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POTENTIAL HYDROLOGIC IMPACT
OF MARCHANT RESORT HOTEL,
HALF MOON BAY, CALIFORNIA

May 1989

A report prepared for:

Robert Marchant
Marchant Enterprises
P.O. Box 3068
Half Moon Bay, CA 94019

POTENTIAL HYDROLOGIC IMPACT OF MARCHANT RESORT HOTEL HALF MOON BAY, CALIFORNIA

Balance Hydrologics, Inc.
Assignment No. 8914.2

by

BH for
James M. Oliver
Senior Staff Hydrogeologist

Barry Hecht
Principal Hydrogeologist, R.G., C.E.G.

May 18, 1989

BALANCE HYDROLOGICS, Inc.
1760 Solano Ave., Ste. 209
Berkeley, CA 94707
(415) 527-0727

1.0 INTRODUCTION

This hydrologic report has been prepared by Balance Hydrologics at the request of Marchant Enterprises to be presented to the California State Coastal Commission. The purpose of the report is to evaluate the hydrologic impact of two wells installed on the hotel property to supply water needed for the proposed resort hotel being built by Marchant Enterprises.

The wells were installed because a moratorium on all new water connections by the Coastside County Water District (CCWD) has been in effect. The timing of eventual connection to the CCWD is unknown at this time, but is expected by late 1990.

The evaluation uses data developed by M.J.King & Associates at the site in early 1989. While Balance Hydrologics feels these data from M.J. King & Associates fall within the reasonable range of expected values, Balance Hydrologics has made no formal review of the work and therefore accepts no responsibility for the data. Readers may review and assess these results presented in Appendix 1.

2.0 LOCATION AND SETTING

2.1 Physical Setting

The proposed Marchant resort hotel is located at the southern end of Pillar Point Harbor in Half Moon Bay, California. The hotel resort is proposed to be a Turn-of-the-Century Seaside Victorian style consisting of 54 units. The proposed site is located on a 1.58 acre parcel on the west side of Cabrillo Highway along the El Granada beach area of Pillar Point Harbor. The hotel is to be constructed on relatively flat ground underlain by marine terrace deposits. An approximately 15-foot high terrace escarpment separates the proposed hotel grounds from the beach, which has widened approximately 200 feet westward since construction of the main harbor breakwater.

2.2 Hydrological Setting

The proposed hotel site is located on the Half Moon Bay Terrace , which is underlain by two recognized aquifer systems. The principal water-bearing zone consists of unconsolidated deposits of sand, silt and clay that comprise the Half Moon Bay Terrace aquifer. The second, or lower, bedrock aquifer is comprised of sandstone and shale of the Purisima Formation (Kleinfelder,1988,p.10). Because water yield is estimated to be at least 20 times less than the terrace aquifer and the hotel wells are primarily screened in the terrace deposits the impacts of the Purisima Formation are assumed to be minimal.

From boring logs for the wells, the terrace deposits are estimated to be 45 to 55 feet deep below the proposed hotel site (M.J.King,1989). Based on information from the borings drilled for the new pier, the salt-water interface for the terrace aquifer was positioned at least 900 feet offshore at the pier a distance to the north, and is likely to currently be in about the same location. The natural ground-water gradient of the terrace and bedrock aquifer is from the hills westward towards the ocean. Based on water-level response during well tests

performed at the proposed hotel site, the terrace aquifer is confined in the vicinity of the site.

3.0 PROJECTED WATER DEMAND AND SUPPLY

3.1 Water Demand

3.1.1 Hotel Requirements

Results of the water-use study are presented in Appendix 1. Conclusions of the study developed by others show that the proposed hotel would need to have supplies for 2 days of peak use; equal to 19,618 gallons, in storage on site. This equates to a constant flow rate from the wells of 6.8 gallons per minute (gpm). Included in the plans for the hotel is a 20,000 gallon storage tank to be used as a water reservoir. The anticipated design water demand is based upon a 70% occupancy rate and a safety factor of three times (King, 1989).

3.1.1 Irrigation Water Demand

The proposed use for the wells once the CCWD connection has been made is to use the wells for irrigation of landscaping within the hotel property. Approximately 0.25 acres of the total 1.58 acres of hotel property will be covered by landscape vegetation. Marchant Enterprises will comply with the City's request that drought resistant vegetation be used for the landscaping. Additionally, to increase irrigation efficiency, drip irrigation will be installed.

Irrigation demand is expected to be highest during the months of July and August. Using a potential evapotranspiration value of approximately 4.5 inches per a month for July and August (Kleinfelder, 1988, Table A2-1), peak plant water use of 30,500 gallons per month may be anticipated. If irrigation efficiencies are 80%, applied water will be about 38000 gallons during each of the two hottest months.. Therefore the highest average monthly flow from the wells required to irrigate the landscaping would approximately be 0.85 gpm. Irrigation of the landscaping could cease during severe droughts or water emergencies.

3.2 Well Performance

Two PVC wells were drilled and installed on the proposed hotel property on January 28, 1989 and February 17, 1989. Upon the completion of each well, a 24-hour well test was performed. Results of the tests show that Wells number 1 and 2 are both estimated to have a sustainable yield of at least 5 gpm or, a combined sustainable yield of 10 gpm (King, 1989). Copies of the drilling logs, permits, electric logs and results of the well test analysis are presented in Appendix 1. A tidal influence was observed in each of the wells during the well tests, but is typical of responses in confined coastal aquifer systems.

4.0 HYDROLOGIC IMPACT OF MARCHANT HOTEL WELLS

4.1 Impact On Surface Waters

The closest stream is Denniston Creek, which lies approximately 2500 feet to the north of the proposed hotel site. At the proposed pumping rate for the hotel wells, any direct impact on surface water supplies is highly unlikely.

4.2 Impact On Ground-Water Supplies

The estimated ground-water outflow beneath Highway 1 is estimated to be 145 million gallons for average rainfall years (Kleinfelder, 1988). Assuming 40 percent of the outflow may be available for withdrawal without producing undesirable effects, it is estimated that a safe yield of approximately 58 million gallons for normal years and 50 to 40 million gallons for years of dry and critical rainfall(Kleinfelder, 1988, p.2). The safe yields estimated in the report are in addition to current withdrawals in the system. Using a flow rate of 2.3 gpm (the three-fold factor of safety is for design purposes and is not needed for water balance calculations) the hotel wells would draw 1.2 million gallons from the aquifer system, or roughly two percent of the 40 percent available, until connected to CCWD.

4.2.1 Long Term Yield

Water-level records from monitoring wells located to the north and south of El Granada indicated average seasonal water-level fluctuations of 4 to 10 feet during average rainfall years. Water-level declines of 14 to 29 feet have been recorded during dry and critically-dry years in a monitoring well just west of the Half Moon Bay Airport. However, water levels recovered to a nearly-constant winter maximum during subsequent normal or above-average rainfall years.

The well tests were made during the third consecutive year of below-average rainfall in the area, a duration of drought identified in the Kleinfelder report as being of particular local concern. Since sufficient yields were obtained from the wells, it is likely that supplies may be available over the longer term under the hydrologic conditions presently prevailing. Further testing would be required to assess the reliability of the yield under more extreme conditions.

If the water connection was not granted in the two-year period and a more severe drought were to occur, the potential impacts are unknown. To accurately assess the impact of a more severe drought, one would need a long record of ground-water levels and pumping discharges through a variety of earlier drought conditions. Such records are not currently available for the El Granada area.

4.2.2 Ground-Water Recharge

To increase ground-water recharge after completion, the hotel was originally designed so that rain water collected from the roof will be recharged to the aquifer. Roof drains will direct rain water to a infiltration well, where the water will then be recharged. However, because of the potential for contamination, runoff from the parking lot will be discharged at a distance and down gradient from the hotel.

4.2.3 Potential Impact On Position of Salt-Water Interface

The major concern in pumping ground water close to the ocean is the potential to change existing ground-water flow gradients and cause salt-water to move inland through the aquifer.

To assess the potential impact of the hotel wells on the salt-water interface, we examined the pumping rates at which local ground-water gradient reversal near the wells. The approach was to estimate the seaward point at which the velocity

of water flowing to the well equaled the regional flow velocity. If this point (also known as the stagnation point) is less than the distance to the salt-water interface, then the wells should not have an effect on the salt-water interface.

The wells were modeled as a single well pumping at the combined flow rate. The regional gradient was assumed to be 0.028 for the worst case and 0.036 for the average case (Kleinfelder, 1988, p.13). The flow rate used in the analysis was 6.8 gpm to estimate the maximum pumping of the hotel wells. The wells are assumed to be in steady state (not changing with time). The hydraulic conductivity (K) values used are taken from the Kleinfelder report. The minimum and average values are for the terrace deposits and the Purisima Formation (bedrock aquifer). An equivalent K value is used, because the wells are screened in both the terrace deposits and the bedrock. It is assumed that there is only horizontal flow, and no vertical flow occurs from the lower portions of the bedrock.

The position of the existing salt-water interface was estimated from the Environmental Impact Report for Pillar Point Harbor prepared by the San Mateo County Harbor District (1972). The report indicates that from borings drilled in the harbor the salt-water interface is estimated to be approximately 900 feet off-shore in the vicinity of the proposed hotel site.

The results (Table 1) of the analysis estimate the point of stagnation in the worst case situation to be approximately 220 feet seaward or 680 feet from the estimated salt-water interface. Under average environmental conditions the point of stagnation is estimated to be approximately 90 feet seaward from the bluff or 810 feet from the estimated salt-water interface. To affect the salt-water interface a continuous pumping rate of at least 45 gpm in the worst case and 65 gpm in the average case would have to be sustained from the hotel.

The analyses are specific for the hotel site only, and become invalid if site or regional conditions change. They should not be considered applicable to sites beyond the immediate vicinity.

Because (0.85gpm) pumping for peak-month landscape irrigation is only 12 percent of that deemed needed to meet hotel demand related effects on the position of the fresh/salt water interface are very small.

5.0 WATER QUALITY

5.1 Results of Sampling

Water samples were collected from both hotel wells 1 and 2 by King (1989). The sample from well 1 was tested for Title 22 general mineral, physical and chemical composition; and well 2 was tested for Secondary Drinking Water Standards. Results of the sampling are presented in Appendix 1. Water quality from the wells was deemed to meet minimum quality standards in San Mateo County for tested constituents except for iron and manganese, which will require treatment. Preliminary design and specifications of the proposed water treatment system are presented in Appendix 1.

The salinity, ionic composition, and specific conductance of the water samples are similar to those observed in other wells in the area. No indications of current or former sea-water intrusion can be discerned from water-quality analyses.

5.2 Water Monitoring

Title 22, Chapter 15, Article 4 defines specific times for water quality samples to be collected from the wells and filtration systems. The water-quality sampling and testing program for the proposed hotel must comply with these requirements.

5.2.1 Salt-Water Intrusion Monitoring

To monitor possible movement of the salt-water interface due to the hotel wells or other inland pumping, bi-weekly measurements of specific conductance should be taken at each well during pumping. The measurements can be made by hotel staff with a portable calibrated specific conductance meter. Samples should be collected every May and September when the wells are in use, and analyzed by a state-certified laboratory for chloride concentration and specific conductance..

5.2.2 Salt-Water Intrusion Mitigation

The specific conductance measurements will be used to assess the potential for salt-water intrusion. The measurements will be evaluated, and mitigation measures initiated, based on the following criteria:

1. If specific conductance exceeds the lower or "recommended" Title 22 standard of 900 micromhos for two months, samples will be sent in to the laboratory for specific conductance and chloride analysis on a monthly basis.

2. If results of the laboratory analysis indicate levels of chloride exceed the Title 22 "mandatory long-term" limit of 500 mg/l, pumping will cease until levels decline.

Two months are used as a criterion because of the high variation of specific conductance values reported for the immediate vicinity of the project in the El Granada ground-water investigation (Kleinfelder, 1988, Plate 11). Therefore a short-term increase in specific conductance may be a seasonal or random and not be indicative of potential salt-water intrusion.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the information available, the two wells installed on the hotel property should be able to produce the yields thought needed to supply the hotel without significant impacts on the surrounding aquifer. The wells have been installed as a temporary water supply until connection with CCWD can be made. The expected use of the wells as the primary hotel water supply is not longer than 2 years. At that time the wells may be used as needed for landscape watering.

To assist in the development of a long-term ground-water level record and aid the County in ground-water management decisions, the wells may also be made available for water level monitoring and water-quality sampling performed by San Mateo County. If the wells do not prove to be useful to the County and are not

used for a period of one year, they will be abandoned as required under existing State and County regulations.

7.0 REFERENCES CITED

Kleinfelder, 1988. El Granada Ground-Water Investigation Report. April 1988.

King, M.J. 1989. Marchant Hotel Resort Half Moon Bay California Preliminary Water System Design. March 1989.

San Mateo County Harbor District, 1972. Environmental Impact Statement: Pillar Point Harbor, East Basin Project, El Granada, California. February 1972.,pp 6-12.

APPENDIX 1

M. J. KING & ASSOCIATES REPORT
March 1989

MICHAEL J. KING
A PROFESSIONAL TECHNICAL AGENCY
520 Arballo Drive
San Franciso, CA 94132
(415) 585-9516

MARCHANT HOTEL RESORT
HALF MOON BAY, CALIFORNIA
PRELIMINARY WATER SYSTEM DESIGN

FOR: MARCHANT ENTERPRISES, INC.

MARCH 1989

BY: M.J. KING & ASSOCIATES
AND AQUA SCIENCE ENGINEERS

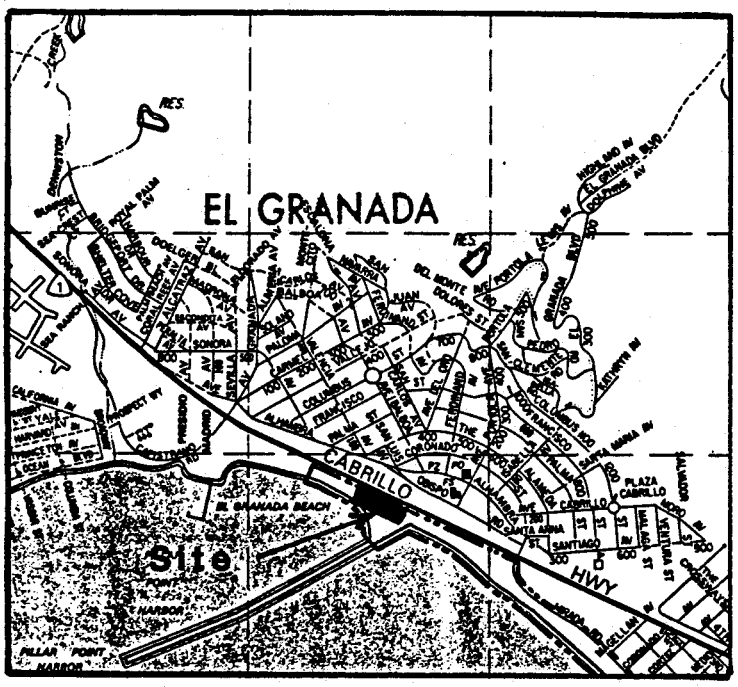
MARCHANT HOTEL RESORT
HALF MOON BAY, CALIFORNIA
PRELIMINARY WATER SYSTEM DESIGN

1. INTRODUCTION

The following is a preliminary water system design for the proposed Marchant Enterprises Hotel Resort located on Cabrillo Highway, Half Moon Bay, California, Figure 1. The hotel resort will be constructed in a Turn-of-the- Century Seaside Victorian style consisting of 54 units. Four of the units will be larger suites with a wet bar and an oversized whirlpool tub, and eleven of the units will be relatively larger units with a wet bar. A spa is planned for one of the courtyard areas.

The proposed project site is situated on a 1.58 acre parcel on the west side of Cabrillo Highway along the protected beach area of the Pillar Point Harbor to the east, Figure 1. The hotel is to be constructed on a relatively flat lying marine terrace separated from the Pillar Point Marina tidal beach area to the east by an approximate 15-feet high terrace escarpement, Figure 2.

The eventual development of this project will require a water supply. The water supply for this project will initially be from a water supply system supported by water wells and eventually from a 2-inch water connection from Coastside County Water District (CCWD), the local water utility. The actual date for the CCWD water connection to this project is unknown, but is estimated to be late 1990. The water supply system supported by water wells must meet the water supply requirements for the project until the CCWD water connection is made. The water well based water system will than be disconnected from the hotel, and will be used for landscaping and laundry use. An appropriate check valve system will be installed to prevent the mixing of well water with utility water.



M.J. King & Associates

Site Location Map

FIGURE 1

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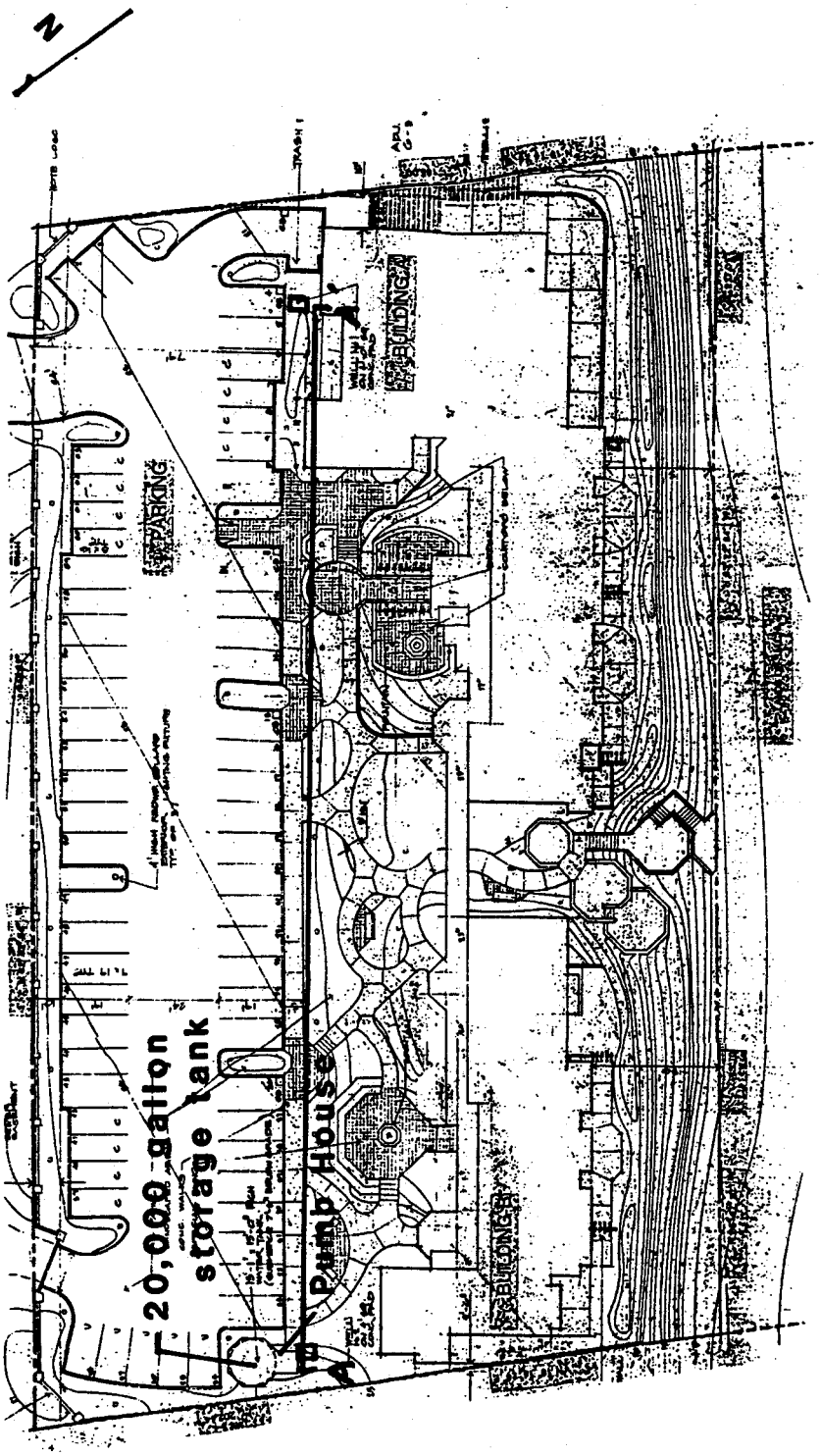

M.J. King & Associates

Project Site Plan

FIGURE 2

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The following is a preliminary water well system design for the Marchant Hotel Resort project. Two water wells have been drilled, constructed, and pump and chemical tested for preliminary system design analysis. The approach to this preliminary system design was to develop system design criteria (water supply requirements), to conduct a groundwater supply and water quality analysis based on water well test results, and to prepare a preliminary water system design.

The design requirements and water quality standards for a transient hotel resort population are stipulated in State of California, Department of Health Services, Health and Safety Code/Administration Code, Title 22, Chapter 15-Domestic Water Quality and Monitoring, Chapter 16- California Waterworks Standards; and State of California, Department of Water Resources, Bulletin 74-81, Water Well Standards.

II. General System Design Criteria

Water supply demands for a given project can be predicted by a method of correlating the historical water use of similar developments or by utilization of standard usage as published by various agencies. The projected water supply requirements for the Marchant Hotel Resort project for purposes of design is based on comparable water usage for three similar hotels in the Half Moon Bay area for basic unit water consumption, and on published water usage for the planned spa, wet bars, and enlarged tubs.

Metered water usage records for three hotels in the Half Moon Bay area were tabulated for two month averages from September 20, 1986, to January 21, 1988, see Appendix A. The three hotels are as follows:

Harbor View Inn	Laundry sent out/no food service
Pillar Point Inn	In-house laundry/breakfast service
Half Moon Bay Lodge	In-house laundry

The average daily water consumption (gallons per day, gpd) per room for these hotels for a 26 month period is as follows:

Harbor View Inn	106.21 gpd per room
Pillar Point Inn	173.40 gpd per room (no flow controls)
Half Moon Bay Lodge	254.69 gpd per room

The Pillar Point Inn is most similar to the Marchant Hotel Resort in that it provides breakfast to guests in the morning, afternoon sherry and operates its own laundry. The primary difference in the two facilities is the 4 large tubs, 15 wet bars, and a central hotel spa. The Pillar Point Inn had an average 73% occupancy last year. A preliminary feasibility study prepared for the Marchant hotel resort is estimating occupancy as follows:

1st year	46.3%
2nd year	55.6%
3rd year	61.1%
4th year	68.5%
5th year	70.4%

The projected slow growth in occupancy is expected due to the fact that the project will increase room availability in the Half Moon Bay area by 38%.

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As planned the Marchant Hotel Resort will be using the newer low flow toilets and flow restrictors in showers to reduce the consumption of water by guests as much as possible. Thus the use of the average daily water usage per unit for the Pillar Point Inn will be a conservative estimate of water usage for the Marchant Hotel Resort. The Granada Sanitary District of San Mateo County has estimated sewer flow rates of 115 gpd per unit, with an estimated peak water demand of 140 gallons per minute (gpm) (CCWD calculated) for a 60 minute period in the mornings (at maximum occupancy), see Appendix A.

Therefore based on the comparable water usage for the Pillar Point Inn, the project level of occupancy for the first three years, and the water saving measures, the base line water supply requirements for the Marchant Hotel Resort is 173 gpd per unit.

The additional water supply requirements of the 4 larger tubs, 15 wet bars, and central spa is determined from published water usage from Small Water System Serving the Public, 1987, Conference of State Sanitary Engineers, Table 3-2. Water supply requirements for these additional water uses are as follows:

Larger tubes	4 units	x	8 gpd-	32 gpd
Wet bars	15 units	x	3 gpd-	45 gpd
Central spa	1 unit	x	307 gpd-	307 gpd

Total additional water usage- 384 gpd

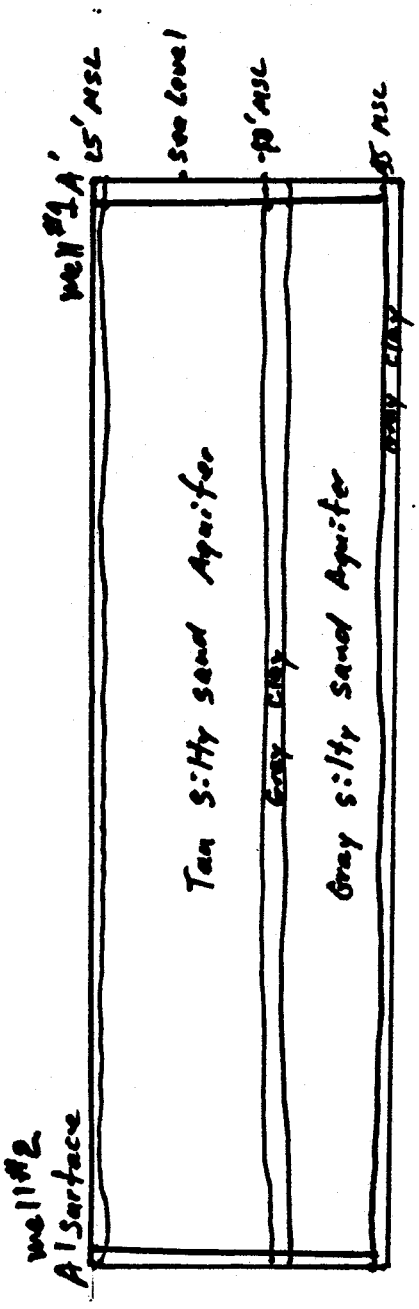
The total water supply requirement for the Marchant Hotel Resort, for purposes of design is 9,726 gpd, or 6.8 gpm from the water wells.

For small domestic water well systems, it is sound engineering practice to design the storage requirements for three times the daily water supply needs. The Marchant Hotel Resort will have a transient population that may average 73% occupancy. Should the water supply system require maintenance, water conservation measures will be invoked, laundry will be sent out, and the spa will be closed. The storage requirements for this project are calculated as follows:

54 units x 70% x 173 gpd/unit x 3- 19,618 gallons storage or
20,000 gallons storage for design.

Additional system design criteria are.

o Water pressure to hotel- 50 psi.



Scale 1" = 53'
See Figure 2

M.J. King & Associates

Geologic Cross Section Marchant Hotel Resort Study Site	FIGURE 3

The results and conclusions from the hydrogeology analysis of the Marchant Hotel Resort site and the results of the Kleinfelder report demonstrate the presence of a suitable groundwater supply; and demonstrate the ability of Water System Wells No. 1 & 2 to deliver a total of 10 gpm of the required 6.8 gpm. The results of the water quality analysis are discussed in the report section, IV. Water Quality Analysis.

IV. WATER QUALITY EVALUATION

The Marchant Hotel Resort groundwater supply must comply with Title 22, Chapter 15, Article 4 Water Quality Standards. Water samples were collected from Wells No. 1 & 2. The Well No. 1 water samples were tested for Title 22 general mineral, physical, and chemical composition; and Well No. 2 samples were tested for Secondary Drinking Water Standards, Appendix D.

Water chemistry from the Marchant Hotel Resort wells meet minimum quality standards for San Mateo County (including mid-range Title 22 standards). The wells did exceed the minimum standards for iron and manganese, which will require use of a greenstone type ultra filter for treatment.

Based on the results of the water quality sample analysis the following filter system will be required to meet Title 22 water quality standards:

- o Iron filtration- remove up to 22 mg/l
- o Manganese filtration- remove up to 22 mg/l
- o Odor removal (optional)- sulfur smell
- o Chlorination- routine chlorination

Title 22, Chapter 15, Article 4 defines specific times for water quality samples to be collected from wells and filtration systems. The water quality sampling and testing program for this project will comply with these requirements.

V. PRELIMINARY WATER SYSTEM DESIGN

The design and operation of a water well supply system involves the integration of the water system components of:

1. Water Well Supply System
2. Water Storage System
3. Water Filtration-Pressure System
4. Water Distribution System

The general design criteria for these system components has been presented in the previous report sections. The preliminary system design for each component, based on the previous general design criteria, is presented in the following discussion.

V.1. Water Well Supply System

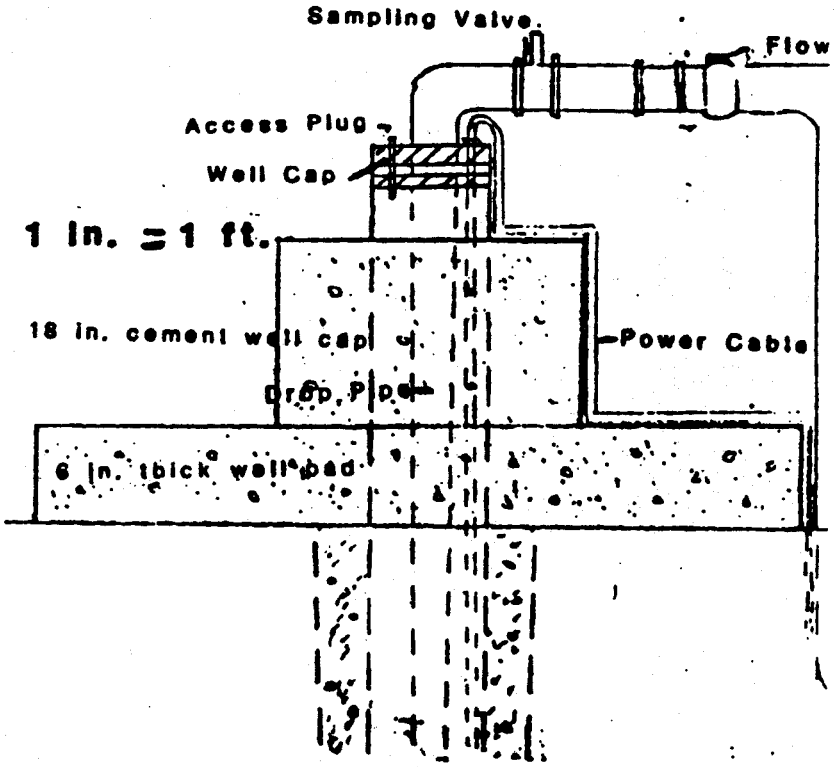
The proposed water well supply system will utilize Well No.'s 1 & 2 for water supply. The conversion of these monitoring wells to commercial water well use is illustrated in Figure 4. Specific design requirements are as follows:

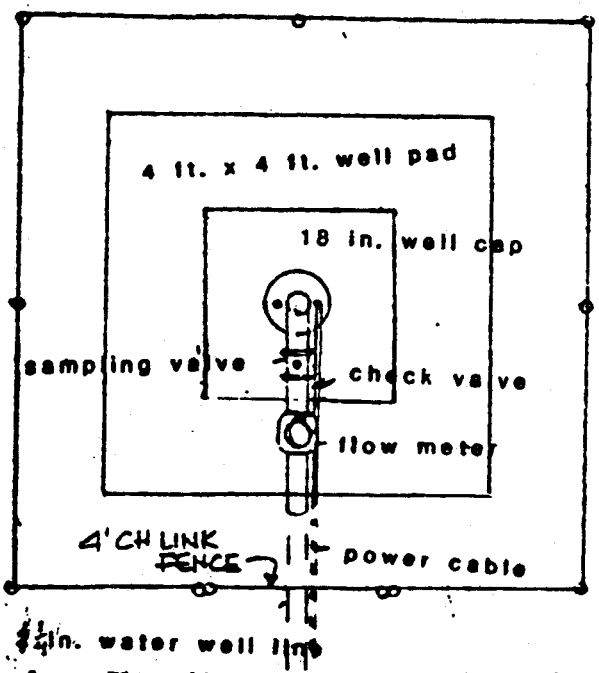
1. Encase each above ground well casing in 24-in. x 24-in. x 18-in. steef reinforced concrete block.
2. Installation of sounding tube into well head.
3. Install a total flow volume meter on a supply line.
4. 1-inch gate value for water sampling

The pump system will consist of the following features:

- 1/2 h.p. submersible pump- 23 gpm capacity at zero head.
- 1 1/4-inch drop pipe to pump.
- 11/4-inch water supply line to storage tanks.
- 220-volt electric line to well from pump house.

The planned water supply line system layout is provided in Figure 4.





Water Wellhead Site Plan View

Scale: 1 in. = 2 ft.

M.J. King & Associates

Wellhead design

FIGURE 4

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V.2 Water Storage System

The total capacity of the storage system is 20,000 gallons in an underground storage tank. The tank is to be located on the north end of the Hotel site, see Figure 2. The dimensions of the storage tank is 12-ft. diameter and 24 ft. length, see Figure 5. The tank will be set at a depth of 4-feet below the surface.

Water will enter the tank by way of the 11/4-inch water well supply lines at the top of the tank. The tank will be connected to the water filtration-pressure system by way of a 3-in. line to the booster pump system near the top of the tank. Along the 3-in. line, in series, will be a chlorinater, check value, and 2-in. gate value for water sampling.

The operation of the wells will be controlled by the water level in the storage tank. This is accomplished by use of a mercury switch in the storage tank and a float switch.

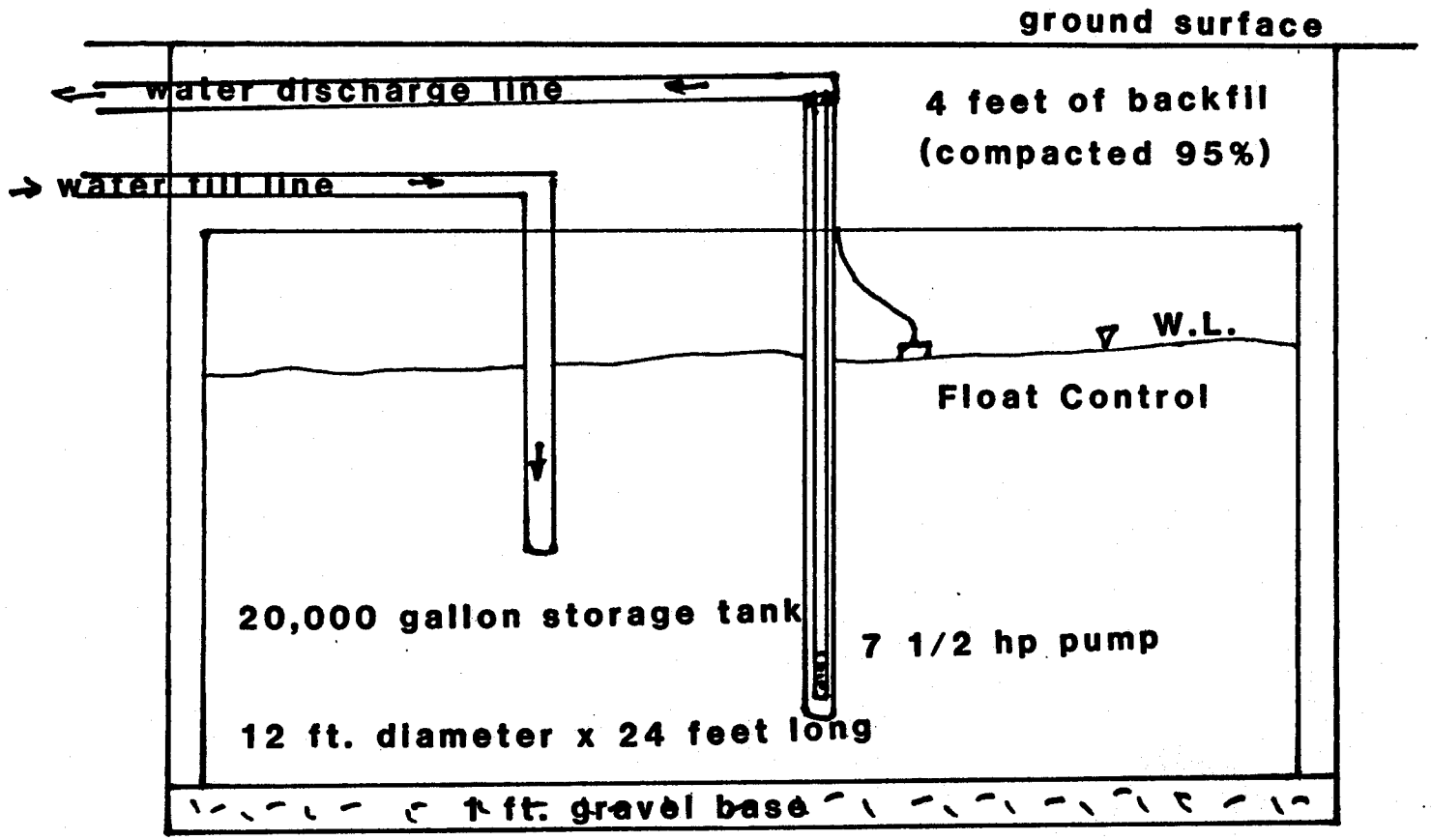
V.3 Water Filtration-Pressure System

The purpose of the water filtration-pressure system is to purify the well water to acceptable Title 22 water quality standards and deliver water to the hotel at the design flow rate of 140 gpm at a minimum flowing pressure of 50 psi. The system is composed of the three elements of:

1. Booster Pump System
2. Pressure Tank System
3. Filtration System

Booster Pump System: The booster pump system pumps water from the storage tank into the Pressure Tank System. The system is a 71/2 h.p. centrifugal pump, with a water production capacity of 9,200 gallons per hour at a line pressure of 80 psi. The system will be controlled by a pressure switch. The system will be operated by a 220-volt, 3-phase electric source if available at the site by Pacific Gas and Electric Company.

Pressure Tank System: The pressure tank system delivers water at a suitable pressure and volume to operate the filtration system and deliver water to the water distribution system. The tank has a 900 gallon capacity, with dimensions of 42-in. diameter and 159-in. length. The system will be contained in the pump house. The system will produce water at a rate of over 140 gpm at a line pressure of 50 psi.



Check valves/flow controls not shown

Scale 1 in. = 4 feet

FIGURE 5

Water Storage Tank System

M.J. King & Associates

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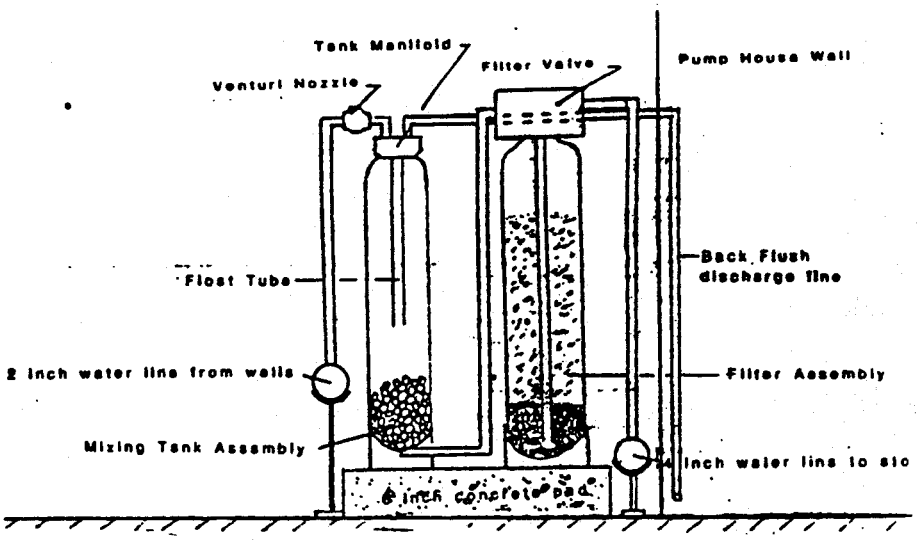
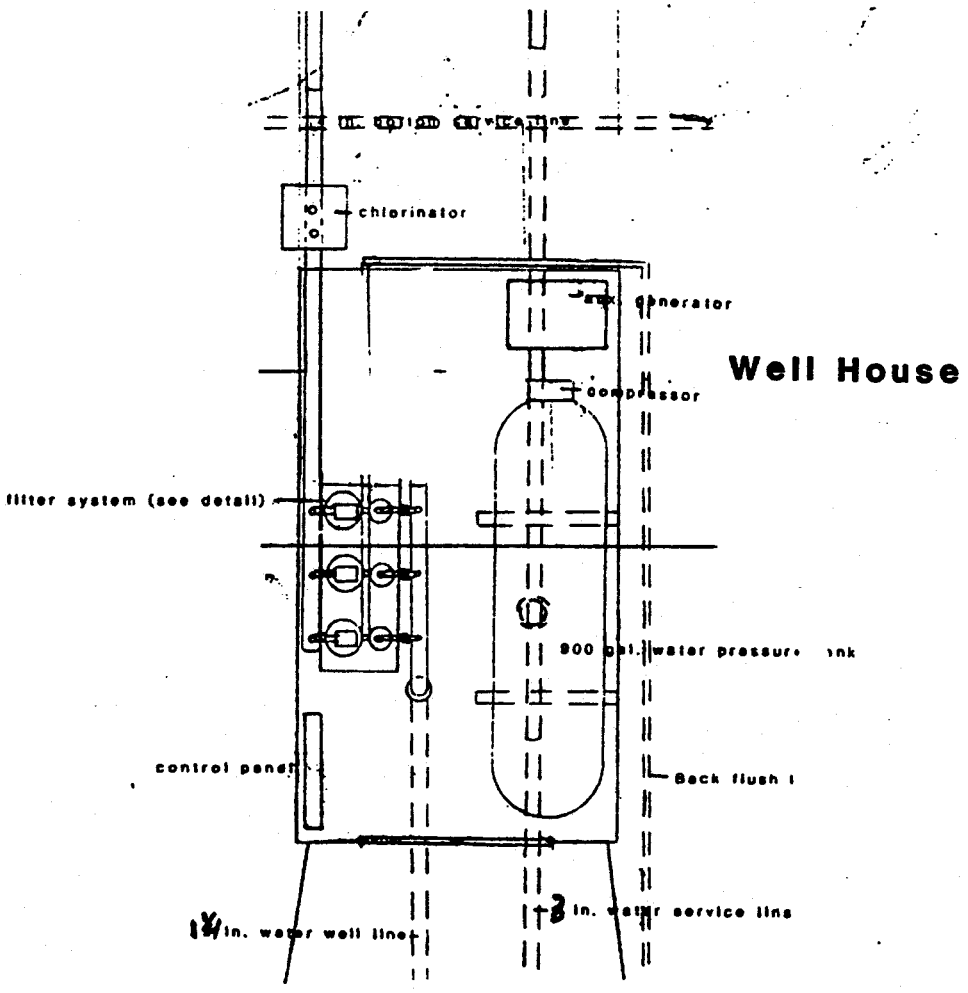


Typical Filtration System Unit Diagram



Well House

M.J. King & Associates

Well House Filtration/Pressure Tank System	FIGURE 6

DATAPRINT N62724

Filtration System: The filtration system will consist of a series of 3 two stage automatic ultra-filters. A typical single two stage filter system is illustrated in Figure 6. The filters are capable of removing up to 22 mg/1 of iron and manganese, and will remove odor, color, low pH, and turbidity that may be present in the water. Materials backflushed from the filter system will be discharged to the sewer system.

V.4 Water Distribution System

The water distribution system will deliver purified water to the hotel. The system designed is as follows:

1. Pump house discharge flow rate of 140 gpm at a line pressure of 50 psi.
2. 2-inch water main to the hotel.

The construction of the distribution line will be according to Title 22, Chapter 16 standards, with all trenching and excavations according to San Mateo grading and underground utility codes.

VI. SUMMARY OF RESULTS AND RECOMMENDATIONS

The results of this preliminary water system design for the Marchant Hotel Resort indicate the following:

1. The groundwater resource and the existing site wells will provide an adequate water supply to the Marchant Hotel Resort.

2. The general design criteria for this project is 20,000 gallons of storage and a cumulative water well pumping rate of 6.8 gpm.

3. The water quality of the groundwater supply is acceptable for public water consumption with proper filtration.

4. A preliminary water system design is provided that fully meets the standards and design specification of Title 22. Chapters 15 and 16.

Upon approval of this preliminary water system design by appropriate review agencies, the following final design and system testing activities should be performed.

1. An application for a mutual water system certificate be submitted to San Mateo County Environmental Health Department for approval of the system.

2. Request design and construction bids from contractors.

3. Request bids for the operation and maintenance of the mutual water company from service companies.

Appendix A

Comparative Water Usage Data Analysis

AVERAGE WATER CONSUMPTION/ROOM/DAY

Date	100 cu ft Used	Gals Used /60 Days	Gals Used /Day	Gals Used /Rm/Day	Av Gals /Rm/Day
HALF MOON BAY LODGE - Half Moon Bay					
1986					
Sep 20-Nov 19	996	745008	12416.80	149.60	
Nov 20-Jan 23	935	699380	11656.33	140.44	145.02
1987					
Jan 24-Mar 23	1068	798864	13314.40	160.41	
Mar 24-May 23	1512	1130976	18849.60	227.10	
May 24-Jul 23	1505	1125740	18762.33	226.05	
Jul 24-Sep 23	1764	1319472	21991.20	264.95	
Sep 24-Nov 20	1202	899096	14984.93	180.54	
Nov 21-Jan 20	1243	929764	15496.07	186.70	207.63
1988					
Jan 21-Mar 23	1589	1188572	19809.53	238.67	
Mar 24-May 23	1544	1154912	19248.53	231.91	
May 24-Jul 22	1679	1255892	20931.53	252.19	
Jul 23-Sep 23	1914	1431672	23861.20	287.48	
Sep 24-Nov 21	1533	1146684	19111.40	230.26	
Nov 22-Jan 21	1915	1432420	23873.67	287.63	254.69
PILLAR POINT INN - Princeton					
1986					
Sep 20-Nov 19	132	98736	1645.60	149.60	
Nov 20-Jan 22	119	89012	1483.53	134.87	142.23
1987					
Jan 23-Mar 23	113	84524	1408.73	128.07	
Mar 24-May 23	154	115192	1919.87	174.53	
May 24-Jul 22	182	136136	2268.93	206.27	
Jul 23-Sep 23	193	144364	2406.07	218.73	
Sep 24-Nov 20	162	121176	2019.60	183.60	
Nov 21-Jan 20	142	106216	1770.27	160.93	178.69
1988					
Jan 21-Mar 23	155	115940	1932.33	175.67	
Mar 24-May 23	165	123420	2057.00	187.00	
May 24-Jul 22	182	136136	2268.93	206.27	
Jul 23-Sep 23	162	121176	2019.60	183.60	
Sep 24-Nov 21	130	97240	1620.67	147.33	
Nov 22-Jan 24	124	92752	1545.87	140.53	173.40

HARBOR VIEW INN - El Granada

1986					
Sep 20-Nov 19	120	89760	1496.00	88.00	
Nov 20-Jan 22	103	77044	1284.07	75.53	81.77
1987					
Jan 23-Mar 23	97	72556	1209.27	71.13	
Mar 24-May 23	130	97240	1620.67	95.33	
May 24-Jul 22	152	113696	1894.93	111.47	
Jul 23-Sep 23	174	130152	2169.20	127.60	
Sep 24-Nov 20	135	100980	1683.00	99.00	
Nov 21-Jan 20	117	87516	1458.60	85.80	98.39
1988					
Jan 21-Mar 23	137	102476	1707.93	100.47	
Mar 24-May 23	138	103224	1720.40	101.20	
May 24-Jul 22	156	116688	1944.80	114.40	
Jul 23-Sep 23	186	139128	2318.80	136.40	
Sep 24-Nov 21	134	100232	1670.53	98.27	
Nov 22-Jan 24	118	88264	1471.07	86.53	106.21

MO.	DAY	100-Cu. Ft.	USED	DAY	100-Cu. Ft.	USED	DAY	100-Cu. Ft.	USED
NOV.	21	14067	1533						
SEP.	23	12534	1914						
JUL.	22	10620	1479						
MAY	23	8941	1544						
MAR.	23	7397	1487						
JAN.	20	5808	1243						
NOV.	20	4565	1202						
SEP.	23	3363	1766						
JUL.	23	1599	1505						
MAY	23	94	94		31884	1498 / 1512			
MAR.	23	30466	1068						
JAN.	23	29398	935	23	15982	1915			
NOV.	19	28463	996	21	14067	1533			

1251777 2400 S. CABRILLO HWY

METER NO. 26025255 HOTEL & MOTELS MAKE Rock SIZE 2"

ON	CONSUMER CHANGES	OFF
~~01/01/80~~ 1-7-75	HAL0036 H. M. B. MOTOR LODGE 2400 S. CABRILLO Hwy HALF MOON BAY CA 94019	

MI. NO. 3005050 ROUTE NO. 020 SERVICE NO. 2560

COASTSIDE COUNTY WATER DIST. - HALF MOON BAY, CA

MO.	DAY	READING	USAGE	DAY	READING	USAGE	DAY	READING	USAGE
NOV.	21	2368	134						
SEP.	23	2234	186						
JUL.	22	2048	156						
MAY	23	1892	138						
MAR.	23	1754	137						
JAN.	20	1617	117						
NOV.	20	1500	135						
SEP.	23	1365	174						
JUL	22	1191	152						
MAY	23	1039	130						
MAR.	23	909	97						
JAN.	22	812	103	24	2486	118			
NOV.	19	709	120	21	2368	134			

1987

AVE ALHAMBRA

METER NO. 25213551 HOTEL & MOTELS MAKE NEPT. 1 SIZE

ON	CONSUMER CHANGES	OFF
~~01/01/80~~ 7-2-85	HAR0035 HARBOR VIEW INN, P.O. BOX 127 EL GRANADA CA 94018	

MI. NO. 3005702 ROUTE NO. 010 SERVICE NO. 0850

COASTSIDE COUNTY WATER DIST. - HALF MOON BAY, CA

NOV.	21	3.01	78						
SEP.	23	247	78						
JUL.	22	169	89						
MAY	23	1080	80						
MAR.	23	1000	75						
JAN.	20	[illegible]	[illegible]						
NOV.	20	855	79						
SEP.	23	776	94						
JUL.	22	682	93						
MAY	23	592	76						
MAR.	23	516	56						
JAN.	22	460	59	24	366	58			
NOV.	19	401	66		309				

380 CAPISTRANO RD
L.M.

METER NO. 35467039 HOTEL & MOTELS MAKE Rock SIZE 5/8

ON	CONSUMER CHANGES	OFF
~~01/01/80~~ 9-25-85	PIL0002 PILLAR POINT INN, Mr. Constello P.O. BOX 388 EL GRANADA CA 94018	

MI NO. 3005622 ROUTE NO. 03 010 SERVICE NO. 1193

COASTSIDE COUNTY WATER DIST. - HALF MOON BAY, CA

NOV.	21	353	69						
SEP.	23	284	84						
JUL.	22	200	93						
MAY	23	1107	85						
MAR.	23	1022	90						
JAN.	20	922	72						
NOV.	20	870	83						
SEP.	23	787	99						
JUL.	21	688	92						
MAY	23	596	78						
MAR.	23	518	57						
JAN.	22	461	60	24	419	66			
NOV.	19	401	66		353				

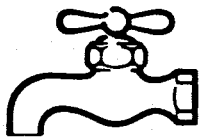
380 CAPISTRANO RD
R.M.

METER NO. 20826347 HOTEL & MOTELS MAKE Rock 5/8 SIZE

ON	CONSUMER CHANGES	OFF
~~01/01/80~~ 9-25-85	PIL0003 PILLAR POINT INN, *r-installed* P.O. BOX 388 EL GRANADA CA 94018	

MI NO. 3005621 ROUTE NO. 03 010 SERVICE NO. 1194

COASTSIDE COUNTY WATER DIST. - HALF MOON BAY, CA



December 15, 1987

Mr. Robert Marchant
Marchant Enterprises, Inc.
P.O. Box 3068
Half Moon Bay, CA 94019

Dear Mr. Marchant:

The District has completed reviewing the preliminary conceptual building plans for your proposed Vacation/Conference Suite Complex. Our review was limited to plumbing fixtures shown on the plans. Prior to a complete analysis of the water demand the plumbing fixtures for the following areas will need to be developed: Irrigation; Conference Center; Restaurant; Spa; and Laundry facilities.

The water demand for the plumbing fixtures shown on the plans total 476 fixture units. This equates to a peak demand of one hundred and forty (140) gallons a minute. If this was the total demand for the complex a two inch connection would be required. However, a final connection size cannot be determined until the plans are completed to show water using fixtures in all areas.

I hope that this information is helpful. Please give me a call if you have any questions requiring further information.

Yours truly,

David L. Mier
Superintendent

cc: Robert R. Rathborne

GRANADA SANITARY DISTRICT
OF SAN MATEO COUNTY
P. O. BOX 335 EL GRANADA, CALIFORNIA 94018

PRINCETON EL GRANADA MIRAMAR

December 7, 1988

Marchant Enterprises, Inc.
P.O. Box 3068
Half Moon Bay, CA 94019

Ref: 2702-0012

Attention: Mr. Robert Marchant

SUBJECT: HOTEL ON CABRILLO HIGHWAY

Dear Mr. Marchant:

Pursuant to our meeting of November 22, 1988, this is to confirm our agreement that your proposed hotel will generate about 115 gallons per day (gpd) per unit. This figure was based on the median value of water consumption for similar hotels in the Bay Area.

Based on the above water consumption per unit, the total amount of connection fees payable to the District amounts to $112,398.19. Please note that if the actual water consumption exceeds the basis of the above charge, the District will invoice you for the additional charges at the District's prevailing rates. Please note also that the proposed hotel may be served by the existing sewer along Highway 1. Once the capacity question is resolved with the District for your development, please submit a site plan showing the actual connection point to the District's sewer. A clean-out structure must be installed on the hotel's lateral and at the parcel's property line. I have attached herein copies of applicable District's standards that should be complied with for the hotel's lateral construction.

Finally, please note that the above fees must be paid to the District at the time that a sewer connection permit is granted.

Please call if you have any questions.

Very truly yours,

GRANADA SANITARY DISTRICT

Kamil S. Azoury, P.E.
District Engineer

cc Judy McKenzie, GSD
William D. Esselstein, Esq.
William S. Heaslet, SAM

KSA:rv
2702#4:cabhotel

Appendix B

Water Well Logs

Domestic well

ENVIRONMENTAL HEALTH PERMIT

San Mateo County Department of Health Services
590 Hamilton Street, Redwood City, CA 94063

W-1-89
issued 1/3/89
1/5/89

Permit to construct a domestic well.

At 4100 N. Cabrillo Avenue, HMB, CA. 94019

No.	W-1-89
Date	applied 12/6/88
Fee paid	150.00
APN	047-252-300/310/320/330
Ordinance No.	03101

This permit has been granted to:
Marchant Enterprises, Inc.
P.O.Box 3068
Half-Moon Bay, Ca. 94019

Contractor: M.E. Seebeck and Sons
permit issued by Stan Low

M.E. Seebeck and Sons
P.O.Box 10
Clarksburgh, CA. 95612

For the Director of
Environmental Health

THIS PERMIT IS NONTRANSFERABLE AND MUST BE ON JOB SITE
Permit shall be void if construction is not started within 90 days of date of this permit.

Domestic Well

ENVIRONMENTAL HEALTH PERMIT

San Mateo County Department of Health Services
590 Hamilton Street, Redwood City, CA 94063

W-18-89
issued 2/14/89

Permit to construct a domestic well.

At 4100 N. Cabrillo, Half Moon Bay, Ca. 94019

No.	W-18-89
Date	applied 2/7/89
Fee paid	150.00
APN	047-252-300
Ordinance No.	03101

This permit has been granted to:
Marchant Enterprises Inc.
4100 Cabrillo Highway
Half Moon Bay, Ca. 94019

Contractor: Aqua Science Engineering Inc.
Permit issued by Ken Robinson

Aqua Science Engb. Inc.
P.O.Box 535
San Ramon, Ca. 94583

For the Director of
Environmental Health

THIS PERMIT IS NONTRANSFERABLE AND MUST BE ON JOB SITE
Permit shall be void if construction is not started within 90 days of date of this permit.

PERMIT # 357-88

COPY DISTRIBUTION:
- County Health Dept.
- City Building Inspector & Pub.Works
- Applicant
- City Planning Dept. (Original/file)

CITY OF HALF MOON BAY
501 MAIN STREET
HALF MOON BAY, CA 94019
415/726-5566

RECEIVED
NOV 17 1988
CITY MANAGERS
OFFICE HMB

APPLICATION FOR EXCEPTION TO ORDINANCE NO. 8-86 - WATER WELL MORATORIUM

Applicant Marchant Enterprises, Inc. Telephone 415 726-5702

P.O. Box 3068

Half Moon Bay, CA 94019

Date: 11/11/88 By (if agent): Robert Marchant

I HEREBY APPLY FOR EXCEPTION TO THE WATER WELL MORATORIUM ON THE BASIS OF:

X PRIORITY LAND USE, AS SET FORTH IN CHAPTER 10, PUBLIC WORKS COMPONENT, CITY OF HALF MOON BAY COASTAL LAND USE PLAN (Exception A, Ord. 8-86)

___ FAILURE OF EXISTING WELL, CAUSING UNDUE HARDSHIP (Exception B, Ord. 8-86)

The following is a detailed explanation of the condition under which application for exception is made (please be specific):

Location of proposed well (address and parcel number, if known):

4100 N. Cabrillo Highway APN 047-252-300/310/320/330

Location of existing failed well (if applicable): N/A

Detailed explanation of request: Request authorization to drill a well to provide water for a 54 unit hotel.

I hereby certify that the foregoing facts are true and complete to the best of my knowledge:

(Signature)

APPROVED:

CITY MANAGER

IF APPLICATION IS NOT APPROVED, A LETTER TO THAT EFFECT WILL BE FORWARDED TO APPLICANT FROM THE CITY OF HALF MOON BAY.

HMB-1046-86

ORIGINAL

File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Do not fill

No. 17574

Notice of Intent No.

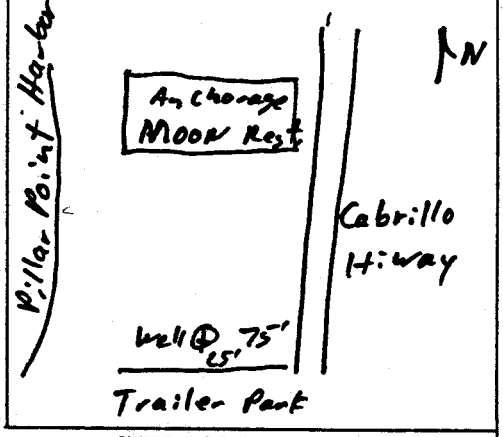
Local Permit No. or Date W-1-89

State Well No.

Other Well No.

(1) OWNER: Name Marchant Enterprises
Address P.O. Box 3068
City Half Moon Bay, CA 94018 Zip

(2) LOCATION OF WELL (See instructions):
County San Mateo Owner's Well Number No. 1
Well address if different from above Cabrillo Hiway
Township Range Section
Distance from cities, roads, railroads, fences, etc. 7,' from Highway 1



WELL LOCATION SKETCH

(3) TYPE OF WORK:
New Well ☒ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:
Domestic ☐
Irrigation ☐
Industrial ☒
Test Well ☐
Stock ☐
Municipal ☐
Other ☐

(5) EQUIPMENT:
Rotary ☒ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) GRAVEL PACK:
Yes ☒ No ☐ Size #3 sand
Diameter of bore 10"
Packed from 75 to 30 ft.

(7) CASING INSTALLED:
Steel ☐ Plastic ☒ Concrete ☐

From ft.	To ft.	Dia. in.	Gage or Wall
75	3	5	160

(8) PERFORATIONS:
Type of perforation or size of screen

From ft.	To ft.	Slot size
75	30	.032

(9) WELL SEAL:
Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 30 ft.
Were strata sealed against pollution? Yes ☒ No ☐ Interval 30' ft.
Method of sealing Bentonite

(10) WATER LEVELS:
Depth of first water, if known 23' ft.
Standing level after well completion ft.

(11) WELL TESTS:
Was well test made? Yes ☒ No ☐ If yes, by whom?
Type of test Pump ☒ Bailer ☐ Air lift ☐
Depth to water at start of test 23 ft. At end of test 70 ft
Discharge 5 gal/min after 24 hours Water temperature
Chemical analysis made? Yes ☐ No ☐ If yes, by whom?
Was electric log made? Yes ☒ No ☐ If yes, attach copy to this report

(12) WELL LOG: Total depth 75 ft. Depth of completed well 75

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	3	top soil
3	14	coarse sand
14	18	Brown sandy clay
18	38	Brown, sandy clay
38	41	Brownfine sand
41	46	loose 1/8" coarse sand
46	51	Blue sandy clay
51	62	hard silty clay w/shells
62	64	mud gray sandy clay
64	64½	shale
64½	70	hard shale
70	85	Sandy clay

Work started 28 Jan 1989 Completed 28 Jan 89

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of knowledge and belief.
SIGNED (Well Driller)
NAME Aqua Science Engineers (Person, firm, or corporation) (Typed or printed)
Address P.O. Box 535
City San Ramon, California 94583 Zip
License No. 487000 Date of this report Feb 30, 1989

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM 43816-950 7-76 50M QUAD

GEO-HYDRO-DATA

INCORPORATED

ELECTRIC WELL LOG

COMPANY MERCHANT ENTERPRISES
WELL NO. 1.
FIELD HALF MOON BAY
COUNTY SAN MATEO STATE CALIFORNIA

COMPANY MERCHANT ENTERPRISES
WELL NO. 1.
FIELD HALF MOON BAY
COUNTY SAN MATEO STATE CAL.

LOCATION
Sec. Twp. Rge.

TYPE LOG
SP, PR
6' Lat

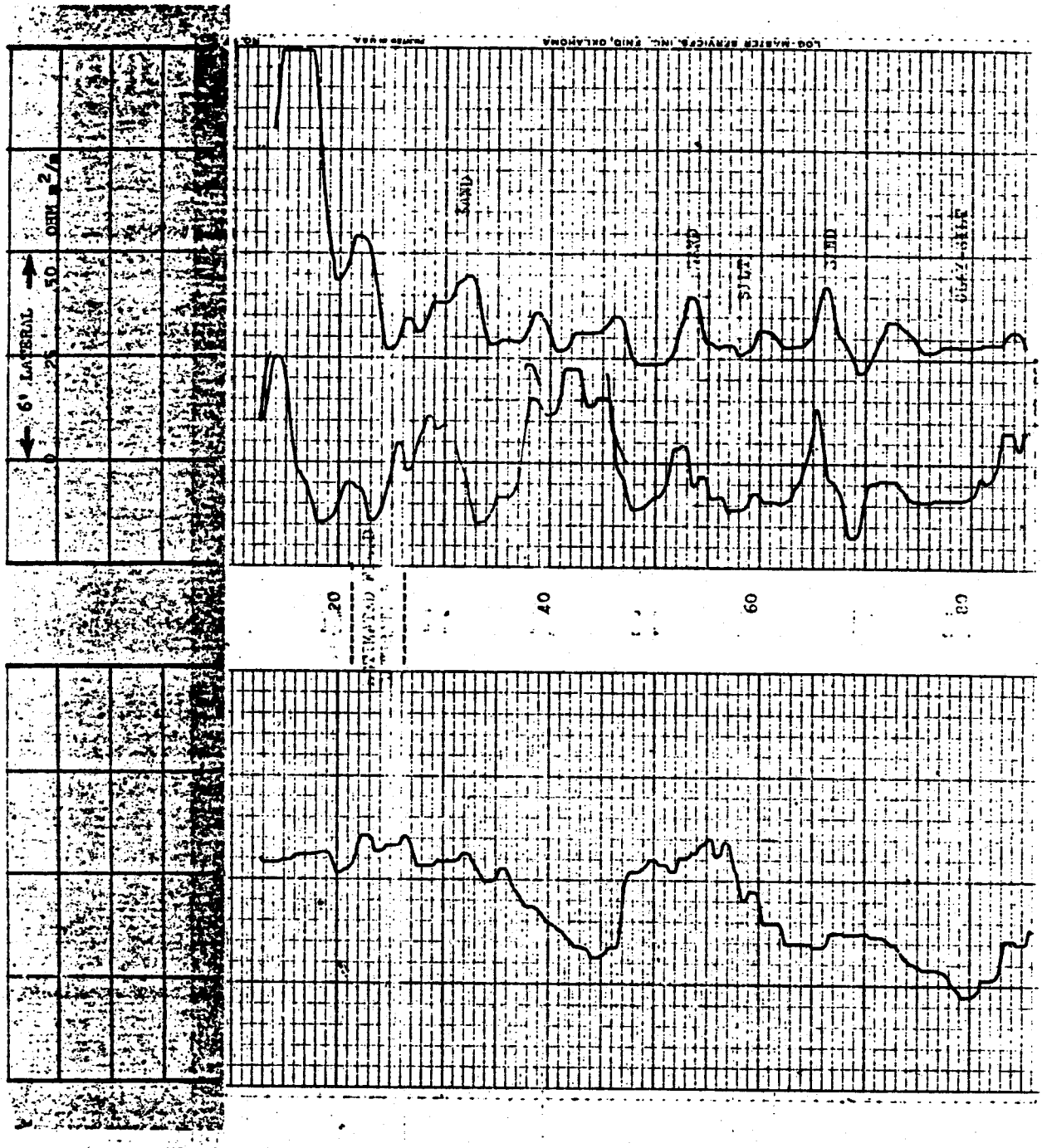
Permanent Datum GROUND LEVEL Elev.
Log Measured From G.L. 0 Ft. Above Perm. Datum
Drilling Measured From GROUND LEVEL

Elev.: K.B.
D.F.
G.L.

Date	28 Jan 89		
Run No.	one		
Depth — Driller	85 ft.	ft.	ft.
Depth — GHD	85 ft.	ft.	ft.
Btm. Log Inter.	85 ft.	ft.	ft.
Top Log Inter.	12 ft.	ft.	ft.
Casing — Driller	in. @ ft.	in. @ ft.	in. @ ft.
Casing — GHD	ft.	ft.	ft.
Bit Size	6 in. to 85 ft.	in. to ft.	in. to ft.
Bit Size	in. to ft.	in. to ft.	in. to ft.
Bit Size	in. to ft.	in. to ft.	in. to ft.
Type Fluid in Hole	clay-gel		
Source of Sample	pit		
PPM TDS	1,000		
Fluid Level	full ft.	ft.	ft.
Dens. / Visc.	/	/	/
pH / Fluid Loss	/ ml	/ ml	/ ml
Rm @ Meas. Temp.	@ °F	@ °F	@ °F
Rmf @ Meas. Temp.	@ °F	@ °F	@ °F
Rmc @ Meas. Temp.	@ °F	@ °F	@ °F
Time Since Circ.	1 hr.	hr.	hr.
Logging Speed	30 ft./min.	ft./min.	ft./min.
Tool Type and No.	combo 4		
Unit No.	5		
Location	Santa Cruz		
Invoice No.	6136		
Recorded By	Ken Kemp Registered Geologist		
Witnessed By	Mike King		
other			

P. O. Box 418 Tehachapi, California 93561 (805) 822-6876

M.J.KING


6' LATERAL
OHM M²/m
50
25
0
20
40
60
80

ORIGINAL

File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Do not fill i

No. 17575

Notice of Intent No.
Local Permit No. or Date W

State Well No.
Other Well No.

(1) OWNER: Name Merchant Enterprise
Address P.O. Box 3068
City Half Moon Bay, CA Zip 94018

(2) LOCATION OF WELL (See instructions):
County San Mateo Owner's Well Number #2
Well address if different from above Hiway 1, HMB
Township Range Section
Distance from cities, roads, railroads, fences, etc. 75' from Hiway 1

(12) WELL LOG: Total depth 80 ft. Depth of completed well 78 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	5'	Top soil
5'	40'	Tan silty sand
40'	45	Tan coarse sand
45'	50'	Gray Clay
50'	80'	Gray silty sand

(3) TYPE OF WORK:
New Well ☑ Deepening ☐
Reconstruction ☐
Reconditioning ☐
Horizontal Well ☐
Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:
Domestic ☐
Irrigation ☐
Industrial ☑
Test Well ☐
Stock ☐
Municipal ☐
Other ☐

WELL LOCATION SKETCH

(5) EQUIPMENT:
Rotary ☑ Reverse ☐
Cable ☐ Air ☐
Other ☐ Bucket ☐

(6) GRAVEL PACK:
Yes ☑ No ☐ Size #3 sand
Diameter of bore 10"
Packed from 78 to 30 ft.

(7) CASING INSTALLED:
Steel ☐ Plastic ☑ Concrete ☐

From ft.	To ft.	Dia. in.	Gage or Wall
28	0	6	160

(8) PERFORATIONS:
Type of perforation or size of screen

From ft.	To ft.	Slot size
78	30	.032

(9) WELL SEAL:
Was surface sanitary seal provided? Yes ☑ No ☐ If yes, to depth 30 ft.
Were strata sealed against pollution? Yes ☑ No ☐ Interval 30 ft.
Method of sealing Benton. Ex

(10) WATER LEVELS:
Depth of first water, if known 20' ft.
Standing level after well completion 24 ft.

(11) WELL TESTS:
Was well test made? Yes ☑ No ☐ If yes, by whom? M.J. Kiins
Type of test Pump ☑ Bailer ☐ Air lift ☐
Depth to water at start of test 24 ft. At end of test 34 ft
Discharge 4 gal/min after 24 hours Water temperature
Chemical analysis made? Yes ☑ No ☐ If yes, by whom? Sequoia
Was electric log made? Yes ☐ No ☑ If yes, attach copy to this report

Work started Feb 17 19 89 Completed Feb 17 19 89

WELL DRILLER'S STATEMENT:

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

SIGNED (Well Driller)
NAME Aqua Science Engineers (Person, firm, or corporation) (Typed or printed)
Address P.O. Box 58
City San Ramon, CA Zip 94583
License No. 487060 Date of this report 3/10/89

DWR 188 (REV. 7-76) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM 43916-950 7-76 50M QUAD ①T C

Appendix C

Water Pump Test Data/Analysis

MICHAEL J. KING
A PROFESSIONAL TECHNICAL AGENCY
520 Arballo Drive
San Franciso, CA 94132
(415) 585-9516

MARCHANT ENTERPRISES PUMPING WELL NO. 1, 24-HOUR PUMP TEST

1.0 Introduction

A 24-hour (1,441 minute) pump test was conducted on February 4 and 5, 1989 of Marchant Enterprises Pumping Well Number 1. This well is located near the center of the southern property boundary, about 100 feet westerly of the edge of the terrace adjacent to the southern end of Pillar Point Harbor, San Mateo County, California. The purpose of the test was to demonstrate that the well was capable of sustaining a specific flow rate for a 24-hour period.

During the 24-hour constant rate pump test MARCHANT Pumping Well No. 1 was pumped at an average rate of 5.41 (std. dev. = 0.19) gallons per minute (GPM) and experienced a hydraulically stable water level with a maximum drawdown in the well of about 17 feet. A tidal influence on water levels was noted during the pump test. The well screen is reported to be set from 35 to 75 feet below ground (bgs) surface and therefore based on the static water at the beginning of the test (17.61 feet bgs) the water level was drawn down to about 0.4 feet above the top of the screen.

2.0 Pump Test Conditions

The 24-hour (1,441 minute) constant rate (5.41 GPM) pump test was conducted on February 4 and 5, 1989 using MARCHANT ENTERPRSES Well Number 1 as the pumping well. The pumping well had been previously constructed using 5-inch PVC casing and screen.

Depth to static water at 07:39 on the morning of February 4, 1989 was 17.61 feet below the north lip of the well casing as present during the test.

The well test was performed using a Grundfos Model 40S15-5 submersible pump with a 1 1/2 HP Franklin Motor. Discharge was controlled using a flexible membrane orifice control valve.

Constancy of flow through this device is within a few percent and is periodically checked during the progress of the test. Water levels in the well during the constant rate test were measured employing a 50-PSI submersible electronic pressure transducer. Transducer power was provided using an electronic data logger which recorded the transducer analog output signal. Pump test data was processed using the proprietary software LOGOMAT which converts data logger memory into compatible graphic software data files as well as into a readable alpha-numeric format.

The pump test was conducted as a constant rate (5.41 GPM) drawdown test after buildup following an attempt to perform the test at about 10 GPM. At 10 GPM the water level in the well was drawn down close to the pump intake at 73 feet below ground surface within about 40 minutes. The 5.41 GPM test lasted from 1321 HRS on 02/04/89 when the pump test began to 1322 HRS on 02/05/89 when the test was turned off. Recovery was monitored for the 60 minutes following pump shutdown. The pump test data and the recovery data are presented in the Attachment.

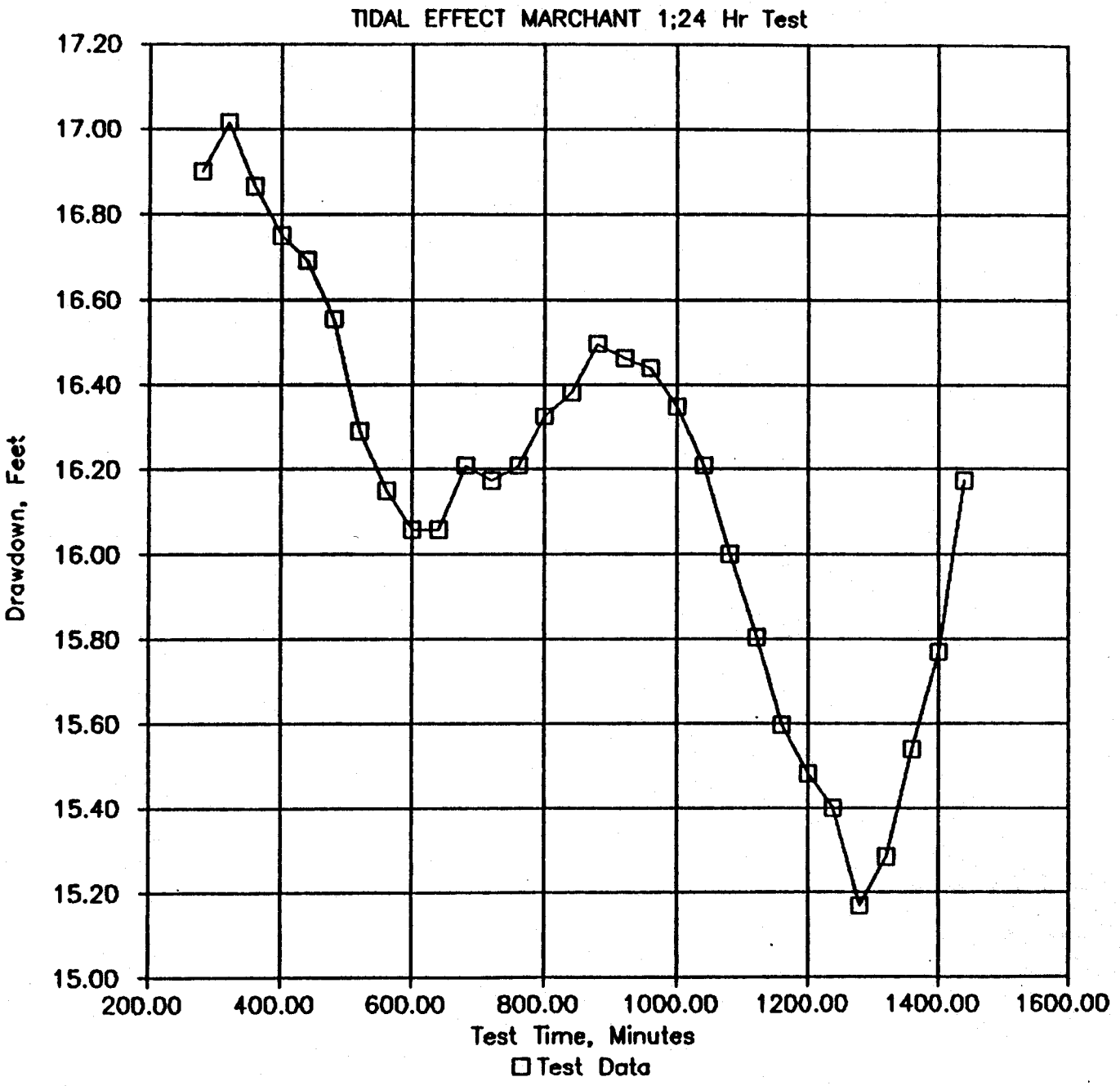
3.0 Certification of Pump Test

The MARCHANT ENTERPRISES Pumping Well No. 1 is capable of pumping groundwater from the aquifer at a rate of about 5 GPM based on this 24-hour pump test.

I certify that I have conducted the above described 24-hour pump test of the MARCHANT ENTERPRISES Pumping Well No. 1, located near the center of the southern property boundry, and that this well produced an average 5.41 gallons per minute throughout the duration of the 24-hour constant rate pump test and that the maximium drawdown during the test was 17.02 feet.

Gary D. Lowe, R.G.
California Registered Geologist 3768

REGISTERED GEOLOGIST
STATE OF CALIFORNIA


TIDAL EFFECT MARCHANT 1;24 Hr Test
17.20
17.00
16.80
16.60
16.40
16.20
16.00
15.80
15.60
15.40
15.20
15.00
Drawdown, Feet
200.00
400.00
600.00
800.00
1000.00
1200.00
1400.00
1600.00
Test Time, Minutes
Test Data

M.J.KING

CONSTANT RATE PUMP TEST DRAWDOWN DATA

Marchant Property Pillar Point Harbor - Well No. 1

Pump Test Date(s)/Time(s) - Begin: 1321 hrs. 02/04/89.
End: 1322 hrs. 02/05/89.
Pump Test Duration: 1,441 minutes.

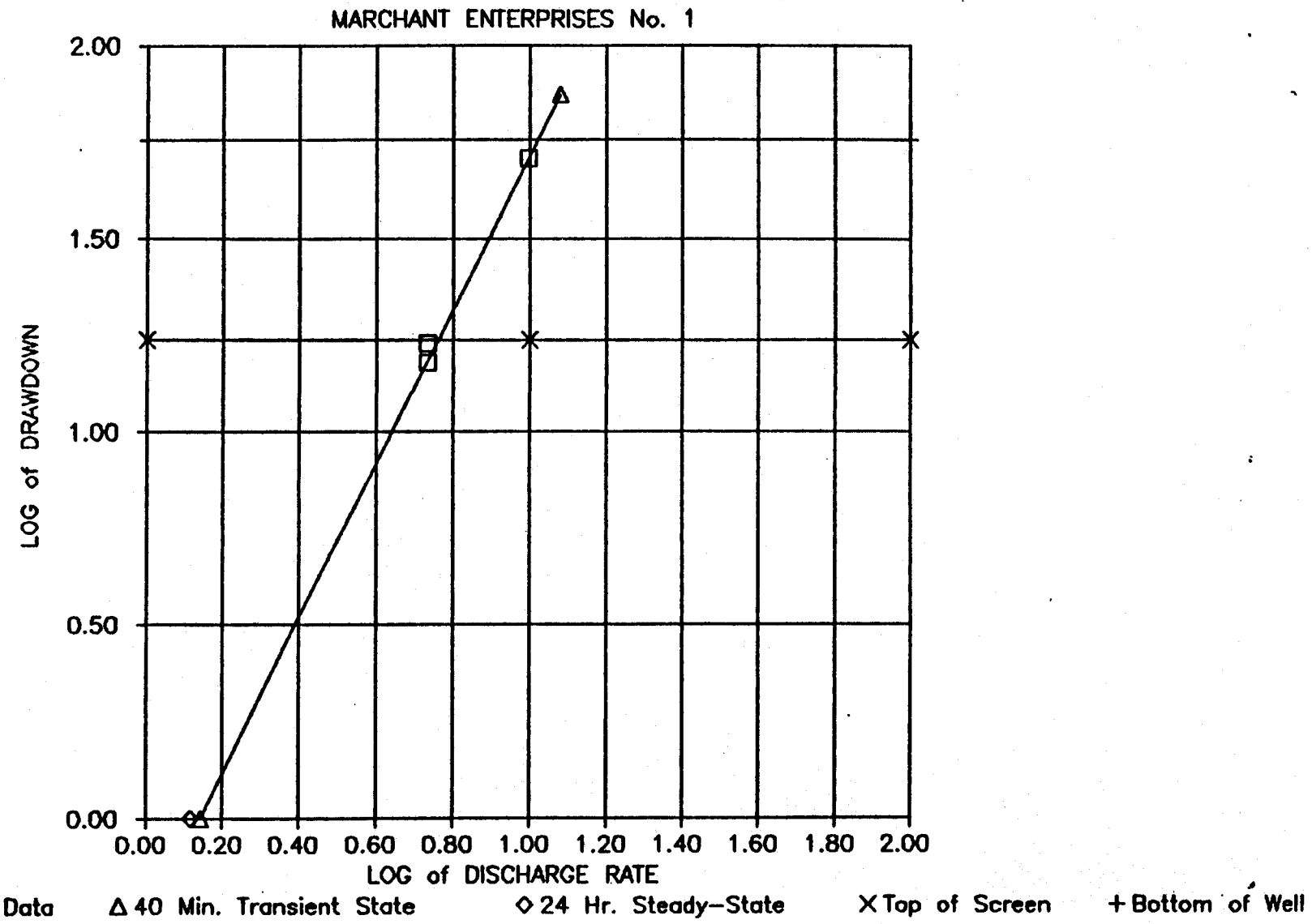
Average Discharge Rate = 5.41 GPM.

Wellbore radius (r) = 0.5 feet.
Depth to static water below casing
top reference mark = 17.61 feet, 0739 hrs. 02/04/89

Elapsed Step Time (min.)	Pumping Well No. 1 Drawdown feet)	1/t	r2/t
0.05	2.3452	.1999E+02	.4998E+01
0.10	3.9625	.9998E+01	.2500E+01
0.15	4.6788	.6666E+01	.1666E+01
0.20	4.7943	.5000E+01	.1250E+01
0.25	5.1755	.4000E+01	.9999E+00
0.30	5.2564	.3333E+01	.8333E+00
0.35	5.5799	.2857E+01	.7143E+00
0.40	5.6607	.2500E+01	.6250E+00
0.45	5.7531	.2222E+01	.5555E+00
0.50	6.0997	.2000E+01	.5000E+00
0.60	6.3885	.1667E+01	.4167E+00
0.70	6.7582	.1429E+01	.3571E+00
0.80	6.9084	.1250E+01	.3125E+00
0.90	7.1626	.1111E+01	.2778E+00
1.00	7.5438	.1000E+01	.2500E+00
1.50	8.6644	.6667E+00	.1667E+00
2.00	9.6463	.5000E+00	.1250E+00
2.50	10.4897	.4000E+00	.1000E+00
3.00	11.1482	.3333E+00	.8333E-01
3.50	11.6680	.2857E+00	.7143E-01
4.00	11.9915	.2500E+00	.6250E-01
4.50	12.4767	.2222E+00	.5556E-01
5.00	12.6846	.2000E+00	.5000E-01
6.00	13.1121	.1667E+00	.4167E-01
7.00	13.3778	.1429E+00	.3571E-01
8.00	13.6666	.1250E+00	.3125E-01
9.00	13.7475	.1111E+00	.2778E-01
10.00	13.9554	.1000E+00	.2500E-01
11.00	14.0941	.9091E-01	.2273E-01
12.00	14.1865	.8333E-01	.2083E-01

Elapsed Step Time (min.)	Pumping Well No. 1 Drawdown feet)	1/t	r2/t
13.00	14.2442	.7692E-01	.1923E-01
14.00	14.4753	.7143E-01	.1786E-01
15.00	14.4984	.6667E-01	.1667E-01
20.00	14.7294	.5000E-01	.1250E-01
25.00	14.8796	.4000E-01	.1000E-01
30.00	15.1684	.3333E-01	.8333E-02
35.00	15.0760	.2857E-01	.7143E-02
40.00	15.1684	.2500E-01	.6250E-02
50.00	15.2840	.2000E-01	.5000E-02
60.00	15.5728	.1667E-01	.4167E-02
70.00	15.5728	.1429E-01	.3571E-02
80.00	15.8038	.1250E-01	.3125E-02
90.00	15.8269	.1111E-01	.2778E-02
100.00	16.0926	.1000E-01	.2500E-02
110.00	16.2659	.9091E-02	.2273E-02
130.00	16.4392	.7692E-02	.1923E-02
150.00	16.6703	.6667E-02	.1667E-02
170.00	16.5201	.5882E-02	.1471E-02
190.00	16.5778	.5263E-02	.1316E-02
210.00	16.6934	.4762E-02	.1190E-02
230.00	16.7858	.4348E-02	.1087E-02
250.00	16.8089	.4000E-02	.1000E-02
280.00	16.9013	.3571E-02	.8929E-03
320.00	17.0168	.3125E-02	.7813E-03
360.00	16.8667	.2778E-02	.6944E-03
400.00	16.7511	.2500E-02	.6250E-03
440.00	16.6934	.2273E-02	.5682E-03
480.00	16.5547	.2083E-02	.5208E-03
520.00	16.2890	.1923E-02	.4808E-03
560.00	16.1504	.1786E-02	.4464E-03
600.00	16.0580	.1667E-02	.4167E-03
640.00	16.0580	.1563E-02	.3906E-03
680.00	16.2082	.1471E-02	.3676E-03
720.00	16.1735	.1389E-02	.3472E-03
760.00	16.2082	.1316E-02	.3289E-03
800.00	16.3237	.1250E-02	.3125E-03
840.00	16.3814	.1190E-02	.2976E-03
880.00	16.4970	.1136E-02	.2841E-03
920.00	16.4623	.1087E-02	.2717E-03
960.00	16.4392	.1042E-02	.2604E-03
1000.00	16.3468	.1000E-02	.2500E-03
1040.00	16.2082	.9615E-03	.2404E-03
1080.00	16.0002	.9259E-03	.2315E-03
1120.00	15.8038	.8929E-03	.2232E-03
1160.00	15.5959	.8621E-03	.2155E-03
1200.00	15.4804	.8333E-03	.2083E-03

Elapsed Step Time (min.)	Pumping Well No. 1 Drawdown feet)	1/t	r2/t
1240.00	15.3995	.8065E-03	.2016E-03
1280.00	15.1684	.7813E-03	.1953E-03
1320.00	15.2840	.7576E-03	.1894E-03
1360.00	15.5381	.7353E-03	.1838E-03
1400.00	15.7692	.7143E-03	.1786E-03
1440.00	16.1735	.6944E-03	.1736E-03


MARCHANT ENTERPRISES No. 1
2.00
1.50
1.00
0.50
0.00
LOG of DRAWDOWN
0.00 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
LOG of DISCHARGE RATE
□ Test Data
Δ 40 Min. Transient State
◇ 24 Hr. Steady-State
X Top of Screen
+ Bottom of Well

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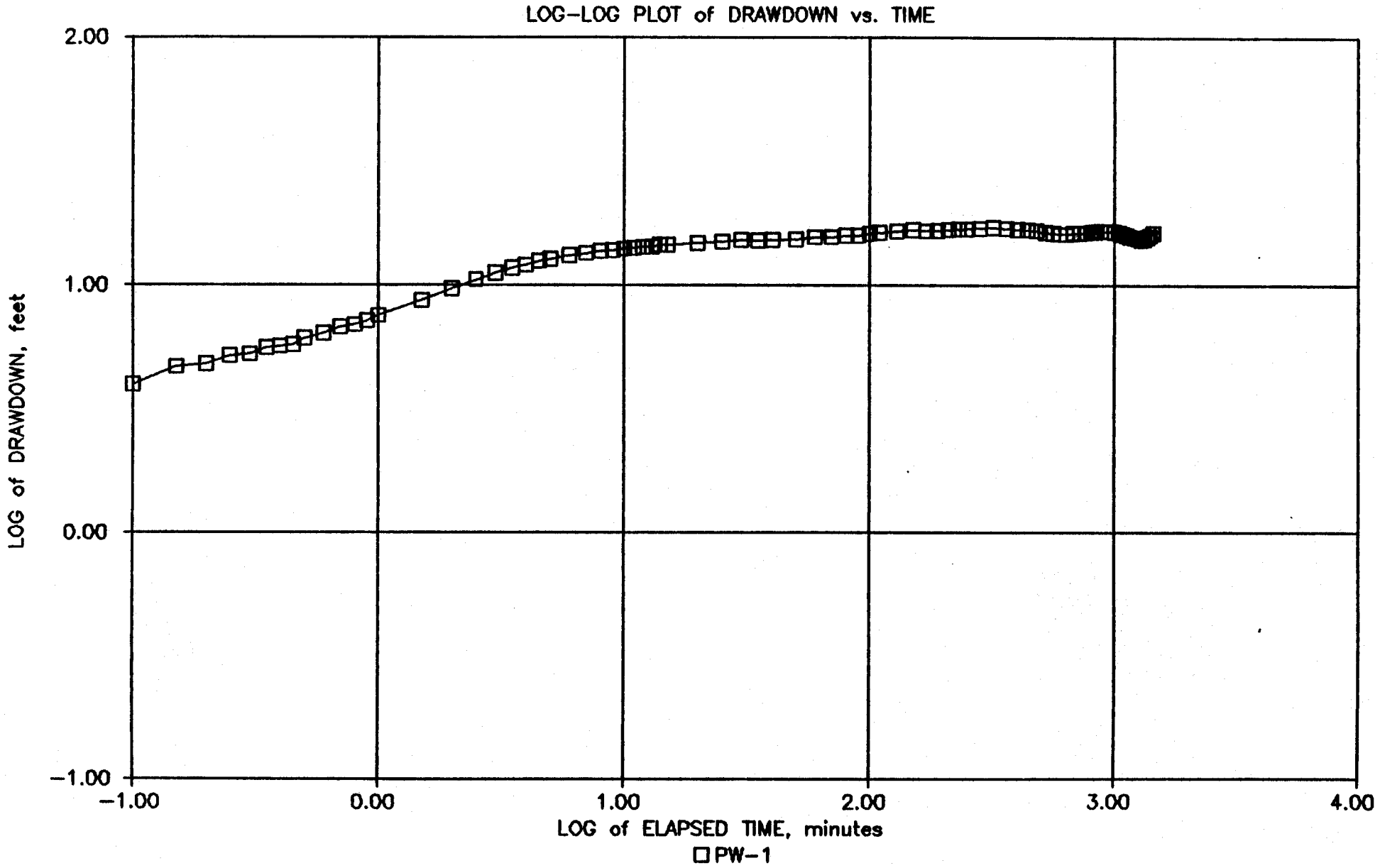
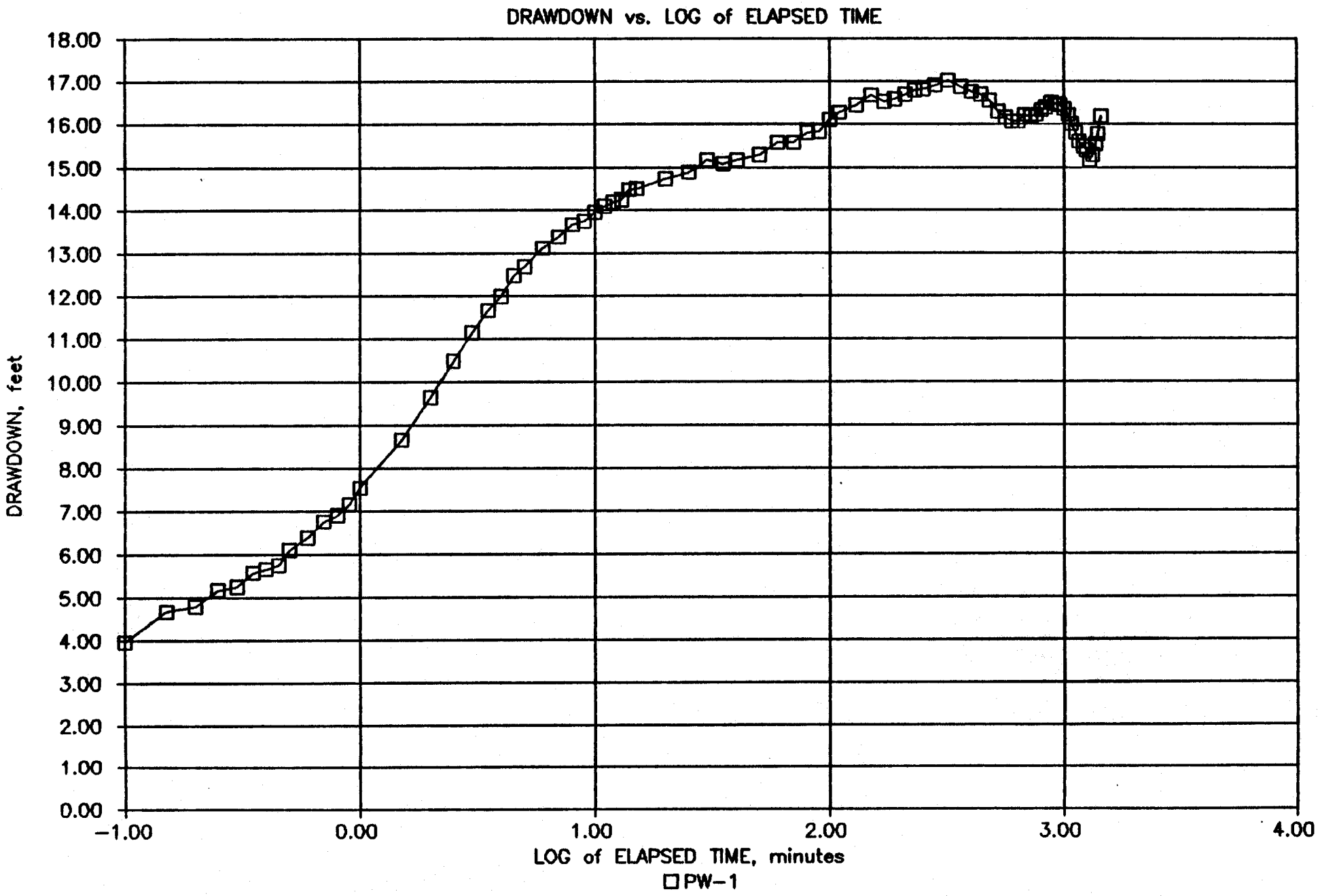

LOG–LOG PLOT of DRAWDOWN vs. TIME
2.00
1.00
0.00
−1.00
LOG of DRAWDOWN, feet
−1.00
0.00
1.00
2.00
3.00
4.00
LOG of ELAPSED TIME, minutes
PW−1


DRAWDOWN vs. LOG of ELAPSED TIME
DRAWDOWN, feet
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
−1.00
0.00
1.00
2.00
3.00
4.00
LOG of ELAPSED TIME, minutes
PW−1

PUMP TEST RECOVERY DATA

Marshon Property Pillar Point Harbor - Well 1.

Pump On: 1321 hrs 02/04/89.
Pump off: 1322 hrs 02/05/89.

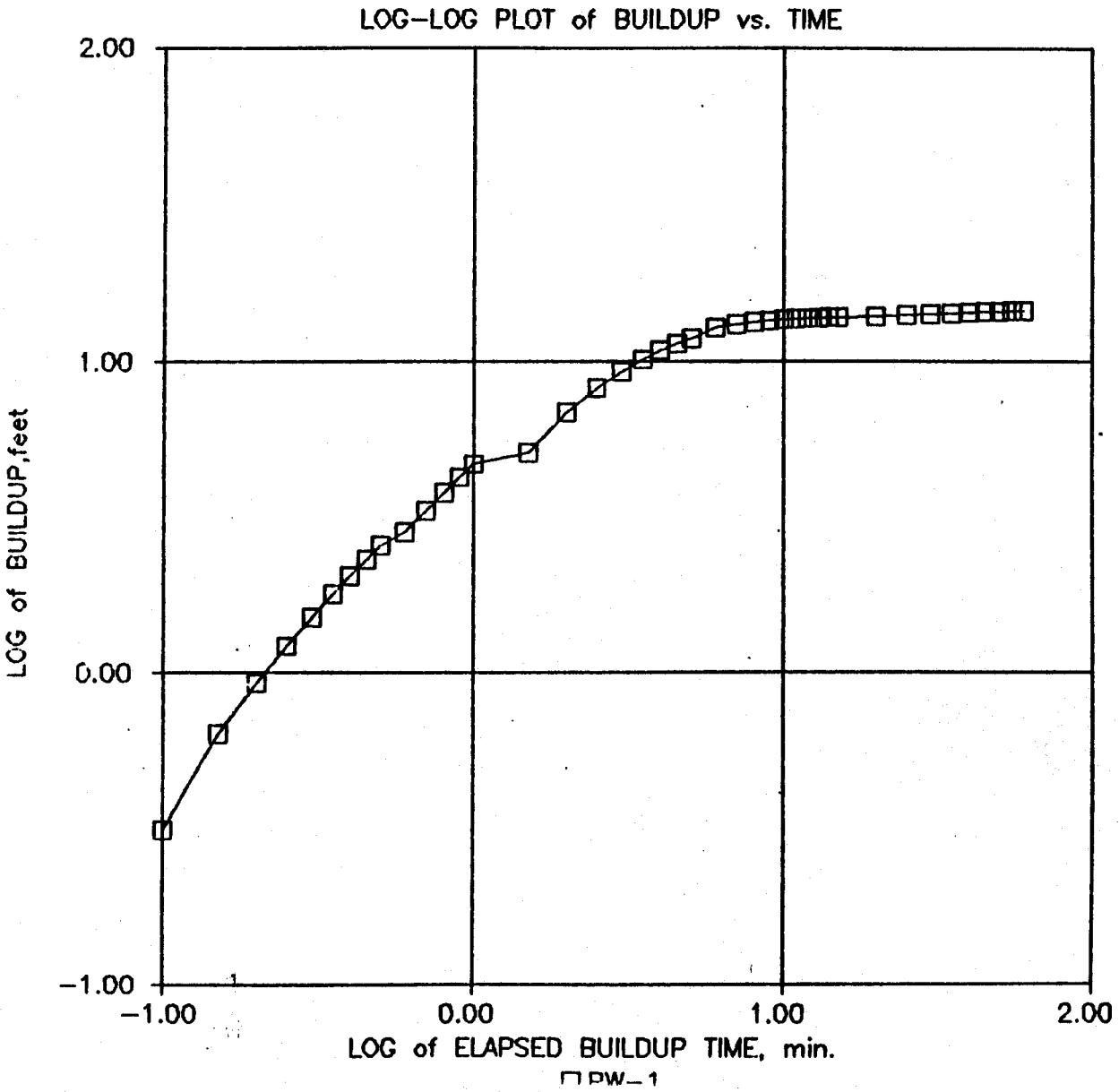
Average Discharge Rate = 5.41 GPM.

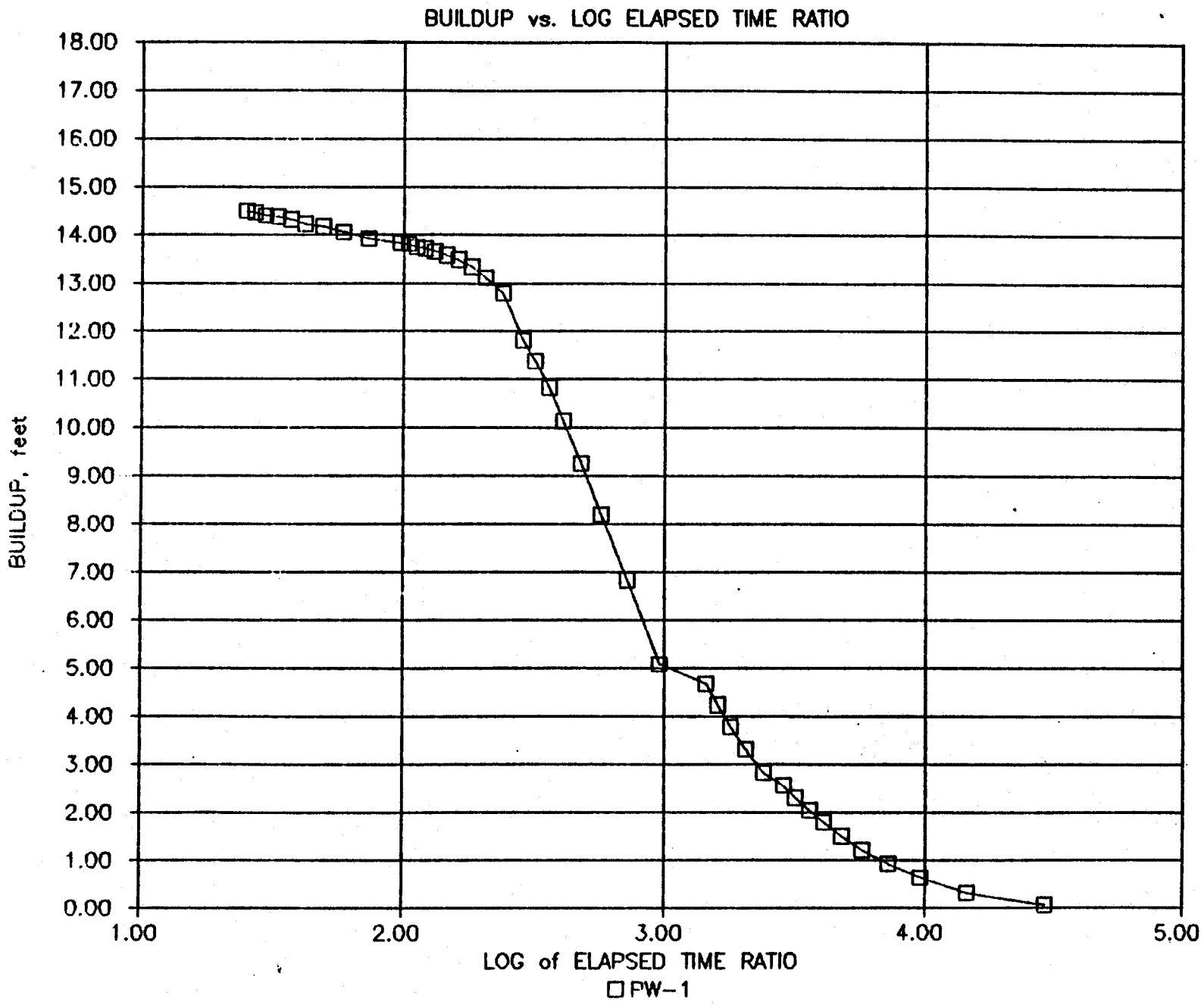
Discharge Duration = 1441 minutes.

Elapsed Recovery Time t' (mins.)	Elapsed Time Ratio t/t'	Pumping Well No. 1 Residual Drawdown (feet) Channel 1
0.05	28811.40	1 16.12
0.10	14408.60	1 15.86
0.15	9606.60	1 15.54
0.20	7205.40	1 15.25
0.25	5764.62	1 14.96
0.30	4804.07	1 14.67
0.35	4117.95	1 14.38
0.40	3603.35	1 14.13
0.45	3203.10	1 13.86
0.50	2882.90	1 13.61
0.60	2402.60	1 13.34
0.70	2059.52	1 12.86
0.80	1802.21	1 12.40
0.90	1602.08	1 11.93
1.00	1441.98	1 11.49
1.50	961.66	1 11.09
2.00	721.49	1 9.33
2.50	577.40	1 7.97
3.00	481.33	1 6.91
3.50	412.71	1 6.04
4.00	361.25	1 5.35
4.50	321.22	1 4.79
5.00	289.20	1 4.37
6.00	241.17	1 3.38
7.00	206.86	1 3.06
8.00	181.13	1 2.83
9.00	161.11	1 2.69
10.00	145.10	1 2.60
11.00	132.00	1 2.52
12.00	121.08	1 2.46
13.00	111.85	1 2.43
14.00	103.93	1 2.37
15.00	97.07	1 2.35

Elapsed Recovery Time t' (mins.)	Elapsed Time Ratio t/t'	Pumping Well No. 1 Residual Drawdown (feet) Channel 1
20.00	73.05 1	2.25
25.00	58.64 1	2.11
30.00	49.03 1	2.00
35.00	42.17 1	1.94
40.00	37.03 1	1.85
45.00	33.02 1	1.79
50.00	29.82 1	1.77
55.00	27.20 1	1.71
60.00	25.02 1	1.68

M.J.KING


LOG-LOG PLOT of BUILDUP vs. TIME
2.00
1.00
0.00
-1.00
LOG of BUILDUP,feet
-1.00
0.00
1.00
2.00
LOG of ELAPSED BUILDUP TIME, min.
PW-1


BUILDUP vs. LOG ELAPSED TIME RATIO
BUILDUP, feet
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
1.00
2.00
3.00
4.00
5.00
LOG of ELAPSED TIME RATIO
PW-1

M.J. KING

MICHAEL J. KING
A PROFESSIONAL TECHNICAL AGENCY
520 Arballo Drive
San Franciso, CA 94132
(415) 585-9516

MARCHANT ENTERPRISES
PUMPING WELL NO. 2,
24-HOUR PUMP TEST

1.0 Introduction

A 24-hour (1,440 minute) pump test was conducted on March 4 and 5, 1989 of Marchant Enterprises Pumping Well Number 2. This well is located near the center of the northern property boundary, about 100 feet easterly of the edge of the terrace adjacent to the southern end of Pillar Point Harbor, San Mateo County, California. The 24-hour test was conducted as an extended third step of a variable rate test. The purpose of the 24-hour third step of the test was to demonstrate that the well was capable of sustaining a specific flow rate for a 24-hour period.

The first step of the variable rate test was conducted at an average rate of 1.79 gallons per minute (GPM) and lasted 60 minutes between 0821 and 0921 on 03/04/89. The drawdown at the end of the first step was 3.6 feet. The second step of the variable rate test was conducted from 0921 and 1021 at an average rate of 3.26 GPM. The second step drawdown was 6.3 feet. The data from the variable rate test are not reported as this requires additional data analysis and processing beyond the scope of this 24-hour pump test.

During the 24-hour constant rate test step MARCHANT Pumping Well No. 2 was pumped at an average rate of 4.00 (std. dev. = 0.13) gallons per minute (GPM) and experienced a hydraulically stable water level with a maximum drawdown in the well of about 9.1 feet. A tidal influence on water levels was noted during the pump test. The well screen is reported to be set from 40 to 78 feet below ground surface (bgs) and therefore based on the static water at the beginning of the test (23.24 feet below casing top) the water level was drawn down to about 7 feet above the top of the screen.

2.0 Pump Test Conditions

The variable rate pump test and the 24-hour (1,440 minute) constant rate (4.00 GPM) test step was conducted on March 4 and 5, 1989 using MARCHANT ENTERPRSES Well Number 2 as the pumping well. The pumping well had been previously constructed using 5-inch PVC casing and screen.

Depth to static water at 07:19 on the morning of March 4, 1989 was 23.24 feet below the north lip of the well casing as present during the test.

The well test was performed using a Grundfos Model SP2-12 submersible pump with a 1/2 HP Franklin Motor. Discharge was controlled using a flexible membrane orifice control valve. Constancy of flow through this device is within a few percent and is periodically checked during the progress of the test. Water levels in the well during the constant rate test were measured employing a 50-PSI submersible electronic pressure transducer. Transducer power was provided using an electronic data logger which recorded the transducer analog output signal. Pump test data was processed using the proprietary software LOGOMAT which converts data logger memory into compatible graphic software data files as well as into a readable alpha-numeric format.

The pump test was conducted as a constant rate (4.00 GPM) drawdown test after 120 minutes of pumping at lower rates as described above. The 4.00 GPM portion of the test lasted from 1021 HRS on 03/04/89 when the 4.00 GPM step began to 1021 HRS on 03/05/89 when the test was turned off. Recovery was monitored for the 60 minutes following pump shutdown. The 4.00 GPM step test data and the recovery data are presented in the Attachment.

3.0 Certification of Pump Test

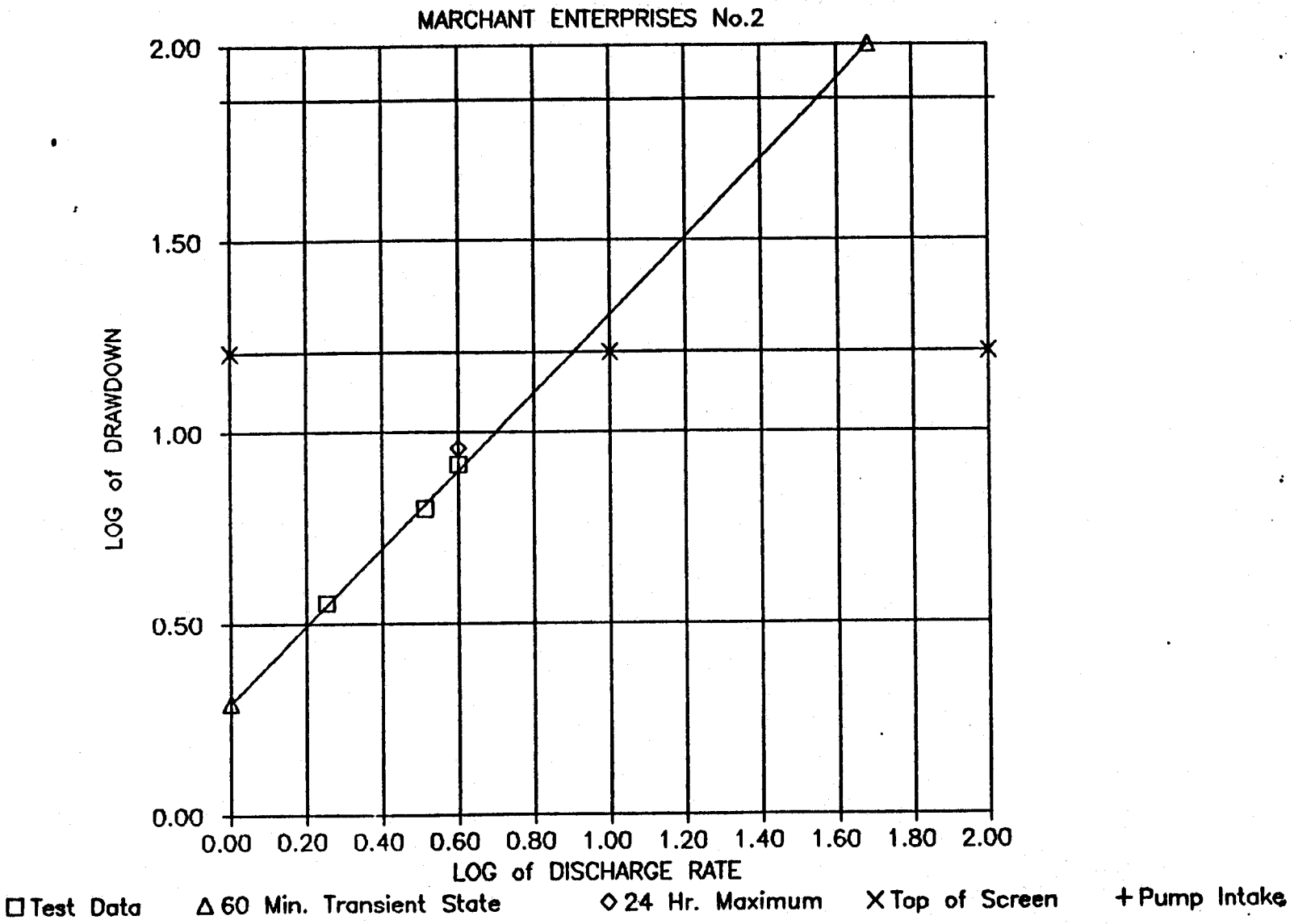
The MARCHANT ENTERPRISES Pumping Well No. 2 is capable of pumping groundwater from the aquifer at a rate of about 5 GPM based on this 24-hour pump test.

I certify that I have conducted the above described 24-hour pump test of the MARCHANT ENTERPRISES Pumping Well No. 2, located near the center of the northern property boundry, and that this well produced an average 4.00 gallons per minute throughout the duration of the 24-hour constant rate test step and that the maximium drawdown during the test was 9.06 feet.

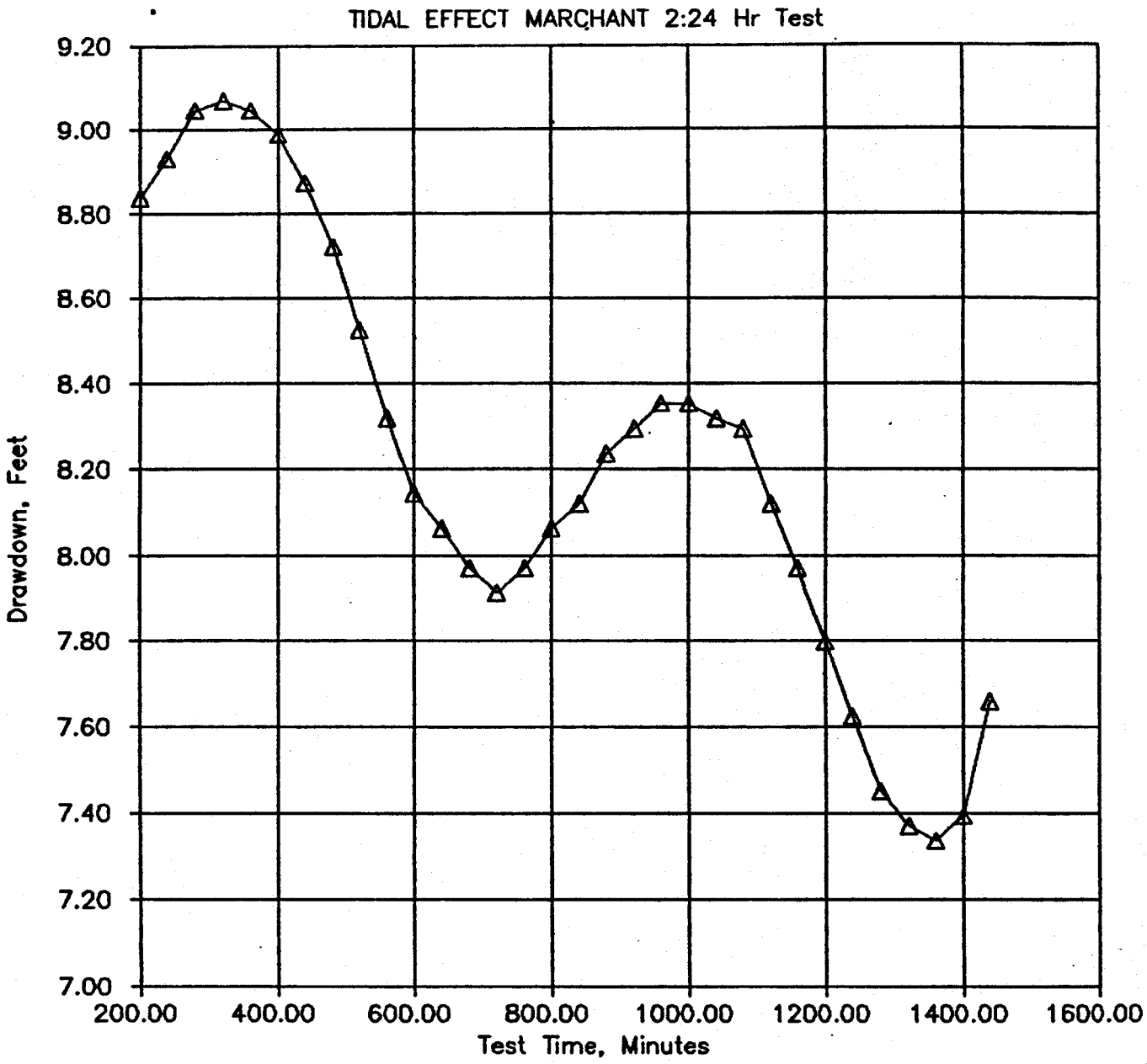
Gary D. Lowe, R.G.
California Registered Geologist 3768

REGISTERED GEOLOGIST
GARY D. LOWE
NO. 3768
STATE OF CALIFORNIA

M.J.KING

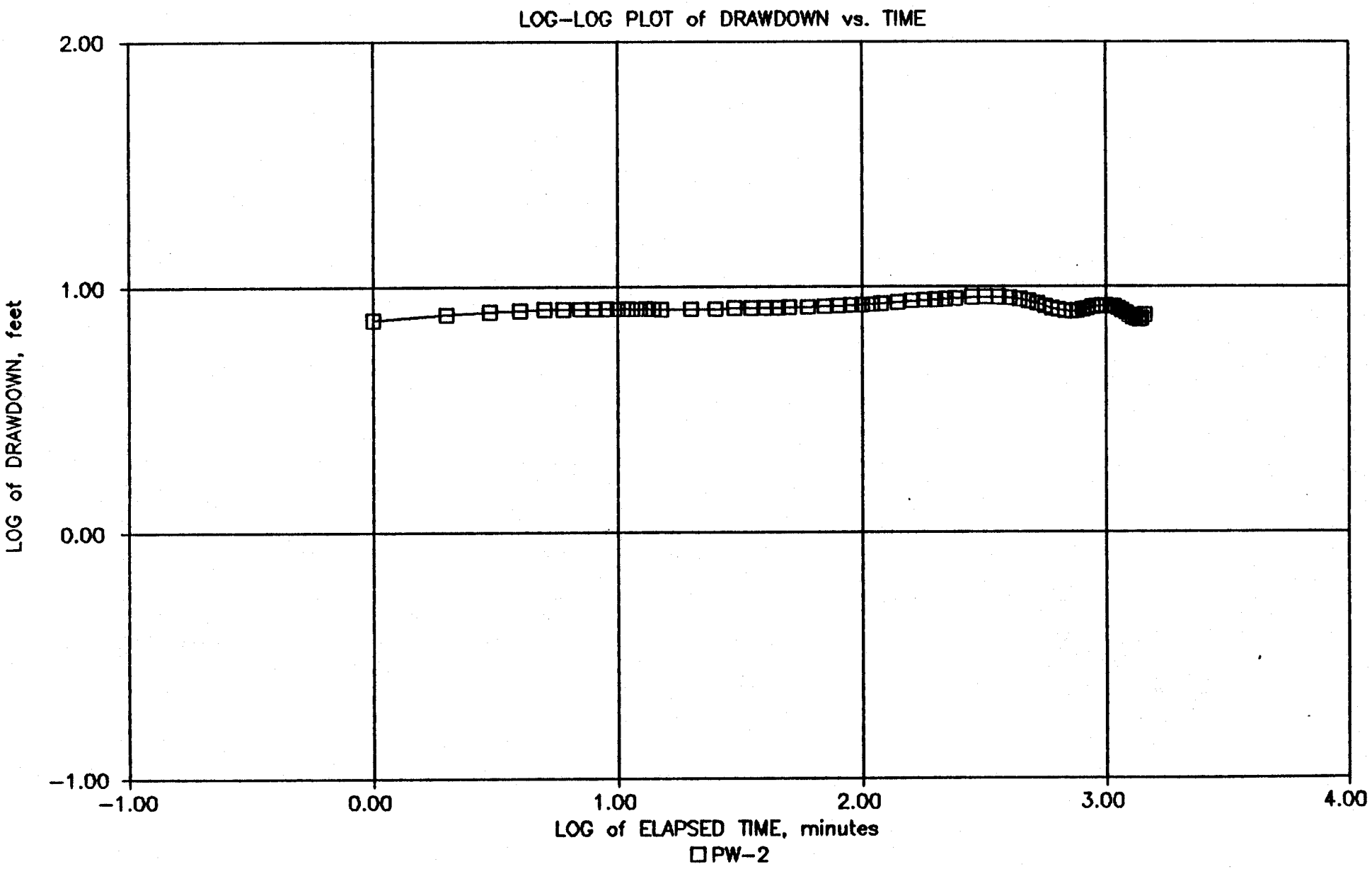

MARCHANT ENTERPRISES No.2
2.00
1.50
1.00
0.50
0.00
LOG of DRAWDOWN
0.00 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
LOG of DISCHARGE RATE
□ Test Data
Δ 60 Min. Transient State
◇ 24 Hr. Maximum
X Top of Screen
+ Pump Intake

M.J.KING


TIDAL EFFECT MARCHANT 2:24 Hr Test
9.20
9.00
8.80
8.60
8.40
8.20
8.00
7.80
7.60
7.40
7.20
7.00
Drawdown, Feet
200.00
400.00
600.00
800.00
1000.00
1200.00
1400.00
1600.00
Test Time, Minutes

M.J.KING

Elapsed Step Time (min.)	Pumping Well Drawdown (feet)	1/t	r2/t
90.00	8.4102	.1111E-01	.2778E-02
100.00	8.4333	.1000E-01	.2500E-02
110.00	8.4680	.9091E-02	.2273E-02
120.00	8.5257	.8333E-02	.2083E-02
140.00	8.6413	.7143E-02	.1786E-02
160.00	8.7568	.6250E-02	.1563E-02
180.00	8.8146	.5556E-02	.1389E-02
200.00	8.8377	.5000E-02	.1250E-02
220.00	8.8723	.4545E-02	.1136E-02
240.00	8.9301	.4167E-02	.1042E-02
280.00	9.0456	.3571E-02	.8929E-03
320.00	9.0687	.3125E-02	.7813E-03
360.00	9.0456	.2778E-02	.6944E-03
400.00	8.9878	.2500E-02	.6250E-03
440.00	8.8723	.2273E-02	.5682E-03
480.00	8.7221	.2083E-02	.5208E-03
520.00	8.5257	.1923E-02	.4808E-03
560.00	8.3178	.1786E-02	.4464E-03
600.00	8.1445	.1667E-02	.4167E-03
640.00	8.0636	.1563E-02	.3906E-03
680.00	7.9712	.1471E-02	.3676E-03
720.00	7.9135	.1389E-02	.3472E-03
760.00	7.9712	.1316E-02	.3289E-03
800.00	8.0636	.1250E-02	.3125E-03
840.00	8.1214	.1190E-02	.2976E-03
880.00	8.2369	.1136E-02	.2841E-03
920.00	8.2947	.1087E-02	.2717E-03
960.00	8.3525	.1042E-02	.2604E-03
1000.00	8.3525	.1000E-02	.2500E-03
1040.00	8.3178	.9615E-03	.2404E-03
1080.00	8.2947	.9259E-03	.2315E-03
1120.00	8.1214	.8929E-03	.2232E-03
1160.00	7.9712	.8621E-03	.2155E-03
1200.00	7.7979	.8333E-03	.2083E-03
1240.00	7.6246	.8065E-03	.2016E-03
1280.00	7.4514	.7813E-03	.1953E-03
1320.00	7.3705	.7576E-03	.1894E-03
1360.00	7.3358	.7353E-03	.1838E-03
1400.00	7.3936	.7143E-03	.1786E-03
1440.00	7.6593	.6944E-03	.1736E-03


LOG-LOG PLOT of DRAWDOWN vs. TIME
2.00
1.00
0.00
-1.00
LOG of DRAWDOWN, feet
-1.00
0.00
1.00
2.00
3.00
4.00
LOG of ELAPSED TIME, minutes
PW-2

PUMP TEST RECOVERY DATA

Marchant Property Pillar Point Harbor - Well 2.

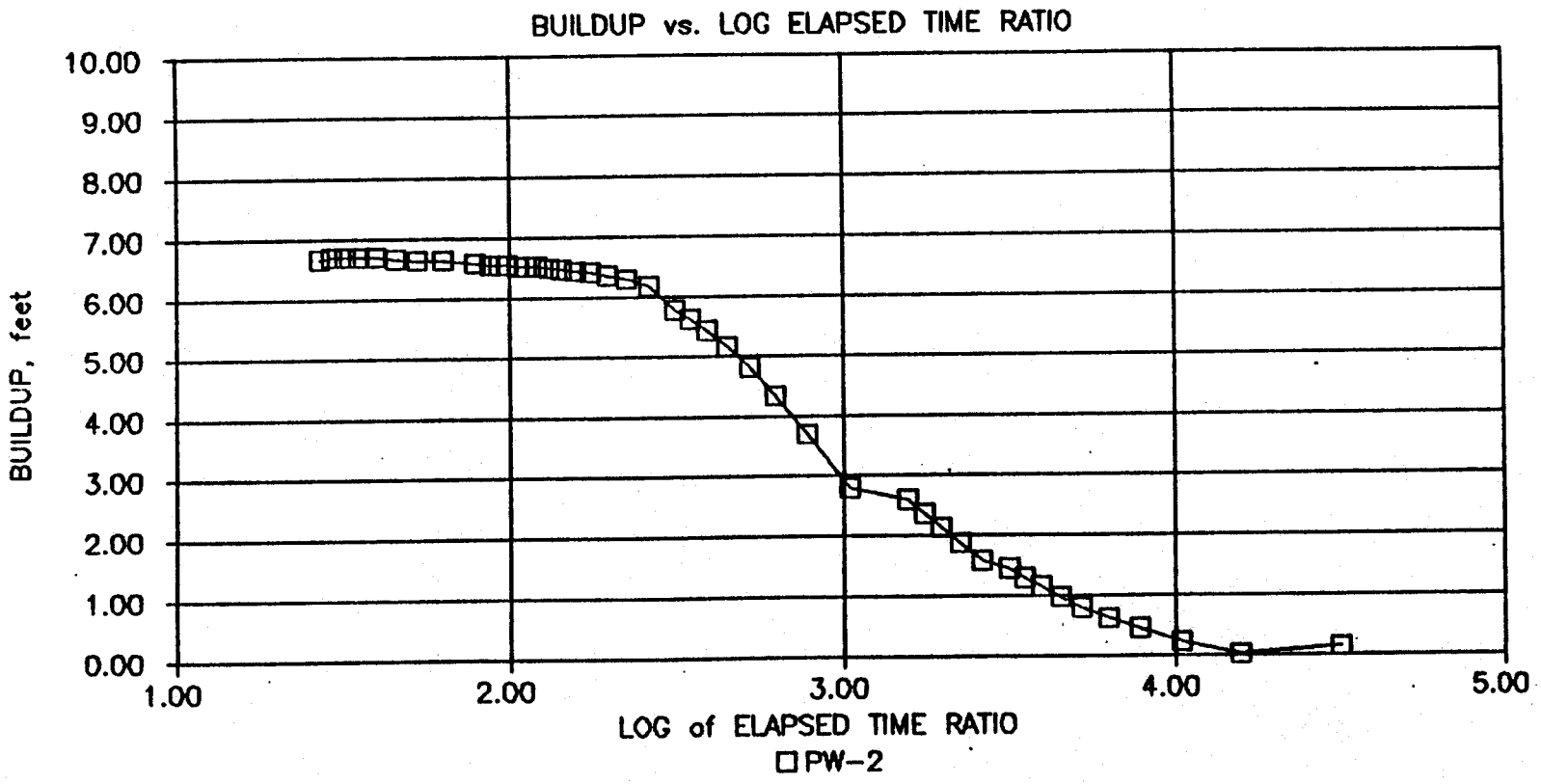
Pump On: 0821 hrs 03/04/89.
Pump off: 1021 hrs 03/05/89.

Average Discharge Rate = 3.89 GPM.

Discharge Duration = 1560 minutes.

Elapsed Recovery Time t' (mins.)	Elapsed Time Ratio t/t'	Pumping Well No. 1 Residual Drawdown (feet) Channel 1
0.05	31170.61	7.05
0.10	15588.40	6.87
0.15	10393.18	6.67
0.20	7795.35	6.43
0.25	6236.58	6.26
0.30	5197.38	6.09
0.35	4455.07	5.91
0.40	3898.34	5.74
0.45	3465.32	5.60
0.50	3118.90	5.45
0.60	2599.26	5.31
0.70	2228.09	5.03
0.80	1949.71	4.76
0.90	1733.19	4.53
1.00	1559.97	4.30
1.50	1040.32	4.10
2.00	780.49	3.20
2.50	624.60	2.56
3.00	520.66	2.08
3.50	446.43	1.73
4.00	390.75	1.47
4.50	347.44	1.27
5.00	312.80	1.12
6.00	260.83	0.72
7.00	223.71	0.60
8.00	195.88	0.54
9.00	174.22	0.49
10.00	156.90	0.46
11.00	142.73	0.43
12.00	130.92	0.40
13.00	120.92	0.37
14.00	112.36	0.37
15.00	104.93	0.37

Elapsed Recovery Time t' (mins.)	Elapsed Time Ratio t/t'	Pumping Well No. 1 Residual Drawdown (feet) Channel 1	
20.00	78.95	1	0.31
25.00	63.36	1	0.25
30.00	52.97	1	0.25
35.00	45.54	1	0.23
40.00	39.97	1	0.20
45.00	35.64	1	0.20
50.00	32.18	1	0.20
55.00	29.35	1	0.20
60.00	26.98	1	0.23


BUILDUP vs. LOG ELAPSED TIME RATIO
BUILDUP, feet
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
1.00
2.00
3.00
4.00
5.00
LOG of ELAPSED TIME RATIO
PW-2

M.J.KING

Appendix D
Water Quality Analysis

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

TITLE 22 CHEMICAL ANALYSES

Date of Report: 2-27-89	Lab Sample ID Number: 9020647
Laboratory Name: Sequoia Analytical	Signature Lab Director: Scott Cocam
Name of Sampler:	Sampler Employed By:
Date/Time Sample Collected: 2-5-89 1500	Date/Time Sample Received at Lab.: 2-6-89 2300
Were Holding Times Observed?: Yes	
System Name: M.J. King & Associates	System Number:
Description of Sampling Point: Hosebib Near Well	
Name/Number of Sample Source: Highway El Granada Well #1	Station Number:
Date and Time of Sample: 8 9 0 2 0 5 1 5 0 0 (Y Y M M D D T T T T)	Water Type: G (G/S)
User ID:	Submitted to SWQIS By:

MCL	Reporting Units	Constituent	TT	Storet Code	Analyses Results
		Analyzing Agency (Laboratory)		28	
	mg/L	Total Hardness (as CaCO3)		900	260
	mg/L	Calcium (Ca)		916	48
	mg/L	Magnesium (Mg)		927	33
	mg/L	Sodium (Na)		929	96
	mg/L	Potassium (K)		937	
Total Cations	meq/L	Value: 9.4			
	mg/L	Total Alkalinity (as CaCO3)		410	
	mg/L	Hydroxide (OH)		71830	<0.001
	mg/L	Carbonate (CO3)		445	<0.5
	mg/L	Bicarbonate (HCO3)		440	98
*	mg/L +	Sulfate (SO4)		945	38
*	mg/L +	Chloride (Cl)		940	210
45	mg/L	Nitrate (NO3)		71850	<0.1
1.4–2.4	mg/L	Fluoride (F) Temp. Depend.		951	0.61
Total Anions	meq/L	Value: 9.3			
	Std Units	pH (Laboratory)		403	8.6
**	umho/cm +	Specific Conductance (E.C.)		95	1000
***	mg/L +	Total Filterable Residue at 180° C (TDS)		70300	570
	UNITS	Apparent Color (Unfiltered)		81	30
	TON	Odor Threshold at 60° C		80	1.0
	NTU	Lab Turbidity		82079	7.5
0.5	mg/L +	MBAS		38260	0.04

* 250–500–600 ** 900–1600–2200 *** 500–1000–1500

SYSTEM NAME AND NUMBER M.J. King & Associates 9020647

*** THE FOLLOWING CONSTITUENTS ARE REPORTED IN UG/L ***

MCL	Reporting Units	Constituent	T	Storet Code	Analyses Results
50	ug/L	Arsenic (As)		1002	< 1 0
1000	ug/L	Barium (Ba)		1007	1 1 0
10	ug/L	Cadmium (Cd)		1027	< 1
50	ug/L	Chromium (Total Cr)		1034	< 5
1000	ug/L+	Copper (Cu)		1042	< 1 0
300	ug/L+	Iron (Fe)		1045	1 5 0 0
50	ug/L	Lead (Pb)		1051	< 5
50	ug/L+	Manganese (Mn)		1055	9 0 0
2	ug/L	Mercury (Hg)		71900	< 1
10	ug/L	Selenium (Se)		1147	< 5
50	ug/L	Silver (Ag)		1077	< 1 0
5000	ug/L	Zinc (Zn)		1092	1 8

ORGANIC CHEMICALS

0.2	ug/L	Endrin		39390	< 0 . 0 1
4	ug/L	Lindane		39340	< 0 . 4
100	ug/L	Methoxychlor		39480	< 1 0
5	ug/L	Toxaphene		39400	< 0 . 5
100	ug/L	2, 4–D		39730	< 1 0
10	ug/L	2, 4, 5–TP Silvex		39045	< 1 . 0
		Date ORGANIC Analyses Completed		73672	8 9 0 2 1 7 (Y Y M M D D)

ADDITIONAL ANALYSES

NTU	Field Turbidity		82078	
C	Source Temperature		10	
	Langelier Index Source Temp.		71814	
	Langelier Index at 60° C		71813	
Std. Units	Field pH		00400	
	Aggressiveness Index		82383	
mg/L	Silica		00955	
mg/L	Phosphate		00650	
mg/L	Iodide		71865	
	Sodium Absorption Ratio		00931	
	Asbestos		81855	

\+ Indicates Secondary Drinking Water Standards

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

RADIOACTIVITY ANALYSES

Date of Report: 2-27-89	Lab Sample ID No. 9020647
Laboratory Name: Sequoia Analytical	Signature of Lab Director:
Name of Sampler:	Sampler Employed By:
Date/Time Sample Collected: 2-5-89 1500	Date/Time Sample Received @ Lab: 2-6-89 1300
Were Holding Times Observed: Yes	
System Name: M.J. King & Associates	System Number:
Description of Sampling Point: Hosebib Near Well	
Name/No. of Sample Source: Highway 1 El Granada	Station Number:
Date & of Time Sample: 8 9 0 2 0 5 1 5 0 0 (Y Y M M D D T T T T)	Water Type: G (G/S)
User ID:	Submitted to SWQIS By:

MCL	REPORTING UNITS	CONSTITUENT	TT	STORET CODE	ANALYSES RESULTS
		Analyzing Agency		28	
		Date Analyses Completed		73672	8 9 0 2 1 7 (Y Y M M D D)
5	pC/l	Total Alpha		1501	0
	PC/l	Total Alpha Counting Error		1502	1.3
50	pC/l	Total Beta		3501	
	pC/l	Total Beta Counting Error		3502	
	pC/l	Natural Uranium		28012	
3	pC/l	Total Radium 226		9501	
	pC/l	Total Radium 226 Counting Error		9502	
	pC/l	Total Radium 228		11501	
	pC/l	Total Radium 228 Counting Error		11502	
5	pC/l	Ra 226 + Ra 228		11503	
	pC/l	Ra 226 + Ra 228 Counting Error		11504	
20,000	pC/l	Total Tritium		7000	
	pC/l	Total Tritium Counting Error		7001	
8	pC/l	Total Strontium-90		13501	
	pC/l	Total Strontium-90 Counting Error		13502	

SEQUOIA ANALYTICAL

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Michael J. King	Client Project ID:	Merchant Interprises	Sampled:	Feb 5, 1989
520 Asballo Drive	Sample Descript:	Water, Hwy 1 El Granada	Received:	Feb 6, 1989
San Francisco, CA 94132		Well #1		
Attention: Michael King	Lab Number:	902-0601	Reported:	Feb 6, 1989

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Chloride	0.1	210

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

9020601.MMM <1>

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
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M J King & Associates	Client Project ID:	Marchant Enterprises - Hwy 1 - El Granada - Well # 1	
520 Asballo Drive	Sample Descript:	Water	
San Francisco, CA 94132	Analysis Method:	Membrane Filtration	
Attention: Michael King	First Sample #:	902-0647	Reported: Feb 22, 1989

BACTERIOLOGICAL ANALYSIS: TOTAL COLIFORM

Sample Number	Date Sampled and Received	Sample Description	Total Coliform Bacteria CFU/100 mL
902-0647	2/5/89	Hwy 1 - El Granada Well # 1	10

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

Please Note:
The State of California Drinking Water Standard is less than one Colony Forming Unit (CFU) per 100 mL.

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
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M.J. King	Client Project ID:	Marchant Enterprises - Hwy 1, Half Moon Bay	
520 Arballo Drive	Sample Descript:	Water	
San Francisco, CA 94132	Analysis Method:	Membrane Filtration	
Attention: Mike King	First Sample #:	903-0611	Reported: Mar 8, 1989

BACTERIOLOGICAL ANALYSIS: TOTAL COLIFORM

Sample Number	Date Sampled and Received	Sample Description	Total Coliform Bacteria CFU/100 mL
903-0611	3/6/89	Marchant Enterprise Repeat	<1

SEQUOIA ANALYTICAL

for Arthur G. Burton
Laboratory Director

Please Note:
The State of California Drinking Water Standard is less than one Colony Forming Unit (CFU) per 100 mL.

9030611.KKK <1>

Well No. 2

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

M.J. King	Client Project ID:	Marchant Enterprise	Sampled:	Feb 26, 1989
520 Arballo Drive	Sample Descript:	Water, Half Moon Bay	Received:	Feb 27, 1989
San Francisco, Ca 94132			Analyzed:	N/A
	Lab Number:	902-2857	Reported:	Mar 6, 1989

DOMESTIC WELL WATER ANALYSIS

Analyte	Detection Limit mg/L (ppm)	Sample Results mg/L (ppm)
Chloride	0.5	160
Iron	0.01	1.2
Manganese	0.01	0.29
Nitrate as NO3	1.0	N.D.
Specific Conductance (umhos/cm)	1.0	770
Total Coliform Bacteria (CFU/100 mL)	1.0	<1

CALIFORNIA DRINKING WATER STANDARDS (TITLE 22)

Chloride, mg/L	250
Iron, mg/L	0.3
Manganese, mg/L	0.05
Nitrate as NO3, mg/L	45
Specific Conductance (umhos/cm)	900
Total Coliform Bacteria (CFU/100 mL)	<1

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

9022857.KKK <1>