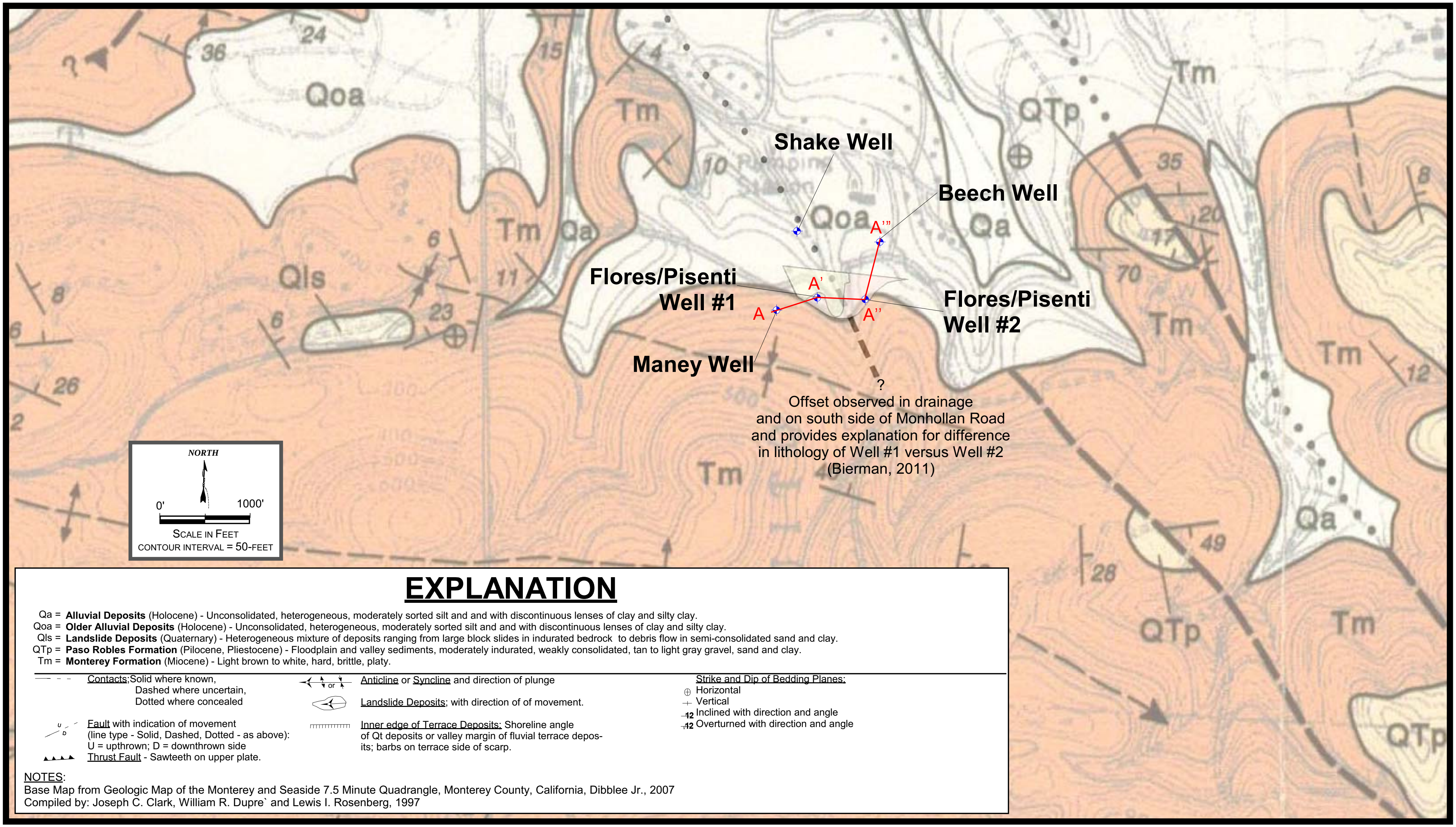
SITE MAP
APN: 103-071-019 & -002
Monterey County, California

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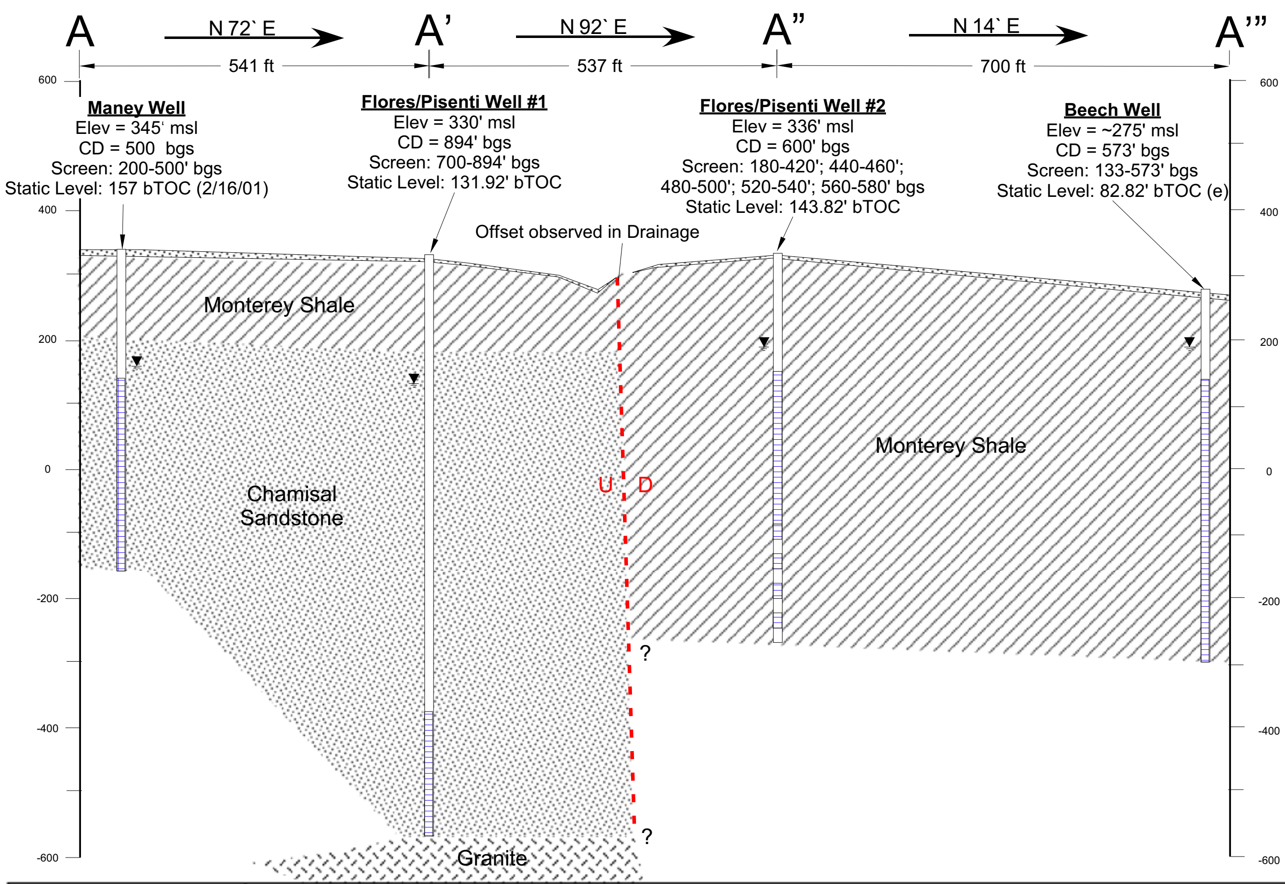
GEOLOGIC MAP
APN:103-071-019 & -002
T16S, R1E, Section 4
Monterey County, California

FIGURE 3

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



0' 200'

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

200'

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.
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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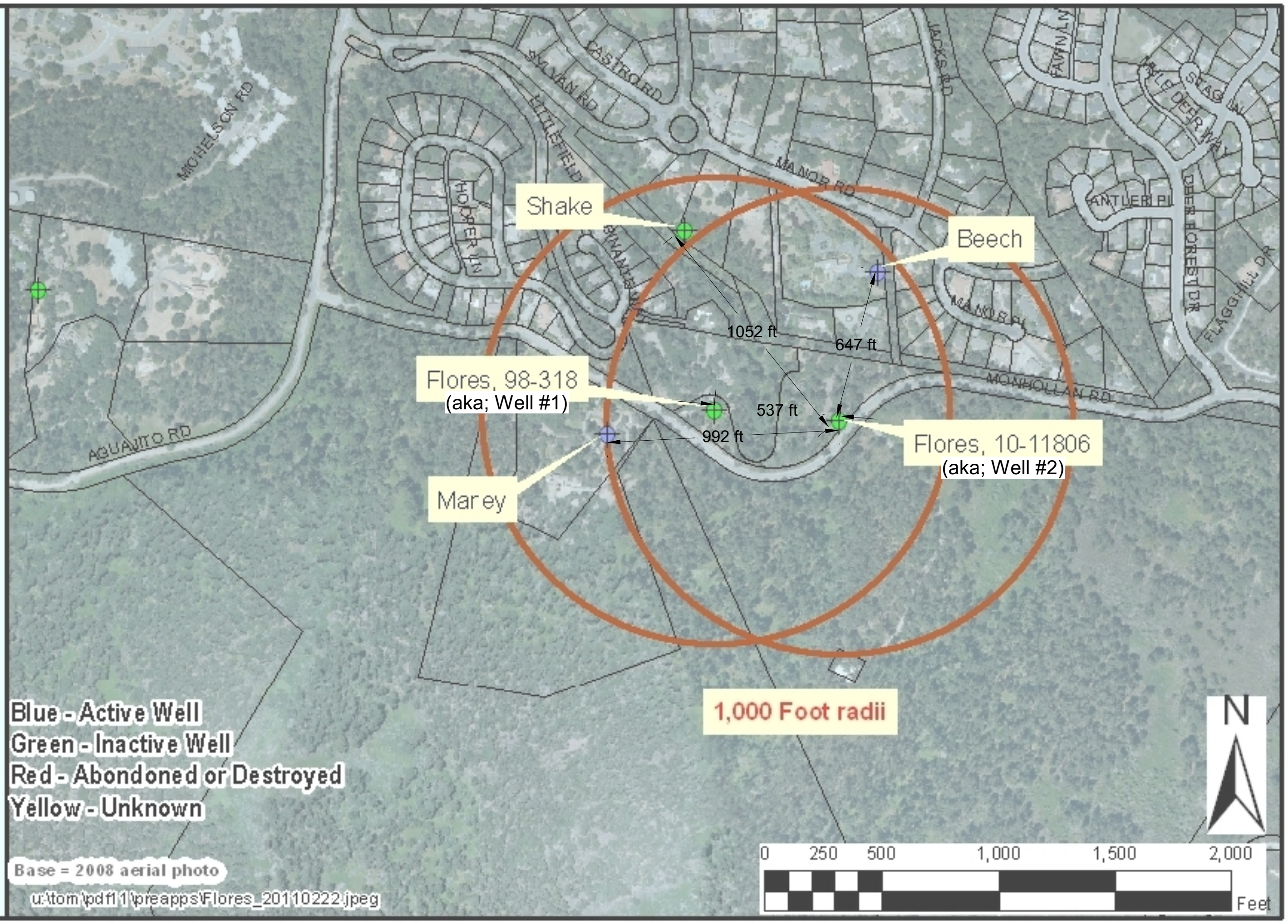
CONCEPTUAL GEOLOGIC CROSS SECTION A-A'-A"-A'"
APN: 103-071-019 & -002
Carmel Valley, Monterey County, California

FIGURE 4

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

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

Wells in Vicinity of Flores Wells (APN 103-071-019)



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

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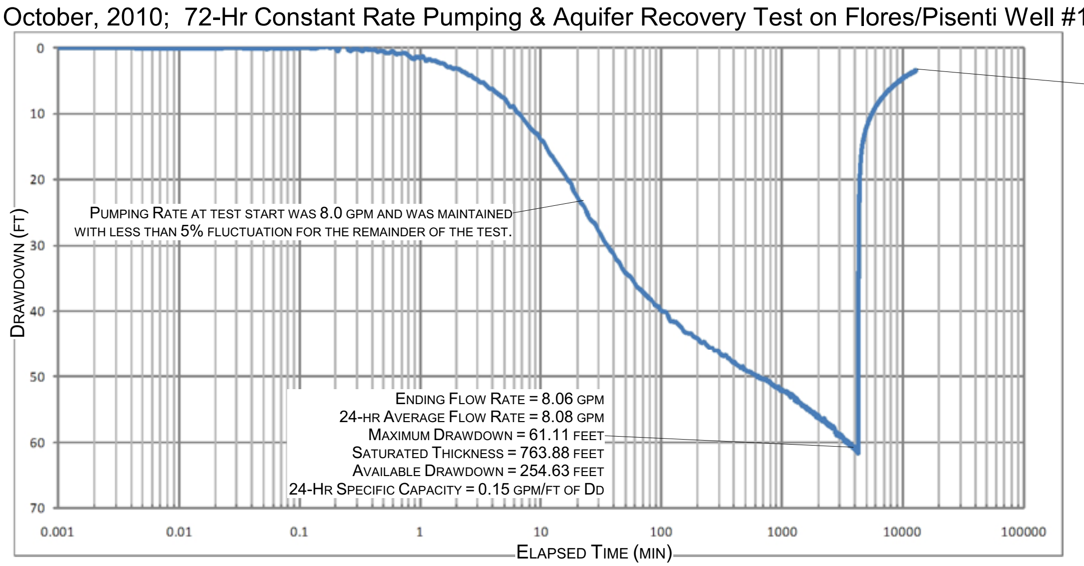
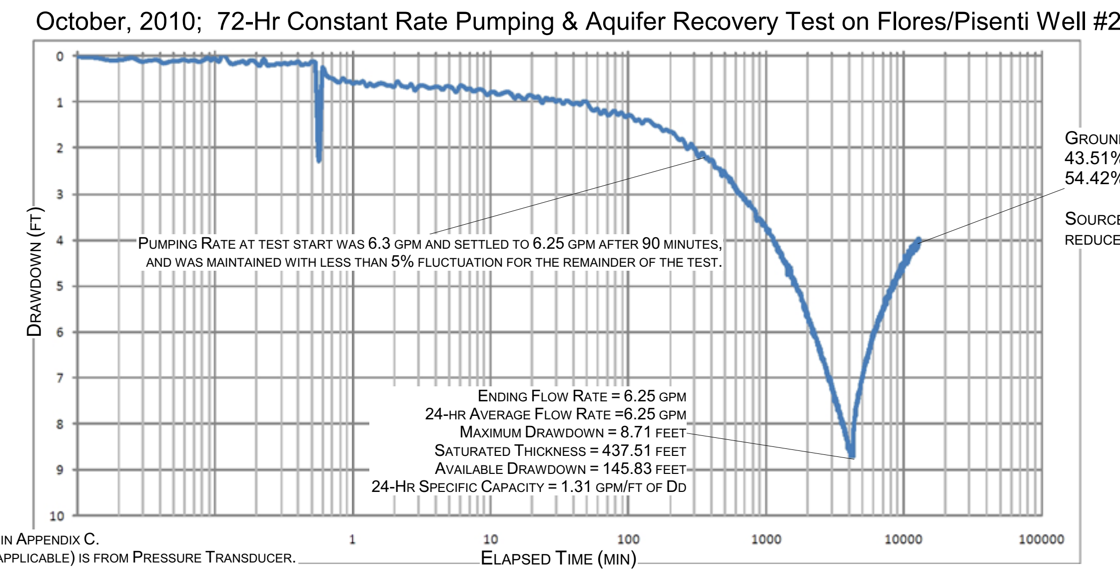
WELL RADIUS MAP
APN: 103-071-019 & -002
Monterey County, California

FIGURE 5

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





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 702 (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
CITY STATE ZIP

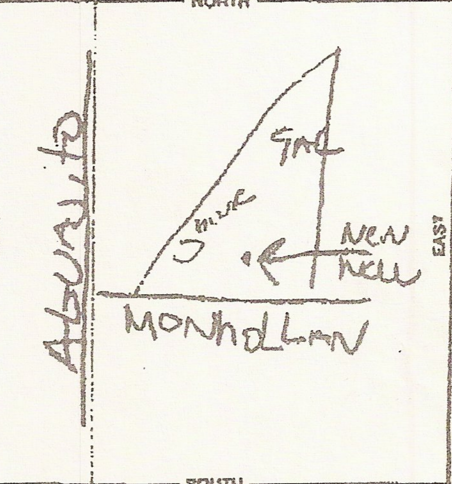
WELL LOCATION

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

NORTH

WEST



EAST

SOUTH

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 (✓)

___ 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 Blnd	5	SDR200	.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 AGH & 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 or animal 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 beween 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

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

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

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 (CITY) CA (STATE) 95032 (ZIP)

WELL LOCATION

Address 577 Monhollan Road

City Monterey CA 93940

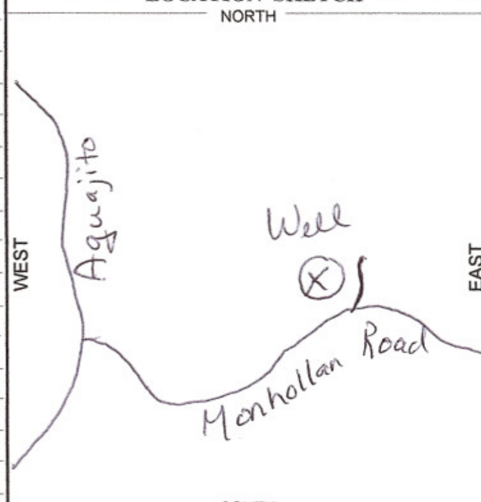
County Monterey

APN Book 103 Page 071 Parcel 019

Township ___ Range ___ Section ___

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

LOCATION SKETCH



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 (ADDRESS) SALINAS (CITY) CA (STATE) 93912 (ZIP)

Signed Kim T Kardel — WELL DRILLER/AUTHORIZED REPRESENTATIVE

10/08/10 (DATE SIGNED) 279262 (C-57 LICENSE NUMBER)

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

APPENDIX B

RESIDENTIAL FIXTURE UNIT COUNT
APN:-019: SINGLE FAMILY DWELLING
APN:-019: GUEST HOUSE

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

TYPE OF FIXTURE ***Easterly Parcel 'Conceptual' SFD Design***	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?

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

Easterly Parcel 'Conceptual' Guest House Design

TYPE OF FIXTURE	NO. OF FIXTURES	FIXTURE UNIT VALUE		FIXTURE UNIT COUNT
Washbasins	1	x 1.0		1.0
Two Washbasins in the Master Bathroom		x 1.0	=	
Toilet, Ultra Low Flush (1.6 gallons-per-flush)	1	x 1.7	=	1.7
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)		x 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)		x 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		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		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)
(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).

= 9.7 or 0.097 af/yr

**** 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

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

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

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

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

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

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 #2 HAND AND ELECTRONIC PRESSURE TRANSDUCER DATA

AQUIFER PUMP TEST DATA INFORMATION SHEET

PROJECT AND SITE INFORMATION Page ____ of _____

Project Name & Number: FLORES WELL #2 72HR & PIA — Date: 10/11/10 — Pumping Test Period: 10/12 – 10/15/10 — Recovery Test Period: 10/15 – 10/21/10

Pump Test Consultant: BIERMAN HYDROGEOLOGIC — Recorded By: A. BIERMAN — APN: 103-071-019

Well Identification: WELL #2 (577) — (Pumping Well) OR Observation Well — Township; Range & Section: T16S, R1E, SEC 4 — Latitude: N36.57406

Groundsurface @ (ft, msl): 336' (AB) — Source: GARMIN III GPS — DWR Well Number: e069163; MCHD#10-11806 — Longitude: W121.86656

WELL CONSTRUCTION INFORMATION

Borehole Dia. & Depth (in & ft): 17" Φ TO 16'

Conductor Casing Dia. & Depth (in & ft): 10.75" Φ TO 16'

Well Type, Dia (ID), & Completion Depth (ft, bgs): 5" Φ SDR 17 TO 600'

Well Perforations Interval (ft, bgs): 180-420', 440-460, 480-500; 520-540; 560-580

Fully or Partially Penetrated Well; Total Length (ft): FULLY PENETRATED ~ 320'

Sanitary Seal Depth & Condition: 0-100' 10-SACK

Top of Casing (ft, ags): 0.38

Sounding Tube (ft, aTOC): 0.95

Sounding Tube (ft, ags): 1.33

PUMP TEST EQUIPMENT INFORMATION

Drop Pipe Type and Diameter (OD in inches): 1.25" Φ SCH. 120

Pump Type and Horsepower: 1.5 HP GRUNDFOS 5S15-31

Depth to Pump Intake (ft, bTOC): 560' — Head on Pump (ft): 416.18

Pump Savor: ON (OFF) — Client Informed of Pump Savor: YES (NO) — TEST PUMP

Flow Meter Type & S/N: TEST METER SN:

Totalizer Value (gal): 3,154.0 — GAL

Xd Type & S/N: LT 700

Xd Start Time: ~~10~~ 11:15 AM — Method: Linear (Log) Event (circle)

Head on Xd (ft): 127.88 — Depth to Xd (ft, bTOC): 271.7

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

Depth to Static Groundwater (ft, below top of sounding tube): 143.82 ~~-1.33~~ — Depth to Static Groundwater (ft, bgs): 143.82 - 1.33 = 142.49

Height of Water Column / Total Saturated Thickness (ft): 580 - 142.49 = 437.51 — Available Drawdown (ft): 437.51 / 3 = 145.83

Discharge Area: >200' FROM WELL HEAD TO RAVINE ON PROP. — Targeted Flow Rate: 6.3

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	1440	Ø	6.0	2,422.0	143.46	Ø		START 2HR PRE-TEST
↓	1500	20	6.1	2,544.1	144.22			
	1540	60	6.0	2,787.7	144.46	1.0		
10/11/10	1640	120	6.1	3,154.0	144.78	1.32		STOP 2HR PRE-TEST
10/12/10	1115	0	6.3	3,154.0	143.82	Ø		START 72HR CONSTANT RATE TEST W/
	1117	2	6.2	-	144.64	0.82		PRESENCE OF MCHD.
	1119	4	6.2	-	144.74	0.92		
	1120	5	6.3	-	144.80	0.98		
	1130	15	6.2	3246.5	—	-		MINOR ADJUSTMENTS.
	1205	50	6.3	3468.4	144.8	0.98		
	1215	60	6.3	3530.7	144.83	1.01		
	1245	90	6.25	3718.9	145.27	1.45		MCHD LEAVES SITE
	1315	120	6.25	3906.3	145.42	1.60		
	1345	150	6.25	4093.9	145.51	1.69		
	1415	180	6.24	4281.1	145.63	1.81		
	1445	210	6.25	4468.6	145.73	1.91		INCREASE SLIGHTLY
	1515	240	6.25	4656.1	145.85	2.03		
	1545	270	6.26	4843.9	145.92	2.10		
	1615	300	6.26	5031.7	146.06	2.24		MINOR ADJUSTMENTS
	1645	330	6.26	5219.6	146.10	2.28		
	1715	360	6.26	5407.4	146.15	2.33		
	1745	390	6.25	5594.9	146.24	2.42		INCREASE SLIGHTLY
	1815	420	6.25	5782.5	146.39	2.57		
↓	1915	480	6.25	6157.6	146.42	2.60		
10/12/10	2015	540	6.25	6532.5	149.08	2.63		STABLE -
10/13/10	0545	1110	6.24	10,092.2	147.73	~~4.16~~ 3.91		MAINTAINED!
	0615	1140	6.23	10,279.2	147.86	4.04		
	0715	1200	6.23	10,652.9	147.95	4.13		INCREASE SLIGHTLY & MAINTAIN.
	0815	1260	6.24	11,027.1	148.25	4.43		
	1115	1440	6.3	12,162.2	148.58	4.76	1.31	24HR AVG FLOW RATE = 6.25GPM
	1315	1560	6.28	-	148.8	4.98		1.31gpm/ft OF DRAWDOWN USING 6.25gpm.
	1515	1680	6.28	13,671.1	149.03	5.21		
↓	1715	1800	6.27	-	149.18	5.36		
10/13/10	1815	1860	6.27	14,800.3	149.34	5.52		NO ADJUSTMENTS
10/14/10	0615	2580	6.34?	19,366.2	150.55	6.73		RE-ADJUST FLOW TO 6.25GPM.
	0915	2760	6.25	20,491.2	150.72	6.90		
	1115	2880	6.24	21,239.6	150.93	7.11	0.88	48HR AVG FLOW RATE = 6.28GPM
	1430	3075	6.27	22,462.9	151.27	7.45		SC CALCULATED USING 6.24GPM.
	1815	3300	6.25	23,870.3	151.57	7.75		
10/15/10	0615	4020	6.25	28,369.6	152.45	8.63		STABLE.
	1115	4320	6.25 → STOP	30,248.2	152.53	8.71	0.72	STOP 72HR TEST
								72HR AVG FLOW RATE = 6.27

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 #2

Pumping Well OR Observation Well

Township; Range & Section:

Latitude:

Groundsurface @ (ft, msl): 336'

Source:

DWR Well Number:

Longitude:

WELL CONSTRUCTION INFORMATION

SEE PG 1

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):

PUMP TEST EQUIPMENT INFORMATION

SEE PG 1

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):

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

Depth to Static Groundwater (ft, below top of sounding tube): 143.82

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	1115	4320	6.25 → 0	30,248.2	152.53	8.71		- CASING STORAGE ELAPSES WITHIN 2 MIN AFTER TEST START
	1116		0		152.06			
	1117				152.0			
	1118				151.98			
	1119				151.98			
	1120				151.93			
	1125				151.89			
	1130				151.86			
	1145				151.78			
	1150				151.75			
	1200				151.72			
10/15/10	1205	4370	0	-	151.71	7.89		152.53-151.71 = 0.82/8.71 = 9.4%
10/16/10	1115	5760	0	-	150.17	~~6.35~~	(6.35)	152.53-150.17 = 2.36/8.71 = 27.09%
10/17/10	1115	7200	0	-	149.34	5.52		152.53-149.34 = 3.19/8.71 = 36.62
10/18/10	1115	8640	0	-	148.74	4.92		152.53-148.74 = 3.79/8.71 = 43.51% (1)
(1) 95% RECOVERY NOT ACHIEVED. WELL RECOVERED TO 43.51%.								
95% - 43.51% = 51.49% AND 51.49% OF 6.25 GPM = 3.218 GPM AND 6.25 - 3.218 = 3.03 GPM								
10/19/10	1115	10,080	—	—	148.34	4.52		152.53-148.34 = 4.19/8.71 = 0.481 = 48.1%
10/20/10	1115	11,520	—	—	148.01	4.19		152.53-148.01 = 4.52/8.71 = 51.89%
10/21/10	1115	12,960	—	—	147.79	3.97		152.53-147.79 = 4.74/8.71 = 54.42% (2)
(2) MPWMD REQUIREMENT OF 95% NOT ACHIEVED. REDUCE CALCULATED WELL YIELD BY 40.58%.								

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
0	143.82	0	0 to 6.3	1) 72-Hr Test Starts on 'Flores' Well #2
0.004	143.901	0.081	6.3	2) Three Other Neighboring Wells witin 1,000 feet of Well #2 (See Figure 5).
0.008	143.846	0.026	6.25	
0.013	143.858	0.038	6.25	3) Well #1 pumped simultaneously during pumping of Well #2
0.017	143.916	0.096	6.25	4) Flow rate at start of test was 6.3 gpm which stabilized to 6.25 gpm within 90-minutes and maintained that rate with less than 5% fluctuation for remainder of test.
0.021	143.906	0.086	6.25	
0.025	143.865	0.045	6.25	
0.029	143.945	0.125	6.25	5) 24-hr average flow rate was 6.25 gpm
0.033	143.922	0.102	6.25	6) 48-hr average flow rate was 6.28 gpm
0.038	143.914	0.094	6.25	7) 72-hr average flow rate was 6.27 gpm
0.042	143.983	0.163	6.25	8) Lowest Sustainable flow rate was 6.25 gpm
0.046	143.948	0.128	6.25	9) Starting Totalizer Reading was 3,154 gal ("Test" Meter)
0.05	143.93	0.11	6.25	10) Ending Totalizer Reading was 30,248.2 gal ("Test" Meter)
0.054	143.933	0.113	6.25	11) Saturated Thickness was 437.51 feet
0.058	143.903	0.083	6.25	12) Available Drawdown was 145.83 feet
0.063	143.93	0.11	6.25	13) 24-Hour Specific Capacity = 1.31 gpm/ft of Drawdown
0.067	143.921	0.101	6.25	
0.071	143.919	0.099	6.25	
0.075	143.951	0.131	6.25	
0.079	143.939	0.119	6.25	
0.083	143.907	0.087	6.25	
0.088	143.864	0.044	6.25	
0.092	143.919	0.099	6.25	
0.096	143.884	0.064	6.25	
0.1	143.887	0.067	6.25	
0.106	143.942	0.122	6.25	
0.112	143.786	-0.034	6.25	
0.119	143.85	0.03	6.25	
0.126	143.963	0.143	6.25	
0.133	144	0.18	6.25	
0.141	143.977	0.157	6.25	
0.15	143.958	0.138	6.25	
0.158	143.938	0.118	6.25	
0.168	143.99	0.17	6.25	
0.178	143.924	0.104	6.25	
0.188	143.924	0.104	6.25	
0.199	143.99	0.17	6.25	
0.211	144.034	0.214	6.25	
0.224	143.887	0.067	6.25	
0.237	144.027	0.207	6.25	
0.251	144.017	0.197	6.25	
0.266	144.02	0.2	6.25	
0.282	143.983	0.163	6.25	
0.298	144.003	0.183	6.25	
0.316	143.978	0.158	6.25	
0.335	144.003	0.183	6.25	
0.355	143.967	0.147	6.25	
0.376	143.976	0.156	6.25	
0.398	143.945	0.125	6.25	
0.422	144.026	0.206	6.25	
0.447	143.994	0.174	6.25	
0.473	144.003	0.183	6.25	
0.501	143.943	0.123	6.25	
0.531	143.971	0.151	6.25	
0.562	146.108	2.288	6.25	
0.596	144.084	0.264	6.25	
0.631	144.227	0.407	6.25	
0.668	144.294	0.474	6.25	
0.708	144.312	0.492	6.25	
0.75	144.37	0.55	6.25	
0.794	144.398	0.578	6.25	
0.841	144.31	0.49	6.25	
0.891	144.384	0.564	6.25	
0.944	144.377	0.557	6.25	
1	144.426	0.606	6.25	
1.06	144.394	0.574	6.25	
1.12	144.408	0.588	6.25	
1.19	144.376	0.556	6.25	
1.26	144.484	0.664	6.25	
1.33	144.424	0.604	6.25	
1.41	144.474	0.654	6.25	
1.5	144.443	0.623	6.25	
1.58	144.415	0.595	6.25	
1.68	144.427	0.607	6.25	
1.78	144.471	0.651	6.25	
1.88	144.465	0.645	6.25	
1.99	144.494	0.674	6.25	
2.11	144.374	0.554	6.25	
2.24	144.468	0.648	6.25	
2.373	144.49	0.67	6.25	
2.51	144.5	0.68	6.25	
2.66	144.437	0.617	6.25	
2.82	144.573	0.753	6.25	
2.98	144.488	0.668	6.25	
3.16	144.465	0.645	6.25	
3.35	144.481	0.661	6.25	
3.55	144.517	0.697	6.25	
3.76	144.512	0.692	6.25	
3.98	144.492	0.672	6.25	
4.22	144.5	0.68	6.25	
4.47	144.556	0.736	6.3	Minor Adjustment, slight increase.
4.73	144.487	0.667	6.3	
5.01	144.487	0.667	6.3	
5.31	144.524	0.704	6.3	
5.623	144.608	0.788	6.3	
5.96	144.474	0.654	6.3	
6.31	144.483	0.663	6.3	

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
6.68	144.546	0.726	6.3	
7.08	144.532	0.712	6.3	
7.5	144.593	0.773	6.3	
7.94	144.563	0.743	6.3	
8.41	144.546	0.726	6.3	
8.91	144.584	0.764	6.3	
9.44	144.672	0.852	6.3	
10	144.614	0.794	6.3	
10.6	144.603	0.783	6.3	
11.202	144.663	0.843	6.3	
11.9	144.647	0.827	6.3	
12.6	144.619	0.799	6.3	
13.3	144.6	0.78	6.3	
14.1	144.647	0.827	6.3	
15	144.743	0.923	6.25	
15.8	144.677	0.857	6.25	Continual minor adjustments - trying to maintain 6.3 gpm.
16.8	144.735	0.915	6.25	
17.8	144.756	0.936	6.3	
18.8	144.679	0.859	6.3	
19.9	144.688	0.868	6.3	
21.1	144.734	0.914	6.3	
22.4	144.709	0.889	6.3	
23.7	144.845	1.025	6.3	
25.1	144.736	0.916	6.3	
26.6	144.778	0.958	6.3	
28.2	144.755	0.935	6.3	
29.8	144.813	0.993	6.3	
31.6	144.778	0.958	6.3	
33.5	144.859	1.039	6.3	
35.5	144.794	0.974	6.3	
37.6	144.827	1.007	6.3	
39.8	144.87	1.05	6.3	
42.2	144.838	1.018	6.3	
44.7	144.882	1.062	6.3	
47.3	144.811	0.991	6.3	
50.1	144.831	1.011	6.3	
53.1	144.962	1.142	6.3	
56.2	145.013	1.193	6.3	
59.6	144.971	1.151	6.3	Flow rate gradually falls.
63.1	145.082	1.262	6.25	
66.8	145.003	1.183	6.25	Stable - maintain.
70.8	145.114	1.294	6.25	
75	145.064	1.244	6.25	
79.4	145.015	1.195	6.25	
84.1	145.105	1.285	6.25	
89.1	145.052	1.232	6.25	
94.4	145.146	1.326	6.25	
100	145.112	1.292	6.25	**Flow rate stabilized at 6.25 gpm with less than 5% fluctuation for**
106	145.131	1.311	6.25	**remainder of the test.**
112	145.228	1.408	6.25	
119	145.207	1.387	6.25	
126	145.285	1.465	6.25	
133	145.216	1.396	6.25	
141	145.223	1.403	6.25	
150	145.299	1.479	6.25	
158	145.343	1.523	6.25	
168	145.355	1.535	6.25	
178	145.448	1.628	6.25	
188	145.424	1.604	6.25	
198	145.466	1.646	6.25	
208	145.473	1.653	6.25	
218	145.523	1.703	6.25	
228	145.6	1.78	6.25	
238	145.649	1.829	6.25	
248	145.629	1.809	6.25	
258	145.71	1.89	6.25	
268	145.838	2.018	6.25	
278	145.805	1.985	6.25	
288	145.733	1.913	6.25	
298	145.824	2.004	6.25	
308	145.847	2.027	6.25	
318	145.97	2.15	6.25	
328.004	146.024	2.204	6.25	
338	145.951	2.131	6.25	
348	145.927	2.107	6.25	
358	145.974	2.154	6.25	
368	146.053	2.233	6.25	
378	146.027	2.207	6.25	
388	146.105	2.285	6.25	
398	146.09	2.27	6.25	
408	146.078	2.258	6.25	
418	146.135	2.315	6.25	
428	146.242	2.422	6.25	
438	146.247	2.427	6.25	
448	146.261	2.441	6.25	
458	146.277	2.457	6.25	
468	146.279	2.459	6.25	
478	146.422	2.602	6.25	
488	146.385	2.565	6.25	
498	146.325	2.505	6.25	
508	146.359	2.539	6.25	
518	146.443	2.623	6.25	
528	146.438	2.618	6.25	
538	146.457	2.637	6.25	
548	146.561	2.741	6.25	
558	146.485	2.665	6.25	
568	146.586	2.766	6.25	

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)		Comments
578	146.584	2.764	6.25		
588	146.68	2.86	6.25		
598	146.642	2.822	6.25		
608	146.754	2.934	6.25		
618	146.723	2.903	6.25		
628	146.809	2.989	6.25		
638	146.799	2.979	6.25		
648	146.794	2.974	6.25		
658	146.859	3.039	6.25		
668	146.833	3.013	6.25		
678	146.863	3.043	6.25		
688	146.916	3.096	6.25		
698	146.959	3.139	6.25		
708	146.91	3.09	6.25		
718	146.963	3.143	6.25		
728	147.024	3.204	6.25		
738	147.014	3.194	6.25		
748	147.072	3.252	6.25		
758	146.995	3.175	6.25		
768	147.051	3.231	6.25		
778	147.076	3.256	6.25		
788	147.087	3.267	6.25		
798	147.131	3.311	6.25		
808	147.141	3.321	6.25		
818	147.152	3.332	6.25		
828	147.15	3.33	6.25		
838	147.193	3.373	6.25		
848	147.256	3.436	6.25		
858	147.4	3.58	6.25		
868	147.389	3.569	6.25		
878	147.393	3.573	6.25		
888	147.356	3.536	6.25		
898	147.391	3.571	6.25		
908	147.353	3.533	6.25		
918	147.429	3.609	6.25		
928	147.383	3.563	6.25		
938	147.441	3.621	6.25		
948	147.504	3.684	6.25		
958	147.469	3.649	6.25		
968	147.452	3.632	6.25		
978	147.515	3.695	6.25		
988	147.499	3.679	6.25		
998	147.536	3.716	6.25		
1008	147.614	3.794	6.25		
1018	147.635	3.815	6.25		
1028	147.574	3.754	6.25		
1038	147.593	3.773	6.25		
1048	147.679	3.859	6.25		
1058	147.6	3.78	6.25		
1068	147.677	3.857	6.25		
1078	147.702	3.882	6.25		
1088	147.72	3.9	6.25		
1098	147.737	3.917	6.25		
1108	147.755	3.935	6.25		Flow rate gradually falls.
1118	147.745	3.925	6.24		
1128	147.771	3.951	6.24		
1138	147.864	4.044	6.23		
1148	147.857	4.037	6.23		
1158	147.913	4.093	6.23		
1168	147.936	4.116	6.23		
1178	147.896	4.076	6.23		
1188	147.887	4.067	6.23		
1198	147.958	4.138	6.23		
1208	147.961	4.141	6.23		
1218	148.074	4.254	6.23		
1228	147.972	4.152	6.23		
1238	148.018	4.198	6.24		Increase to maintain 6.25 gpm average.
1248	148.083	4.263	6.24		
1258	148.046	4.226	6.24		
1268	148.134	4.314	6.24		
1278	148.126	4.306	6.24		
1288	148.19	4.37	6.24		
1298	148.108	4.288	6.24		
1308	148.152	4.332	6.24		
1318	148.139	4.319	6.24		
1328	148.272	4.452	6.24		
1338	148.282	4.462	6.24		
1348	148.224	4.404	6.24		
1358	148.323	4.503	6.24		
1368	148.268	4.448	6.24		
1378	148.323	4.503	6.25		
1388	148.353	4.533	6.3		Increase to maintain 6.25 gpm average.
1398	148.289	4.469	6.3		
1408	148.365	4.545	6.3		
1418	148.368	4.548	6.3		
1428	148.451	4.631	6.3		
1438	148.582	4.762	6.25	1.31	24-Hr Specific Capacity = 1.31 gpm/ft of Dd (calculated using lowest flow)
1448	148.397	4.577	6.25		24-hr average flow rate = 6.25 gpm
1458	148.365	4.545	6.25		Lowest sustainable 24-hr flow rate 6.25 gpm
1468	148.407	4.587	6.28		Flow rate maintained with less than 5% fluctuation for remainder of test.
1478	148.53	4.71	6.28		24-hr totalizer Reading = 12,162.2 gallons
1488	148.52	4.7	6.28		
1498	148.525	4.705	6.28		
1508	148.51	4.69	6.28		
1518	148.428	4.608	6.28		
1528	148.612	4.792	6.28		
1538	148.649	4.829	6.28		

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
1548	148.629	4.809	6.28	
1558	148.622	4.802	6.28	
1568	148.644	4.824	6.28	
1578	148.777	4.957	6.28	
1588	148.705	4.885	6.28	
1598	148.656	4.836	6.28	
1608	148.758	4.938	6.28	
1618	148.679	4.859	6.28	
1628	148.771	4.951	6.28	
1638	148.783	4.963	6.28	
1648	148.827	5.007	6.28	
1658	148.788	4.968	6.28	
1668	148.811	4.991	6.28	
1678	148.892	5.072	6.28	
1688	148.82	5	6.28	
1698	148.931	5.111	6.28	
1708	148.88	5.06	6.27	Flow rate very stable.
1718	148.919	5.099	6.27	
1728	148.934	5.114	6.27	
1738	148.936	5.116	6.27	
1748	148.917	5.097	6.27	
1758	148.998	5.178	6.27	
1768	148.956	5.136	6.27	
1778	149.012	5.192	6.27	
1788	148.968	5.148	6.27	
1798	149.01	5.19	6.27	
1808	149.024	5.204	6.27	
1818	149.137	5.317	6.27	
1828	149.113	5.293	6.27	
1838	149.109	5.289	6.27	
1848	149.155	5.335	6.27	
1858	149.162	5.342	6.27	
1868	149.183	5.363	6.27	
1878	149.241	5.421	6.27	
1888	149.328	5.508	6.27	
1898	149.261	5.441	6.27	
1908	149.232	5.412	6.27	
1918	149.222	5.402	6.27	
1928	149.377	5.557	6.3	Adjust flow upward to accommodate for potential increasing head
1938	149.271	5.451	6.3	and decreasing flow rate overnight.
1948	149.301	5.481	6.3	
1958	149.44	5.62	6.3	
1968	149.493	5.673	6.3	
1978	149.368	5.548	6.3	
1988	149.403	5.583	6.3	
1998	149.375	5.555	6.3	
2008	149.433	5.613	6.3	
2018	149.467	5.647	6.3	
2028	149.447	5.627	6.3	
2038	149.594	5.774	6.3	
2048	149.576	5.756	6.3	
2058	149.543	5.723	6.3	
2068	149.544	5.724	6.3	
2078	149.538	5.718	6.3	
2088	149.613	5.793	6.3	
2098	149.626	5.806	6.3	
2108	149.65	5.83	6.3	
2118	149.694	5.874	6.3	
2128	149.687	5.867	6.3	
2138	149.631	5.811	6.3	
2148	149.73	5.91	6.3	
2158	149.691	5.871	6.3	
2168	149.739	5.919	6.3	
2178	149.855	6.035	6.3	
2188	149.823	6.003	6.3	
2198	149.782	5.962	6.3	
2208	149.751	5.931	6.3	
2218	149.784	5.964	6.3	
2228	149.839	6.019	6.3	
2238	149.929	6.109	6.3	
2248	149.883	6.063	6.3	
2258	149.837	6.017	6.3	
2268	149.874	6.054	6.3	
2278	149.883	6.063	6.3	
2288	149.925	6.105	6.3	
2298	149.908	6.088	6.3	
2308	149.929	6.109	6.3	
2318	149.957	6.137	6.3	
2328	149.98	6.16	6.3	
2338	149.969	6.149	6.3	
2348	150.004	6.184	6.3	
2358	150.054	6.234	6.3	
2368	150.1	6.28	6.3	
2378	150.079	6.259	6.3	
2388	150.031	6.211	6.3	
2398	150.124	6.304	6.3	
2408	150.07	6.25	6.3	
2418	150.13	6.31	6.3	
2428	150.216	6.396	6.3	
2438	150.167	6.347	6.3	
2448	150.114	6.294	6.3	
2458	150.257	6.437	6.3	
2468	150.192	6.372	6.3	
2478	150.175	6.355	6.3	
2488	150.175	6.355	6.3	
2498	150.246	6.426	6.3	
2508	150.341	6.521	6.3	

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)		Comments
2518	150.255	6.435	6.3		
2528	150.295	6.475	6.3		
2538	150.327	6.507	6.3		
2548	150.429	6.609	6.3		
2558	150.361	6.541	6.3		
2568	150.419	6.599	6.3		
2578	150.373	6.553	6.3		
2588	150.463	6.643	6.34		Flow rate elevated, maintain at 6.25 gpm
2598	150.391	6.571	6.25		
2608	150.421	6.601	6.25		
2618	150.414	6.594	6.25		
2628	150.4	6.58	6.25		
2638	150.472	6.652	6.25		
2648	150.444	6.624	6.25		
2658	150.519	6.699	6.25		
2668	150.549	6.729	6.25		
2678	150.546	6.726	6.25		
2688	150.519	6.699	6.25		
2698	150.599	6.779	6.25		
2708	150.56	6.74	6.25		
2718	150.615	6.795	6.25		
2728	150.641	6.821	6.25		
2738	150.606	6.786	6.25		
2748	150.597	6.777	6.25		
2758	150.724	6.904	6.25		
2768	150.634	6.814	6.25		
2778	150.733	6.913	6.25		
2788	150.694	6.874	6.25		
2798	150.787	6.967	6.25		
2808	150.75	6.93	6.25		
2818	150.724	6.904	6.25		
2828	150.756	6.936	6.25		
2838	150.807	6.987	6.25		
2848	150.885	7.065	6.25		
2858	150.782	6.962	6.25		
2868	150.814	6.994	6.25		
2878	150.798	6.978	6.25	0.887	48-hr Specific Capacity = 0.885 gpm/ft of Dd
2888	150.87	7.05	6.27		48-hr Specific Capacity calculated using 6.25 gpm.
2898	150.885	7.065	6.27		48-hr Average Flow Rate = 6.28 gpm
2908	150.916	7.096	6.27		48-hr totalizer Reading = 21,239.6 gallons
2918	150.819	6.999	6.27		
2928	150.821	7.001	6.27		
2938	150.909	7.089	6.27		
2948	150.879	7.059	6.27		
2958	150.916	7.096	6.27		
2968	150.999	7.179	6.27		
2978	150.883	7.063	6.27		
2988	150.962	7.142	6.27		
2998	151.087	7.267	6.27		
3008	151.038	7.218	6.27		
3018	150.981	7.161	6.27		
3028	151.073	7.253	6.27		
3038	151.029	7.209	6.27		
3048	151.029	7.209	6.27		
3058	151.082	7.262	6.27		Flow rate gradually falls.
3068	151.119	7.299	6.25		
3078	151.119	7.299	6.25		
3088	151.161	7.341	6.25		
3098	151.149	7.329	6.25		
3108	151.173	7.353	6.25		
3118	151.124	7.304	6.25		
3128	151.168	7.348	6.25		
3138	151.338	7.518	6.25		
3148	151.228	7.408	6.25		
3158	151.218	7.398	6.25		
3168	151.276	7.456	6.25		
3178	151.343	7.523	6.25		
3188	151.254	7.434	6.25		
3198	151.285	7.465	6.25		
3208	151.313	7.493	6.25		
3218	151.278	7.458	6.25		
3228	151.394	7.574	6.25		
3238	151.343	7.523	6.25		
3248	151.276	7.456	6.25		
3258	151.327	7.507	6.25		
3268	151.329	7.509	6.25		
3278	151.433	7.613	6.25		
3288	151.464	7.644	6.25		
3298.004	151.452	7.632	6.25		
3308	151.54	7.72	6.25		
3318	151.438	7.618	6.25		
3328	151.466	7.646	6.25		
3338	151.452	7.632	6.25		
3348	151.475	7.655	6.25		
3358	151.481	7.661	6.25		
3368	151.413	7.593	6.25		
3378	151.535	7.715	6.25		
3388	151.526	7.706	6.25		
3398	151.542	7.722	6.25		
3408	151.562	7.742	6.25		
3418	151.593	7.773	6.25		
3428	151.539	7.719	6.25		
3438	151.583	7.763	6.25		
3448	151.597	7.777	6.25		
3458	151.574	7.754	6.25		
3468	151.713	7.893	6.25		
3478	151.658	7.838	6.25		

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)		Comments
3488	151.602	7.782	6.25		
3498	151.66	7.84	6.25		
3508	151.695	7.875	6.25		
3518	151.695	7.875	6.25		
3528	151.741	7.921	6.25		
3538	151.697	7.877	6.25		
3548	151.828	8.008	6.25		
3558	151.711	7.891	6.25		
3568	151.743	7.923	6.25		
3578	151.796	7.976	6.25		
3588	151.791	7.971	6.25		
3598	151.831	8.011	6.25		
3608	151.858	8.038	6.25		
3618	151.762	7.942	6.25		
3628	151.852	8.032	6.25		
3638	151.909	8.089	6.25		
3648	151.847	8.027	6.25		
3658	151.868	8.048	6.25		
3668	151.847	8.027	6.25		
3678	151.914	8.094	6.25		
3688	151.926	8.106	6.25		
3698	151.916	8.096	6.25		
3708	151.999	8.179	6.25		
3718	151.997	8.177	6.25		
3728	151.907	8.087	6.25		
3738	151.914	8.094	6.25		
3748	152.032	8.212	6.25		
3758	151.96	8.14	6.25		
3768	152.027	8.207	6.25		
3778	152.087	8.267	6.25		
3788	152.041	8.221	6.25		
3798	152.043	8.223	6.25		
3808	151.999	8.179	6.25		
3818	152.092	8.272	6.25		Flow rate maintained
3828	152.115	8.295	6.25		
3838	152.106	8.286	6.25		
3848	152.106	8.286	6.25		
3858	152.172	8.352	6.25		
3868	152.103	8.283	6.25		
3878	152.188	8.368	6.25		
3888	152.182	8.362	6.25		
3898	152.196	8.376	6.25		
3908	152.194	8.374	6.25		
3918	152.205	8.385	6.25		
3928	152.214	8.394	6.25		
3938	152.219	8.399	6.25		
3948	152.364	8.544	6.25		
3958	152.249	8.429	6.25		
3968	152.288	8.468	6.25		
3978	152.201	8.381	6.25		
3988	152.297	8.477	6.25		
3998	152.29	8.47	6.25		
4008	152.267	8.447	6.25		
4018	152.339	8.519	6.25		
4028	152.392	8.572	6.25		
4038	152.42	8.6	6.25		
4048	152.323	8.503	6.25		
4058	152.321	8.501	6.25		
4068	152.363	8.543	6.25		
4078	152.383	8.563	6.25		
4088	152.339	8.519	6.25		
4098	152.422	8.602	6.25		
4108	152.448	8.628	6.25		
4118	152.424	8.604	6.25		
4128	152.48	8.66	6.25		
4138	152.529	8.709	6.25		
4148	152.499	8.679	6.25		
4158	152.529	8.709	6.25		
4168	152.499	8.679	6.25		
4178	152.529	8.709	6.25		
4188	152.519	8.699	6.25		
4198	152.533	8.713	6.25		
4208	152.529	8.709	6.25		
4218	152.529	8.709	6.25		
4228	152.529	8.709	6.25		
4238.003	152.529	8.709	6.25		
4248	152.529	8.709	6.25		
4258	152.529	8.709	6.25		
4268	152.529	8.709	6.25		
4278	152.529	8.709	6.25		
4288	152.529	8.709	6.25		
4298	152.529	8.709	6.25		
4308	152.529	8.709	6.25		Adjust upward to 46 gpm.
4318	152.529	8.709	6.25		
4320	152.533	8.71	6.25 to 0	0.72	72-hr Test Stops at 4320 min.
4328	151.981	8.161	0		72-hr Specific Capacity = 0.72 gpm/ft of Dd.
4338	152.023	8.203	0		72-hr Specific Capacity calculated using 6.25 gpm.
4348	151.921	8.101	0		72-hr Average Flow Rate = 6.27 gpm.
4358	151.974	8.154	0		72-hr totalizer Reading = 30,248.2 gallons
4368	151.85	8.03	0		Recovery Test Starts
4378	151.808	7.988	0		
4388	151.785	7.965	0		
4398	151.767	7.947	0		
4408	151.753	7.933	0		
4418	151.702	7.882	0		
4428	151.695	7.875	0		
4438	151.648	7.828	0		

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
4448	151.612	7.792	0	
4458	151.66	7.84	0	Based on Transducer Data;
4468	151.552	7.732	0	9.4% Groundwater recovery after one hour.
4478	151.561	7.741	0	
4488	151.487	7.667	0	
4498	151.654	7.834	0	
4508	151.52	7.7	0	
4518	151.538	7.718	0	Recovery continues
4528	151.494	7.674	0	
4538	151.432	7.612	0	
4548	151.385	7.565	0	
4558	151.441	7.621	0	
4568	151.411	7.591	0	
4578	151.351	7.531	0	
4588	151.397	7.577	0	
4598	151.353	7.533	0	
4608	151.399	7.579	0	
4618	151.309	7.489	0	
4628	151.369	7.549	0	
4638	151.299	7.479	0	
4648	151.26	7.44	0	
4658	151.309	7.489	0	
4668	151.309	7.489	0	
4678	151.237	7.417	0	
4688	151.172	7.352	0	
4698	151.244	7.424	0	
4708	151.228	7.408	0	
4718	151.275	7.455	0	
4728	151.128	7.308	0	
4738	151.17	7.35	0	
4748	151.156	7.336	0	
4758	151.133	7.313	0	
4768	151.142	7.322	0	
4778	151.166	7.346	0	
4788	151.184	7.364	0	
4798	151.124	7.304	0	
4808	151.147	7.327	0	
4818	151.115	7.295	0	
4828	151.071	7.251	0	
4838	151.059	7.239	0	
4848	151.002	7.182	0	
4858	150.997	7.177	0	
4868	151.061	7.241	0	
4878	150.981	7.161	0	
4888	150.941	7.121	0	
4898	150.932	7.112	0	
4908	150.925	7.105	0	
4918	150.902	7.082	0	
4928	150.911	7.091	0	
4938	150.902	7.082	0	
4948	150.895	7.075	0	
4958	150.884	7.064	0	
4968	150.916	7.096	0	
4978	150.902	7.082	0	
4988	150.911	7.091	0	
4998	150.814	6.994	0	
5008	150.849	7.029	0	
5018	150.805	6.985	0	
5028	150.807	6.987	0	
5038	150.803	6.983	0	
5048	150.763	6.943	0	
5058	150.763	6.943	0	
5068	150.807	6.987	0	
5078	150.717	6.897	0	
5088	150.722	6.902	0	
5098	150.742	6.922	0	
5108	150.678	6.858	0	
5118	150.687	6.867	0	
5128	150.673	6.853	0	
5138	150.659	6.839	0	
5148	150.647	6.827	0	
5158	150.689	6.869	0	
5168	150.632	6.812	0	
5178	150.608	6.788	0	
5188	150.617	6.797	0	
5198	150.617	6.797	0	
5208	150.566	6.746	0	
5218	150.573	6.753	0	
5228	150.543	6.723	0	
5238	150.58	6.76	0	
5248	150.518	6.698	0	
5258	150.511	6.691	0	
5268	150.552	6.732	0	
5278	150.472	6.652	0	
5288	150.451	6.631	0	
5298	150.486	6.666	0	
5308	150.446	6.626	0	
5318	150.523	6.703	0	
5328	150.486	6.666	0	
5338	150.446	6.626	0	
5348	150.486	6.666	0	
5358	150.486	6.666	0	
5368	150.463	6.643	0	
5378	150.384	6.564	0	
5388	150.414	6.594	0	
5398	150.486	6.666	0	
5408	150.455	6.635	0	

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
5418	150.43	6.61	0	
5428	150.437	6.617	0	
5438	150.409	6.589	0	
5448	150.391	6.571	0	
5458	150.384	6.564	0	
5468	150.407	6.587	0	
5478	150.375	6.555	0	
5488	150.37	6.55	0	
5498	150.296	6.476	0	
5508	150.395	6.575	0	
5518	150.305	6.485	0	
5528	150.275	6.455	0	
5538	150.391	6.571	0	
5548	150.303	6.483	0	
5558	150.303	6.483	0	
5568	150.306	6.486	0	
5578	150.312	6.492	0	
5588	150.287	6.467	0	
5598	150.256	6.436	0	
5608	150.194	6.374	0	
5618	150.256	6.436	0	
5628	150.25	6.43	0	
5638	150.189	6.369	0	
5648	150.263	6.443	0	
5658	150.208	6.388	0	
5668	150.187	6.367	0	
5678	150.187	6.367	0	
5688	150.106	6.286	0	
5698	150.189	6.369	0	
5708	150.166	6.346	0	
5718	150.178	6.358	0	
5728	150.141	6.321	0	
5738	150.11	6.29	0	
5748	150.106	6.286	0	
5758	150.175	6.355	0	
5768	150.044	6.224	0	
5778	150.074	6.254	0	
5788	150.076	6.256	0	
5798	150.099	6.279	0	
5808	150.051	6.231	0	
5818	150.085	6.265	0	
5828	150.101	6.281	0	
5838	150.06	6.24	0	27.09% Groundwater recovery after one day
5848	150.002	6.182	0	
5858	149.983	6.163	0	
5868	150.027	6.207	0	
5878	149.99	6.17	0	
5888	149.978	6.158	0	
5898	149.955	6.135	0	
5908	149.907	6.087	0	
5918	150.018	6.198	0	
5928	149.937	6.117	0	
5938	149.965	6.145	0	
5948	149.921	6.101	0	
5958	149.87	6.05	0	
5968	149.978	6.158	0	
5978	149.978	6.158	0	
5988	149.914	6.094	0	
5998	149.911	6.091	0	
6008	149.965	6.145	0	
6018	149.863	6.043	0	
6028	149.921	6.101	0	
6038	149.879	6.059	0	
6048	149.916	6.096	0	
6058	149.911	6.091	0	
6068	149.898	6.078	0	
6078	149.877	6.057	0	
6088	149.877	6.057	0	
6098	149.837	6.017	0	
6108	149.806	5.986	0	
6118	149.782	5.962	0	
6128	149.849	6.029	0	
6138	149.842	6.022	0	
6148	149.826	6.006	0	
6158	149.787	5.967	0	
6168	149.849	6.029	0	
6178	149.798	5.978	0	
6188	149.819	5.999	0	
6198	149.837	6.017	0	
6208	149.796	5.976	0	
6218	149.761	5.941	0	
6228	149.793	5.973	0	
6238	149.777	5.957	0	
6248	149.784	5.964	0	
6258	149.803	5.983	0	
6268	149.782	5.962	0	
6278	149.733	5.913	0	
6288	149.743	5.923	0	
6298	149.77	5.95	0	
6308	149.747	5.927	0	
6318	149.701	5.881	0	
6328	149.678	5.858	0	
6338	149.743	5.923	0	
6348	149.708	5.888	0	
6358	149.761	5.941	0	
6368	149.687	5.867	0	
6378	149.675	5.855	0	

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
6388	149.747	5.927	0	
6398	149.651	5.831	0	
6408	149.618	5.798	0	
6418	149.624	5.804	0	
6428	149.618	5.798	0	
6438	149.608	5.788	0	
6448	149.648	5.828	0	
6458	149.643	5.823	0	
6468	149.699	5.879	0	
6478	149.62	5.8	0	
6488	149.569	5.749	0	
6498	149.696	5.876	0	
6508	149.666	5.846	0	
6518	149.627	5.807	0	
6528	149.571	5.751	0	
6538	149.558	5.738	0	
6548	149.615	5.795	0	
6558	149.566	5.746	0	
6568	149.543	5.723	0	
6578	149.527	5.707	0	
6588	149.527	5.707	0	
6598	149.523	5.703	0	
6608	149.583	5.763	0	
6618	149.55	5.73	0	
6628	149.499	5.679	0	
6638	149.534	5.714	0	
6648	149.565	5.745	0	
6658	149.521	5.701	0	
6668	149.532	5.712	0	
6678	149.467	5.647	0	
6688	149.565	5.745	0	
6698	149.543	5.723	0	
6708	149.453	5.633	0	
6718	149.513	5.693	0	
6728	149.529	5.709	0	
6738	149.484	5.664	0	
6748	149.446	5.626	0	
6758	149.529	5.709	0	
6768	149.525	5.705	0	
6778	149.46	5.64	0	
6788	149.507	5.687	0	
6798	149.488	5.668	0	
6808	149.409	5.589	0	
6818	149.472	5.652	0	
6828	149.416	5.596	0	
6838	149.388	5.568	0	
6848	149.444	5.624	0	
6858	149.444	5.624	0	
6868	149.477	5.657	0	
6878	149.433	5.613	0	
6888	149.427	5.607	0	
6898	149.446	5.626	0	
6908	149.386	5.566	0	
6918	149.377	5.557	0	
6928	149.379	5.559	0	
6938	149.493	5.673	0	
6948	149.405	5.585	0	
6958	149.449	5.629	0	
6968	149.388	5.568	0	
6978	149.393	5.573	0	
6988	149.4	5.58	0	
6998	149.356	5.536	0	
7008	149.437	5.617	0	
7018	149.377	5.557	0	
7028	149.349	5.529	0	
7038	149.363	5.543	0	
7048	149.347	5.527	0	
7058	149.341	5.521	0	
7068	149.372	5.552	0	
7078	149.34	5.52	0	
7088	149.268	5.448	0	
7098	149.366	5.546	0	
7108	149.299	5.479	0	
7118	149.366	5.546	0	
7128	149.344	5.524	0	
7138	149.366	5.546	0	
7148	149.312	5.492	0	
7158	149.344	5.524	0	
7168	149.319	5.499	0	
7178	149.319	5.499	0	
7188	149.309	5.489	0	
7198	149.344	5.524	0	
7208	149.268	5.448	0	
7218	149.299	5.479	0	36.62% Groundwater recovery after two days.
7228	149.33	5.51	0	
7238	149.28	5.46	0	
7248	149.282	5.462	0	
7258	149.279	5.459	0	
7268	149.303	5.483	0	
7278	149.252	5.432	0	
7288	149.224	5.404	0	
7298	149.237	5.417	0	
7308	149.106	5.286	0	
7318	149.255	5.435	0	
7328	149.24	5.42	0	
7338	149.153	5.333	0	
7348	149.201	5.381	0	

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
7358	149.108	5.288	0	
7368	149.171	5.351	0	
7378	149.159	5.339	0	
7388	149.173	5.353	0	
7398	149.08	5.26	0	
7408	149.108	5.288	0	
7418	149.175	5.355	0	
7428	149.208	5.388	0	
7438	149.124	5.304	0	
7448	149.087	5.267	0	
7458	149.092	5.272	0	
7468	149.122	5.302	0	
7478	149.157	5.337	0	
7488	149.115	5.295	0	
7498	149.231	5.411	0	
7508	149.162	5.342	0	
7518	149.101	5.281	0	
7528	149.111	5.291	0	
7538	149.106	5.286	0	
7548	149.073	5.253	0	
7558	149.078	5.258	0	
7568	149.05	5.23	0	
7578	149.12	5.3	0	
7588	149.045	5.225	0	
7598	149.106	5.286	0	
7608	149.106	5.286	0	
7618	149.041	5.221	0	
7628	149.078	5.258	0	
7638	149.053	5.233	0	
7648	149.106	5.286	0	
7658	149.097	5.277	0	
7668	149.053	5.233	0	
7678	149.069	5.249	0	
7688	149.039	5.219	0	
7698	149.039	5.219	0	
7708	149.087	5.267	0	
7718	149.074	5.254	0	
7728	149.057	5.237	0	
7738	149.057	5.237	0	
7748	149.029	5.209	0	
7758	149.062	5.242	0	
7768	149.076	5.256	0	
7778	149.085	5.265	0	
7788	148.971	5.151	0	
7798	148.925	5.105	0	
7808	149.027	5.207	0	
7818	148.976	5.156	0	
7828	148.976	5.156	0	
7838	149.016	5.196	0	
7848	149.006	5.186	0	
7858	148.988	5.168	0	
7868	149.018	5.198	0	
7878	148.96	5.14	0	
7888	148.964	5.144	0	
7898	149.004	5.184	0	
7908	148.985	5.165	0	
7918	148.99	5.17	0	
7928	148.939	5.119	0	
7938	149.013	5.193	0	
7948	148.995	5.175	0	
7958	149.051	5.231	0	
7968	148.93	5.11	0	
7978	148.934	5.114	0	
7988	148.953	5.133	0	
7998	148.941	5.121	0	
8008	148.969	5.149	0	
8018	148.953	5.133	0	
8028	148.95	5.13	0	
8038	148.909	5.089	0	
8048	148.941	5.121	0	
8058	148.955	5.135	0	
8068	148.905	5.085	0	
8078	148.876	5.056	0	
8088	148.902	5.082	0	
8098	148.948	5.128	0	
8108	148.896	5.076	0	
8118	148.865	5.045	0	
8128	148.909	5.089	0	
8138	148.895	5.075	0	
8148	148.849	5.029	0	
8158	148.87	5.05	0	
8168	148.881	5.061	0	
8178	148.896	5.076	0	
8188	148.847	5.027	0	
8198	148.867	5.047	0	
8208	148.905	5.085	0	
8218	148.861	5.041	0	
8228	148.874	5.054	0	
8238	148.865	5.045	0	
8248	148.861	5.041	0	
8258	148.881	5.061	0	
8268	148.823	5.003	0	
8278	148.833	5.013	0	
8288	148.831	5.011	0	
8298	148.772	4.952	0	
8308	148.805	4.985	0	
8318	148.87	5.05	0	

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
8328	148.911	5.091	0	
8338	148.823	5.003	0	
8348	148.805	4.985	0	
8358	148.826	5.006	0	
8368	148.826	5.006	0	
8378	148.782	4.962	0	
8388	148.816	4.996	0	
8398	148.805	4.985	0	
8408	148.749	4.929	0	
8418	148.722	4.902	0	
8428	148.867	5.047	0	
8438	148.833	5.013	0	
8448	148.821	5.001	0	
8458	148.874	5.054	0	
8468	148.828	5.008	0	
8478	148.819	4.999	0	
8488	148.745	4.925	0	
8498	148.77	4.95	0	
8508	148.787	4.967	0	
8518	148.726	4.906	0	
8528	148.742	4.922	0	
8538	148.807	4.987	0	
8548	148.74	4.92	0	
8558	148.788	4.968	0	
8568	148.816	4.996	0	
8578	148.768	4.948	0	
8588	148.756	4.936	0	
8598	148.796	4.976	0	
8608	148.712	4.892	0	
8618	148.752	4.932	0	
8628	148.717	4.897	0	
8638	148.747	4.927	0	
8648	148.747	4.927	0	
8658	148.717	4.897	0	
8668	148.715	4.895	0	
8678	148.696	4.876	0	
8688	148.689	4.869	0	
8698	148.724	4.904	0	43.51% Groundwater Recovery in three days,
8708	148.756	4.936	0	which ***DOES NOT EXCEED*** MCEHB recovery requirements of 95%
8718	148.731	4.911	0	*Therefore, the well's source capacity was adjusted (see Table 4)*
8728	148.722	4.902	0	95% - 43.51% = 51.49%
8738	148.724	4.904	0	And, 51.49% of 6.25gpm = 3.218 gpm
8748	148.777	4.957	0	*So; 6.25 gpm - 3.218 gpm = 3.03 gpm*
8758	148.677	4.857	0	
8768	148.712	4.892	0	
8778	148.712	4.892	0	
8788	148.659	4.839	0	
8798	148.649	4.829	0	
8808	148.663	4.843	0	
8818	148.689	4.869	0	
8828	148.657	4.837	0	
8838	148.622	4.802	0	
8848	148.682	4.862	0	
8858	148.677	4.857	0	
8868	148.691	4.871	0	
8878	148.668	4.848	0	
8888	148.594	4.774	0	
8898	148.603	4.783	0	
8908	148.691	4.871	0	
8918	148.652	4.832	0	
8928	148.594	4.774	0	
8938	148.617	4.797	0	
8948	148.606	4.786	0	
8958	148.631	4.811	0	
8968	148.552	4.732	0	
8978	148.556	4.736	0	
8988	148.578	4.758	0	
8998	148.571	4.751	0	
9008	148.624	4.804	0	
9018	148.59	4.77	0	
9028	148.647	4.827	0	
9038	148.622	4.802	0	
9048	148.629	4.809	0	
9058	148.652	4.832	0	
9068	148.629	4.809	0	
9078	148.596	4.776	0	
9088	148.596	4.776	0	
9098	148.612	4.792	0	
9108	148.59	4.77	0	
9118	148.59	4.77	0	
9128	148.58	4.76	0	
9138	148.594	4.774	0	
9148	148.532	4.712	0	
9158	148.516	4.696	0	
9168	148.559	4.739	0	
9178	148.532	4.712	0	
9188	148.567	4.747	0	
9198	148.532	4.712	0	
9208	148.611	4.791	0	
9218	148.55	4.73	0	
9228	148.627	4.807	0	
9238	148.59	4.77	0	
9248	148.564	4.744	0	
9258	148.522	4.702	0	
9268	148.571	4.751	0	
9278	148.588	4.768	0	
9288	148.552	4.732	0	

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
9298	148.543	4.723	0	
9308	148.541	4.721	0	
9318	148.529	4.709	0	
9328	148.546	4.726	0	
9338	148.564	4.744	0	
9348	148.513	4.693	0	
9358	148.567	4.747	0	
9368	148.601	4.781	0	
9378	148.541	4.721	0	
9388	148.543	4.723	0	
9398	148.437	4.617	0	
9408	148.45	4.63	0	
9418	148.578	4.758	0	
9428	148.554	4.734	0	
9438	148.513	4.693	0	
9448	148.471	4.651	0	
9458	148.506	4.686	0	
9468	148.478	4.658	0	
9478	148.467	4.647	0	
9488	148.462	4.642	0	
9498	148.513	4.693	0	
9508	148.534	4.714	0	
9518	148.401	4.581	0	
9528	148.499	4.679	0	
9538	148.455	4.635	0	
9548	148.49	4.67	0	
9558	148.457	4.637	0	
9568	148.487	4.667	0	
9578	148.434	4.614	0	
9588	148.422	4.602	0	
9598	148.353	4.533	0	
9608	148.474	4.654	0	
9618	148.455	4.635	0	
9628	148.401	4.581	0	
9638	148.364	4.544	0	
9648	148.432	4.612	0	
9658	148.42	4.6	0	
9668	148.418	4.598	0	
9678	148.455	4.635	0	
9688	148.351	4.531	0	
9698	148.367	4.547	0	
9708	148.397	4.577	0	
9718	148.441	4.621	0	
9728	148.411	4.591	0	
9738	148.392	4.572	0	
9748	148.364	4.544	0	
9758	148.409	4.589	0	
9768	148.448	4.628	0	
9778	148.415	4.595	0	
9788	148.455	4.635	0	
9798	148.39	4.57	0	
9808	148.434	4.614	0	
9818	148.444	4.624	0	
9828	148.397	4.577	0	
9838	148.45	4.63	0	
9848	148.504	4.684	0	
9858	148.367	4.547	0	
9868	148.341	4.521	0	
9878	148.404	4.584	0	
9888	148.355	4.535	0	
9898	148.321	4.501	0	
9908	148.365	4.545	0	
9918	148.36	4.54	0	
9928	148.409	4.589	0	
9938	148.409	4.589	0	
9948	148.351	4.531	0	
9958	148.365	4.545	0	
9968	148.369	4.549	0	
9978	148.416	4.596	0	
9988	148.372	4.552	0	
9998	148.325	4.505	0	
10008	148.344	4.524	0	
10018	148.349	4.529	0	
10028	148.351	4.531	0	
10038	148.342	4.522	0	
10048	148.407	4.587	0	
10058	148.36	4.54	0	
10068	148.329	4.509	0	
10078	148.348	4.528	0	
10088	148.339	4.519	0	
10098	148.369	4.549	0	48.1% Groundwater Recovery in four days.
10108	148.316	4.496	0	
10118	148.337	4.517	0	
10128	148.293	4.473	0	
10138	148.34	4.52	0	
10148	148.295	4.475	0	
10158	148.344	4.524	0	
10168	148.247	4.427	0	
10178	148.284	4.464	0	
10188	148.293	4.473	0	
10198	148.165	4.345	0	
10208	148.263	4.443	0	
10218	148.268	4.448	0	
10228	148.27	4.45	0	
10238	148.293	4.473	0	
10248	148.284	4.464	0	
10258	148.231	4.411	0	

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
10268	148.172	4.352	0	
10278	148.254	4.434	0	
10288	148.268	4.448	0	
10298	148.258	4.438	0	
10308	148.233	4.413	0	
10318	148.256	4.436	0	
10328	148.272	4.452	0	
10338	148.27	4.45	0	
10348	148.23	4.41	0	
10358	148.29	4.47	0	
10368	148.263	4.443	0	
10378	148.267	4.447	0	
10388	148.265	4.445	0	
10398	148.198	4.378	0	
10408	148.216	4.396	0	
10418	148.263	4.443	0	
10428	148.235	4.415	0	
10438	148.263	4.443	0	
10448	148.244	4.424	0	
10458	148.235	4.415	0	
10468	148.27	4.45	0	
10478	148.206	4.386	0	
10488	148.279	4.459	0	
10498	148.27	4.45	0	
10508	148.207	4.387	0	
10518	148.281	4.461	0	
10528	148.228	4.408	0	
10538	148.346	4.526	0	
10548	148.205	4.385	0	
10558	148.216	4.396	0	
10568	148.182	4.362	0	
10578	148.256	4.436	0	
10588	148.191	4.371	0	
10598	148.225	4.405	0	
10608	148.217	4.397	0	
10618	148.307	4.487	0	
10628	148.182	4.362	0	
10638	148.238	4.418	0	
10648	148.242	4.422	0	
10658	148.201	4.381	0	
10668	148.219	4.399	0	
10678	148.164	4.344	0	
10688	148.206	4.386	0	
10698	148.212	4.392	0	
10708	148.168	4.348	0	
10718	148.18	4.36	0	
10728	148.2	4.38	0	
10738	148.117	4.297	0	
10748	148.3	4.48	0	
10758	148.223	4.403	0	
10768	148.156	4.336	0	
10778	148.307	4.487	0	
10788	148.126	4.306	0	
10798	148.156	4.336	0	
10808	148.068	4.248	0	
10818	148.147	4.327	0	
10828	148.27	4.45	0	
10838	148.203	4.383	0	
10848	148.173	4.353	0	
10858	148.175	4.355	0	
10868	148.147	4.327	0	
10878	148.182	4.362	0	
10888	148.161	4.341	0	
10898	148.191	4.371	0	
10908	148.147	4.327	0	
10918	148.103	4.283	0	
10928	148.156	4.336	0	
10938	148.11	4.29	0	
10948	148.203	4.383	0	
10958	148.11	4.29	0	
10968	148.177	4.357	0	
10978	148.147	4.327	0	
10988	148.184	4.364	0	
10998	148.124	4.304	0	
11008	148.117	4.297	0	
11018	148.135	4.315	0	
11028	148.214	4.394	0	
11038	148.172	4.352	0	
11048	148.141	4.321	0	
11058	148.155	4.335	0	
11068	148.143	4.323	0	
11078	148.138	4.318	0	
11088	148.062	4.242	0	
11098	148.15	4.33	0	
11108	148.141	4.321	0	
11118	148.094	4.274	0	
11128	148.073	4.253	0	
11138	148.145	4.325	0	
11148	148.135	4.315	0	
11158	148.124	4.304	0	
11168	148.15	4.33	0	
11178	148.126	4.306	0	
11188	148.073	4.253	0	
11198	148.119	4.299	0	
11208	148.04	4.22	0	
11218	148.073	4.253	0	
11228	148.087	4.267	0	

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
11238	148.131	4.311	0	
11248	148.133	4.313	0	
11258	148.147	4.327	0	
11268	148.019	4.199	0	
11278	148.066	4.246	0	
11288	148.068	4.248	0	
11298	148.136	4.316	0	
11308	148.059	4.239	0	
11318	148.08	4.26	0	
11328	148.067	4.247	0	
11338	147.962	4.142	0	
11348	148.031	4.211	0	
11358	148.019	4.199	0	
11368	148.052	4.232	0	
11378	148.089	4.269	0	
11388	148.12	4.3	0	
11398	148.036	4.216	0	
11408	148.059	4.239	0	
11418	148.015	4.195	0	
11428	148.033	4.213	0	
11438	148.087	4.267	0	
11448	148.11	4.29	0	
11458	148.078	4.258	0	
11468	148.12	4.3	0	
11478	148.117	4.297	0	
11488	148.012	4.192	0	
11498	148.059	4.239	0	
11508	148.068	4.248	0	
11518	148.017	4.197	0	
11528	148.043	4.223	0	
11538	148.043	4.223	0	51.89% Groundwater Recovery in five days.
11548	148.057	4.237	0	
11558	148.064	4.244	0	
11568	148.061	4.241	0	
11578	147.996	4.176	0	
11588	148.04	4.22	0	
11598	148.082	4.262	0	
11608	147.973	4.153	0	
11618	148.038	4.218	0	
11628	147.976	4.156	0	
11638	148.027	4.207	0	
11648	148.012	4.192	0	
11658	147.996	4.176	0	
11668	148.089	4.269	0	
11678	148.047	4.227	0	
11688	148.012	4.192	0	
11698	148.105	4.285	0	
11708	148.073	4.253	0	
11718	147.982	4.162	0	
11728	147.989	4.169	0	
11738	148.082	4.262	0	
11748	148.003	4.183	0	
11758	148.047	4.227	0	
11768	147.966	4.146	0	
11778	147.938	4.118	0	
11788	147.994	4.174	0	
11798	147.976	4.156	0	
11808	147.996	4.176	0	
11818	147.971	4.151	0	
11828	147.98	4.16	0	
11838	147.955	4.135	0	
11848	147.952	4.132	0	
11858	147.943	4.123	0	
11868	148.036	4.216	0	
11878	148.036	4.216	0	
11888	148.019	4.199	0	
11898	148.01	4.19	0	
11908	147.945	4.125	0	
11918	147.994	4.174	0	
11928	148.006	4.186	0	
11938	148.024	4.204	0	
11948	148.05	4.23	0	
11958	147.915	4.095	0	
11968	147.962	4.142	0	
11978	148.006	4.186	0	
11988	147.952	4.132	0	
11998	148.057	4.237	0	
12008	148.045	4.225	0	
12018	148.033	4.213	0	
12028	148.019	4.199	0	
12038	147.966	4.146	0	
12048	148.015	4.195	0	
12058	148.022	4.202	0	
12068	147.95	4.13	0	
12078	147.959	4.139	0	
12088	148.003	4.183	0	
12098	147.952	4.132	0	
12108	147.989	4.169	0	
12118	148.015	4.195	0	
12128	147.934	4.114	0	
12138	148.025	4.205	0	
12148	147.936	4.116	0	
12158	148.017	4.197	0	
12168	147.98	4.16	0	
12178	147.999	4.179	0	
12188	148.028	4.208	0	
12198	148.003	4.183	0	

Well #2 - Transducer Data

Elapsed Time (min)	Depth to Water (ft, bTOC)	Drawdown (ft)	Pumping Rate (gpm)	Comments
12208	148.054	4.234	0	
12218	147.996	4.176	0	
12228	147.995	4.175	0	
12238	147.955	4.135	0	
12248	147.969	4.149	0	
12258	147.932	4.112	0	
12268	147.973	4.153	0	
12278	147.941	4.121	0	
12288	147.897	4.077	0	
12298	147.941	4.121	0	
12308	147.947	4.127	0	
12318	147.955	4.135	0	
12328	147.908	4.088	0	
12338	147.86	4.04	0	
12348	147.915	4.095	0	
12358	147.999	4.179	0	
12368	147.888	4.068	0	
12378	147.988	4.168	0	
12388	147.962	4.142	0	
12398	148.036	4.216	0	
12408	147.93	4.11	0	
12418	147.943	4.123	0	
12428	147.918	4.098	0	
12438	147.913	4.093	0	
12448	147.965	4.145	0	
12458	147.88	4.06	0	
12468	147.906	4.086	0	
12478	147.927	4.107	0	
12488	147.96	4.14	0	
12498	147.897	4.077	0	
12508	147.92	4.1	0	
12518	147.89	4.07	0	
12528	147.885	4.065	0	
12538	147.91	4.09	0	
12548	147.841	4.021	0	
12558	147.897	4.077	0	
12568	147.874	4.054	0	
12578	147.82	4	0	
12588	147.846	4.026	0	
12598	147.869	4.049	0	
12608	147.911	4.091	0	
12618	147.874	4.054	0	
12628	147.822	4.002	0	
12638	147.839	4.019	0	
12648	147.858	4.038	0	
12658	147.86	4.04	0	
12668	147.996	4.176	0	
12678	147.892	4.072	0	
12688	147.869	4.049	0	
12698	147.89	4.07	0	
12708	147.922	4.102	0	
12718	147.899	4.079	0	
12728	147.93	4.11	0	
12738	147.914	4.094	0	
12748	147.834	4.014	0	
12758	147.932	4.112	0	
12768	147.806	3.986	0	
12778	147.827	4.007	0	
12788	147.862	4.042	0	
12798	147.867	4.047	0	
12808	147.799	3.979	0	
12818	147.834	4.014	0	
12828	147.93	4.11	0	
12838	147.874	4.054	0	
12848	147.925	4.105	0	
12858	147.82	4	0	
12868	147.839	4.019	0	
12878	147.869	4.049	0	
12888	147.871	4.051	0	
12898	147.827	4.007	0	
12908	147.86	4.04	0	
12918	147.846	4.026	0	54.42% Groundwater Recovery in six days.
12928	147.871	4.051	0	which ***DOES NOT EXCEED*** MPWMD recovery requirements.
12938	147.836	4.016	0	*Therefore, there will be adjustments to well's Calculated Yield (see Table 4).*
12948	147.86	4.04	0	
12958	147.793	3.973	0	95% - 54.42% = 40.58% reduction in the wells Calculated Yield

APPENDIX D

AQUIFER TEST 4.2© PUMPING TEST ANALYSIS REPORTS

WELL #1

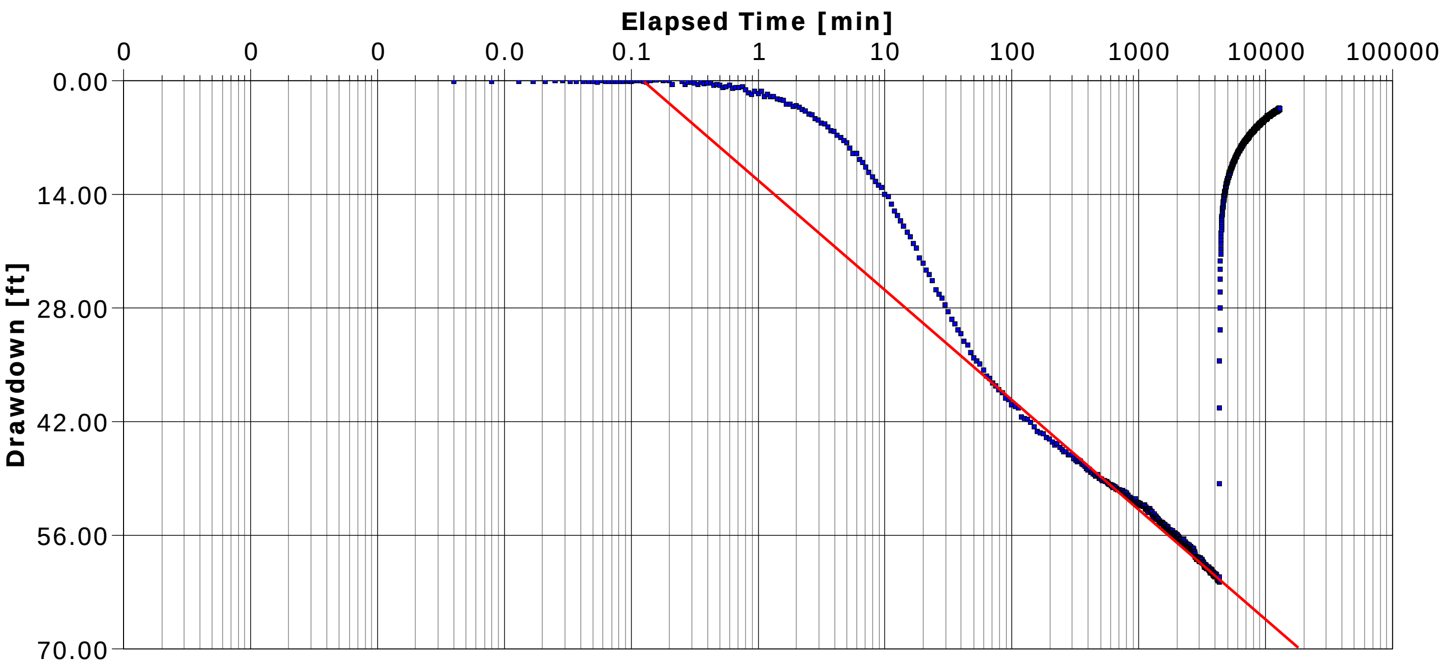
A) COOPER - JACOB TIME DRAWDOWN METHOD ANALYSIS (EARLY TIME DATA)
B) COOPER - JACOB TIME DRAWDOWN METHOD ANALYSIS (LATE TIME DATA)
C) MOENCH FRACTURE FLOW/DOUBLE POROSITY METHOD ANALYSIS
D) THEIS RECOVERY METHOD ANALYSIS

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

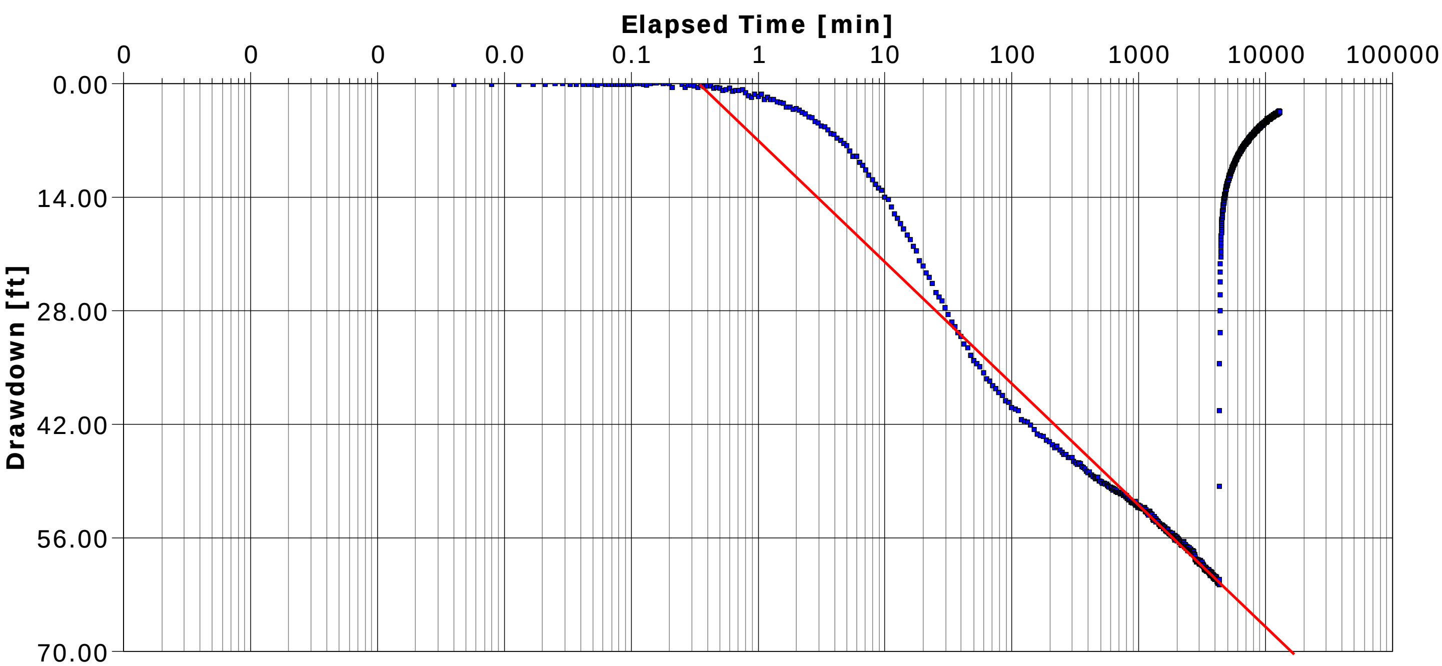
Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Storage coefficient	Radial Distance to PW [ft]	
Well 1	1.58×10^{2}	2.06×10^{-1}	6.90×10^{-4}	0.21	

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]	



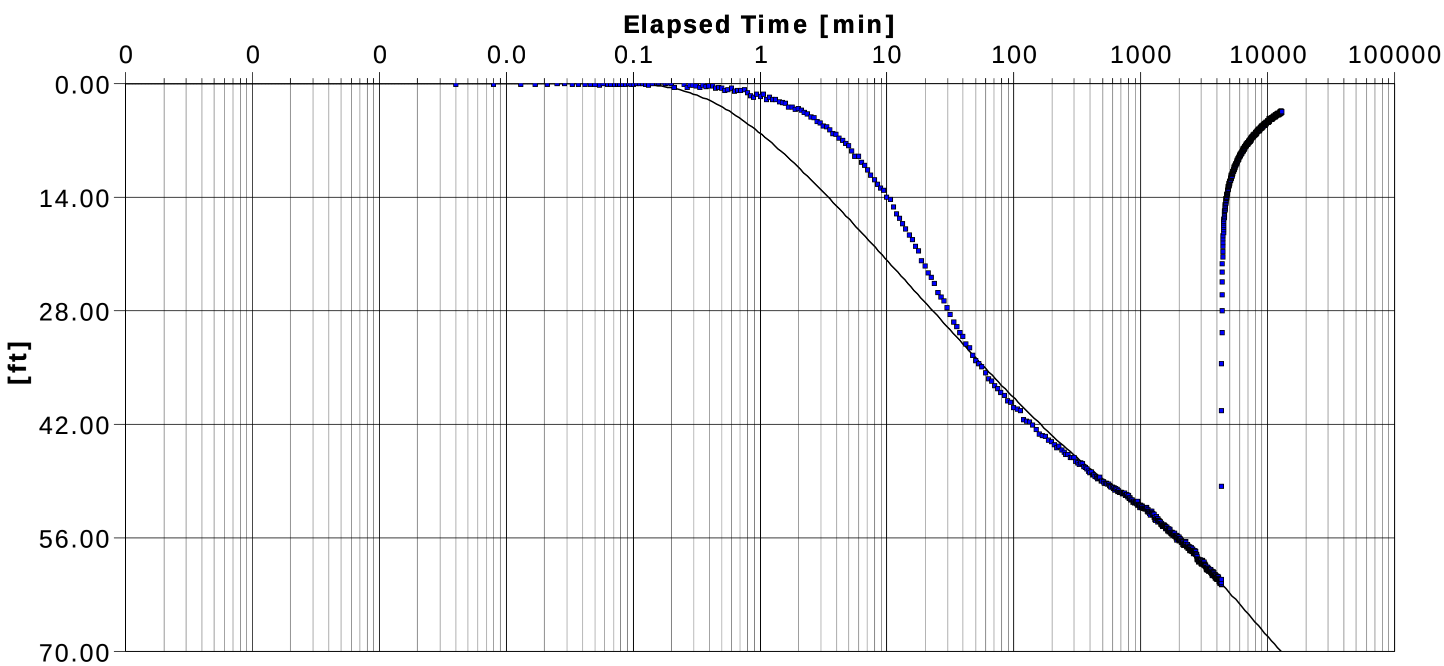
Calculation after Cooper & Jacob

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** Project: Flores/Pisenti Pumping Impact Assessment Number: APN: 103-071-019 Client: Flores	Appendix D

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

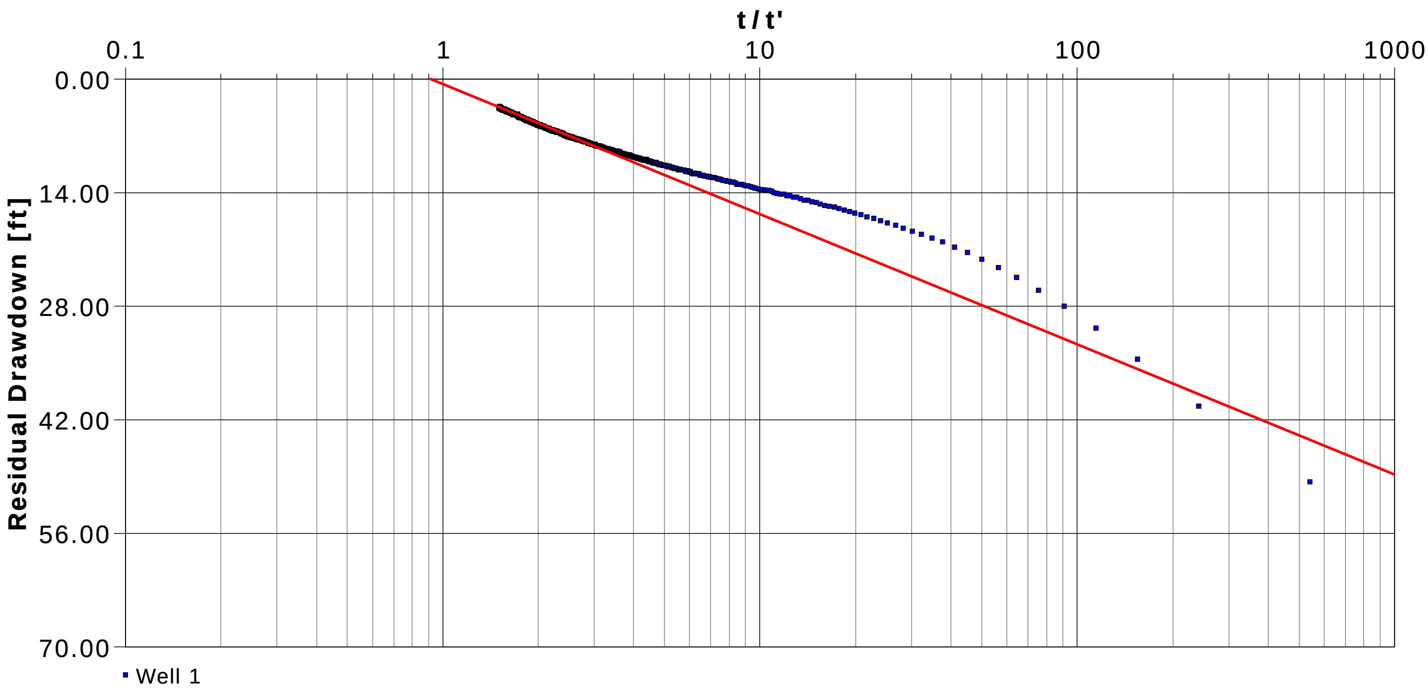
Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Specific storage	Sigma	Lambda	Radial Distance to PW [ft]
Well 1	1.18×10^{2}	1.54×10^{-1}	3.61×10^{-1}	1.61×10^{0}	1.78×10^{-3}	0.21

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	

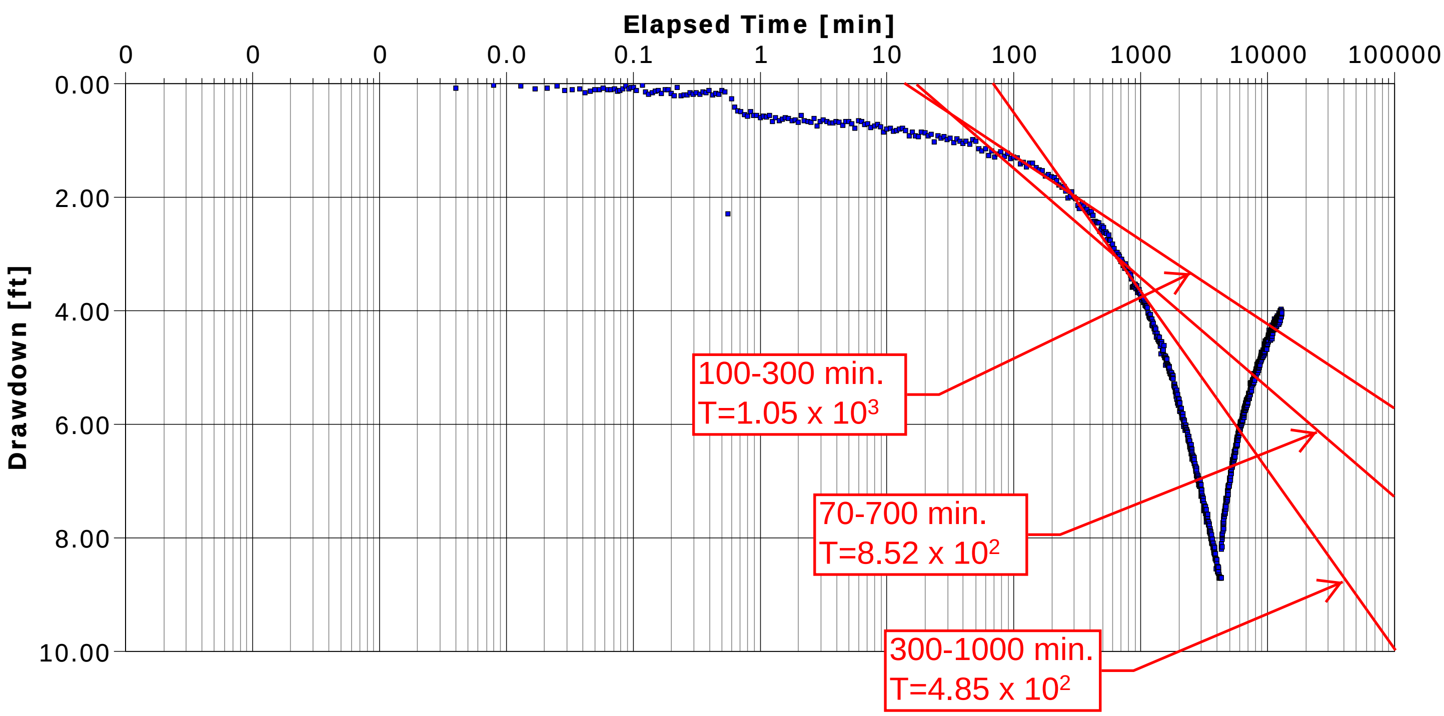
Theis Recovery Analysis provides the best values of T and K values as their are no pumping influences that could alter aquifer parameters.

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.

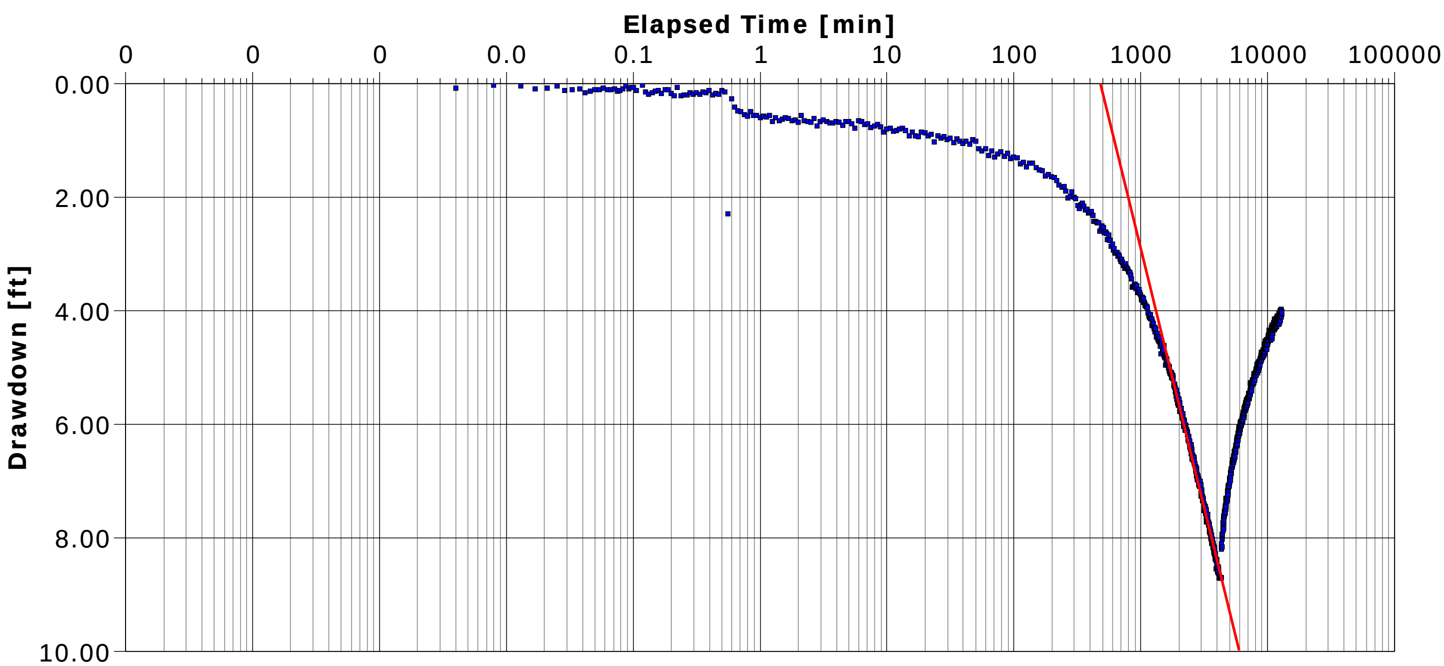
The Early Time Transmissivity was obtained using data between 70-700 minutes and was compared to the transmissivity between 100-1000 min (7.67 x E2), which was obtained from the average of the slopes of the drawdown curve between 100-300 min (1.05 x E3) and 300-1000 min (4.85 x E2) as shown above.

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]	



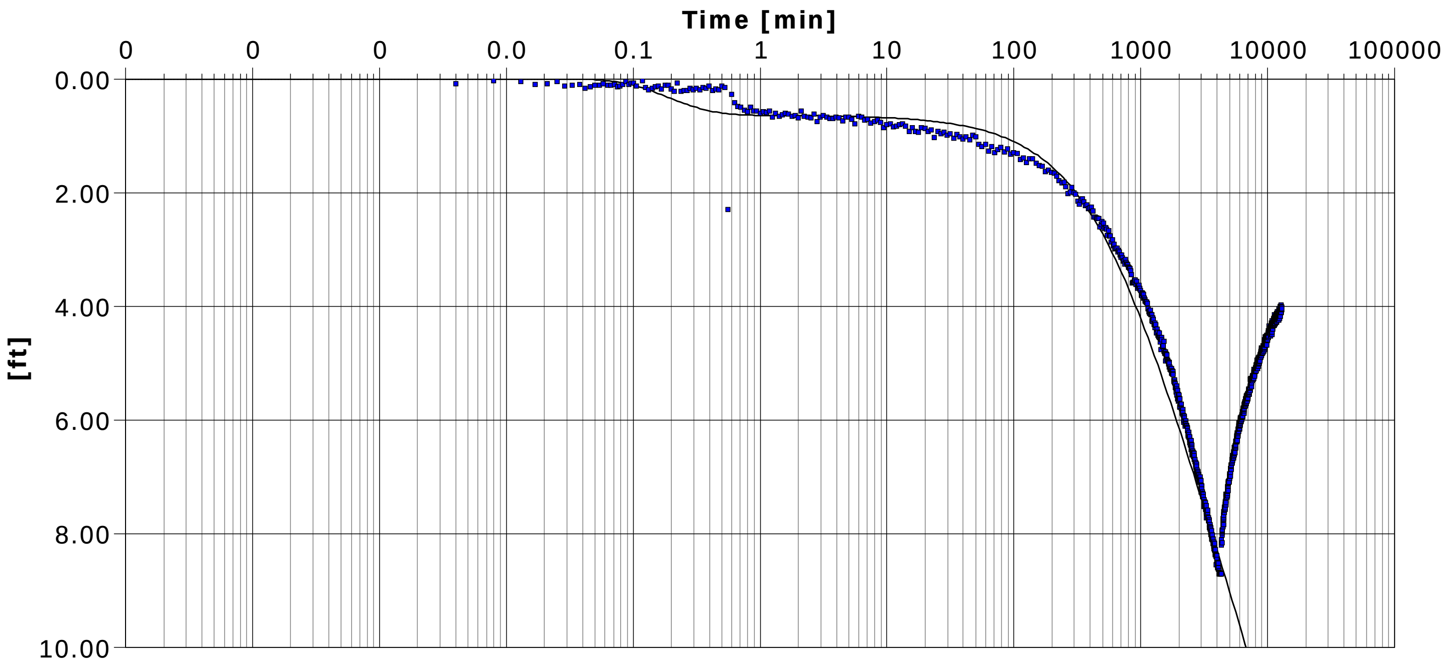
Calculation after Cooper & Jacob

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

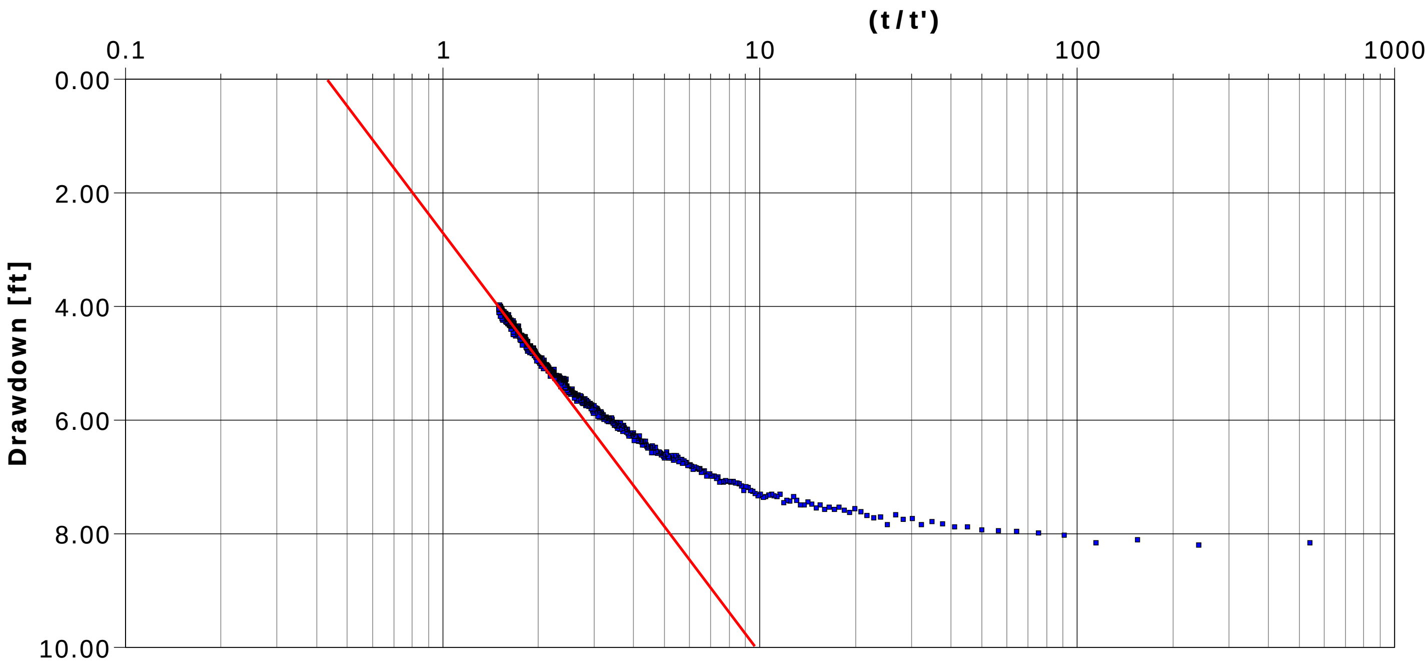
Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft²]	Specific storage	Sigma	Lambda	Radial Distance to PW [ft]
Well 2	2.12×10^{2}	4.85×10^{-1}	3.69×10^{-1}	1.00×10^{3}	4.67×10^{0}	0.21

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 = 1.33 gpm (Pumping 24/7) or 2.66 gpm (Pumping 12-hr cycles).

$Q_{IW\#1}$ = 1.33 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).

$Q_{IW\#2}$ = 1.33 gpm (Imaginary Well #2 Pumping Rate). Pumped at a rate equal to the difference between the cyclic pumping rate (2.66 gpm) and that of imaginary well #1 (1.33 gpm).

T = Transmissivity[2] is 233 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] = 0.79 gpm. Dry Season Demand[2] = 0.94 gpm

T = Transmissivity[3] = 233 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#2)
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 =	1.5069528 LOG 664.05 / 0.00025	+	1.50695279 LOG 34.95 / 0.00025	$Q_{IW\#1}$ = 1.330; $Q_{IW\#2}$ = 1.330; T = 233.00; $IW\#1_t$ = 9.5; $IW\#2_t$ = 0.5
s =	1.5069528 LOG 2656200	+	1.50695279 LOG 139800	r = 0.5; S = 0.001
s =	1.5069528 6.424260772	+	1.50695279 5.145507171	
s =	9.6810577	+	7.75403639	
s =	17.435094			

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

s =	1.5069528 LOG 2062.05 / 0.00025	+	1.50695279 LOG 34.95 / 0.00025	$Q_{IW\#1}$ = 1.330; $Q_{IW\#2}$ = 1.330; T = 233.00; $IW\#1_t$ = 29.5; $IW\#2_t$ = 0.5
s =	1.5069528 LOG 8248200	+	1.50695279 LOG 139800	r = 0.5; S = 0.001
s =	1.5069528 6.916359183	+	1.50695279 5.145507171	
s =	10.422627	+	7.75403639	
s =	18.176663			

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

s =	1.5069528 LOG 6256.05 / 0.00025	+	1.50695279 LOG 34.95 / 0.00025	$Q_{IW\#1}$ = 1.330; $Q_{IW\#2}$ = 1.330; T = 233.00; $IW\#1_t$ = 89.5; $IW\#2_t$ = 0.5
s =	1.5069528 LOG 25024200	+	1.50695279 LOG 139800	r = 0.5; S = 0.001
s =	1.5069528 7.398360202	+	1.50695279 5.145507171	
s =	11.14898	+	7.75403639	
s =	18.903016			

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

s =	1.5069528 LOG 12756.75 / 0.00025	+	1.50695279 LOG 34.95 / 0.00025	$Q_{IW\#1}$ = 1.330; $Q_{IW\#2}$ = 1.330; T = 233.00; $IW\#1_t$ = 182.5; $IW\#2_t$ = 0.5
s =	1.5069528 LOG 51027000	+	1.50695279 LOG 139800	r = 0.5; S = 0.001
s =	1.5069528 7.707800036	+	1.50695279 5.145507171	
s =	11.615291	+	7.75403639	
s =	19.369327			

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

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

s =	1.5069528 LOG 664.05 / 0.000025	+	1.5069528 LOG 34.95 / 0.000025	$Q_{IW\#1}$ = 1.330; $Q_{IW\#2}$ = 1.330; T = 233.00; $IW\#1_t$ = 9.5; $IW\#2_t$ = 0.5
s =	1.5069528 LOG 26562000	+	1.5069528 LOG 1398000	r = 0.5; S = 0.0001
s =	1.5069528 7.424260772	+	1.5069528 6.145507171	
s =	11.18801	+	9.2609892	
s =	20.449			

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

s =	1.5069528 LOG 2062.05 / 0.000025	+	1.5069528 LOG 34.95 / 0.000025	$Q_{IW\#1}$ = 1.330; $Q_{IW\#2}$ = 1.330; T = 233.00; $IW\#1_t$ = 29.5; $IW\#2_t$ = 0.5
s =	1.5069528 LOG 82482000	+	1.5069528 LOG 1398000	r = 0.5; S = 0.0001
s =	1.5069528 7.916359183	+	1.5069528 6.145507171	
s =	11.92958	+	9.2609892	
s =	21.190569			

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

s =	1.5069528 LOG 6256.05 / 0.000025	+	1.5069528 LOG 34.95 / 0.000025	$Q_{IW\#1}$ = 1.330; $Q_{IW\#2}$ = 1.330; T = 233.00; $IW\#1_t$ = 89.5; $IW\#2_t$ = 0.5
s =	1.5069528 LOG 250242000	+	1.5069528 LOG 1398000	r = 0.5; S = 0.0001
s =	1.5069528 8.398360202	+	1.5069528 6.145507171	
s =	12.655932	+	9.2609892	
s =	21.916922			

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

s =	1.5069528 LOG 12756.75 / 0.000025	+	1.5069528 LOG 34.95 / 0.000025	$Q_{IW\#1}$ = 1.330; $Q_{IW\#2}$ = 1.330; T = 233.00; $IW\#1_t$ = 182.5; $IW\#2_t$ = 0.5
s =	1.5069528 LOG 510270000	+	1.5069528 LOG 1398000	r = 0.5; S = 0.0001
s =	1.5069528 8.707800036	+	1.5069528 6.145507171	
s =	13.122244	+	9.2609892	
s =	22.383233			

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

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

s =	1.506953 LOG 664.05 / 2.5E-06	+	1.506953 LOG 34.95 / 2.5E-06	$Q_{IW\#1}$ = 1.330; $Q_{IW\#2}$ = 1.330; T = 233.00; $IW\#1_t$ = 9.5; $IW\#2_t$ = 0.5
s =	1.506953 LOG 2.66E+08	+	1.506953 LOG 13980000	r = 0.5; S = 0.00001
s =	1.506953 8.424260772	+	1.506953 7.145507171	
s =	12.69496	+	10.76794	
s =	23.46291			

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

s =	1.506953 LOG 2062.05 / 2.5E-06	+	1.506953 LOG 34.95 / 2.5E-06	$Q_{IW\#1}$ = 1.330; $Q_{IW\#2}$ = 1.330; T = 233.00; $IW\#1_t$ = 29.5; $IW\#2_t$ = 0.5
s =	1.506953 LOG 8.25E+08	+	1.506953 LOG 13980000	r = 0.5; S = 0.00001
s =	1.506953 8.916359183	+	1.506953 7.145507171	
s =	13.43653	+	10.76794	
s =	24.20447			

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

s =	1.506953 LOG 6256.05 / 2.5E-06	+	1.506953 LOG 34.95 / 2.5E-06	$Q_{IW\#1}$ = 1.330; $Q_{IW\#2}$ = 1.330; T = 233.00; $IW\#1_t$ = 89.5; $IW\#2_t$ = 0.5
s =	1.506953 LOG 2.5E+09	+	1.506953 LOG 13980000	r = 0.5; S = 0.00001
s =	1.506953 9.398360202	+	1.506953 7.145507171	
s =	14.16289	+	10.76794	
s =	24.93083			

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

s =	1.506953 LOG 12756.75 / 2.5E-06	+	1.506953 LOG 34.95 / 2.5E-06	$Q_{IW\#1}$ = 1.330; $Q_{IW\#2}$ = 1.330; T = 233.00; $IW\#1_t$ = 182.5; $IW\#2_t$ = 0.5
s =	1.506953 LOG 5.1E+09	+	1.506953 LOG 13980000	r = 0.5; S = 0.00001
s =	1.506953 9.707800036	+	1.506953 7.145507171	
s =	14.6292	+	10.76794	
s =	25.39714			

APPENDIX E

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

1.0×10^{-3} Storage Coefficient

10 days of continuous pumping

$$s = 1.0650644 \text{ LOG } \frac{699}{288.369}$$

$$s = 1.0650644 \text{ LOG } 2.423977612$$

$$s = 1.0650644 \quad 0.384528604$$

$$s = 0.4095477$$

Q = 0.94
T = 233.00
t = 10
= 30
= 90
= 183
r = 537
S = 0.001

30 days of continuous pumping

$$s = 1.0650644 \text{ LOG } \frac{2097}{288.369}$$

$$s = 1.0650644 \text{ LOG } 7.271932836$$

$$s = 1.0650644 \quad 0.861649859$$

$$s = 0.9177126$$

90 days of continuous pumping

$$s = 1.0650644 \text{ LOG } \frac{6291}{288.369}$$

$$s = 1.0650644 \text{ LOG } 21.81579851$$

$$s = 1.0650644 \quad 1.338771114$$

$$s = 1.4258774$$

183 days of continuous pumping

$$s = 1.0650644 \text{ LOG } \frac{12791.7}{288.369}$$

$$s = 1.0650644 \text{ LOG } 44.3587903$$

$$s = 1.0650644 \quad 1.646979694$$

$$s = 1.7541394$$

1.0×10^{-4} Storage Coefficient

10 days of continuous pumping

$$s = 1.0650644 \text{ LOG } \frac{699}{28.8369}$$

$$s = 1.0650644 \text{ LOG } 24.23977612$$

$$s = 1.0650644 \quad 1.384528604$$

$$s = 1.4746121$$

Q = 0.94
T = 233
t = 10
= 30
= 90
= 183
r = 537
S = 0.0001

30 days of continuous pumping

$$s = 1.0650644 \text{ LOG } \frac{2097}{28.8369}$$

$$s = 1.0650644 \text{ LOG } 72.71932836$$

$$s = 1.0650644 \quad 1.861649859$$

$$s = 1.9827769$$

90 days of continuous pumping

$$s = 1.0650644 \text{ LOG } \frac{6291}{28.8369}$$

$$s = 1.0650644 \text{ LOG } 218.1579851$$

$$s = 1.0650644 \quad 2.338771114$$

$$s = 2.4909418$$

183 days of continuous pumping

$$s = 1.0650644 \text{ LOG } \frac{12791.7}{28.8369}$$

$$s = 1.0650644 \text{ LOG } 443.587903$$

$$s = 1.0650644 \quad 2.646979694$$

$$s = 2.8192038$$

1.0×10^{-5} Storage Coefficient

10 days of continuous pumping

$$s = 1.065064 \text{ LOG } \frac{699}{2.88369}$$

$$s = 1.065064 \text{ LOG } 242.3978$$

$$s = 1.065064 \quad 2.384528604$$

$$s = 2.539676$$

Q = 0.94
T = 233
t = 10
= 30
= 90
= 183
r = 537
S = 0.00001

30 days of continuous pumping

$$s = 1.065064 \text{ LOG } \frac{2097}{2.88369}$$

$$s = 1.065064 \text{ LOG } 727.1933$$

$$s = 1.065064 \quad 2.861649859$$

$$s = 3.047841$$

90 days of continuous pumping

$$s = 1.065064 \text{ LOG } \frac{6291}{2.88369}$$

$$s = 1.065064 \text{ LOG } 2181.58$$

$$s = 1.065064 \quad 3.338771114$$

$$s = 3.556006$$

183 days of continuous pumping

$$s = 1.065064 \text{ LOG } \frac{12791.7}{2.88369}$$

$$s = 1.065064 \text{ LOG } 4435.879$$

$$s = 1.065064 \quad 3.646979694$$

$$s = 3.884268$$

APPENDIX E

Continuous Pumping; Time and Distance Drawdown Calculations On Beech Well at 647 feet away from Flores/Pisenti Well #2 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 = 1.0650644 LOG 699	Q = 0.94	s = 1.0650644 LOG 699	Q = 0.94	s = 1.065064 LOG 699	Q = 0.94
418.609	T = 233.00	41.8609	T = 233	4.18609	T = 233
	t = 10		t = 10		t = 10
s = 1.0650644 LOG 1.669815986	= 30	s = 1.0650644 LOG 16.69815986	= 30	s = 1.065064 LOG 166.9816	= 30
	= 90		= 90		= 90
s = 1.0650644 0.222668614	= 183	s = 1.0650644 1.222668614	= 183	s = 1.065064 2.222668614	= 183
	r = 647		r = 647		r = 647
s = 0.2371564	S = 0.001	s = 1.3022208	S = 0.0001	s = 2.367285	S = 0.00001
30 days of continuous pumping		30 days of continuous pumping		30 days of continuous pumping	
s = 1.0650644 LOG 2097		s = 1.0650644 LOG 2097		s = 1.065064 LOG 2097	
418.609		41.8609		4.18609	
s = 1.0650644 LOG 5.009447957		s = 1.0650644 LOG 50.09447957		s = 1.065064 LOG 500.9448	
s = 1.0650644 0.699789869		s = 1.0650644 1.699789869		s = 1.065064 2.699789869	
s = 0.7453213		s = 1.8103856		s = 2.87545	
90 days of continuous pumping		90 days of continuous pumping		90 days of continuous pumping	
s = 1.0650644 LOG 6291		s = 1.0650644 LOG 6291		s = 1.065064 LOG 6291	
418.609		41.8609		4.18609	
s = 1.0650644 LOG 15.02834387		s = 1.0650644 LOG 150.2834387		s = 1.065064 LOG 1502.834	
s = 1.0650644 1.176911124		s = 1.0650644 2.176911124		s = 1.065064 3.176911124	
s = 1.2534861		s = 2.3185505		s = 3.383615	
183 days of continuous pumping		183 days of continuous pumping		183 days of continuous pumping	
s = 1.0650644 LOG 12791.7		s = 1.0650644 LOG 12791.7		s = 1.065064 LOG 12791.7	
418.609		41.8609		4.18609	
s = 1.0650644 LOG 30.55763254		s = 1.0650644 LOG 305.5763254		s = 1.065064 LOG 3055.763	
s = 1.0650644 1.485119704		s = 1.0650644 2.485119704		s = 1.065064 3.485119704	
s = 1.5817481		s = 2.6468125		s = 3.711877	

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

APPENDIX E

Continuous Pumping; Time and Distance Drawdown Calculations On Maney Well at 992 feet away from Flores/Pisenti Well #2 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		10 days of continuous pumping		10 days of continuous pumping	
s = 1.0650644 LOG 699 / 984.064	Q = 0.94	s = 1.0650644 LOG 699 / 98.4064	Q = 0.94	s = 1.065064 LOG 699 / 9.84064	Q = 0.94
	T = 233.00		T = 233		T = 233
	t = 10		t = 10		t = 10
s = 1.0650644 LOG 0.710319654	= 30	s = 1.0650644 LOG 7.10319654	= 30	s = 1.065064 LOG 71.03197	= 30
	= 90		= 90		= 90
s = 1.0650644 -0.148546169	= 183	s = 1.0650644 0.851453831	= 183	s = 1.065064 1.851453831	= 183
	r = 992		r = 992		r = 992
s = -0.158211	S = 0.001	s = 0.9068531	S = 0.0001	s = 1.971918	S = 0.00001
30 days of continuous pumping		30 days of continuous pumping		30 days of continuous pumping	
s = 1.0650644 LOG 2097 / 984.064		s = 1.0650644 LOG 2097 / 98.4064		s = 1.065064 LOG 2097 / 9.84064	
s = 1.0650644 LOG 2.130958962		s = 1.0650644 LOG 21.30958962		s = 1.065064 LOG 213.0959	
s = 1.0650644 0.328575086		s = 1.0650644 1.328575086		s = 1.065064 2.328575086	
s = 0.3499536		s = 1.415018		s = 2.480082	
90 days of continuous pumping		90 days of continuous pumping		90 days of continuous pumping	
s = 1.0650644 LOG 6291 / 984.064		s = 1.0650644 LOG 6291 / 98.4064		s = 1.065064 LOG 6291 / 9.84064	
s = 1.0650644 LOG 6.392876886		s = 1.0650644 LOG 63.92876886		s = 1.065064 LOG 639.2877	
s = 1.0650644 0.805696341		s = 1.0650644 1.805696341		s = 1.065064 2.805696341	
s = 0.8581185		s = 1.9231828		s = 2.988247	
183 days of continuous pumping		183 days of continuous pumping		183 days of continuous pumping	
s = 1.0650644 LOG 12791.7 / 984.064		s = 1.0650644 LOG 12791.7 / 98.4064		s = 1.065064 LOG 12791.7 / 9.84064	
s = 1.0650644 LOG 12.99884967		s = 1.0650644 LOG 129.9884967		s = 1.065064 LOG 1299.885	
s = 1.0650644 1.113904921		s = 1.0650644 2.113904921		s = 1.065064 3.113904921	
s = 1.1863805		s = 2.2514448		s = 3.316509	

APPENDIX E

Continuous Pumping; Time and Distance Drawdown Calculations On
Shake Well at 1052 feet away from Flores/Pisenti Well #2
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		10 days of continuous pumping		10 days of continuous pumping	
s = 1.0650644 LOG 699	Q = 0.94	s = 1.0650644 LOG 699	Q = 0.94	s = 1.065064 LOG 699	Q = 0.94
1106.704	T = 233.00	110.6704	T = 233	11.06704	T = 233
	t = 10		t = 10		t = 10
s = 1.0650644 LOG 0.631605199	= 30	s = 1.0650644 LOG 6.316051989	= 30	s = 1.065064 LOG 63.16052	= 30
	= 90		= 90		= 90
s = 1.0650644 -0.199554304	= 183	s = 1.0650644 0.800445696	= 183	s = 1.065064 1.800445696	= 183
	r = 1052		r = 1052		r = 1052
s = -0.212538	S = 0.001	s = 0.8525262	S = 0.0001	s = 1.917591	S = 0.00001
30 days of continuous pumping		30 days of continuous pumping		30 days of continuous pumping	
s = 1.0650644 LOG 2097		s = 1.0650644 LOG 2097		s = 1.065064 LOG 2097	
1106.704		110.6704		11.06704	
s = 1.0650644 LOG 1.894815597		s = 1.0650644 LOG 18.94815597		s = 1.065064 LOG 189.4816	
s = 1.0650644 0.277566951		s = 1.0650644 1.277566951		s = 1.065064 2.277566951	
s = 0.2956267		s = 1.360691		s = 2.425755	
90 days of continuous pumping		90 days of continuous pumping		90 days of continuous pumping	
s = 1.0650644 LOG 6291		s = 1.0650644 LOG 6291		s = 1.065064 LOG 6291	
1106.704		110.6704		11.06704	
s = 1.0650644 LOG 5.68444679		s = 1.0650644 LOG 56.8444679		s = 1.065064 LOG 568.4447	
s = 1.0650644 0.754688206		s = 1.0650644 1.754688206		s = 1.065064 2.754688206	
s = 0.8037915		s = 1.8688559		s = 2.93392	
183 days of continuous pumping		183 days of continuous pumping		183 days of continuous pumping	
s = 1.0650644 LOG 12791.7		s = 1.0650644 LOG 12791.7		s = 1.065064 LOG 12791.7	
1106.704		110.6704		11.06704	
s = 1.0650644 LOG 11.55837514		s = 1.0650644 LOG 115.5837514		s = 1.065064 LOG 1155.838	
s = 1.0650644 1.062896786		s = 1.0650644 2.062896786		s = 1.065064 3.062896786	
s = 1.1320535		s = 2.1971179		s = 3.262182	

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 x 10^{-3} Storage Coefficient		1.0 x 10^{-4} Storage Coefficient		1.0 x 10^{-5} Storage Coefficient	
10 days of continuous pumping		10 days of continuous pumping		10 days of continuous pumping	
s = 16.12 LOG 118.8	Q = 8.06	s = 16.12 LOG 118.8	Q = 8.06	s = 16.12 LOG 118.8	Q = 8.06
822.649	T = 132.00	82.2649	T = 132.00	8.22649	T = 132.00
	t = 3		t = 3		t = 3
s = 16.12 LOG 0.144411529	=	s = 16.12 LOG 1.444115291		s = 16.12 LOG 14.44115	
	=				
s = 16.12 -0.840398133	=	s = 16.12 0.159601867		s = 16.12 1.159601867	
	r = 907		r = 907		r = 907
s = -13.54722	S = 0.001	s = 2.5727821	S = 0.0001	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 x 10^{-3} Storage Coefficient		1.0 x 10^{-4} Storage Coefficient		1.0 x 10^{-5} Storage Coefficient	
10 days of continuous pumping		10 days of continuous pumping		10 days of continuous pumping	
s = 7.0815451 LOG 209.7	Q = 6.25	s = 7.0815451 LOG 209.7	Q = 6.25	s = 7.081545 LOG 209.7	Q = 6.25
418.609	T = 233.00	41.8609	T = 233	4.18609	T = 233
	t = 3		t = 3		t = 3
s = 7.0815451 LOG 0.500944796	=	s = 7.0815451 LOG 5.009447957		s = 7.081545 LOG 50.09448	
	=				
s = 7.0815451 -0.300210131	=	s = 7.0815451 0.699789869		s = 7.081545 1.699789869	
	r = 647		r = 647		r = 647
s = -2.125952	S = 0.001	s = 4.9555935	S = 0.0001	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 #2 ANALYTICAL RESULTS**

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: **AA70277**

Collection Date/Time:	10/14/2010	11:20	Sample Collector:	BIERMAN, A
Submittal Date/Time:	10/14/2010	11:30	Sample ID	

Sample Description: Flores-577 Monholland, Well #2; APN 103-071-019

Analyte	Method	Unit	**Result**	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	**338**		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	**3**		1	10	10/18/2010
Barium, Total	EPA200.8	ug/L	**56**		10	1000	10/18/2010
Beryllium, Total	EPA200.8	ug/L	**Not Detected**		1	4	10/18/2010
Bicarbonate (as HCO3-)	2320B	mg/L	**412**		10		10/15/2010
Bromide	EPA300.0	mg/L	**0.27**		0.05		10/14/2010
Cadmium, Total	EPA200.8	ug/L	**Not Detected**		0.5	5	10/18/2010
Calcium	EPA200.7	mg/L	**146**		0.5		10/22/2010
Carbonate as CaCO3	2320B	mg/L	**Not Detected**		10		10/15/2010
Chloride	EPA300.0	mg/L	**177**		1	250	10/14/2010
Chromium, Total	EPA200.8	ug/L	**13**		2	50	10/18/2010
Coliform E coli	9223	#/100ml	**Present**		1	1	10/14/2010
Coliform Total	9223	#/100ml	**Present**		1	1	10/14/2010
Color, Apparent (Unfiltered)	2120B	Color Units	**8**		3	15	10/14/2010
Copper, Total	EPA200.8	ug/L	**Not Detected**		4	1300	10/18/2010
Cyanide	QuikChem 10-204	ug/L	**Not Detected**		10	200	10/18/2010
Fluoride	EPA300.0	mg/L	**0.17**		0.10	2.0	10/14/2010
Hardness (as CaCO3)	2340B	mg/L	**500**		10		10/26/2010
Hydroxide	2320B	mg/L	**Not Detected**		5		10/15/2010
Iron	EPA 200.7	ug/L	**310**		10		10/22/2010
Langlier Index (15 deg. C)	2330B		**0.20**				10/26/2010
Langlier Index (60 deg. C)	2330B		**0.79**				10/26/2010
Lead, Total	EPA200.8	ug/L	**Not Detected**		5	15	10/18/2010
Magnesium	EPA200.7	mg/L	**33**		0.5		10/22/2010
Manganese, Total	EPA200.8	ug/L	**74**		10	50	10/18/2010

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

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Lab Number: **AA70277**

Collection Date/Time: 10/14/2010 11:20 Sample Collector: BIERMAN, A
Submittal Date/Time: 10/14/2010 11:30 Sample ID

Sample Description: Flores-577 Monholland, Well #2; APN 103-071-019

Analyte	Method	Unit	**Result**	Qual	PQL	MCL	Date Analyzed
MBAS (Surfactants)	5540C	mg/L	**Not Detected**		0.05	0.50	10/28/2010
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	**2**		1	3	10/14/2010
o-Phosphate-P	EPA300.0	mg/L	**Not Detected**		0.05		10/14/2010
pH (Laboratory)	4500-H+B	STD. Units	**7.1**				10/14/2010
Potassium	EPA200.7	mg/L	**2.4**		0.1		10/22/2010
QC Anion Sum x 100	Calculaltion	%	**102%**				11/1/2010
QC Anion-Cation Balance	Calculaltion	%	**3**				11/1/2010
QC Cation Sum x 100	Calculaltion	%	**108%**				10/26/2010
QC Ratio TDS/SEC	Calculation		**0.65**				10/21/2010
SAR (Sodium Adsorption Ratio)	Suarez, 1981		**2.0**				10/26/2010
SAR, Adjusted	Suarez, 1981		**2.8**				10/26/2010
Selenium, Total	EPA200.8	ug/L	**5**		2	50	10/18/2010
Silver, Total	EPA200.8	ug/L	**Not Detected**		10		10/18/2010
Sodium	EPA200.7	mg/L	**101**		0.5		10/22/2010
Specific Conductance (E.C)	2510B	umhos/cm	**1342**		1	900	10/14/2010
Sulfate	EPA300.0	mg/L	**95**		1	250	10/14/2010
Thallium, Total	EPA200.8	ug/L	**Not Detected**		1	2	10/18/2010
Total Diss. Solids	2540C	mg/L	**870**		10	500	10/21/2010
Turbidity	180.1	NTU	**0.80**		0.05	5.0	10/14/2010
Zinc, Total	EPA200.8	ug/L	**Not Detected**		10	5000	10/18/2010

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D = Method deviates from standard method due to insufficient sample for MS/MSD

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Lab Number: **AA70277**

Collection Date/Time:	10/14/2010	11:20	Sample Collector:	BIERMAN, A
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Sample Description: Flores-577 Monholland, Well #2; APN 103-071-019

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

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

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