EXHIBIT 6-A

PUEBLO water resources

April 6, 2007
Project No. 06-0061

Monterey Peninsula Water Management District
Post Office Box 85
Monterey, California 93942-0085

Attention: Mr. Joe Oliver

Subject: Draft Summary of Operations Report, Water Year 2006, Santa Margarita Test Injection Well

Dear Mr. Oliver:

We are transmitting 1 electronic copy (PDF) of the subject draft report documenting the testing of the Santa Margarita Test Injection Well (SMTIW) during Water Year 2006 (WY2006). This well will be referred to as SMTIW No. 1 in future documents as the District's SMTIW No. 2 is currently under construction. We believe that the WY2006 program was an overall success. Well hydraulic performance was stable throughout the injection season, with a total of 411 acre-feet of water diverted for injection testing operations in the Seaside Basin. This volume represents approximately 14 percent of the basin's estimated annual natural 'safe yield'.

We appreciate the opportunity to provide assistance to the District on this important project, and look forward to discussing the SMTIW results and potential for expansion of the District's Aquifer Storage and Recovery program in the Seaside Basin.

Sincerely,

PUEBLO WATER RESOURCES, INC.

Stephen P. Tanner, P.E.
Principal Engineer

Robert C. Marks, P.G., C.Hg.
Principal Hydrogeologist

Copies submitted: (1 electronic)

PUEBLO water resources

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INTRODUCTION

GENERAL STATEMENT

Presented in this report are the principal findings, conclusions, and recommendations resulting from hydrogeologic testing of the Santa Margarita Test Injection Well (SMTIW) during Water Year 2006 (WY2006). The SMTIW project is part of the Monterey Peninsula Water Management District's (District) ongoing study of Aquifer Storage and Recovery (ASR) in the Seaside Groundwater Basin. The well site is located on a parcel leased by the District on the former Fort Ord property along General Jim Moore Boulevard in the northeast corner of the City of Seaside, California, and is shown on Plate 1 - Site Location Map.

WY2006 injection testing at the SMTIW was intermittently performed during the period of January 4 to May 24, 2006. A total volume of approximately 411 acre-feet (AF) of Carmel River system water was successfully diverted for injection testing operations in the Santa Margarita Sandstone aquifer of the Seaside Groundwater Basin during the period at average injection rates ranging between approximately 980 and 1,115 gallons per minute (gpm) (approximately 4.2 to 4.9 acre-feet per day).

BACKGROUND

The District has undertaken a Water Supply Augmentation Plan, which includes the evaluation of the feasibility of injecting treated water originating from the Carmel River and Carmel Valley aquifer system into the aquifer system in the Seaside Basin (a.k.a. Aquifer Storage and Recovery [ASR]). In general, the ASR concept involves the diversion, treatment, and conveyance of excess winter flows of the Carmel River system to the Seaside Groundwater Basin for injection and storage. The water is delivered via Cal-Am's existing distribution system, which connects Carmel Valley to the Seaside/Monterey area. During periods of high demand, the same well(s) used for injection and/or existing Cal-Am production wells are used to recover the stored water. The injected water could ultimately restore groundwater conditions in the Basin and increase the Basin yield, which would reduce extractions on the Carmel River system during dry periods and preserve fisheries habitat in critical reaches of the river.

The SMTIW was constructed and preliminarily tested in the spring of 2001 (documented in a report prepared by Padre Associates, dated May 2002). The well is constructed to a total depth of 720 feet, and is perforated solely in the Santa Margarita Sandstone aquifer to accurately assess the hydrogeologic conditions of this formation for injection/recovery. The design injection rate of the SMTIW is approximately 1,000 gpm. An as-built schematic of the SMTIW is presented on Plate 2 - As-Built Well Schematic.

Formal testing of the SMTIW has been performed in WY2002, WY2003, WY2004, and WY2005 with a total of approximately 856 acre-feet (AF) of water successfully injected into the Seaside Groundwater Basin with the SMTIW through WY2005. Testing and analyses conducted to date has confirmed that the design operational injection rate of 1,000 gpm (approximately 4.4 acre-feet per day) is sustainable and is recommended for ongoing injection operation of the SMTIW.

Testing has also indicated that a second well at the site could feasibly be operated simultaneously with the SMTIW, thereby increasing the overall injection capacity of the existing site. Previous analyses have indicated that two wells at the site could feasibly inject 2,500 gpm (11 acre-feet per day) combined, and possibly up to 3,000 gpm, without inducing undesirable effects (i.e., water 'daylighting' at the ground surface or hydrofracture of confining layers).

An Environmental Impact Report was recently certified for an expanded SMTIW project, known as the Phase 1 ASR Project (Project). As part of this Project, a second ASR well, known as SMTIW No. 2, was recently (March 2007) constructed approximately 280 feet from SMTIW No.1. Preliminary testing indicates that it will be capable of its design capacities of 1,500 gpm injection and 3,000 gpm production[1].

PURPOSE AND SCOPE

The overall purpose of the ongoing SMTIW program is to further demonstrate the capabilities and limitations of injection, storage, and recovery of treated Carmel River system water in the Santa Margarita Sandstone aquifer of the Seaside Groundwater Basin. The scope of work for the WY2006 SMTIW testing program was developed through discussions with Mr. Joseph W. Oliver, C.Hg., Senior Hydrogeologist with the District; and included the following:

- Assessment of data needs and development of the WY2006 hydrogeologic and water quality testing program.
- Oversight and field assistance with injection and water quality testing program implementation.

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[1] A Summary of Operations Report documenting the construction and production testing of SMTIW No. 2 will be presented in a separate report.

- Coordination and implementation of formal well rehabilitation[2].
- Preparation of a Summary of Operations Report documenting the test program, procedures, and results, including recommendations for further analysis and subsequent test phases.

FINDINGS

INJECTION TESTING

WY2006 injection operations at the SMTIW were performed during the period of January 4 to May 24, 2006, with a total of approximately 411 acre-feet (AF) of water successfully diverted from CAW sources in Carmel Valley for injection testing operations in the Seaside Groundwater Basin during the period.

Injection Testing Procedures

Injection feed water was potable water provided from the Cal-Am distribution system, and was conveyed from Carmel Valley water sources through the Cal-Am distribution system to the Cal-Am Paralta Well site, and finally to the SMTIW through a temporary aboveground 12-inch-diameter HDPE line that was installed as part of the WY2002 capital improvements program.

Injection water was introduced into the SMTIW via the pump column. Injection rates were controlled by a flow control valve at the Luzern booster pump, two gate valves on the SMTIW wellhead piping, and the downhole flow control valve (FCV) in the SMTIW. Positive gauge pressures were maintained at the wellhead during injection testing to prevent cascading of water into the well. Injection flow rates and total injected volumes were measured with a 12-inch-diameter totalizing meter. Water levels in the SMTIW were measured with the District's pressure transducer coupled to a data logger.

Injection Testing Summary

Seventeen (17) separate injection tests were conducted during WY2006 at average rates ranging between approximately 946 and 1,114 gpm. The water level data collected during the injection testing are presented on Plates 3 through 19. Field data sheets collected during testing are presented in Appendix A - Field Data Sheets (not included in draft). A summary of pertinent injection testing results is presented below in Table 1 - WY2006 Injection Testing Summary.

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[2] Rehabilitation of SMTIW No. 1 had not yet been implemented as of this writing; documentation of

Table 1. WY2006 Injection Testing Summary

Test No.	Dates	Duration (days)	Avg. Injection Rate (gpm)	Total Volume[1] (AF)	SWL (ft btoc)	Final IWL (ft btoc)	Final DUP (ft)
1	1-4 thru 1-7	2.7	1,039	13.2	360.1	281.9	78.2
2	1-7 thru 1-9	1.7	1,114	8.6	354.5	280.2	74.3
3	1-9 thru 1-13	3.8	1,094	18.3	358.6	260.6	98.0
4	1-13 thru 1-19	5.7	1,092	27.6	357.1	257.8	99.3
5	1-19 thru 1-26	6.9	978	29.6	356.4	274.1	82.3
6	1-26 thru 1-31	5.0	974	21.5	355.4	279.2	76.2
7	2-27 thru 3-7	7.1	1,082	34.1	354.7	272.9	81.8
8	3-7 thru 3-14	6.8	1,024	30.7	353.1	284.1	69.0
9	3-14 thru 3-21	6.8	1,018	30.7	352.9	263.9	89.0
10	3-21 thru 3-28	6.4	1,017	30.7	352.7	254.0	98.7
11	3-28 thru 4-4	6.8	1,023	30.9	350.5	276.3	74.2
12	4-4	0.25	1,089	1.2	350.7	282.0	68.7
13	4-5 thru 4-13	7.9	1,015	35.6	350.2	270.1	80.1
14	4-13 thru 4-20	7.0	992	30.7	350.9	269.2	81.7
15	4-20 thru 4-27	6.9	1,020	30.9	350.2	269.9	80.3
16	4-27 thru 5-4	6.8	1,008	30.3	349.7	281.2	68.5
17	5-23 thru 5-24	0.9	946	3.8	355.2	291.2	64.0
			WY2006 TOTAL	**408.4 AF**			

Notes
1 Values represent total volumes injected during each test, and do not include minor (less than 0.2 AF) amounts of line flushing to percolation pit prior to each test. Total combined diversions from CAW system for injection and line flushing was 411.35 AF.
btoc below top of casing
SWL Static Water Level
IWL Injection Water Level
DUP Drawup

As shown above, the duration of the injection tests ranged between approximately 0.25 and 8 days, with total volumes of between approximately 1.2 and 36 AF injected during each test. Water levels (depth to water) in the well at the end of the injection tests ranged between approximately 254 and 291 feet btoc,

rehabilitation work will be documented in a later separate Technical Memorandum.

indicating a significant amount of additional available 'freeboard' remained in the casing at all times.

Injection Performance Summary

A summary of the injection performance of the SMTIW (as measured by the 24-hour injection specific capacities) observed during WY2006 injection testing is presented in Table 2 - WY2006 24-hour Injection Specific Capacity Summary.

Table 2. WY2006 24-hour Injection Specific Capacity Summary

Injection Test No.	Avg. Injection Rate (gpm)	Static Water Level (feet bgs)	24-hour Injection Water Level (feet bgs)	24-hour Drawup (feet)	24-hour Injection Specific Capacity (gpm/ft)	Percent Deviation from Year Start Baseline
WY2005						
11	976	352.3	258.2	94.1	**10.4**	--
WY2006						
1	1,039	360.1	288.6	71.5	**15.0**	--
2	1,114	354.5	274.3	80.2	**13.6**	-9.7
3	1,094	358.6	281.3	77.3	**13.8**	-7.8
4	1,092	357.1	279.4	77.7	**16.0**	+6.5
5	978	356.4	290.3	66.1	**15.3**	+1.7
6	974	355.4	291.4	64.0	**15.2**	+1.5
7	1,082	354.7	290.5	64.2	**16.1**	+7.2
8	1,024	353.1	288.0	65.1	**15.4**	+2.9
9	1,018	352.9	279.9	73.0	**13.7**	-8.5
10	1,017	352.7	280.1	72.6	**13.9**	-7.7
11	1,076	350.5	261.9	88.6	**12.1**	-19.1
12[3]	--	--	--	--	--	--
13	1,015	350.2	275.7	74.5	**13.8**	-8.3
14	992	350.9	283.6	67.3	**15.2**	+1.5
15	1,020	350.2	285.0	65.2	**15.7**	+4.7
16	1,008	349.7	287.5	62.2	**17.5**	+16.8
17[4]	--	--	--	--	--	--

[3] Test No. 12 ended after approximately 360 minutes

As shown in Table 2, during the final test of the previous injection season (i.e., WY2005 Test No. 11), the 24-hour injection specific capacity of the SMTIW was approximately 10.4 gpm/ft. The injection specific capacity during the first test of WY2006 was approximately 15.0 gpm/ft, an increase of approximately 50 percent. The observed increase in injection performance between the end of last year and the beginning of this year is due to the backflushing and sampling pumping that was conducted after the WY2005 injection season. Also shown in Table 2 is the 24-hour injection specific capacity ranging between approximately 12.1 and 17.5 gpm/ft, with no overall decline in performance during the WY2006 injection season. These results further validate the general operational parameters for the SMTIW of; a) an injection rate of approximately 1,000 gpm, and, b) weekly backflushing, successfully maintains injection performance.

Plugging Rate Analysis

Observed and normalized plugging rates were calculated for those injection tests of sufficient duration (at least two days) and relatively stable injection rate (plugging rates could not be calculated for other tests because the injection rates varied significantly during the tests). The observed plugging rates were calculated using the graphical Observed vs. Theoretical Water Level Rise Method (Pyne, 1994), and were normalized to a reference velocity at the well bore (casing perforated interval) of 3 feet per hour (ft/hr) and a water temperature of 20 degrees Celsius (Huisman and Olsthoorn, 1983). Normalization allows comparison of data from tests that have different injection rates and water temperatures. These methods have been utilized as part of analysis of previous injection tests (both at the SMTIW and the Paso Robles Test Injection Well). Detailed explanations/descriptions of these plugging rate calculation methods were presented in previous reports (e.g., SMTIW Summary of Operations Report for WY2003), and will not be repeated here.

A summary of the calculated plugging rates during WY2006 is presented below in Table 3. The plugging rate analyses are presented graphically on Plates 3 through 10.

Table 3. WY2006 Plugging Analysis Summary

Injection Test No.	Observed Plugging Rate (feet/day)	Normalized Plugging Rate (feet/day)
1	1.8	0.15
3	2.8	0.21

[4] Test No. 17 ended after approximately 1320 minutes

Injection Test No.	Observed Plugging Rate (feet/day)	Normalized Plugging Rate (feet/day)
5	2.9	0.28
6	1.9	0.18
7	2.6	0.20
8	2.0	0.17
Average	**2.3**	**0.20**

As shown in Table 3, the calculated rate of observed water level rise due to plugging during WY2006 ranged from approximately 1.8 to 2.9 feet per day (ft/day), and averaged approximately 2.3 ft/day. The normalized plugging rates ranged between approximately 0.15 and 0.28 ft/day, and averaged approximately 0.2 ft/day. For comparison, the average observed and normalized plugging rates during WY2005 were approximately 7.0 ft/day and 0.53 ft/day, respectively. Silt Density Index (SDI) testing results indicate that the particulate levels in the injectate during WY2006 were not significantly different than in previous years, suggesting that other plugging mechanisms, such as gas evolution, redox reactions, or bioactivity may have decreased during this year's injection activities. The reduced rate of Disinfection Byproduct (DBP) degradation (discussed later in this report) supports the idea that subsurface bioactivity was lower than in previous years.

Monitoring Well Response to Injection

As part of the SMTIW project, submersible water level transducer/data logger units (Mini-Trolls, manufactured by In-Situ, Inc.) have been installed in seven existing District monitoring wells (Fort Ord Monitoring Well Nos. 7 and 8 [FO-7 and FO-8, respectively], PCA East, Ord Terrace, Ord Grove Test, Paralta Test and the Paso Robles Test Injection Well [PRTIW]) to observe the response of the aquifer system to injection operations at the SMTIW. The locations of each monitoring well are shown on Plate 1, water level hydrographs are graphically presented on Plates 20 through 25, and a summary of the water level observations during the WY2006 injection period is presented in Table 4 - Summary of Monitoring Well Observations, Injection Period.

Table 4. Summary of WY2006 Monitoring Well Observations, Injection Period

Well ID	Distance from SMTIW (feet)	Aquifer Monitored	Static Water Level (1/4/06) (feet)		End Water Level (5/12/06) (feet)		Water Level Change (feet)
			DTW	Elev.	DTW	Elev.	
FO-7 (Deep)	3,300	Tsm	490.5	-16.6	483.8	-9.9	+6.7
(Shallow)		QTp	458.7	15.2	458.7	15.2	0.0
FO-8 (Deep)	7,300	Tsm	394.4	-15.9	NA[5]	NA	NA
Ord Grove Test	1,800	QTp & Tsm	323.3	-34.7	312.9	-24.3	+10.4
Ord Terrace (Deep)	2,400	Tsm	258.0	-28.0	244.9	-14.9	+13.1
Paralta Test	500	QTp & Tsm	338.7	-7.4	331.6	-0.3	+7.1
PCA East (Deep)	6,300	Tsm	87.0	-17.7	NA[6]	NA	NA
(Shallow)		QTp	64.5	4.8	63.2	6.1	+1.3
PRTIW	300	QTp	NA[7]	NA	NA	NA	NA

Notes:

* The Ord Grove production well was operating just prior to the injection season; therefore, the static water level in the monitoring well was depressed and recovering.

As shown on the water level hydrographs and in Table 4, water levels in the Santa Margarita Sandstone (Tsm) at the start of the WY2006 injection season ranged between approximately 16 and 28 feet below sea level. Positive response to injection was observed, with water levels in the Tsm increasing between approximately 7 to 13 feet[8]. It is important to note that water levels in the Tsm remained between approximately 10 to 20 feet below sea level at the end of the injection season.

Review of the water level hydrographs indicates that most of the Paso Robles Formation (QTp) wells did not exhibit a significant response to injection, which is consistent with previous year's observations.

[5] FO-8 transducer/datalogger removed from well for repairs.
[6] PCA-East Deep datalogger test ended abnormally (ABEND).
[7] PRTIW tranducer/datalogger removed by well operator due to pump failure and was not reinstalled.
[8] Because CAW production wells were shut off just prior to initiation of injection operations, it is extremely difficult to 'trend' the monitoring well data and to quantitatively separate the observed water level increase that is due to 'natural' recovery of basin water levels from that due solely to injection response.

Backflushing

Periodic backflushing of injection wells is necessary to maintain the well's performance by removing materials deposited/accumulated around the well bore during injection. Backflusing of the SMTIW is routinely (weekly) performed to create flow reversals in the well, which is intended to remove particles and/or biofouling material introduced into the well during injection. The procedure is similar to backwashing a media filter to remove accumulated material deposited during filtration.

Generally, backflushing was performed following each injection test to limit the amount of residual plugging, and to assess the efficacy of backflushing operations. Backflush water was discharged to the on-site backflush pit, with overflow routed to a natural depression north of the well site. During the injection season, backflushing was performed at rates of approximately 2,100 to 2,300 gpm, and generally consisted of pumping for a period of approximately 10 to 15 minutes. The initial discharge was usually very turbid and of a deep orange brown color, becoming clearer after 3 to 5 minutes. Periodically, this procedure was repeated one or two times until the discharge was clear. These observations are consistent with previous years. Additional backflushing was also conducted following the injection season, typically as part of water quality sampling of the stored water (discussed later in the report).

Following the backflushing operations and periods of water level recovery, controlled 10-minute specific capacity tests were performed to track the well's performance over the injection and storage periods. A summary of pertinent production specific capacity data collected during the 10-minute tests are summarized in Table 5 below:

Table 5. Summary of WY2006 SMTIW 10-Minute Production Specific Capacity Data

Date	Pumping Rate (gpm)	Drawdown (feet)	Specific Capacity (gpm/ft)	Remarks
1/4/06	1,500	82.4	**18.2**	Just prior to WY2006 Injection Season
6/12/06	1,600	74.1	**21.6**	End of WY2006 Injection/Start of Storage
12/5/06	1,500	80.7	**18.6**	End of WY2006 Storage Period

As shown in Table 5, the production specific capacity remained relatively stable throughout WY2006, which is consistent with the observed injection performance.

WATER QUALITY

While it has been successfully demonstrated at the SMTIW (and at other ASR sites in California and elsewhere) that successive injection/storage/recovery cycles can yield fully potable water upon recovery, issues regarding the fate and stability of Disinfection by-Products DBPs (i.e., TTHMs and HAAs) in the subsurface can also affect the potability of the recovered water, and is of increasing interest by various regulatory agencies overseeing ASR programs.

During the injection season, a variety of field and laboratory water quality parameters were routinely monitored, including DBPs. Following the injection season, the aquifer storage water quality data collection period ran from May 24 (the end of injection) until December 5, 2006. During the 194-day storage period, samples were generally collected on an approximate bi- to tri-weekly basis to monitor water quality, and in particular DBPs. Representative aquifer water samples were obtained by starting the well pump and discharging to waste for a period of approximately 1 hour[9] prior to collecting samples for laboratory analyses. A variety of field water quality parameters were also monitored concurrently with the sampling. A summary of selected pertinent data is presented in Table 6 and a summary of all of the collected water quality data is presented in Table 7.

Table 6. Selected WY2006 Water Quality Data

Parameter	Pre-Injection	Injectate		Storage	
		Average	Range	Average	Range
Conductivity (uS)	780	506	460 - 530	598	518 - 670
Chloride Ion (mg/l)	109	29	26 - 34	51	29 - 59
TTHMs (ug/l)	2	31	24 - 44	86	67 - 120
Total HAAs (ug/L)	0	12	10 - 14	4.6	0 - 15
ORP (mV)	+55	+750	+704 - +758	+237	+117 - +363
Dissolved Oxygen (mg/l)	0.2	4.0	3.5 – 4.5	2.8	2.0 – 3.5

[9] At pumping rates ranging between 1,500 to 2,100 gpm and total volumes ranging between approximately 50,000 to 135,000 gallons pumped.

Review of Tables 6 and 7 reveals several findings from the WY2006 water quality investigation, including the following:

- Using conductivity and chloride ion as 'tracer' compounds to distinguish injected and native ground waters, the data indicates that there was from 0 to 22 percent influx of 'native' ground water through the storage period. In general, the native ground water influx increased linearly after approximately 90 days of storage.
- THM's varied largely in conformance to previous years observations, namely an initial 'ingrowth' period in the first 40 days of storage where levels increased by 300 to 500 percent, followed by a slow decline in THM level over the next 6 months. As in previous years, the more brominated species degraded more quickly than the more chlorinated species.
- HAA's did not show an 'ingrowth' trend like the THM compounds, but did decline steadily during aquifer storage; reaching non-detect levels within 4 to 5 months. The more rapid decline in HAA's when compared to THM's is typical for most ASR sites; however, the very slow overall rate of decline is atypical, and much slower than observed elsewhere. This is likely attributable to the subsurface environment of the Santa Margarita Sandstone aquifer, which is largely free of organic carbon and predominantly made up of inert siliceous sands.
- Although redox conditions declined during storage, ORP levels never reached negative (anaerobic) conditions. This may correlate to the incomplete degradation of THM's, which degrade more rapidly under lower (i.e., negative) redox conditions.
- Variations in bioactive nutrients (i.e., nitrogen, phosphorous, and organic carbon) did not correlate with any clear trends in bioactivity.

Table 7. Summary of WY2006 Water Quality Data

Parameter	Unit	Date															
		1/4/06	1/4/06	1/26/06	3/21/06	4/5/06	4/24/06	6/27/06	8/7/06	8/21/06	9/6/06	9/28/06	10/11/06	10/26/06	11/9/06	11/22/06	12/5/06
Sample Description		WY05 Storage	WY06 Injectate					WY06 Storage									
Elapsed Storage Time	Days	281	--	--	--	--	--	33	74	88	104	126	139	154	168	181	194
Volume Pumped at Sampling	1,000 gals							133	135	56	128	119	111	85	104	55	98
Laboratory Results																	
Alkalinity, Total (as CaCO3)	mg/l	222	146		134		124	154	136		144		166		170		174
Ammonia-N	mg/l	ND	0.06		ND		ND	0.19	ND		ND		0.09		ND		ND
Boron	mg/l	0.5	0.34		0.41		0.52	0.14	0.28		0.36		0.25		0.24		0.3
Bromide	mg/l																
Calcium	mg/l	69	47		44		38	46	42		46		53		52		54
Chloramines	mg/l																
Chloride	mg/l	109	34	33	29	26	25	40	29	31	38	48	52	52	55	53	59
Conductivity	umho/cm	780	530		528		460	573	518		520		640		665		670
Total Haloacetic Acids	**ug/l**	**ND**	**14**	**10**	**11**	**13**	**14**	**15**	**12**	**9.1**	**5.7**	**1.4**	**ND**	**1.1**	**1.7**	**ND**	**ND**
Monobromoacetic Acid	*ug/l*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
Monochloroacetic Acid	*ug/l*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
Dibromoacetic Acid	*ug/l*	*ND*	*3.5*	*2.7*	*2.9*	*2.5*	*2.6*	*1.1*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
Dichloroacetic Acid	*ug/l*	*ND*	*6*	*4.1*	*4*	*5.2*	*6.1*	*2.8*	*3.3*	*3.3*	*2*	*1.4*	*ND*	*1.1*	*1.7*	*ND*	*ND*
Trichloroacetic Acid	*ug/l*	*ND*	*5*	*3.2*	*4*	*4.9*	*5.6*	*11*	*8.2*	*5.8*	*3.7*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
Iron	ug/l	100	ND		ND		ND	313	118		131		132		258		150
Total Kjehldahl Nitrogen	mg/l	ND	0.5		ND		ND	0.7	ND		ND		ND		ND		ND
Magnesium	mg/l	23	15		15		12	14	13		15		18		19		18
Manganese	ug/l	20	ND		ND		37	21	ND		ND		ND		ND		ND
Nitrate as NO3-N	mg/l	ND	ND		ND		ND	ND	1		ND		ND		ND		ND
Nitrite as NO2-N	mg/l	ND	ND		ND		ND	ND	ND		ND		ND		ND		ND
o-Phosphate-P	mg/l	0.17	0.18		0.31		0.16	0.17	0.15		0.14		0.15		0.15		0.12
Potasium	mg/l	4.4	3.1		2.7		2.9	2.6	2.7		3.3		3.7		4.1		4.3
pH	Std Units	7.3	7.6		7.3		7	7.4	7.6		7.4		7.7		7.2		7.2
Sodium	mg/l	81	48		48		40	51	46		46		54		57		64
Sulfate	mg/l	81	74		74		69	73	72		80		72		82		75
Total Nitrogen	mg/l																
Total Organic Carbon	mg/l	0.84	1		1.2		1.2	1.1	1.1		1.1		0.99		0.83		0.74
Dissolved Organic Carbon	mg/l	0.87	1		ND		1.2	1.1	1.1		1.1		1		0.98		0.88
Total Phosphorous	mg/l	0.18	0.19		0.34		0.18	0.21	0.18		0.15		0.18		0.15		0.15
Total Trihalomethanes	**ug/l**	**2**	**24**	**24**	**44**	**36**	**26**	**120**	**100**	**98**	**84**	**74**	**76**	**91**	**70**	**81**	**67**
Bromodichloromethane	*ug/l*	*0.77*	*8.3*	*7.7*	*15*	*13*	*9.1*	*31*	*28*	*27*	*23*	*24*	*21*	*25*	*19*	*22*	*18*
Bromoform	*ug/l*	*ND*	*1.4*	*1.7*	*2.5*	*1.6*	*0.89*	*14*	*3.3*	*3*	*2*	*1.4*	*1.1*	*2.3*	*1.9*	*1.6*	*1.2*
Chloroform	*ug/l*	*1.2*	*7.4*	*6.1*	*12*	*11*	*9.8*	*43*	*55*	*52*	*45*	*40*	*43*	*50*	*39*	*44*	*38*
Dibromochloromethane	*ug/l*	*ND*	*6.7*	*8.3*	*14*	*10*	*6.7*	*27*	*17*	*16*	*14*	*8.1*	*11*	*14*	*10*	*13*	*10*
Trihalomethanes Formation Potential	ug/l																
Field Parameters																	
pH	Std Units	6.8	7.6	6.2	6.9	6.9	7.3	7	7.1	7.1	7.3	7.2	6.9	7	6.7	6.8	9
ORP	mV	55	762	778	704	753	751	363	229	225	46	263				117	212
Temp	°C	21.1	16.6	16	15.5	16.5	15.9	18	17.4	17.2	17.2	17.3	17.5	17.6	18	18.1	18
EC	uS	906	551	516	453	435	426	509	481	451	458	506	525	521	561	529	533
H2S	mg/l	ND									0.01	ND	ND	ND	ND	ND	ND
Free Chlorine Residual	mg/l	ND		1.4	1.2	1.2	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Chlorine Residual	mg/l	ND															
Dissolved Oxygen	mg/l	0.2	3.5	4.0	4.5		4.0			2.5	2.5	2.5	2.0	2.0	3.5	3.0	3.5

CONCLUSIONS

Based on the findings from the WY2006 testing program at the SMTIW, we conclude the following:

- Approximately 408 AF of water were successfully injected into the Santa Margarita Sandstone of the Seaside Groundwater Basin with the SMTIW during WY2006. This volume represents approximately 15 percent of the basin's estimated annual 'safe yield'.
- The general SMTIW operational procedure of injection at a rate of 1,000 gpm, with weekly backflushing cycles, continues to be an effective mode of operation to sustain injection well capacity.
- Consistent with previous years, positive hydraulic response to injection operations was observed with increases in water levels at all of the Santa Margarita Sandstone wells monitored in the Basin during testing; although water levels remained below sea level, even at the peak/end of the injection season.
- The available data regarding the available 'freeboard' in the well and aquifer during injection continue to indicate that a second well at the site (i.e., SMTIW No. 2) can feasibly be operated with a 1,500 gpm (possibly up to 2,000 gpm) injection capacity.

Specific conclusions regarding the water quality investigation include the following:

- Significant ingrowth of THMs occurred during initial storage, as has been observed in previous years (except WY2005 when dechlorination of the injecate was performed). Following the ingrowth 'peak' within the intial month of storage, THM degradation gradually occurred during the remainder of the storage period.
- The lack of complete THM degradation was consistent with the persistent positive redox conditions and dissolved oxygen levels during storage. As presented in the WY2004 report, THM degradation at the SMTIW (and at other ASR sites) has been shown to occur predominantly under reduced/anoxic aquifer conditions, where anoxic or anaerobic bioactivity can affect THM degradation through biometabolism.
- Possible reasons for the persistent positive redox conditions during WY2006 include the following:

- No mixing with native groundwater occurred as a result of no recovery pumping being performed.
- A lack of aerobic bacteria populations to consume/reduce dissolved oxygen in the subsurface to create anoxic conditions.

- It is possible that THM degradation did occur farther away from the well bore, in the injection water/native groundwater diffused/mixing zone. Future sampling at the recently installed monitoring well located approximately 100 feet from SMTIW No. 1 will provide substantially more data to allow investigation of DBP degradation in the subsurface away from the ASR well.

RECOMMENDATIONS

Based on the WY2006 program testing results, and our experience with similar projects, we offer the following recommendations for continued and future operation of the SMTIW site:

- Conduct additional injection operations during the 2007 water year. We estimate that approximately 350 AFY can be injected with the SMTIW in a 'normal' rainfall year. During a 'wet' year, up to 800 AF could be injected (assuming adequate diversion water rights are obtained).
- The SMTIW should continue to be operated at a maximum injection rate of approximately 1,000 gpm with weekly backflushing to maintain performance.
- Future testing should include injection testing with SMTIW No.1 and recently installed SMTIW No. 2 operating simultaneously to determine appropriate operational parameters for the Phase 1 ASR Project site (e.g., mutual interference effects).
- Include concurrent water quality sampling of the recently installed monitoring well along with sampling of SMTIW Nos. 1 and 2.
- Perform recovery pumping operations to further assess THM degradation.
- Backflush and sample the well(s) under rigorous, identical conditions to obtain more consistent grab samples.

CLOSURE

This report has been prepared exclusively for the Monterey Peninsula Water Management District for the specific application to the District's injection/recovery (ASR) well program in the Seaside Basin. The findings, conclusions, and recommendations presented herein were prepared in accordance with generally accepted hydrogeologic and engineering practices. No other warranty, express or implied, is made.

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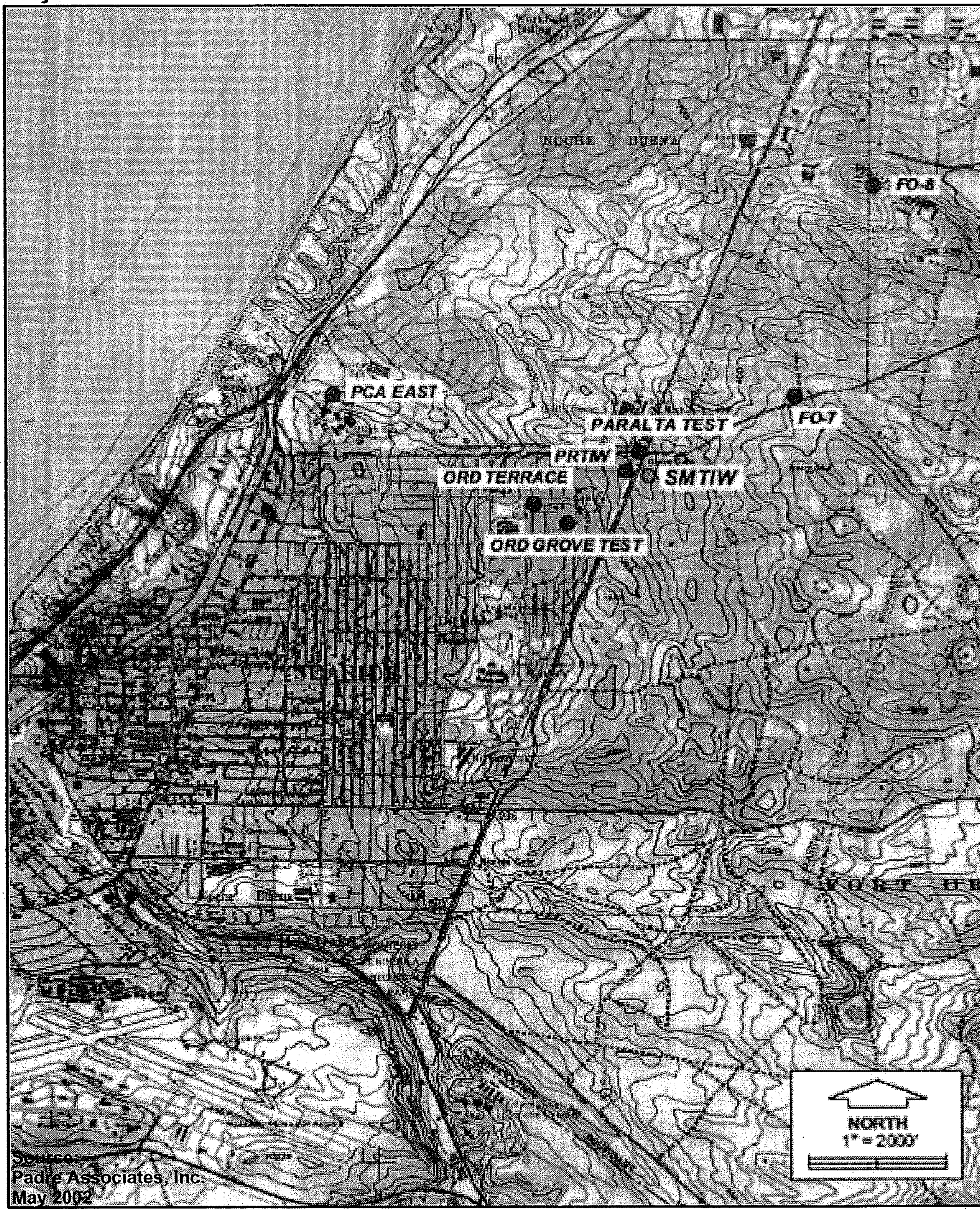
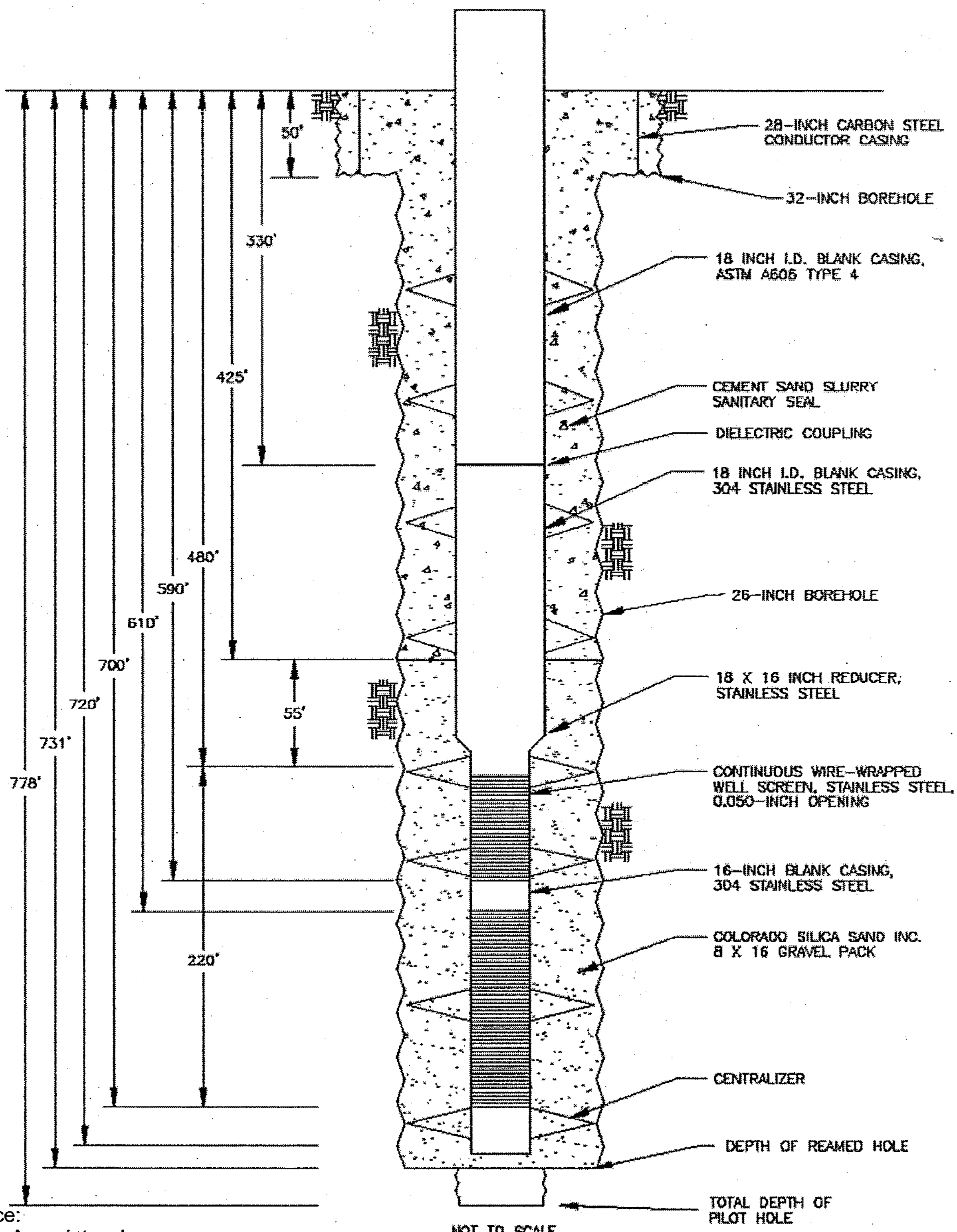
April 2007
Project No. 06-0061



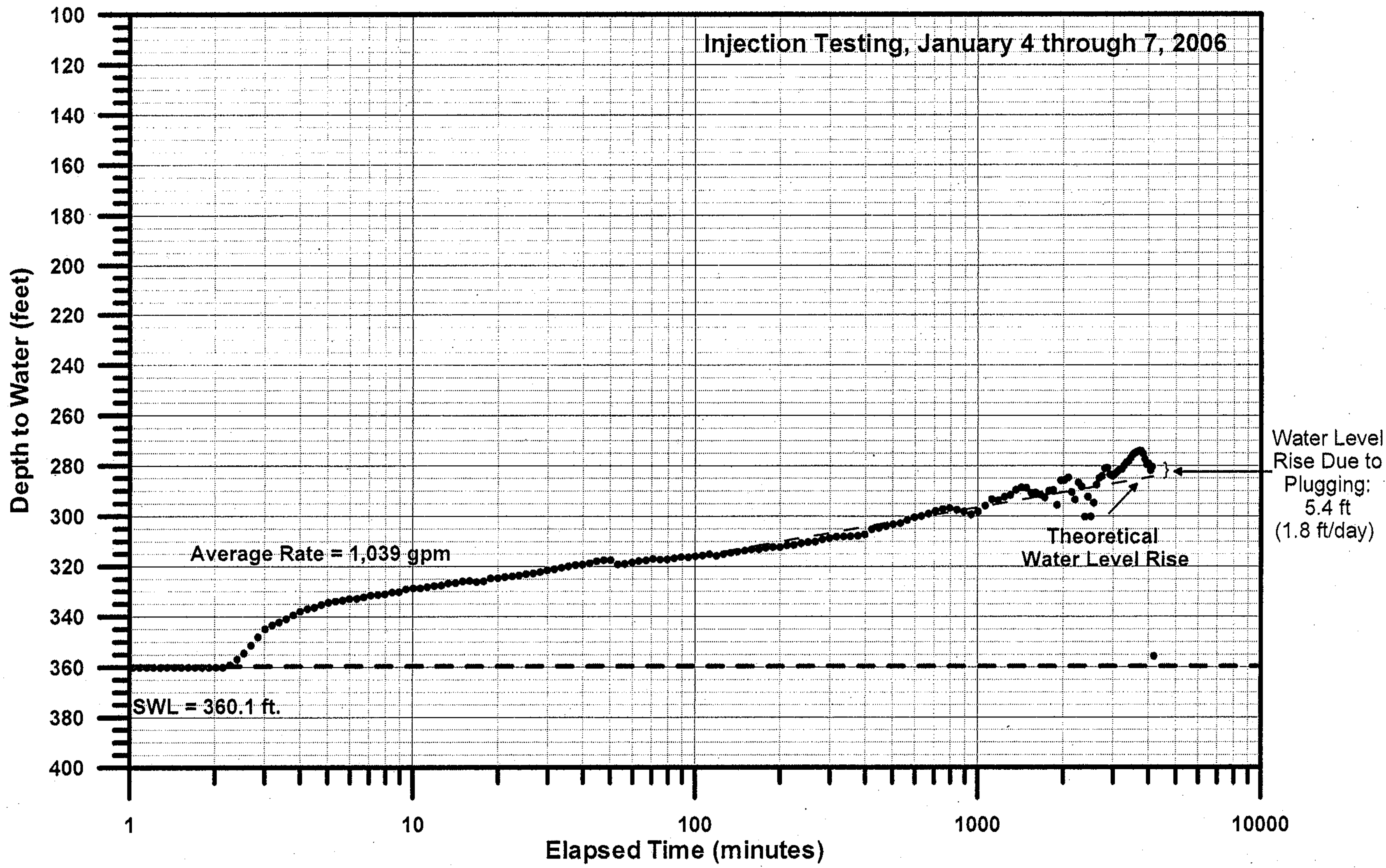
PUEBLO water resources

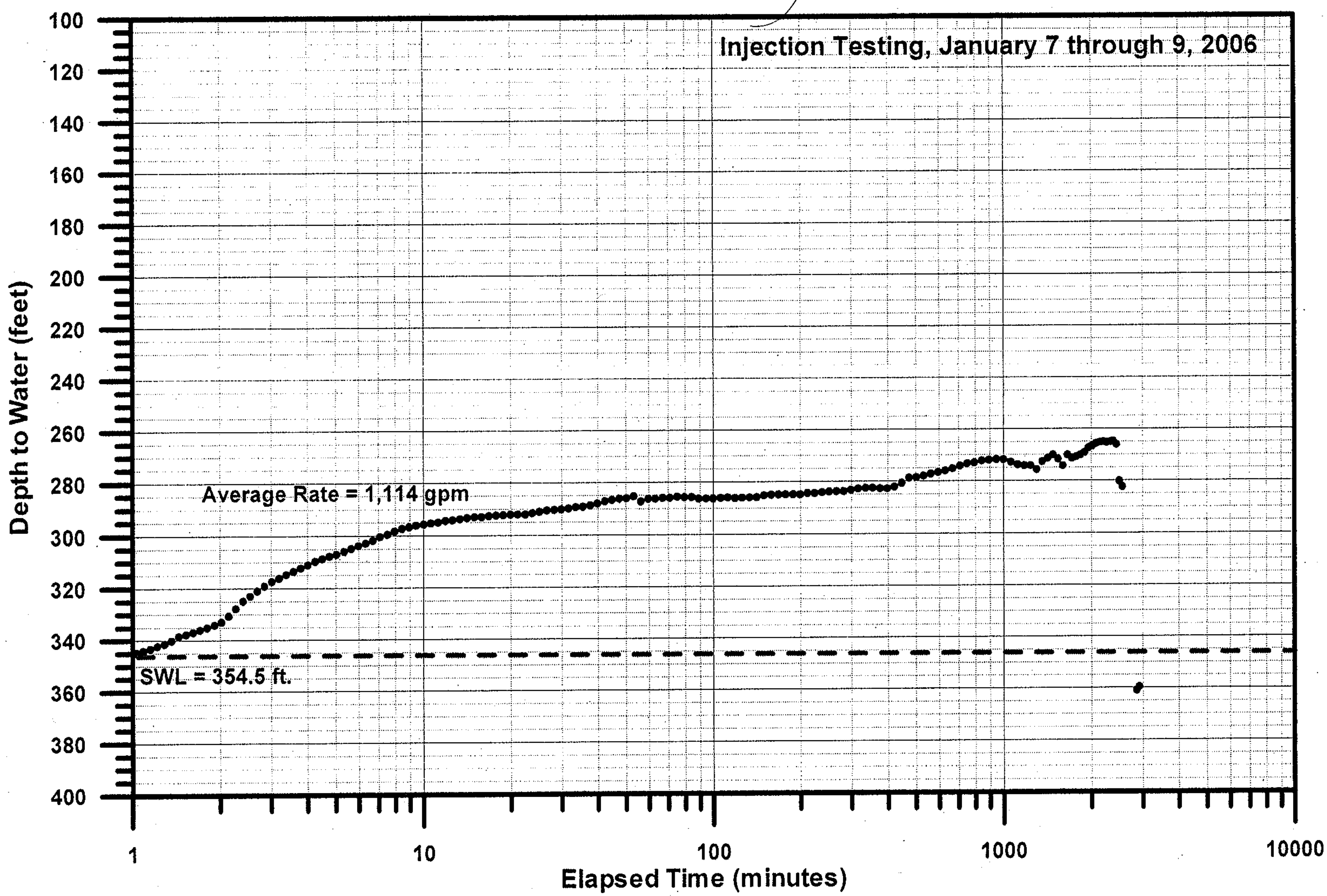
SITE LOCATION MAP
PLATE 1

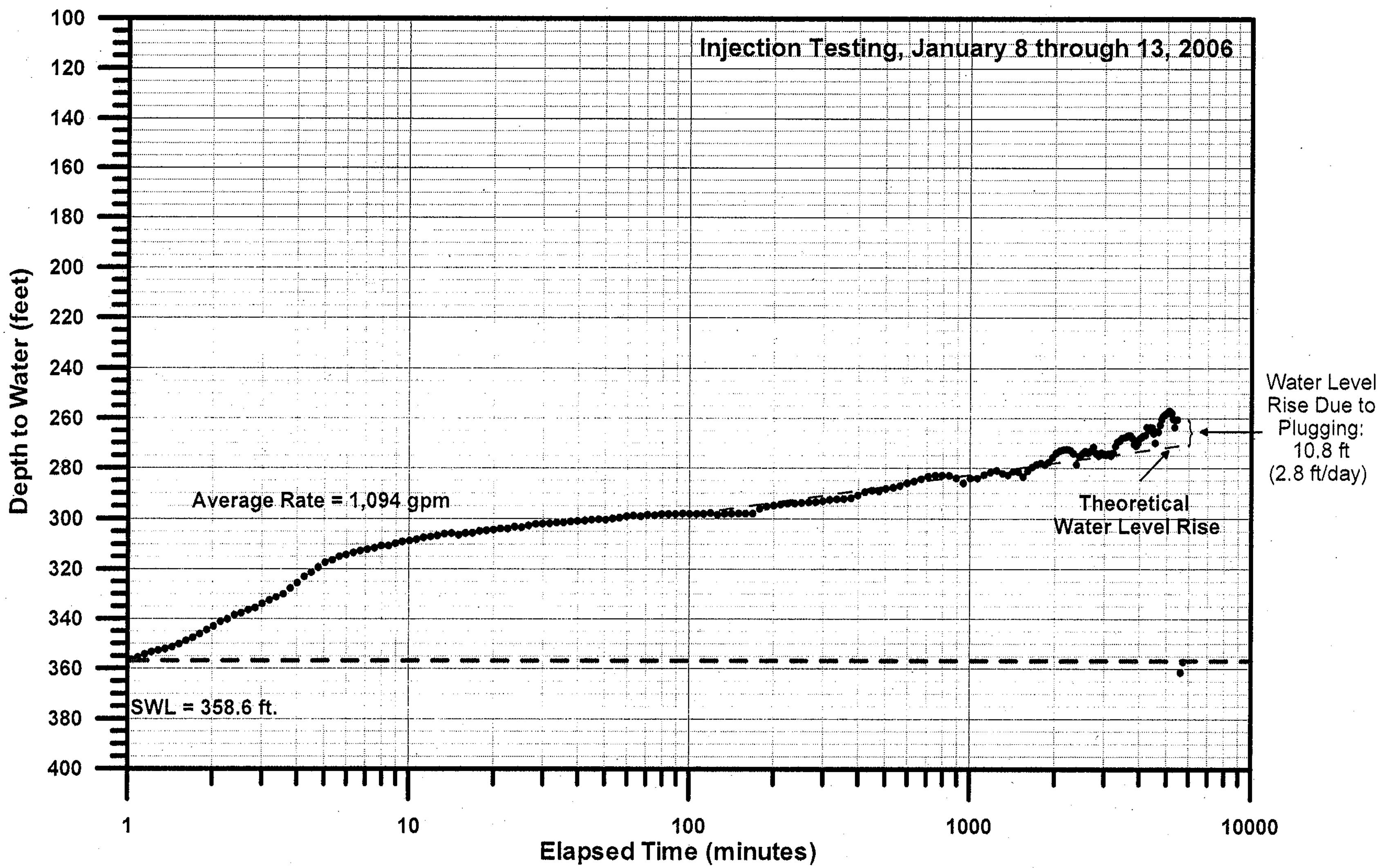
Monterey Peninsula Water Management District - SMTIW

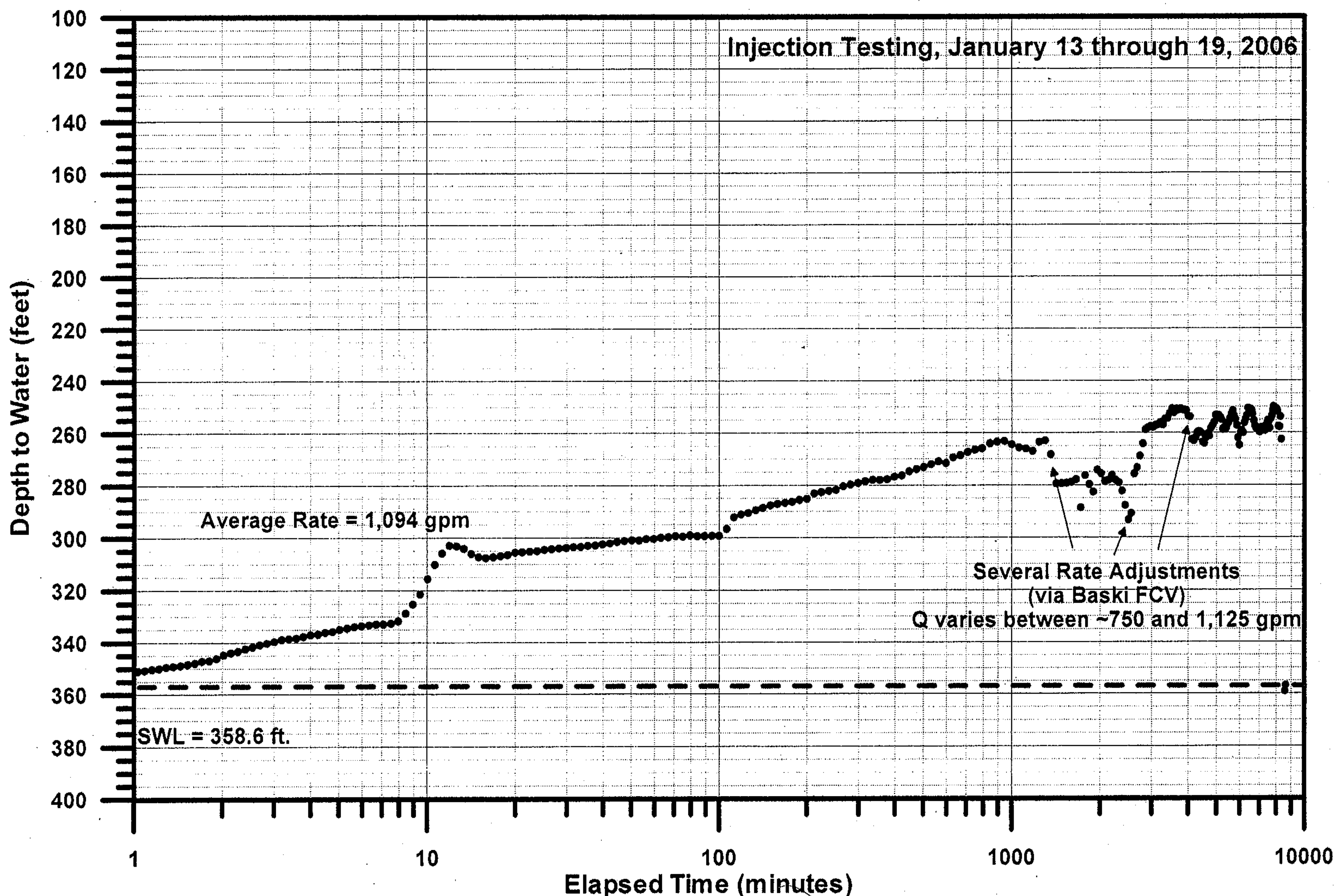


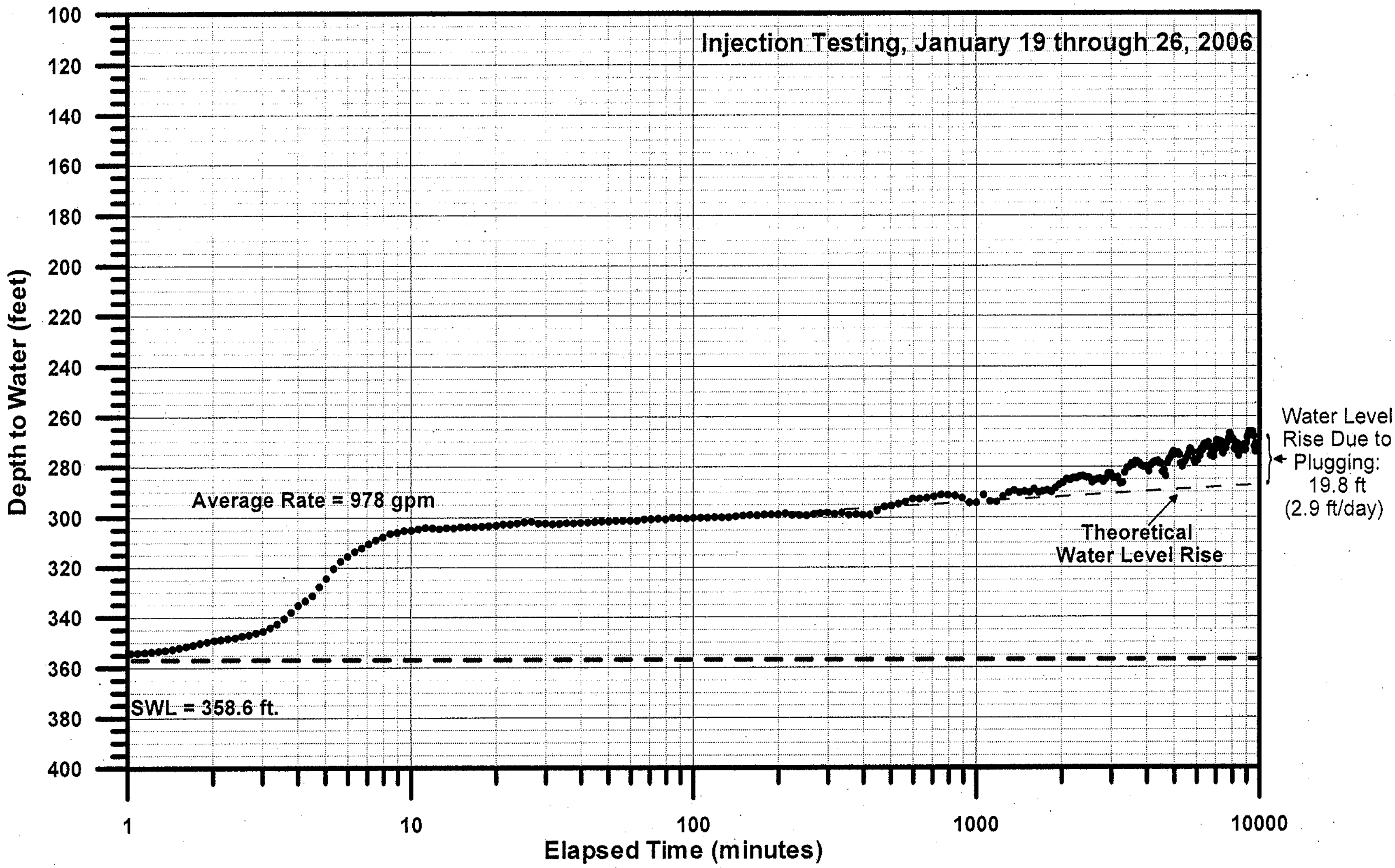
Source:
Padre Associates, Inc.
May 2002

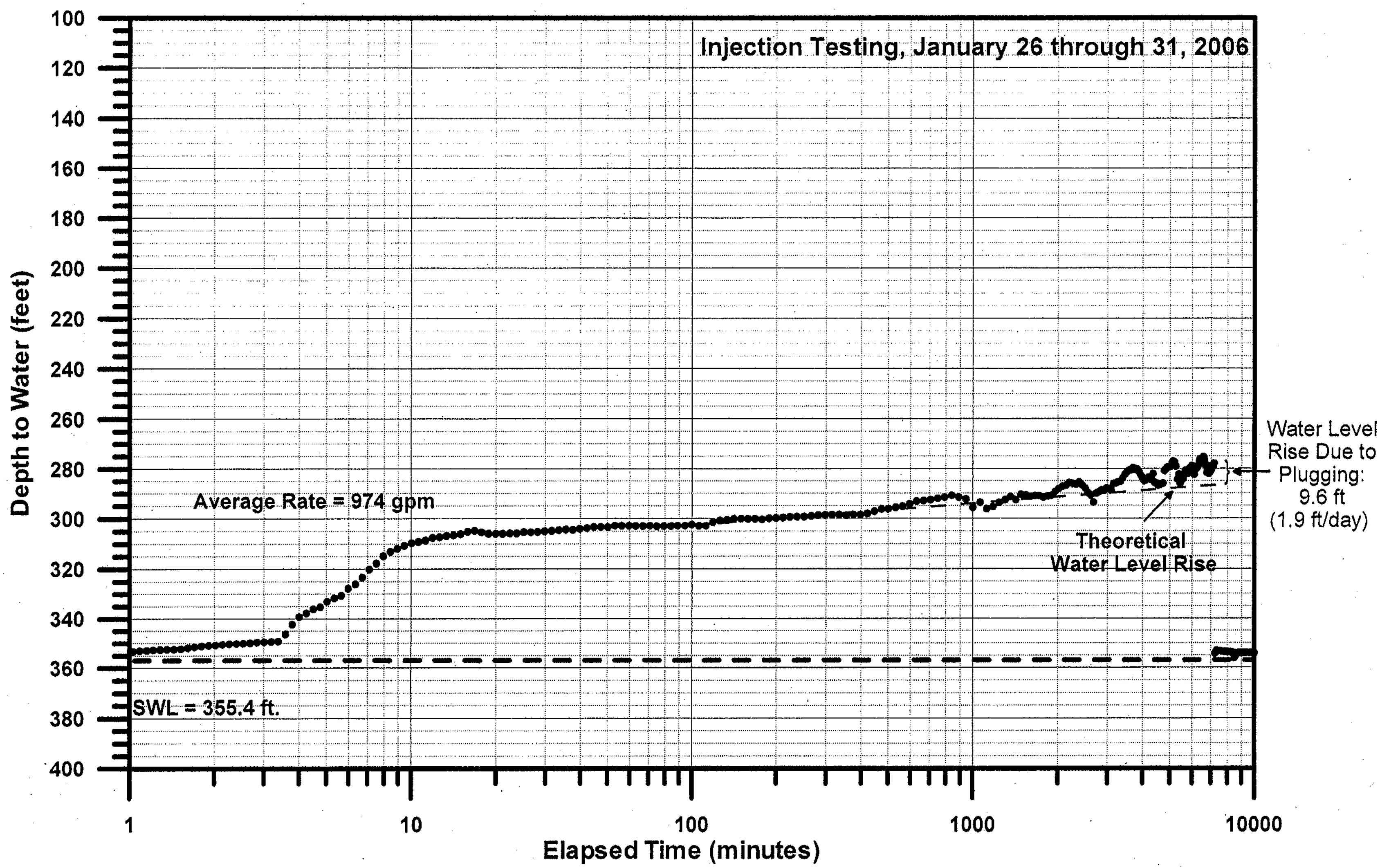

Injection Testing, January 4 through 7, 2006
Depth to Water (feet)
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
1
10
100
1000
10000
Elapsed Time (minutes)
Average Rate = 1,039 gpm
SWL = 360.1 ft.
Theoretical Water Level Rise
Water Level Rise Due to Plugging: 5.4 ft (1.8 ft/day)


Injection Testing, January 7 through 9, 2006
Average Rate = 1,114 gpm
SWL = 354.5 ft.
Depth to Water (feet)
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
1
10
100
1000
10000
Elapsed Time (minutes)

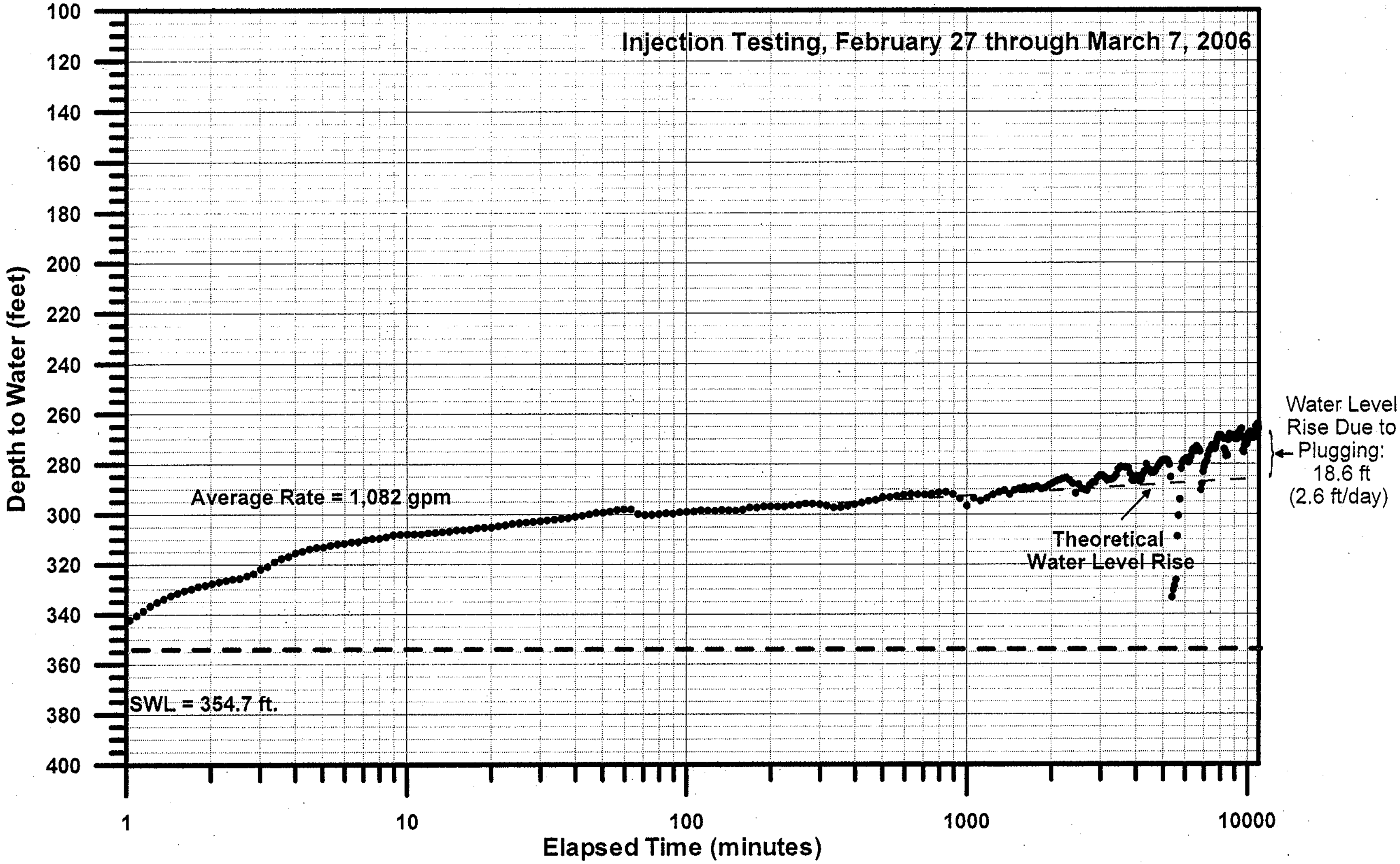

Injection Testing, January 8 through 13, 2006
Depth to Water (feet)
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
1
10
100
1000
10000
Elapsed Time (minutes)
Average Rate = 1,094 gpm
SWL = 358.6 ft.
Water Level Rise Due to Plugging: 10.8 ft (2.8 ft/day)
Theoretical Water Level Rise


Injection Testing, January 13 through 19, 2006
Depth to Water (feet)
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
Average Rate = 1,094 gpm
SWL = 358.6 ft.
Several Rate Adjustments
(via Baski FCV)
Q varies between ~750 and 1,125 gpm
1
10
100
1000
10000
Elapsed Time (minutes)


Injection Testing, January 19 through 26, 2006
Depth to Water (feet)
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
Average Rate = 978 gpm
SWL = 358.6 ft.
Water Level
Rise Due to
Plugging:
19.8 ft
(2.9 ft/day)
Theoretical
Water Level Rise
1
10
100
1000
10000
Elapsed Time (minutes)



WY2006 TESTING PROGRAM
INJECTION TEST NO. 6
PLATE 8



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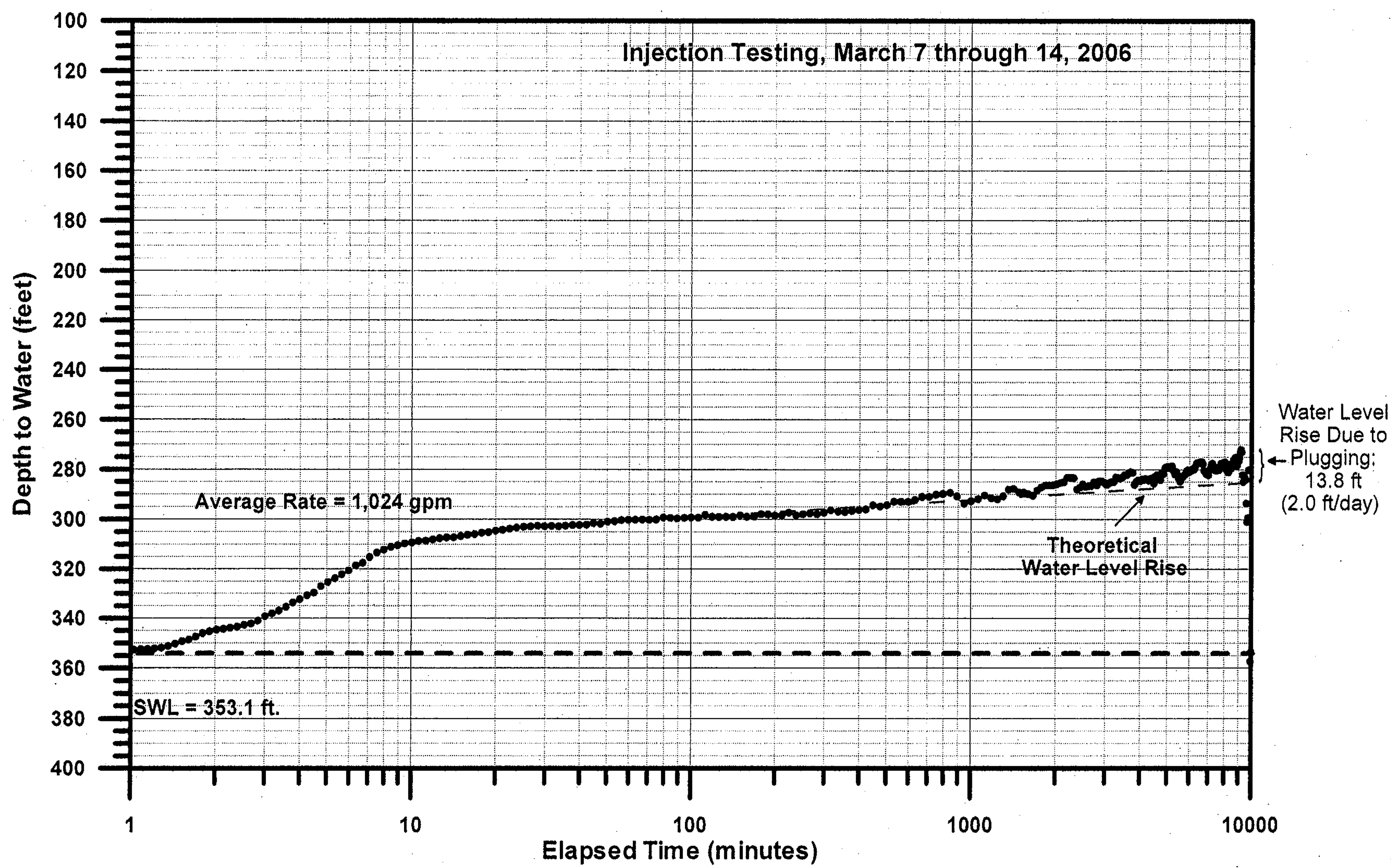
Monterey Peninsula Water Management District - SMTIW

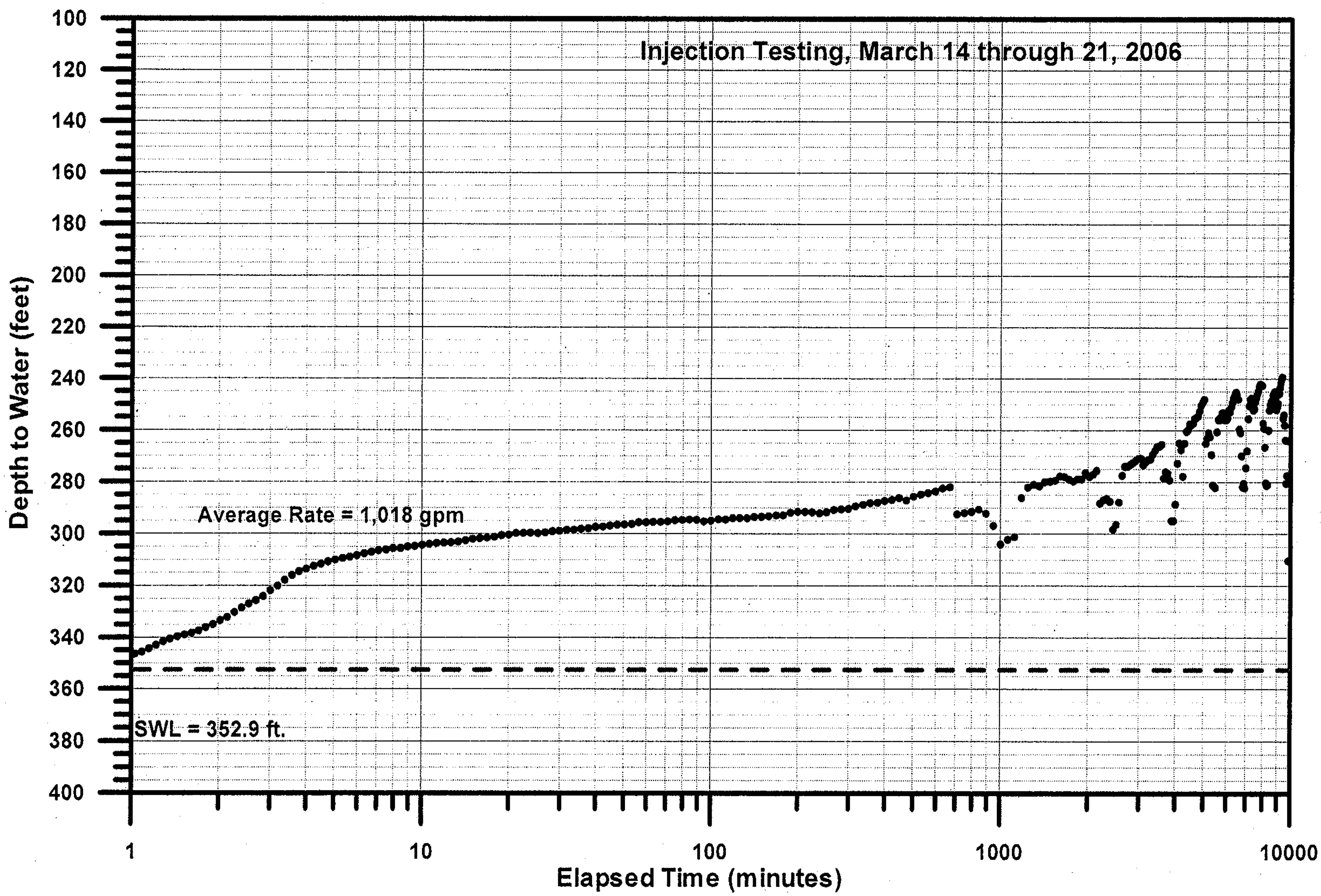
WY2006 TESTING PROGRAM
INJECTION TEST NO. 7
PLATE 9

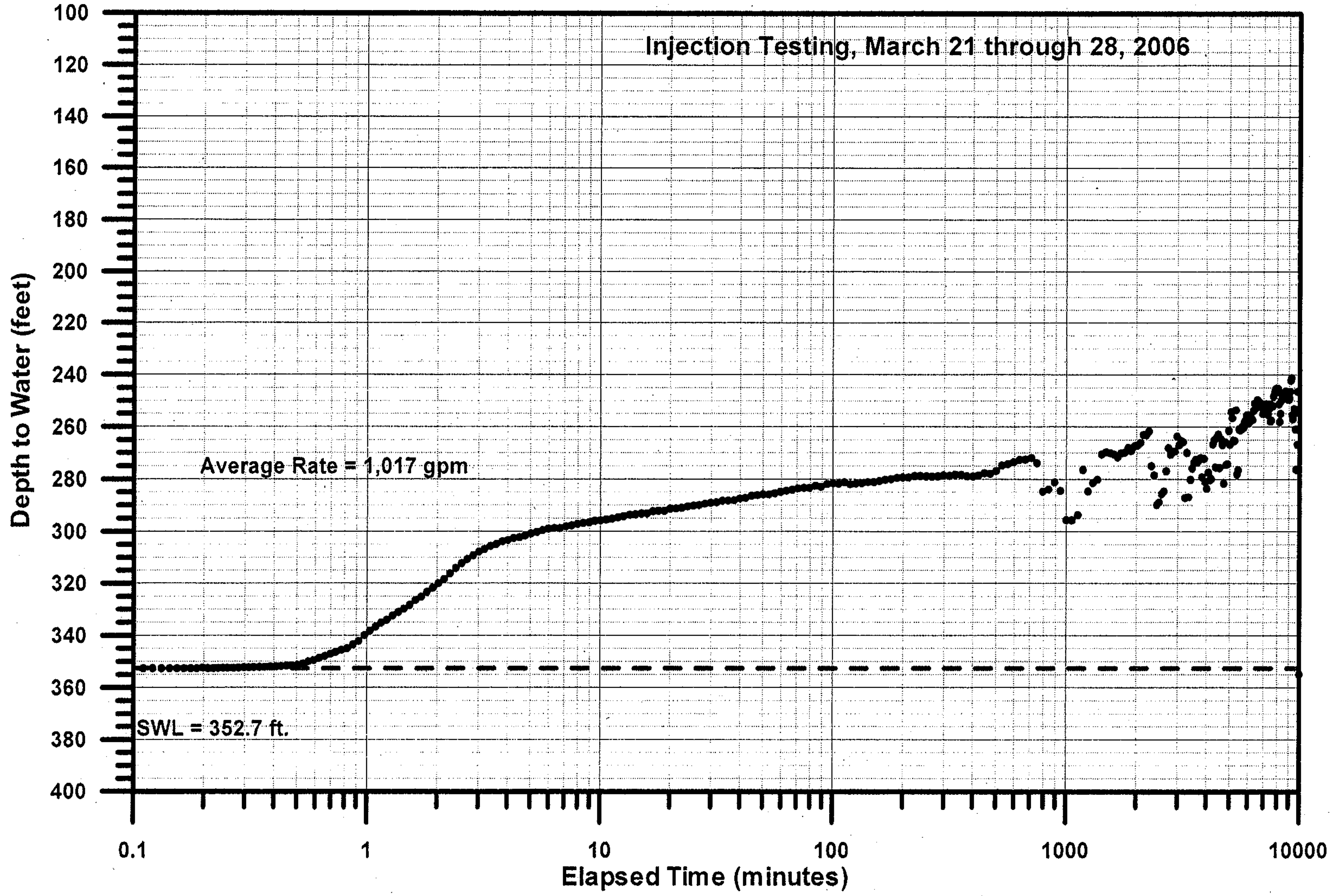


PUEBLO water resources

Monterey Peninsula Water Management District - SMTIW

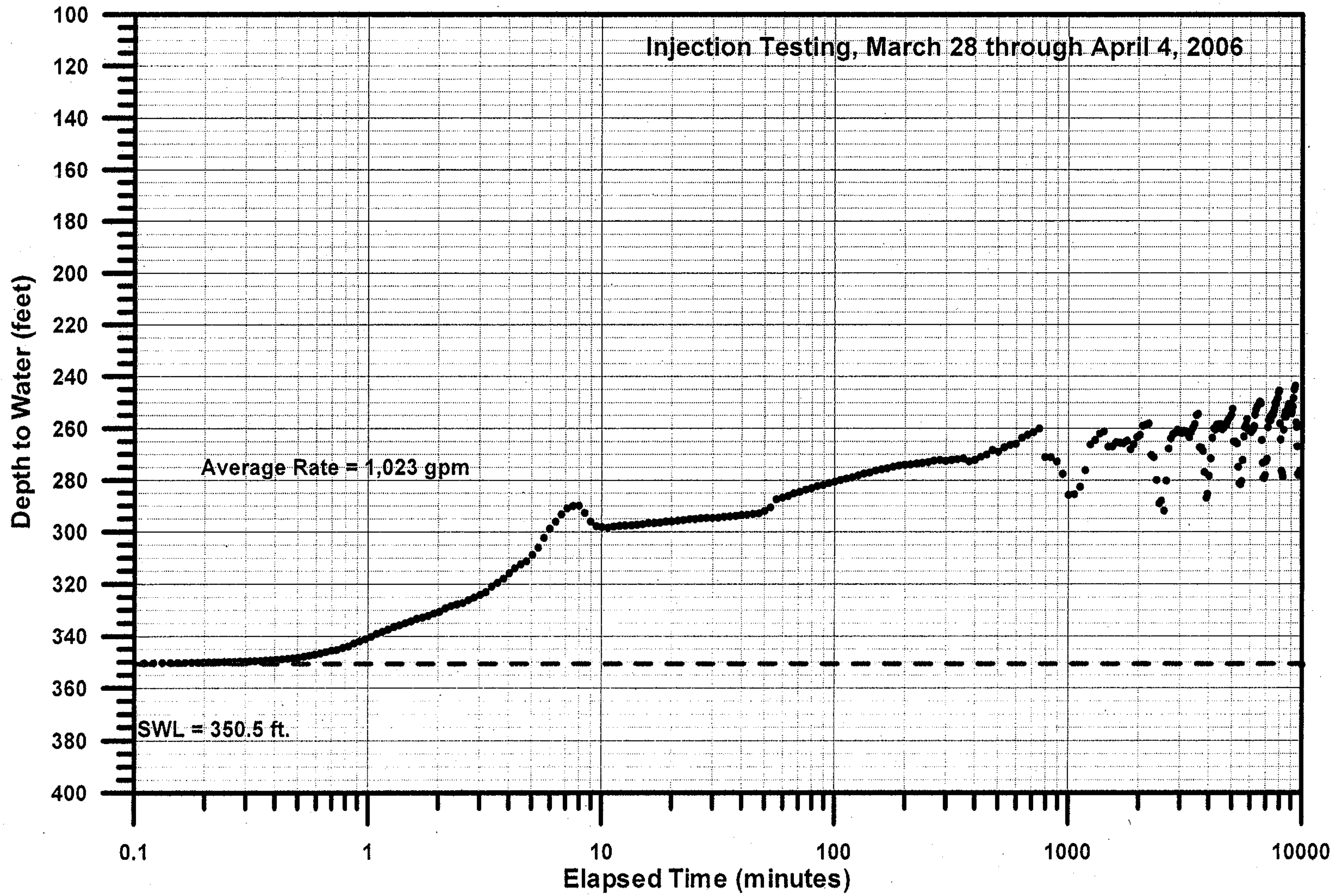
WY2006 TESTING PROGRAM
INJECTION TEST NO. 8
PLATE 10


Injection Testing, March 14 through 21, 2006
Average Rate = 1,018 gpm
SWL = 352.9 ft.
Depth to Water (feet)
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
Elapsed Time (minutes)
1
10
100
1000
10000



Monterey Peninsula Water Management District - SMTIW

WY2006 TESTING PROGRAM
INJECTION TEST NO. 10
PLATE 12



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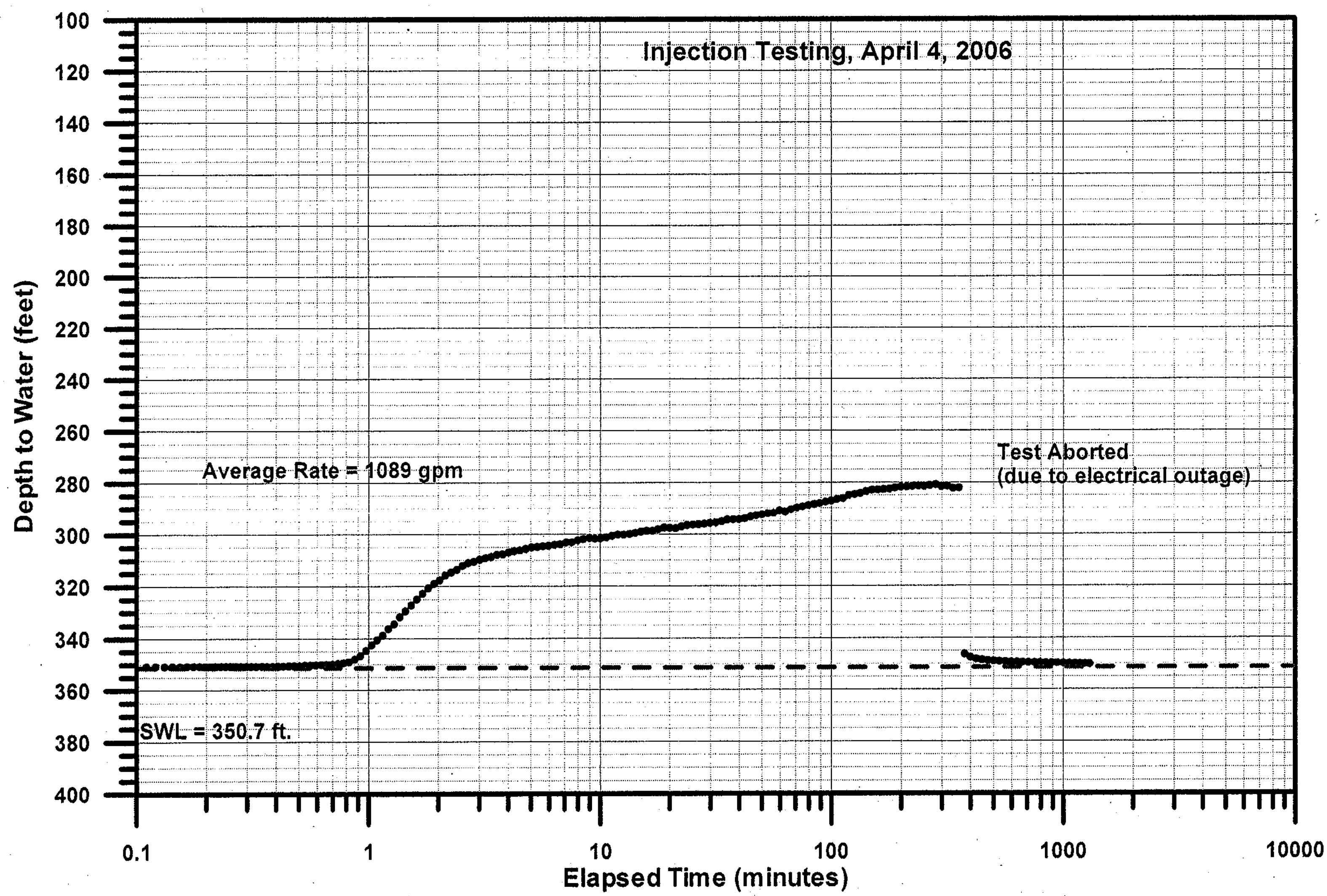
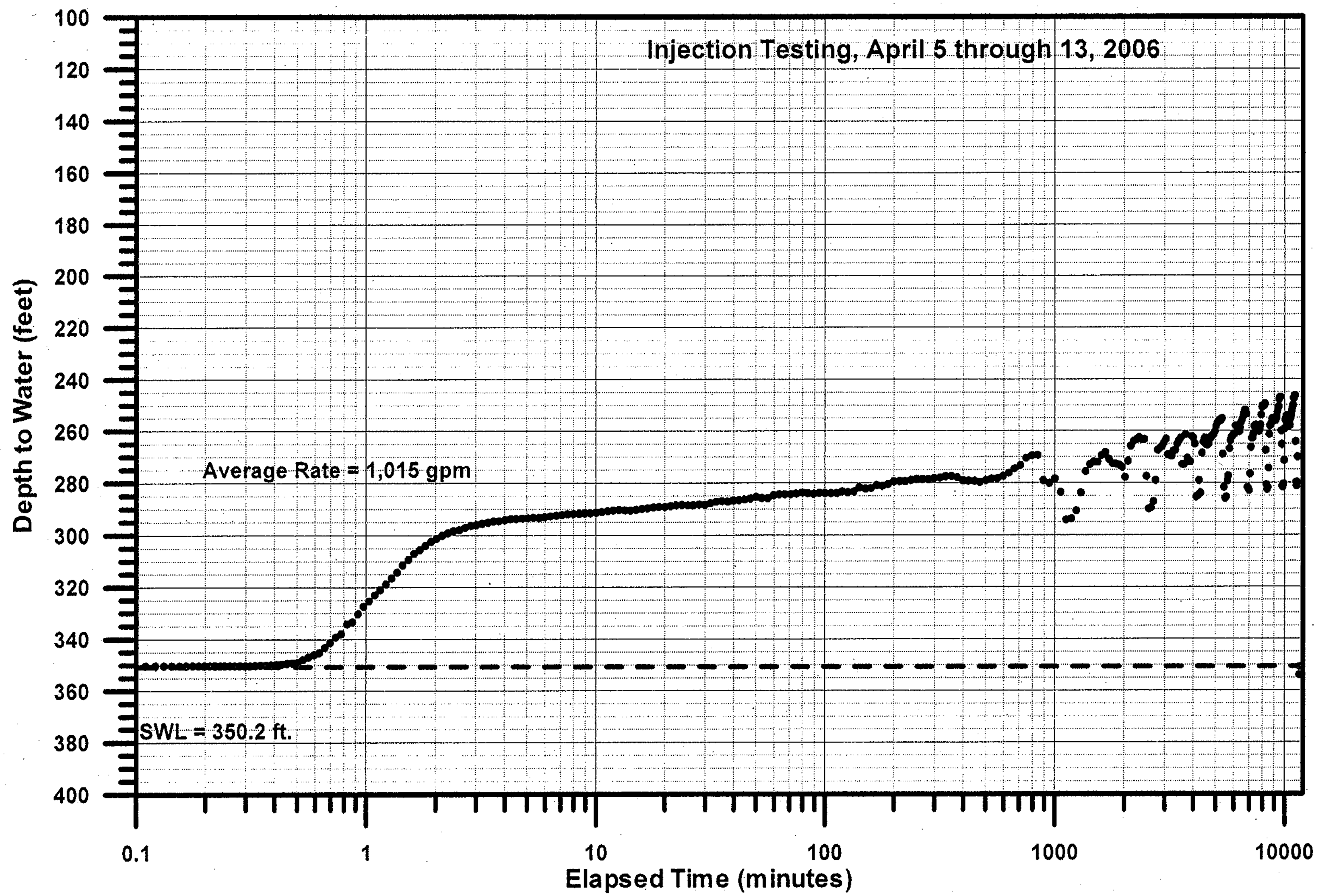
Monterey Peninsula Water Management District - SMTIW

WY2006 TESTING PROGRAM
INJECTION TEST NO. 11
PLATE 13

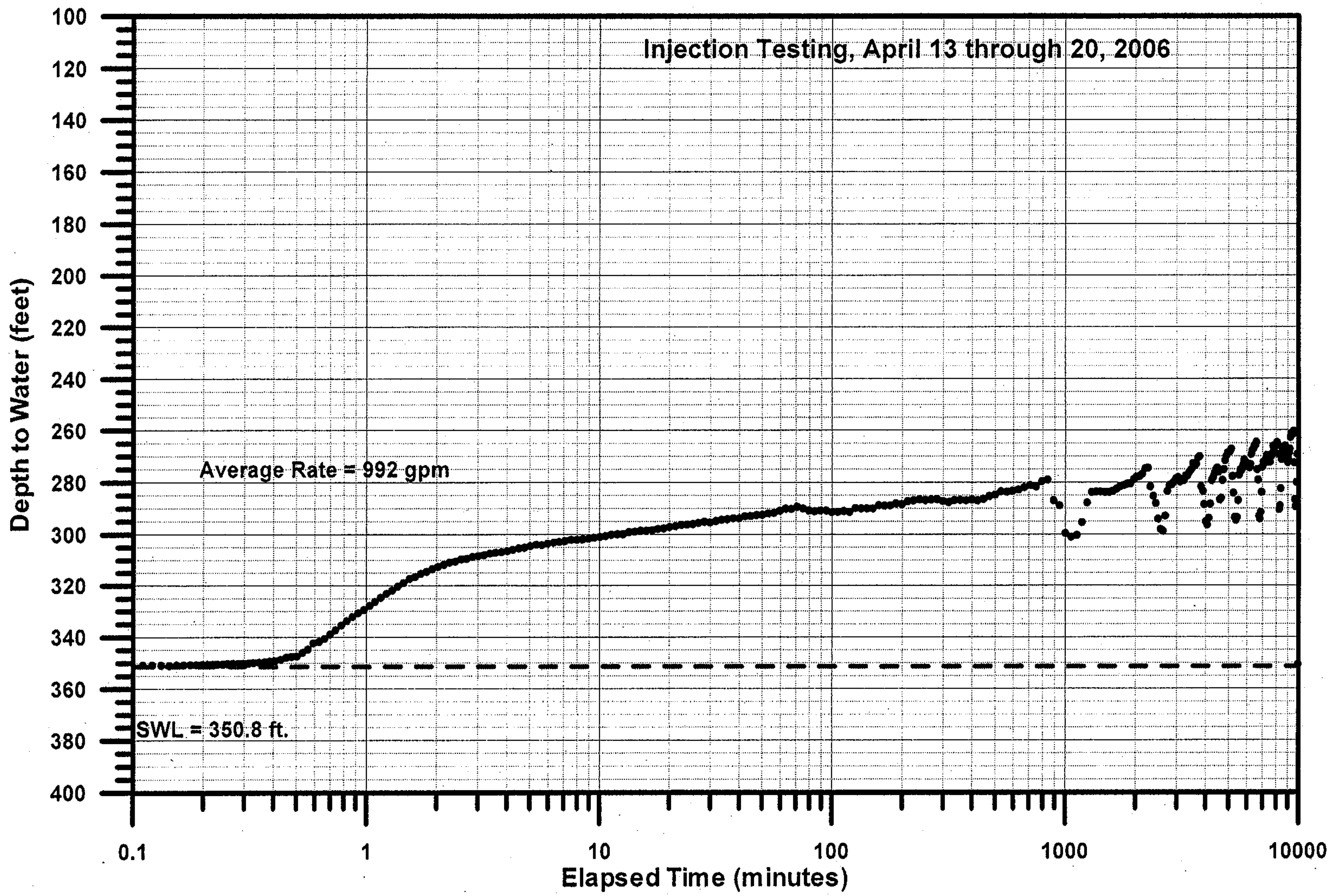

Injection Testing, April 4, 2006
Depth to Water (feet)
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
Average Rate = 1089 gpm
Test Aborted
(due to electrical outage)
SWL = 350.7 ft.
0.1
1
10
100
1000
10000
Elapsed Time (minutes)



PUEBLO water resources

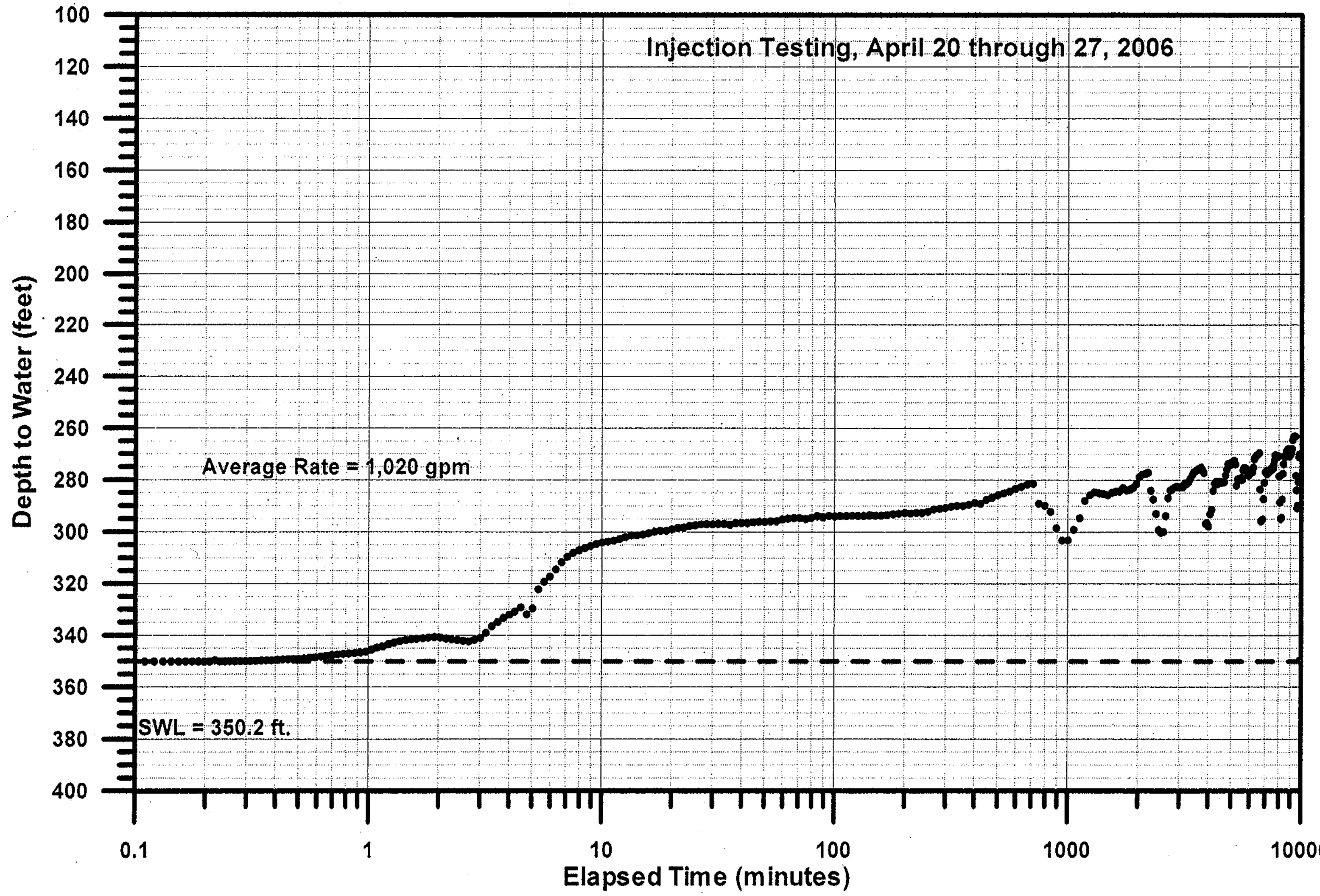
Monterey Peninsula Water Management District - SMTIW

WY2006 TESTING PROGRAM
INJECTION TEST NO. 13
PLATE 15



Monterey Peninsula Water Management District - SMTIW

WY2006 TESTING PROGRAM
INJECTION TEST NO. 14
PLATE 16



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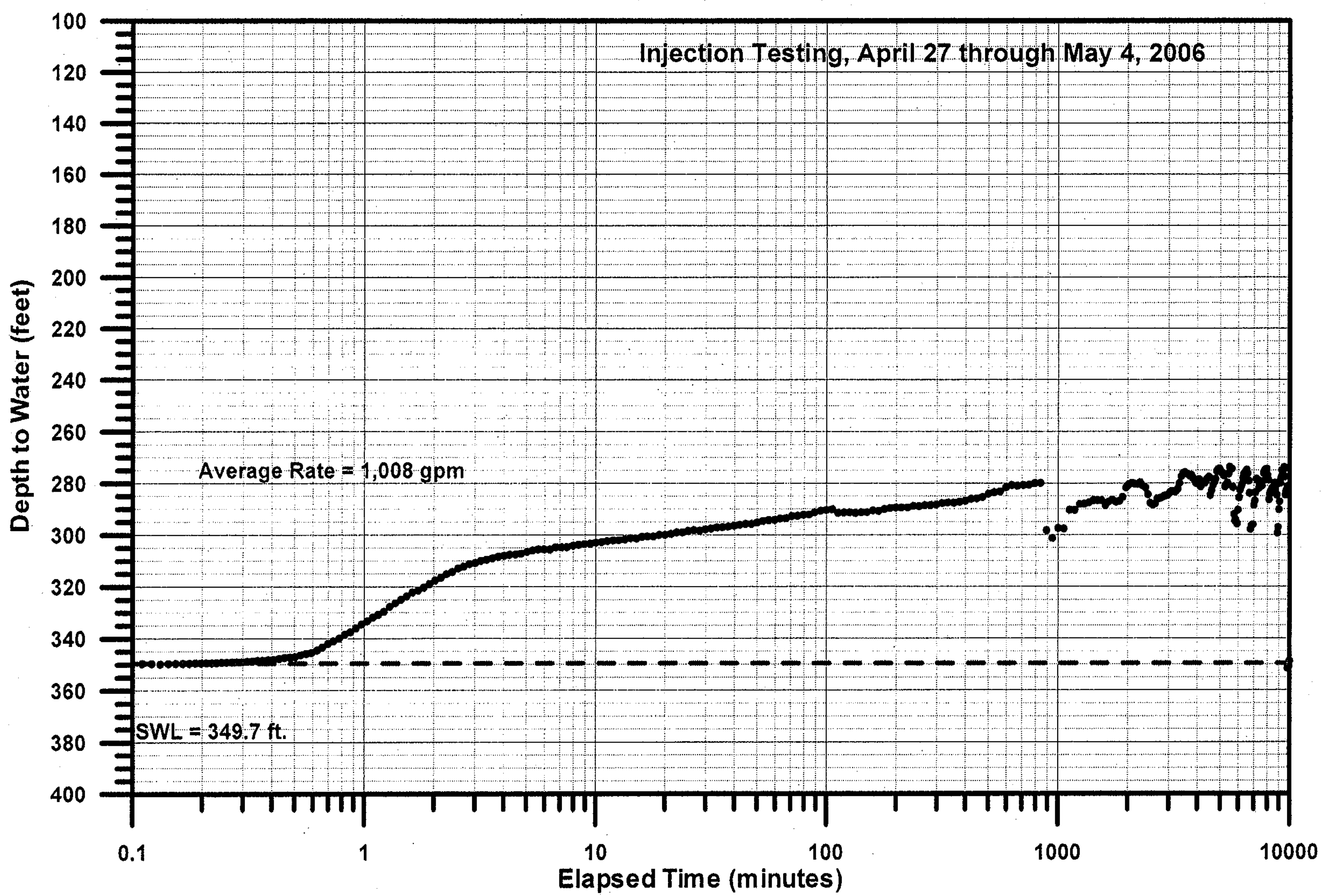
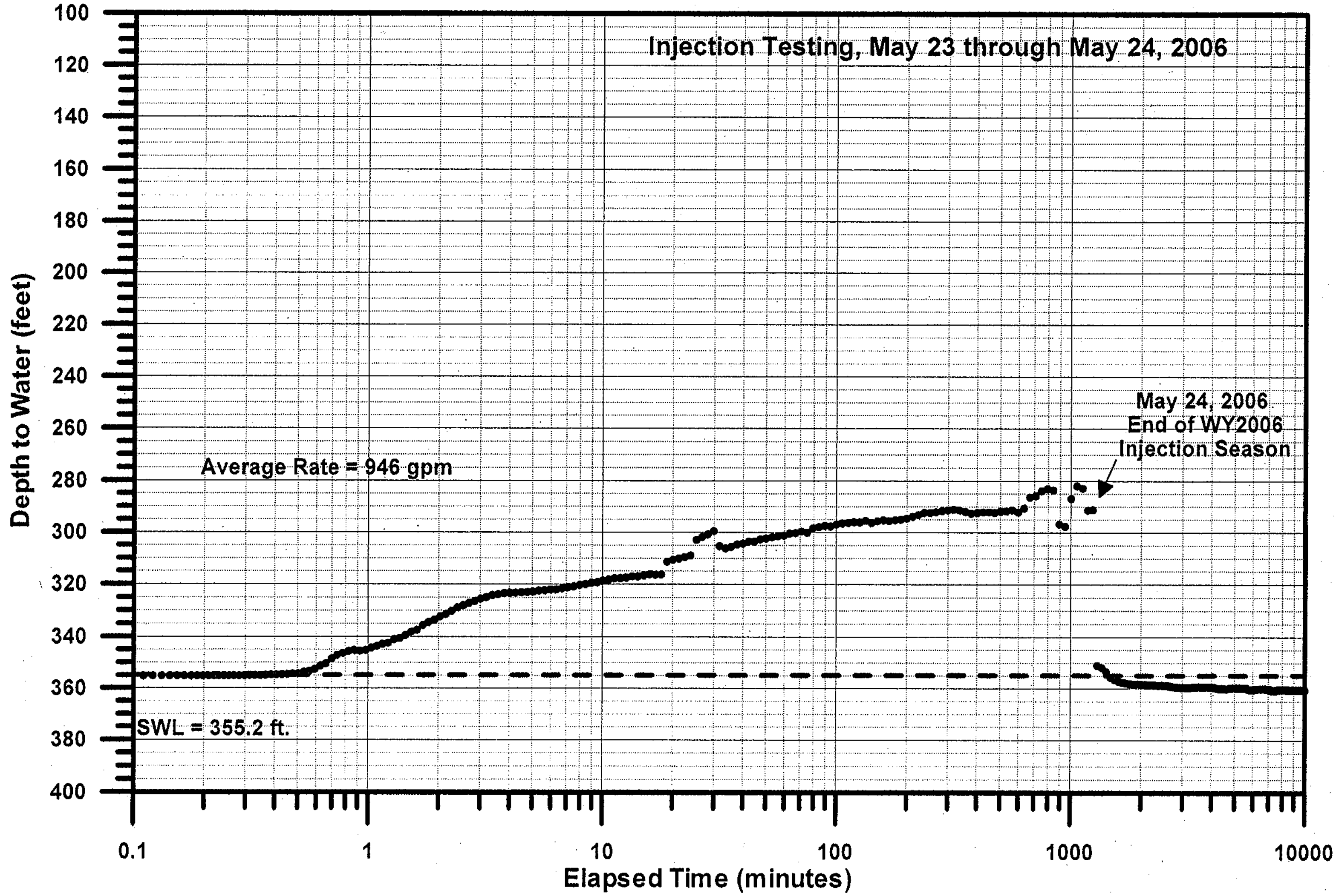
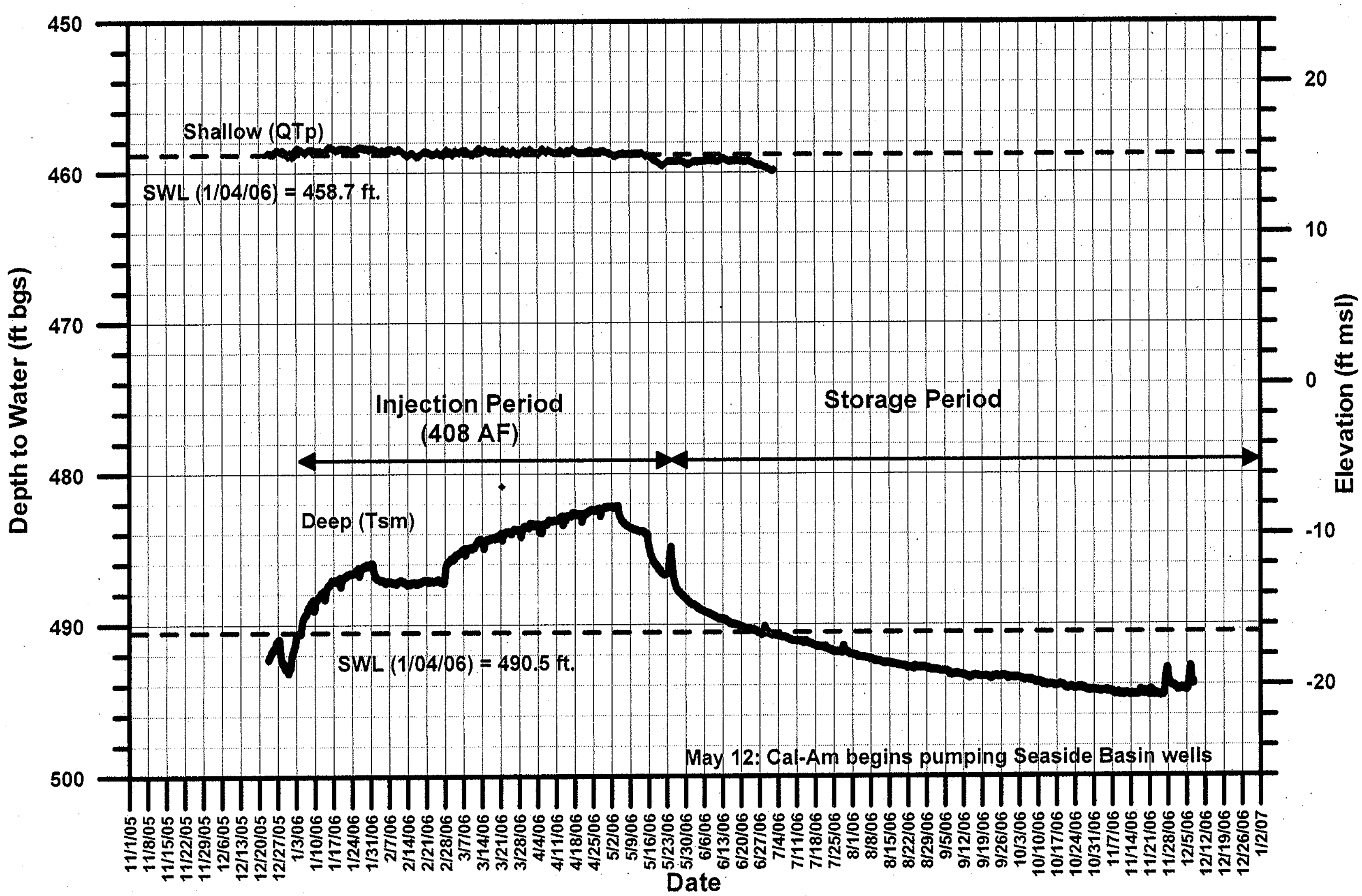
Monterey Peninsula Water Management District - SMTIW

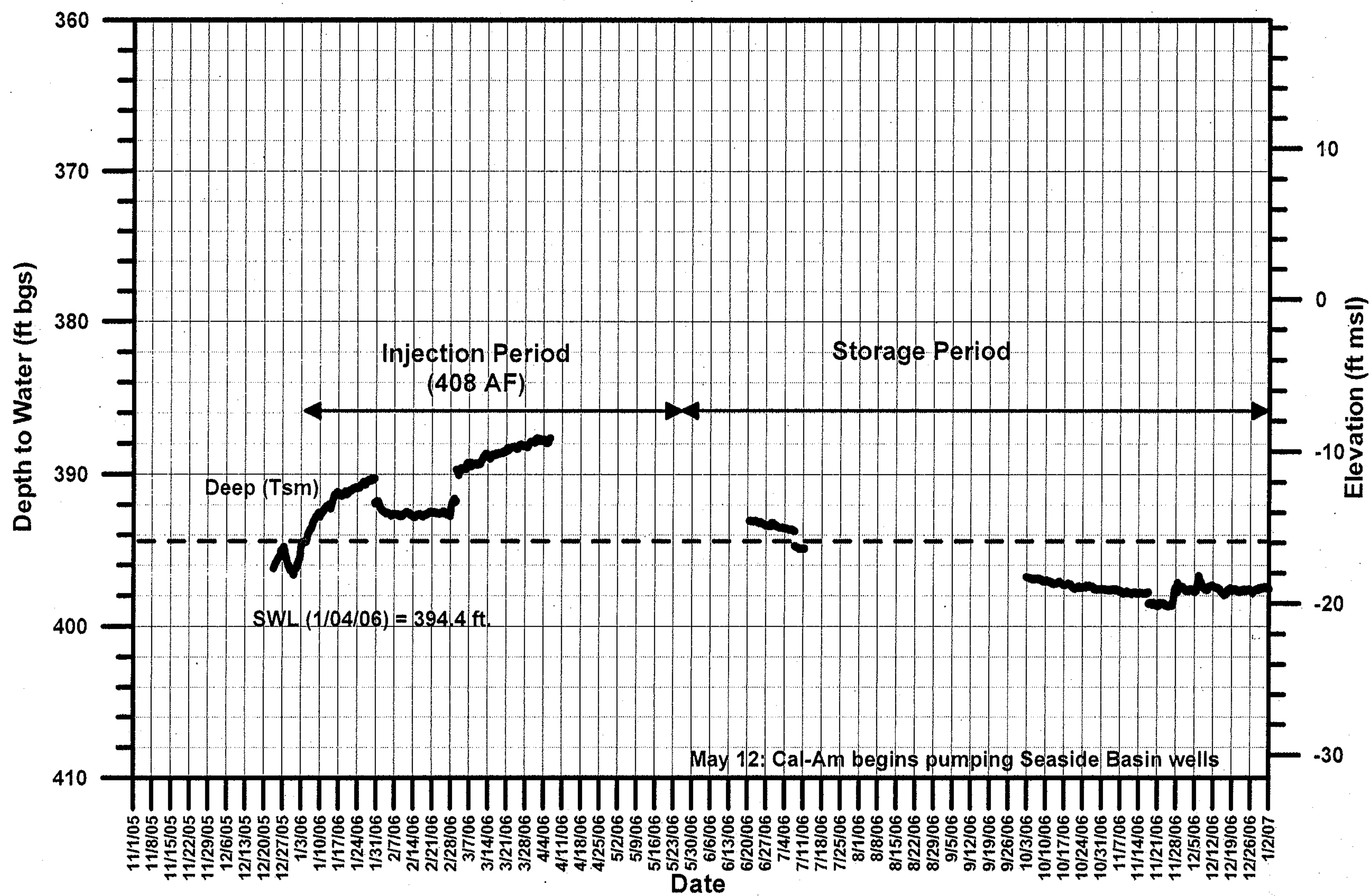
WY2006 TESTING PROGRAM
INJECTION TEST NO. 15
PLATE 17


Injection Testing, April 27 through May 4, 2006
Average Rate = 1,008 gpm
SWL = 349.7 ft.
Depth to Water (feet)
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
0.1
1
10
100
1000
10000
Elapsed Time (minutes)


Injection Testing, May 23 through May 24, 2006
Depth to Water (feet)
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
Average Rate = 946 gpm
May 24, 2006
End of WY2006
Injection Season
SWL = 355.2 ft.
0.1
1
10
100
1000
10000
Elapsed Time (minutes)



WY2006 TESTING PROGRAM, FO-7 WATER LEVEL DATA
PLATE 20



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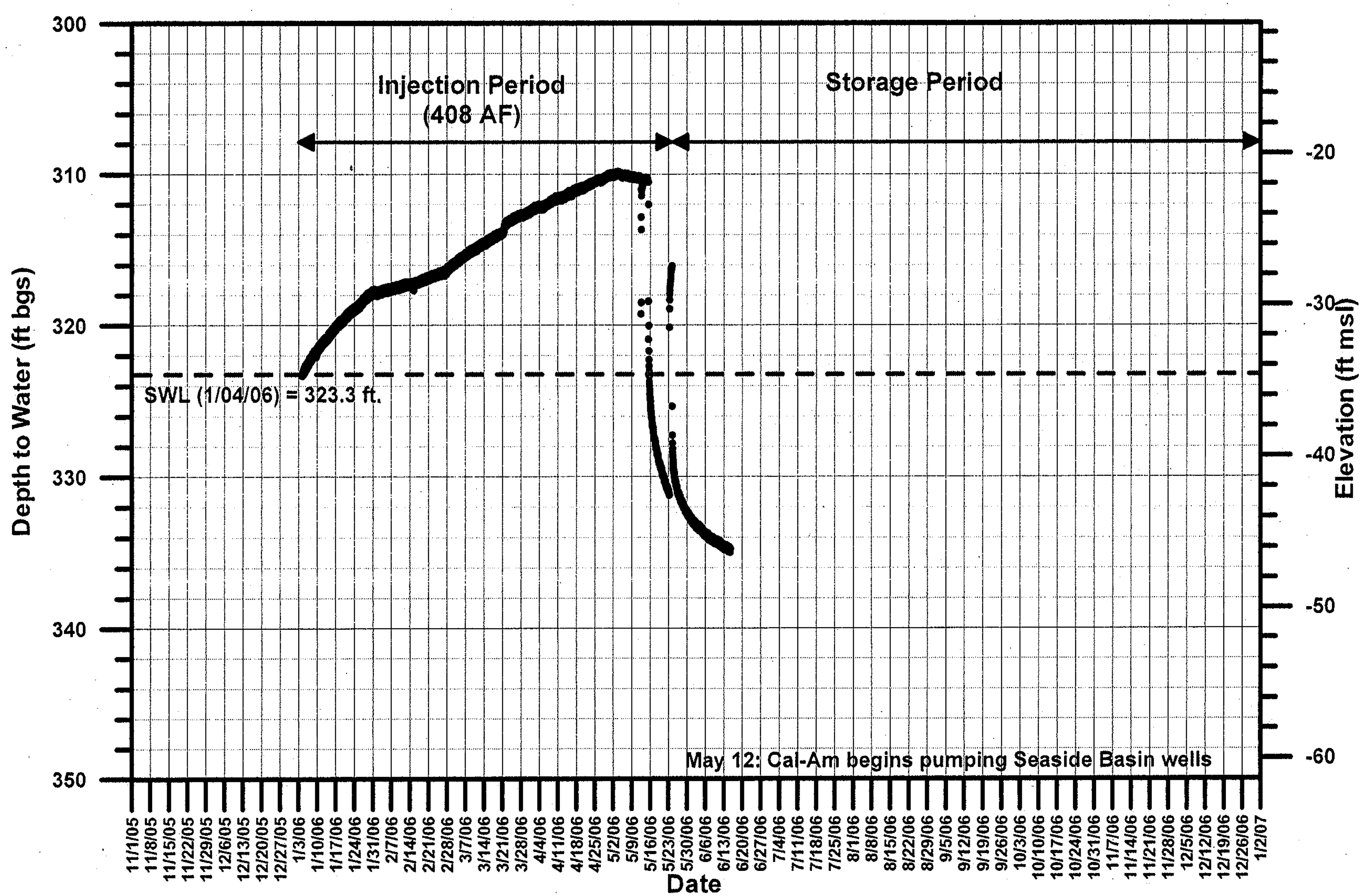
WY2006 TESTING PROGRAM, FO-8 WATER LEVEL DATA
PLATE 21



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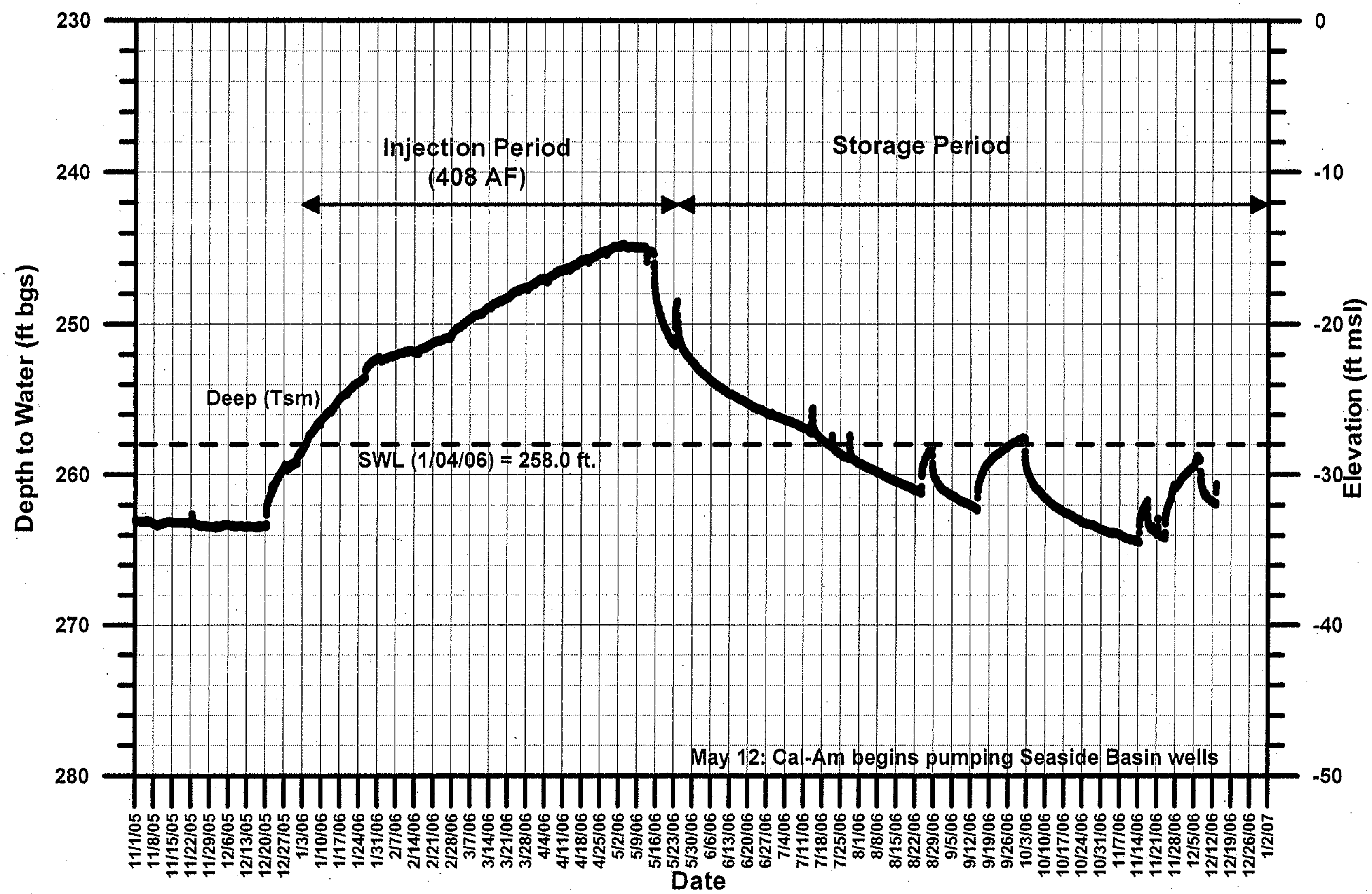
WY2006 TESTING PROGRAM, ORD GROVE TEST WATER LEVEL DATA
PLATE 22



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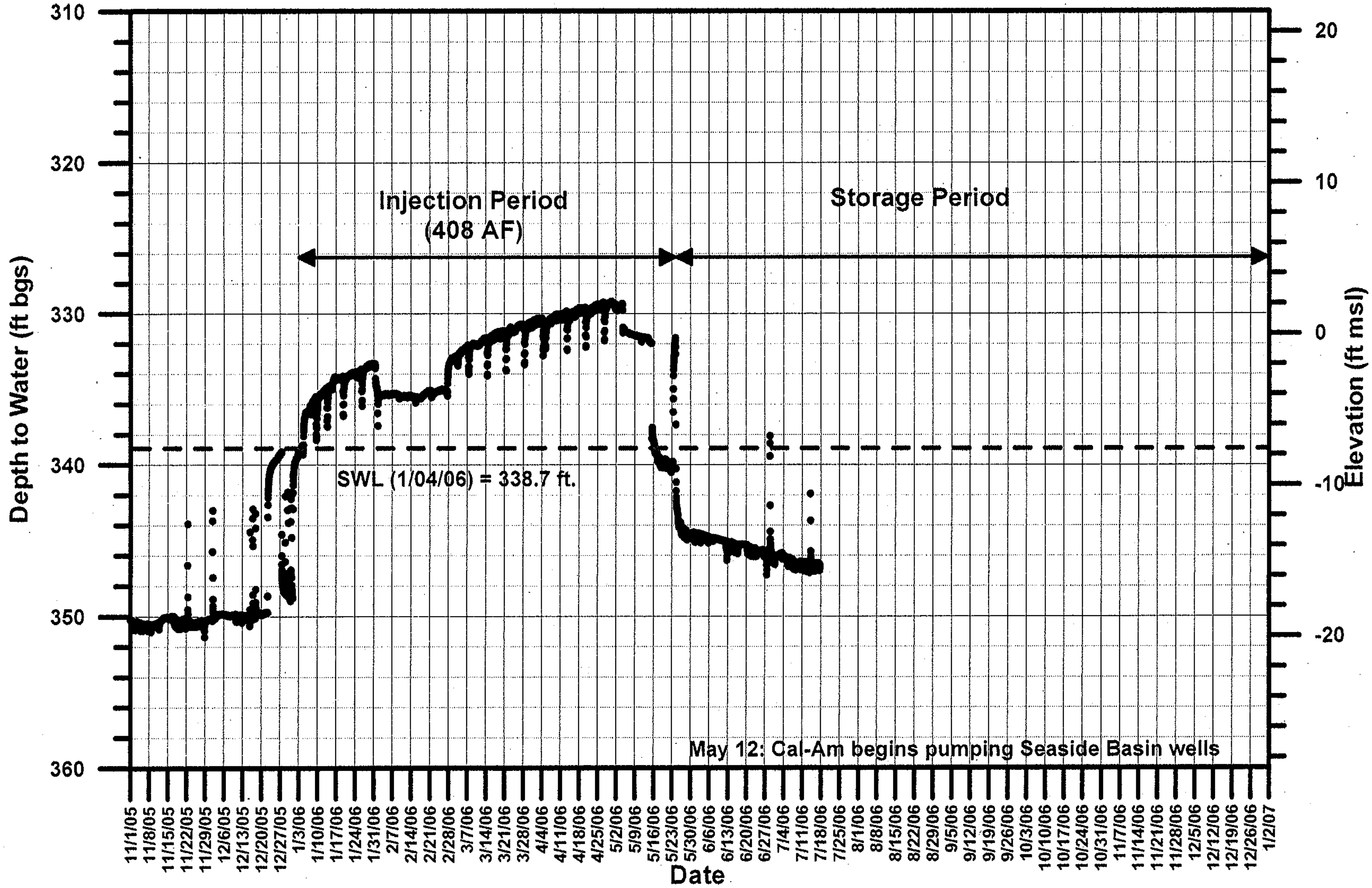
WY2006 TESTING PROGRAM, ORD TERRACE DEEP WATER LEVEL DATA
PLATE 23



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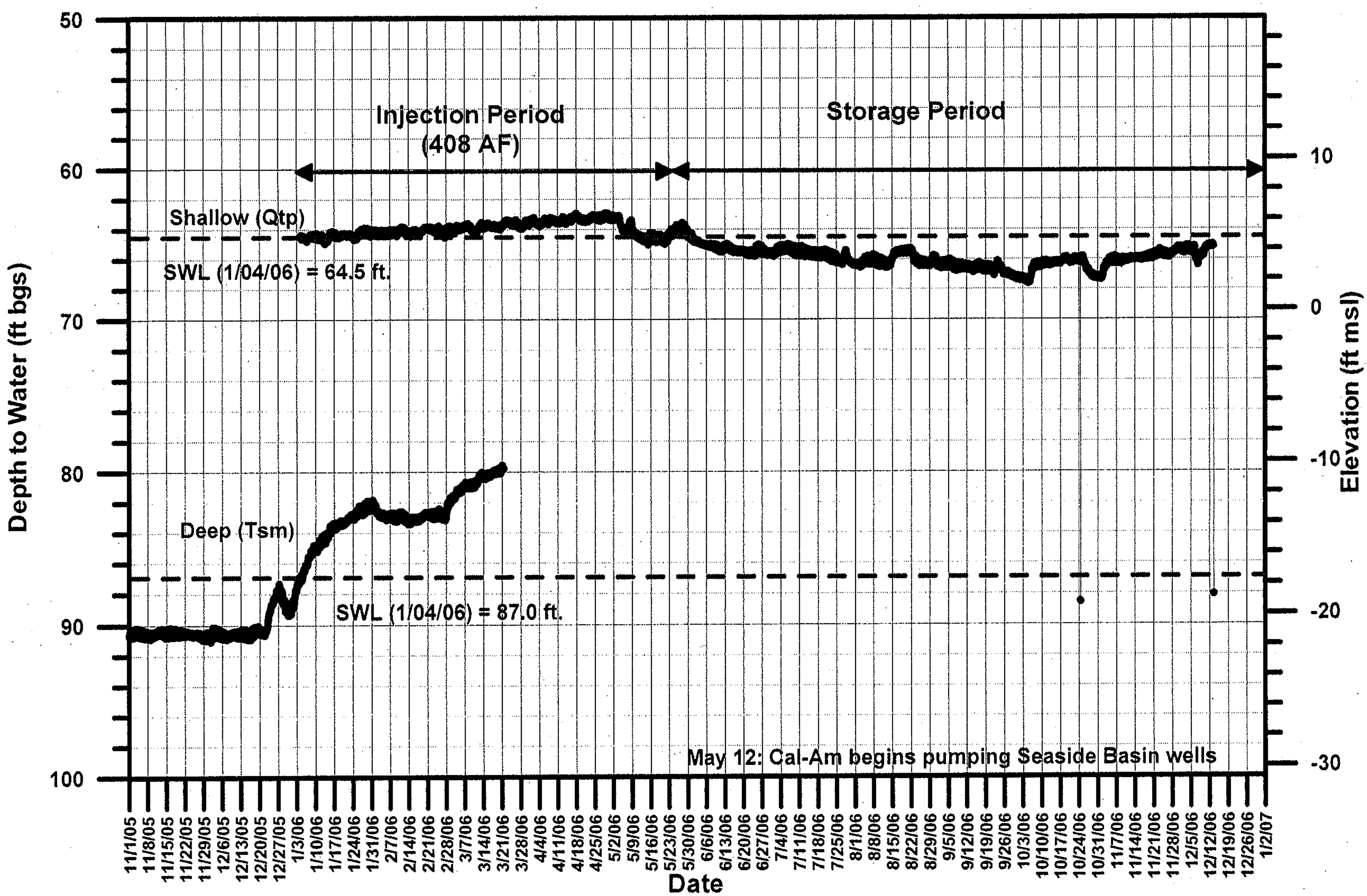
WY2006 TESTING PROGRAM, PARALTA TEST WATER LEVEL DATA
PLATE 24



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Monterey Peninsula Water Management District - SMTIW

WY2006 TESTING PROGRAM, PCA-EAST WATER LEVEL DATA
PLATE 25