APPENDIX 5.16
Tidal Influence and Flood Analysis Discussion, Tables, and Graphs

Appendix 5.16
Evaluation of Tidal Groundwater Water Level Data

Introduction

As described in Section 5.12, continuous water level elevation data were obtained during the months of October and November, 2004. The proposed intent of the data analysis was to examine tidal propagation within the landfill. However, during October there was significant rainfall and corresponding floodwater flows within the San Diego River channel located to the south of the landfill. The flood events provided an opportunity to examine the water level response to elevated water levels to the south of the landfill. Water level observations were initiated in the adjacent San Diego River channel; however, the installed staff gage washed away due to the high flow in the River from the rainfall events.

Local daily hydrologic data are available for rainfall at Sea World and for flow in the San Diego River at Mission Valley (approximately 2.5 miles upstream [west] of the site). Table N.1 summarizes the daily rainfall quantities recorded at Sea World and San Diego River stream gage height and flow data for the months of October and November 2004.

Table 5.16.1
Rainfall at Sea World and Flow in the San Diego River at Mission Valley

Date	Daily Rainfall (inches)	Instantaneous San Diego River Gage Height (feet)			Mean River Flow (cfs)		
		Maximum	Minimum	Mean	Maximum	Minimum	Mean
10/1/2004	0.00	1.54	1.53	1.54	1.6	1.5	1.6
10/2/2004	0.00	1.58	1.54	1.56	2.0	1.6	1.8
10/3/2004	0.00	1.60	1.58	1.59	2.2	2.0	2.1
10/4/2004	0.00	1.61	1.58	1.60	2.4	2.1	2.2
10/5/2004	0.00	1.59	1.58	1.59	2.2	2.1	2.1
10/6/2004	0.00	1.60	1.58	1.59	2.3	2.1	2.2
10/7/2004	0.00	1.59	1.58	1.59	2.2	2.1	2.1
10/8/2004	0.00	1.58	1.56	1.57	2.1	1.9	2.0
10/9/2004	0.00	1.59	1.57	1.58	2.2	2.0	2.1
10/10/2004	0.00	1.59	1.59	1.59	2.2	2.2	2.2
10/11/2004	0.00	1.60	1.58	1.59	2.3	2.1	2.2
10/12/2004	0.00	1.58	1.56	1.57	2.1	1.9	2.0
10/13/2004	0.00	1.57	1.55	1.56	2.0	1.8	1.9
10/14/2004	0.00	1.56	1.54	1.56	1.9	1.7	1.8
10/15/2004	0.00	1.55	1.53	1.54	1.8	1.6	1.7
10/16/2004	0.00	1.55	1.53	1.54	1.8	1.6	1.7
10/17/2004	0.06	2.43	1.55	1.85	23.0	1.8	7.7
10/18/2004	0.09	2.45	2.13	2.32	24	13	19
10/19/2004	0.66	5.74	2.45	3.92	466	24	197
10/20/2004	0.95	10.02	5.34	6.94	1520	394	721
10/21/2004	0.20	9.59	5.03	7.31	1250	342	757
10/22/2004	0.00	5.03	3.70	4.21	342	135	210

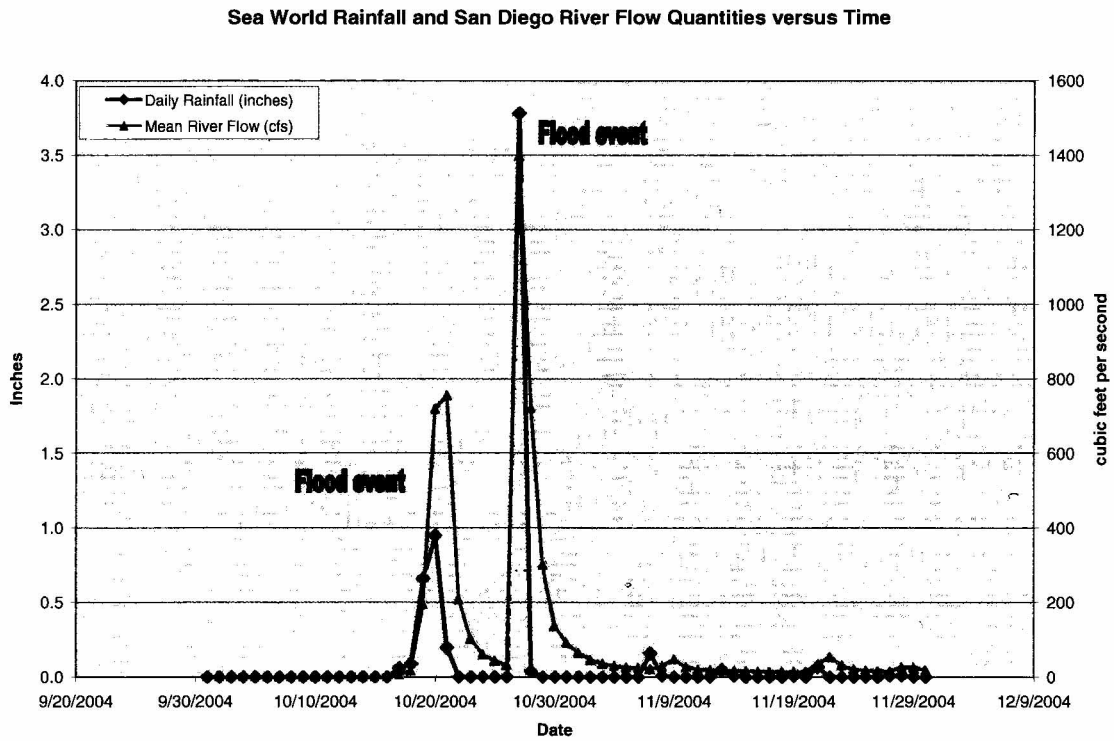
Date	Daily Rainfall (inches)	Instantaneous San Diego River Gage Height (feet)			Mean River Flow (cfs)		
		Maximum	Minimum	Mean	Maximum	Minimum	Mean
10/23/2004	0.00	3.70	3.24	3.45	135	78	104
10/24/2004	0.00	3.24	2.95	3.08	78	51	63
10/25/2004	0.00	2.95	2.75	2.85	51	38	45
10/26/2004	0.00	2.75	2.58	2.67	38	30	34
10/27/2004	3.78	11.08	2.58	8.36	2680	30	1400
10/28/2004	0.04	10.00	5.82	7.11	1500	479	723
10/29/2004	0.00	5.82	3.99	4.78	479	173	303
10/30/2004	0.00	3.99	3.53	3.73	173	112	138
10/31/2004	0.00	3.53	3.26	3.39	112	78	94
11/1/2004	0.00	3.26	3.02	3.14	78	55	67
11/2/2004	0.00	3.02	2.84	2.91	55	43	48
11/3/2004	0.00	2.84	2.70	2.76	43	35	38
11/4/2004	0.00	2.70	2.59	2.65	35	29	32
11/5/2004	0.00	2.59	2.54	2.56	29	27	28
11/6/2004	0.00	2.54	2.48	2.51	27	24	26
11/7/2004	0.16	2.48	2.45	2.46	24	23	24
11/8/2004	0.01	2.96	2.47	2.65	51	24	32
11/9/2004	0.00	3.09	2.70	2.94	62	35	50
11/10/2004	0.00	2.70	2.47	2.56	35	24	28
11/11/2004	0.00	2.47	2.37	2.41	24	20	22
11/12/2004	0.00	2.38	2.37	2.38	20	20	20
11/13/2004	0.05	2.37	2.34	2.35	20	19	19
11/14/2004	0.01	2.36	2.33	2.35	20	19	19
11/15/2004	0.00	2.33	2.28	2.31	19	17	18
11/16/2004	0.00	2.28	2.25	2.26	17	16	17
11/17/2004	0.00	2.25	2.24	2.24	16	16	16
11/18/2004	0.00	2.24	2.24	2.24	16	16	16
11/19/2004	0.01	2.24	2.22	2.23	16	15	16
11/20/2004	0.00	2.22	2.21	2.22	15	15	15
11/21/2004	0.07	3.10	2.21	2.67	63	15	37
11/22/2004	0.00	3.13	2.82	3.01	66	41	56
11/23/2004	0.00	2.90	2.49	2.66	47	25	33
11/24/2004	0.00	2.49	2.36	2.41	25	20	22
11/25/2004	0.00	2.36	2.32	2.34	20	18	19
11/26/2004	0.00	2.32	2.28	2.30	18	17	18
11/27/2004	0.01	2.36	2.25	2.27	20	16	17
11/28/2004	0.01	2.69	2.36	2.57	34	20	28
11/29/2004	0.00	2.56	2.47	2.53	28	24	27
11/30/2004	0.00	2.47	2.30	2.37	24	18	20

Notes:

1) Rainfall values provided by San Diego County Flood Control District and were collected with a rainfall gage on the Sea World Property.

2) Data collected at USGS Stream gage number 11023000, (Latitude 324554 Longitude 1171004 NAD27 Drainage Area 429, Contributing Drainage Area, Datum 20 NGVD29)
San Diego River, Fashion Valley, San Diego, CA; Source Agency USGS, State 06, County 073

3) Gage-height values are arbitrary, meaning they are not related to a bed elevation or sea level. Therefore, a gage-height of 10 ft does not mean there was 10 ft of depth at the gage as stage data may imply. The gage-height near the streambed may be 3.0 ft meaning there was really about 7 ft of stage. Low flow gage-heights at this site were reported to average around 1.5 ft.



Overall, the rainfall events provided the opportunity to observe a second hydraulic stress upon the Site. The daily tidal variation is the primary hydraulic stress evaluated, and the analysis is conducted for data obtained before the flood events. Each is described in this Appendix.

Pre-flood Tidal Data Evaluation

Tides within Mission Bay are substantial and range up to approximately 7 feet. The tidal variation can be observed in water levels recorded in all of the groundwater monitoring wells. The pressure pulse caused by the rise and fall of the water in the bay propagates inland from the shoreline. The observed water level response in the monitoring wells will be attenuated and decrease with distance away from the shoreline. Similarly the pressure pulse will be delayed in time as a function of distance.

In general, the amplitude of the tidal water level variation is expected to exponentially decrease with distance from the shoreline. The overall pattern of variations will depend upon the subsurface conditions. The shallow subsurface conditions observed at the Site are comprised of hydraulic fill containing landfill contents which produces a relatively heterogeneous substratum, as described in geological description sections of this report.

The analysis conducted for the tidally-influenced water level measurements examines the amount of attenuation that occurs and how quickly the tidal pulse propagates from the shoreline. Both the attenuation and the lag time are primarily related to the hydraulic

properties of the aquifer system between the shoreline and the well. Here these characteristics are termed the tidal efficiency and the tidal lag where

TE, the tidal efficiency.
Defined as the change in WL at the well divided by the change in WL in the Bay

Tidal Lag.
Defined as the difference in time between when a peak water level is observed in the Bay and when it is observed in a monitoring well

The tidal information at nearby Quivira Basin was obtained from www.saltwatertides.com and the data have been compared to the data obtained at each of the wells. Graphs have been generated for each well that received a pressure transducer during the tidal study. The graphs depict the groundwater elevation and a running average (based on one lunar day [24 hours and 50 minutes]) of the groundwater elevation for the dates of October 13 through October 18. The period of October 13 to October 18 was selected as being a time period when rainfall and flooding does not appear to influence the water levels at the site. Review of the tidal data shows that a relatively strong diurnal tide occurs during the first portion of this time period, characterized by approximately 12-hour tidal cycles. The water level rises in the wells are directly compared to those in the bay for each of the wells in the attached tables. Table 5.16.2 below summarizes the analyses:

Table 5.16.2

Well No.	Distance to Bay (feet)	Average Time Lag (days)	Average Time Lag (minutes)	Average Tidal Efficiency (dimensionless)
MBW1	500	0.208	299.297	0.012
MBW2	600	0.033	47.429	0.456
MBW3	500	0.277	398.491	0.030
MBE4	1,000	0.629	905.900	0.022
MBW5	1,300	0.241	347.607	0.008
MBE6	825	0.145	209.022	0.108
MBW7	2,600	NC	NC	NC
MW10	400	0.199	286.891	0.016
SCS1	125	0.050	71.452	0.018
SCS2*	540	NC	NC	NC
SCS3	925	0.168	242.153	0.033
SCS4	75	0.051	74.047	0.286

Notes:
* = No significant tidal response was observed in SCS2.

Figure 6.1 depicts the average tidal lag and efficiency calculated for the onsite monitoring wells (except MBW7 and SCS2).

Long-term water level

Tides form in response to the gravitational effects of the moon and the sun, and the overall tidal cycles occur in response to the relative positions of the earth, moon, and sun. Lunar effects are the most dominant and occur over a time period equal to the lunar cycle, or the period of time required for the moon to orbit the earth. One lunar period, the time required for the moon to be in the same overhead position from day to day is 24 hours and 50 minutes (1490 minutes). This is also known as the principal lunar diurnal period, and is the primary lunar and solar cycle represented in the tidal records (Carr, 1971).

The long-term average water level in each of the wells is obtained by taking the average of all water levels during the principal lunar diurnal period. This is done by taking the moving average of the water levels obtained at each of the wells. Review of the averaged values presented in this report shows that cyclic fluctuations remain visible in the records. These fluctuations correspond to the other lunar and solar tidal components. The 1490 minute moving average is judged sufficient to assess the average groundwater levels that occur at the site.

The averaged water levels are used to assess the relative non-tidally influenced change in water levels that occurred at the site in response to the increased water level in the San Diego River channel caused by the October flood events. The attached Table 5.16.3 summarizes the measured water levels at the monitoring wells which were utilized in constructing the groundwater elevation maps (Figure 5.8 and Figures 5.16.1 through 5.16.3) and the flood pulse thickness map (Figure 5.9).

References

Carr, P.A. and G.S. VanDerKamp, Determining Aquifer Characteristics by the Tidal Method, Water Resources Research Vol 5, No. 5, October 1969.

Carr, P.A., Use of Harmonic Analysis to study tidal fluctuations in aquifers near the sea, Water Resources Research, volume 7, no. 3, June 1971.

Ferris, John G., Cyclic fluctuations of water levels as a basis for determining aquifer transmissibility, Ass. Int. Hydrol. Sci. Bull., 2, 148-155, 1951.

Hvorslev, M.J, Time lag and soil permeability in groundwater observations, U.S. Army Corps Eng. Bull. 36, Vicksburg, Mississippi, 1951.

Table 5.16.3
Measured and Tidal Average Groundwater Elevations in Monitoring Wells
Mission Bay Landfill
San Diego, California

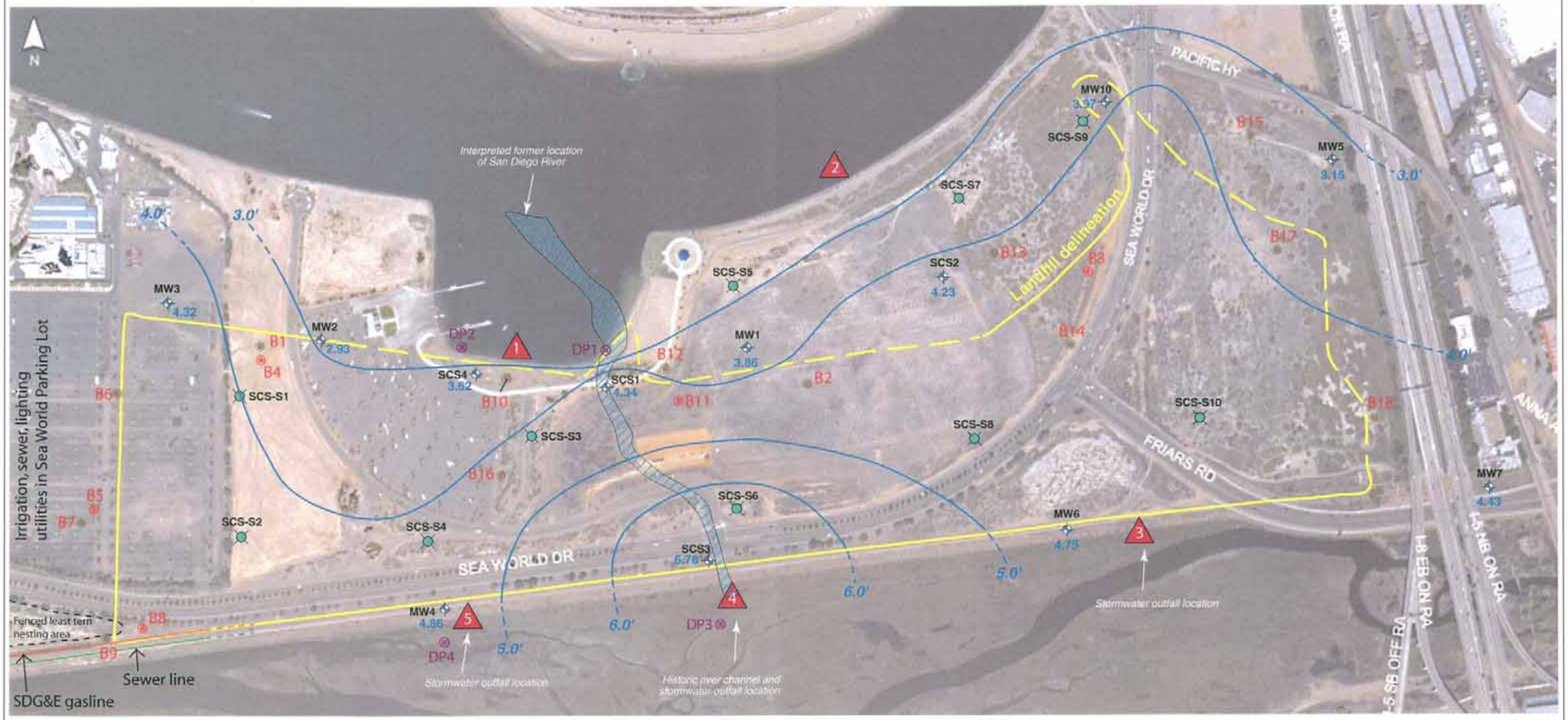
Date & Approx. Time	MBW1	Avg.	MBW2	Avg.	MBW3	Avg.	MBE4	Avg.	MBW5	Avg.	MBE6	Avg.	MBW7	Avg.	MW10	Avg.	SCS1	Avg.	SCS2	Avg.	SCS3	Avg.	SCS4	Avg.
10/7/2004 13:40	3.82	na	2.90	na	4.02	na	4.64	na	3.06	na	3.96	na	4.11	na	3.94	na	4.30	na	4.16	na	6.46	na	3.49	na
10/9/2004 17:45	3.85	3.84	3.30	2.68	4.05	4.07	4.59	4.60	3.09	3.08	3.88	3.93	3.98	na	4.01	3.99	4.34	4.31	4.17	4.17	6.44	6.44	3.76	3.36
10/12/2004 17:25	3.81	3.81	2.11	2.80	4.14	4.12	4.66	4.66	3.05	3.05	4.08	4.13	4.03	na	3.96	3.74	4.29	4.32	4.20	3.76	6.55	6.03	3.26	3.47
10/14/2004 7:55	3.80	3.82	3.36	2.88	4.10	4.15	4.69	4.71	3.04	3.05	4.29	4.48	4.09	na	3.96	3.99	4.33	4.32	4.19	4.19	6.57	6.62	3.89	3.53
10/14/2004 9:43	3.82	3.83	4.34	2.88	4.09	4.15	4.70	4.71	3.04	3.05	4.44	4.49	na	na	3.98	3.99	4.38	4.32	4.19	4.19	6.59	6.62	4.35	3.53
10/14/2004 16:13	3.86	3.83	1.57	2.85	4.25	4.16	4.73	4.72	3.08	3.06	4.58	4.51	na	na	4.05	4.00	4.28	4.32	4.19	4.19	6.65	6.63	2.78	3.52
10/16/2004 12:00	3.84	3.83	4.62	2.93	4.16	4.20	4.74	4.75	3.04	3.05	5.15	4.65	4.23	na	4.00	4.00	4.41	4.33	4.20	4.20	6.85	6.62	4.47	3.57
10/19/2004 17:49	3.91	3.87	3.36	3.06	4.33	4.26	4.84	4.82	3.11	3.09	4.85	4.76	4.30	na	4.12	4.06	4.39	4.35	4.21	4.21	6.80	6.76	3.80	3.67
10/20/2004 17:55	3.92	3.89	3.89	3.16	4.36	4.33	4.89	4.89	3.12	3.13	5.10	4.99	4.32	na	4.10	4.08	4.44	4.39	4.23	4.23	6.91	6.86	4.11	3.74
10/22/2004 7:38	3.83	3.86	3.54	2.93	4.25	4.32	4.85	4.86	3.14	3.15	4.74	4.75	4.43	na	3.94	3.97	4.35	4.34	4.23	4.23	6.77	6.78	3.92	3.62
10/27/2004 17:42	3.88	3.89	1.94	3.22	4.75	4.60	5.11	5.09	3.31	3.30	5.38	5.35	4.49	na	4.09	4.09	4.35	4.41	4.26	4.26	7.09	7.07	3.11	3.77
10/28/2004 7:30	3.91	3.91	3.74	3.15	4.14	4.32	5.12	5.11	3.31	3.31	5.13	5.27	4.55	na	4.01	4.03	4.44	4.41	4.26	4.26	6.99	7.05	4.11	3.74
11/1/2004 18:02	3.95	3.92	2.16	2.90	4.39	4.29	5.06	5.05	3.36	3.35	4.66	4.69	4.64	na	4.07	4.02	4.41	4.43	4.26	4.26	6.82	6.81	3.15	3.56
11/5/2004 8:05	3.93	3.95	3.31	2.89	4.21	4.27	4.99	5.00	3.36	3.37	4.34	4.69	4.57	na	4.05	4.08	4.45	4.45	4.27	4.27	6.67	6.66	3.74	3.53
11/8/2004 7:39	3.95	3.96	3.86	2.95	4.24	4.29	5.01	5.01	3.35	3.36	4.26	4.18	4.48	na	4.06	4.07	4.50	4.46	4.28	4.28	6.64	6.65	4.02	3.54
11/10/2004 7:35	3.95	na	4.04	na	4.19	na	5.02	na	3.36	na	4.39	na	4.39	na	4.11	na	4.50	na	4.26	na	6.67	na	4.15	na
11/21/2004 16:31	3.79	na	3.58	na	4.35	na	4.54	na	5.31	na	4.54	na	4.41	na	3.10	na	3.71	na	3.51	na	4.52	na	3.37	na
	MBW1	thick.	MBW2	thick.	MBW3	thick.	MBE4	thick.	MBW5	thick.	MBE6	thick.	MBW7	thick.	MW10	thick.	SCS1	thick.	SCS2	thick.	SCS3	thick.	SCS4	thick.
Flood pulse thickness		0.08		0.21		0.12		0.37		0.26		0.61		0.32		0.02		0.08		0.06		0.43		0.16

Notes:

1) Avg. = tidal average groundwater elevation value in feet above mean sea level., thick. = thickness in feet

2) Flood pulse thickness calculated by subtracting the tidal average groundwater elevation value for October 16, 2004 @ 12:00pm (preflood) from the tidal average groundwater elevation value for October 28, 2004 @ 7:30am (postflood).

3) na = Not available



Note: Digital ortho-photograph provided to SCS by City of San Diego. Photograph dated March 2002.
Disclaimer: This figure is based on data provided by others. Actual conditions may differ. All locations and dimensions are approximate.

EXPLANATION

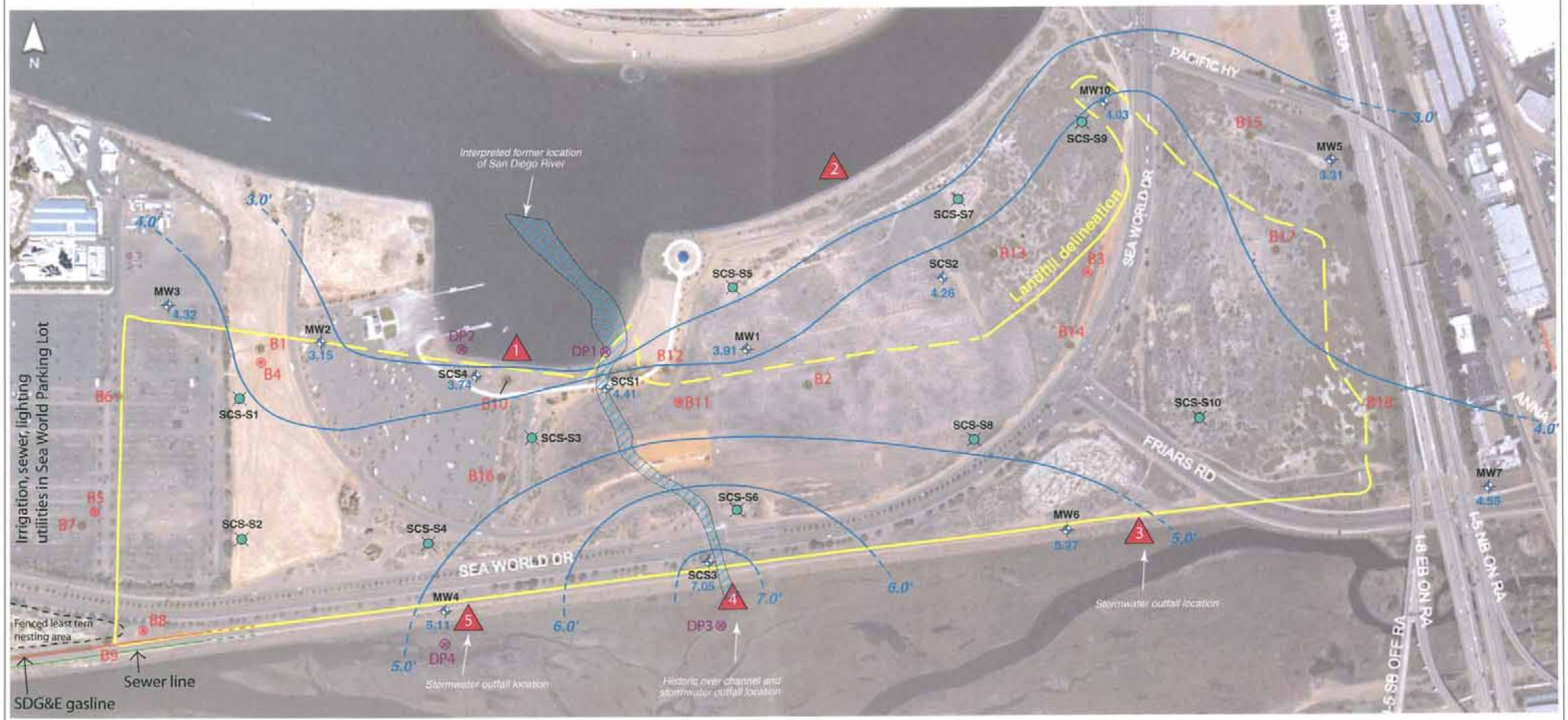
- Drive point locations
- Surface soil sample location (0 to 12 inches below grade collected by hand auger) (SCS-S7)
- Location and designation of existing monitoring wells. (MW2)
- Sediment sample locations
- Boring location and designation where soil and groundwater was not sampled for chemical analysis.
- Boring location and designation where soil and/or groundwater samples were collected for chemical analysis.
- 4.86 Groundwater elevation in feet above mean sea level (MSL).
- 5.0' Estimated groundwater contour in feet above mean sea level.

0 200 400 600
Approximate Graphic Scale in Feet

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
8799 Balboa Avenue, Suite 290
San Diego, California 92123

SITE MAP SHOWING GROUNDWATER ELEVATIONS
October 22, 2004 at 7:38 am
City of San Diego
Mission Bay Landfill
San Diego, California

Project No.: 01203520.00
Figure 5.16.1
Date Drafted: 4/27/06



Note: Digital ortho-photograph provided to SCS by City of San Diego. Photograph dated March 2002.
Disclaimer: This figure is based on data provided by others. Actual conditions may differ. All locations and dimensions are approximate.

EXPLANATION

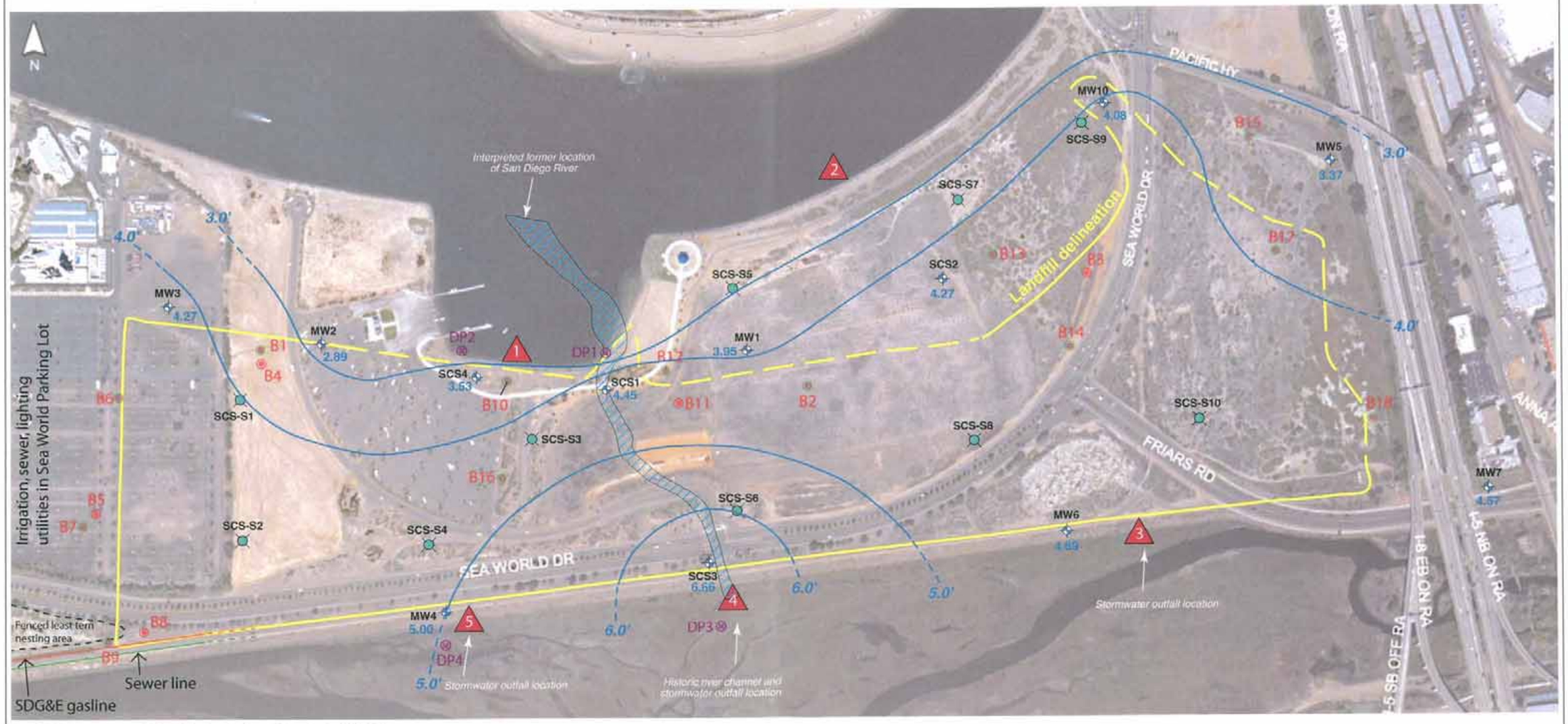
- Drive point locations
- Surface soil sample location (0 to 12 inches below grade collected by hand auger) (SCS-S7)
- Location and designation of existing monitoring wells. (MW2)
- Sediment sample locations
- Boring location and designation where soil and groundwater was not sampled for chemical analysis.
- Boring location and designation where soil and/or groundwater samples were collected for chemical analysis.
- 5.11 Groundwater elevation in feet above mean sea level (MSL).
- 5.0' Estimated groundwater contour in feet above mean sea level.

0 200 400 600
Approximate Graphic Scale in Feet

SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
8799 Balboa Avenue, Suite 290
San Diego, California 92123

SITE MAP SHOWING GROUNDWATER ELEVATIONS
October 28, 2004 at 7:30 am
City of San Diego
Mission Bay Landfill
San Diego, California

Project No.: 01203520.00
Figure 5.16.2
Date Drafted: 4/27/06



Note: Digital ortho-photograph provided to SCS by City of San Diego. Photograph dated March 2002.
Disclaimer: This figure is based on data provided by others. Actual conditions may differ. All locations and dimensions are approximate.

EXPLANATION

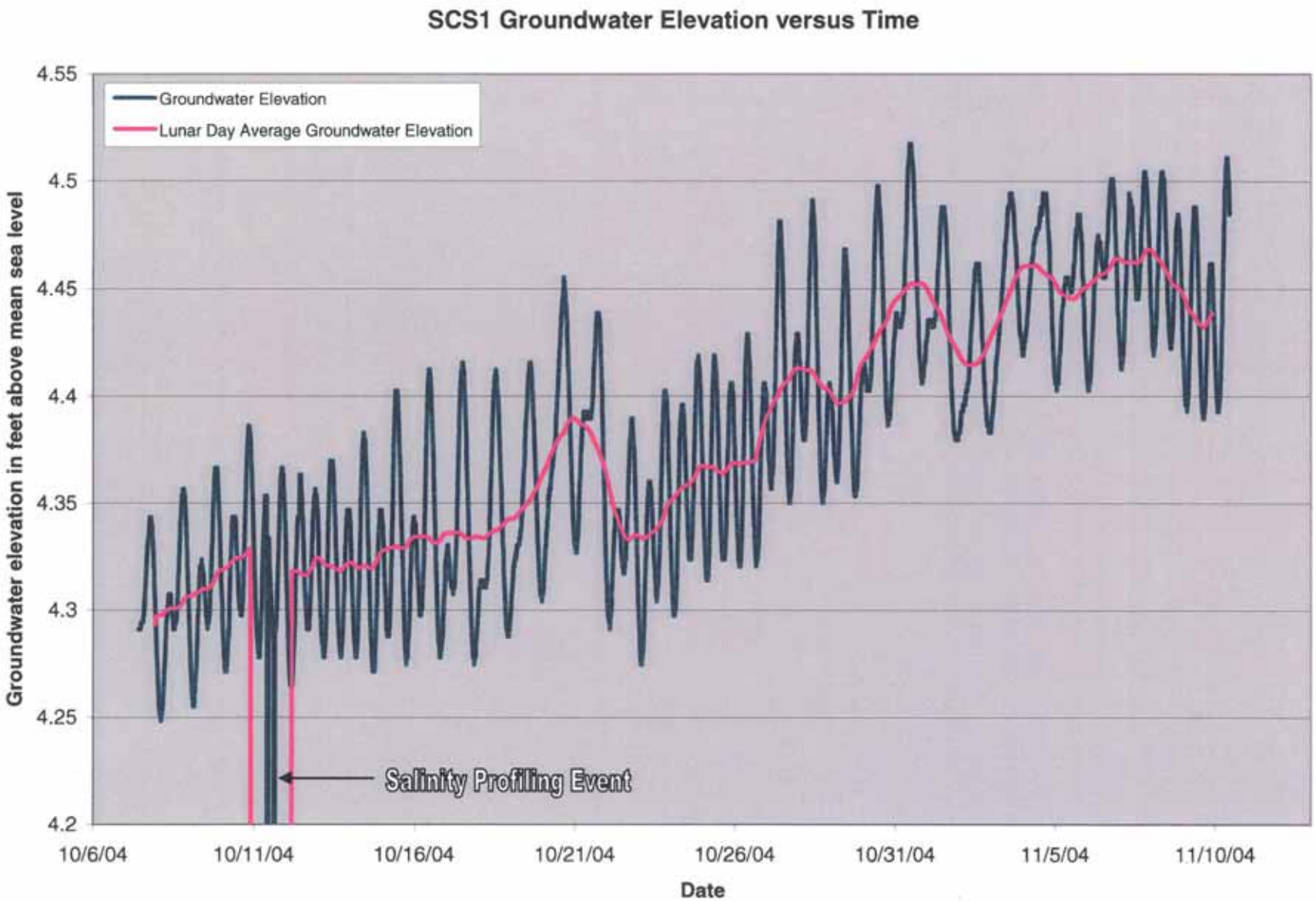
- Drive point locations
- Surface soil sample location (0 to 12 inches below grade collected by hand auger) — SCS-S7
- Location and designation of exisitng monitoring wells. — MW2
- Sediment sample locations
- Boring location and designation where soil and groundwater was not sampled for chemical analysis.
- Boring location and designation where soil and/or groundwater samples were collected for chemical analysis.
- 5.00 — Groundwater elevation in feet above mean sea level (MSL).
- 5.0' — Estimated groundwater contour in feet above mean sea level.

0 200 400 600
Approximate Graphic Scale in Feet

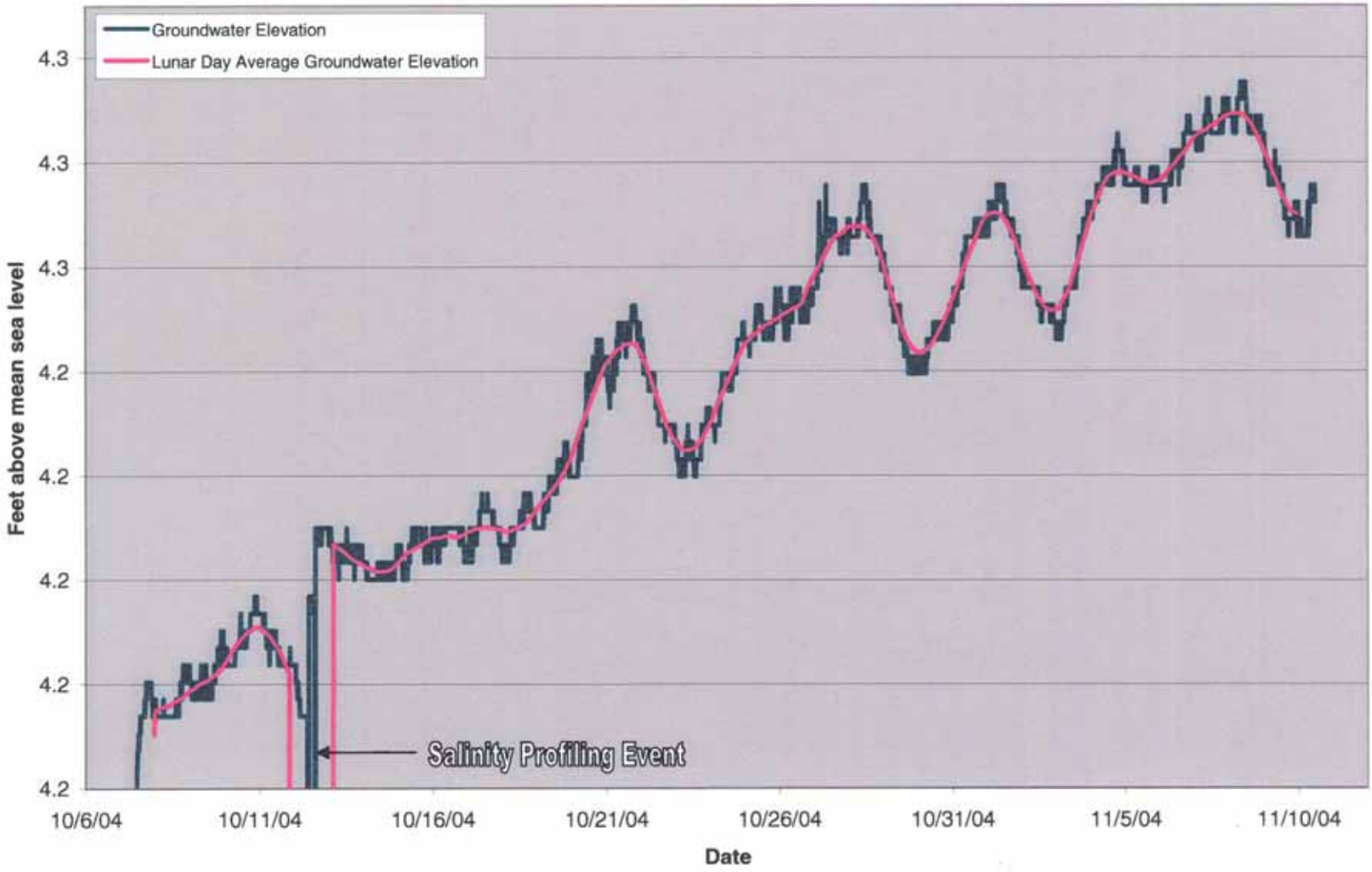
SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
8799 Balboa Avenue, Suite 290
San Diego, California 92123

SITE MAP SHOWING GROUNDWATER ELEVATIONS
November 5, 2004 at 8:05 am
City of San Diego
Mission Bay Landfill
San Diego, California

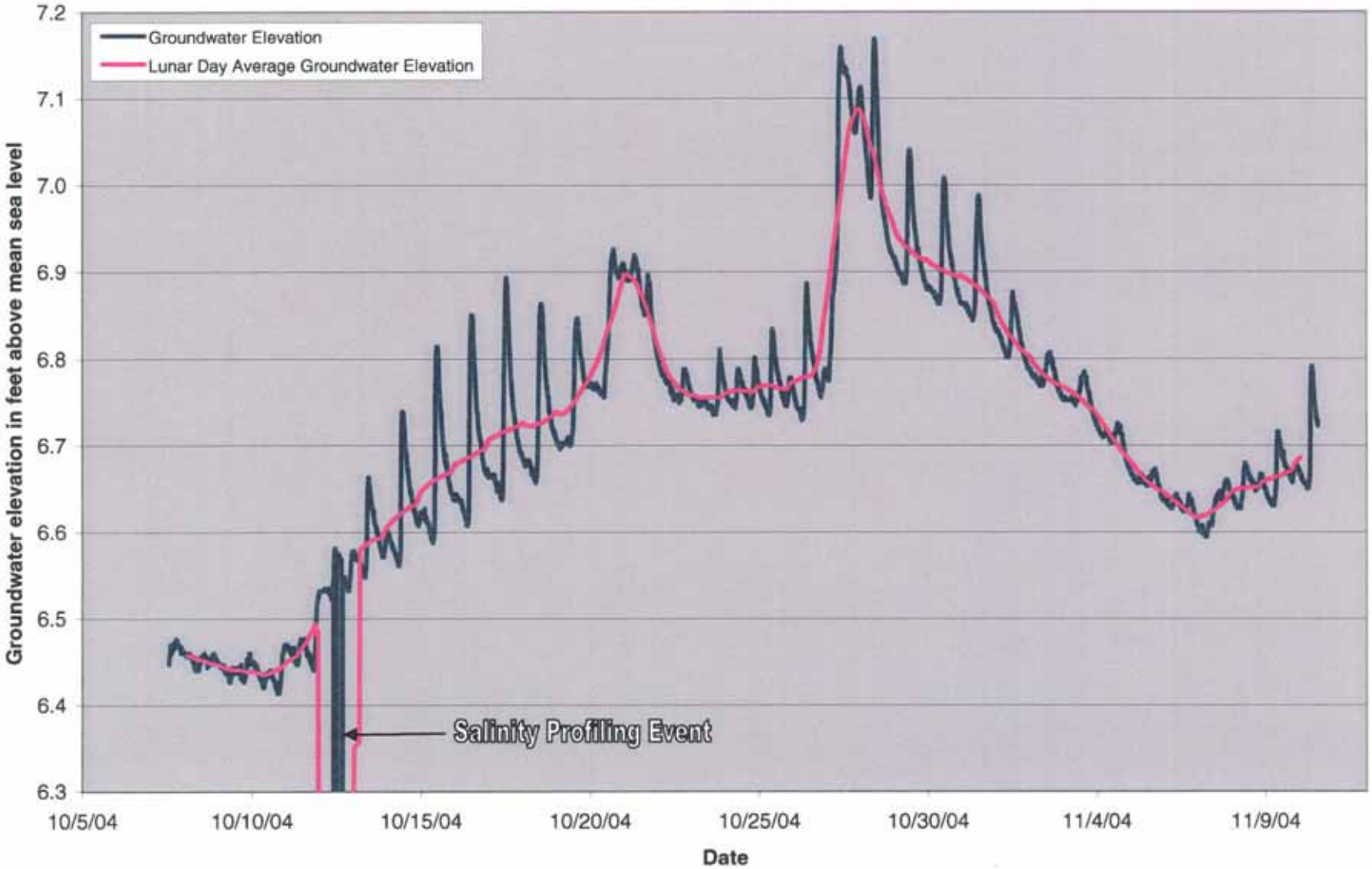
Project No.: 01203520.00
Figure 5.16.3
Date Drafted: 4/27/06

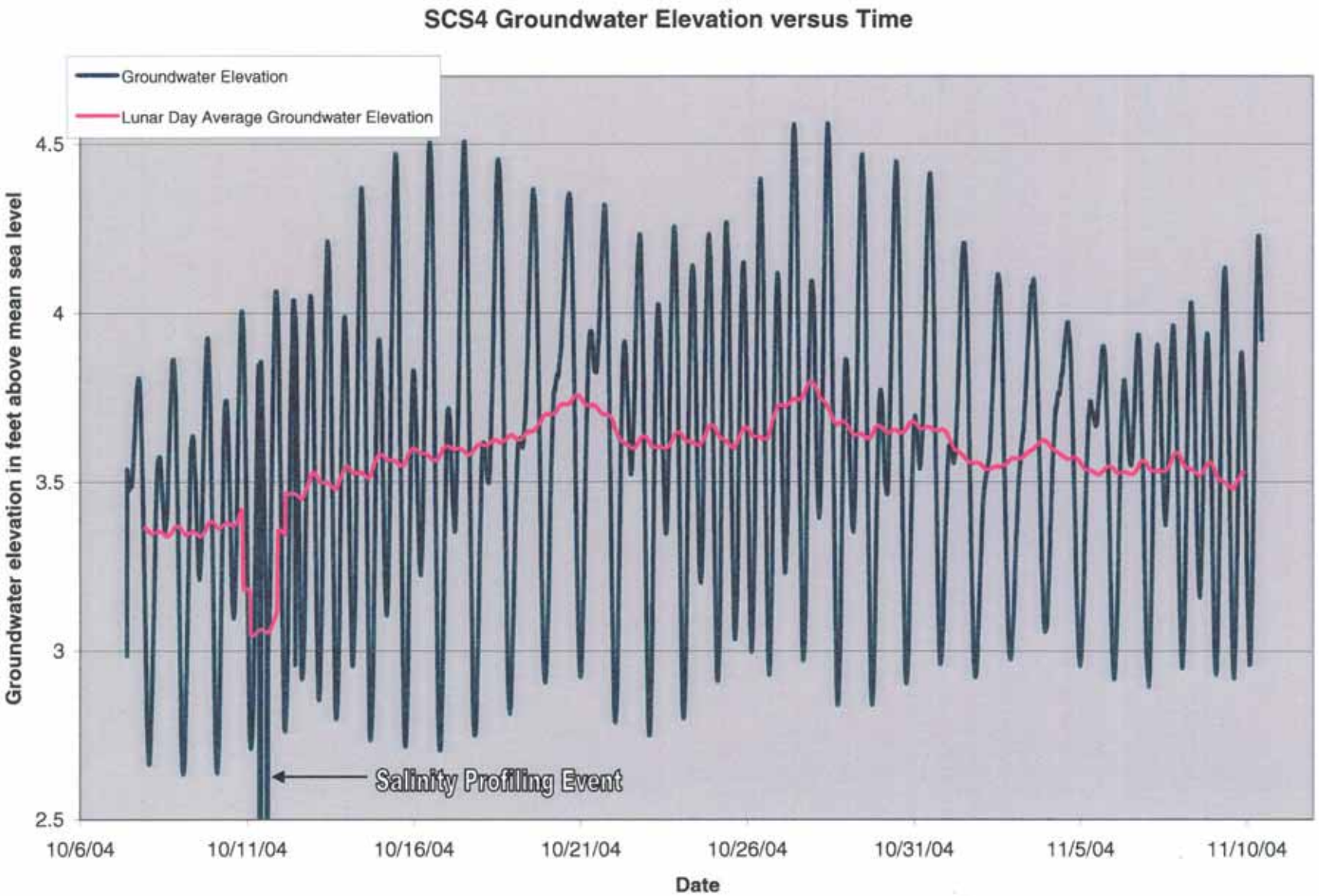

SCS1 Groundwater Elevation versus Time
Groundwater Elevation
Lunar Day Average Groundwater Elevation
Groundwater elevation in feet above mean sea level
4.55
4.5
4.45
4.4
4.35
4.3
4.25
4.2
Salinity Profiling Event
10/6/04
10/11/04
10/16/04
10/21/04
10/26/04
10/31/04
11/5/04
11/10/04
Date

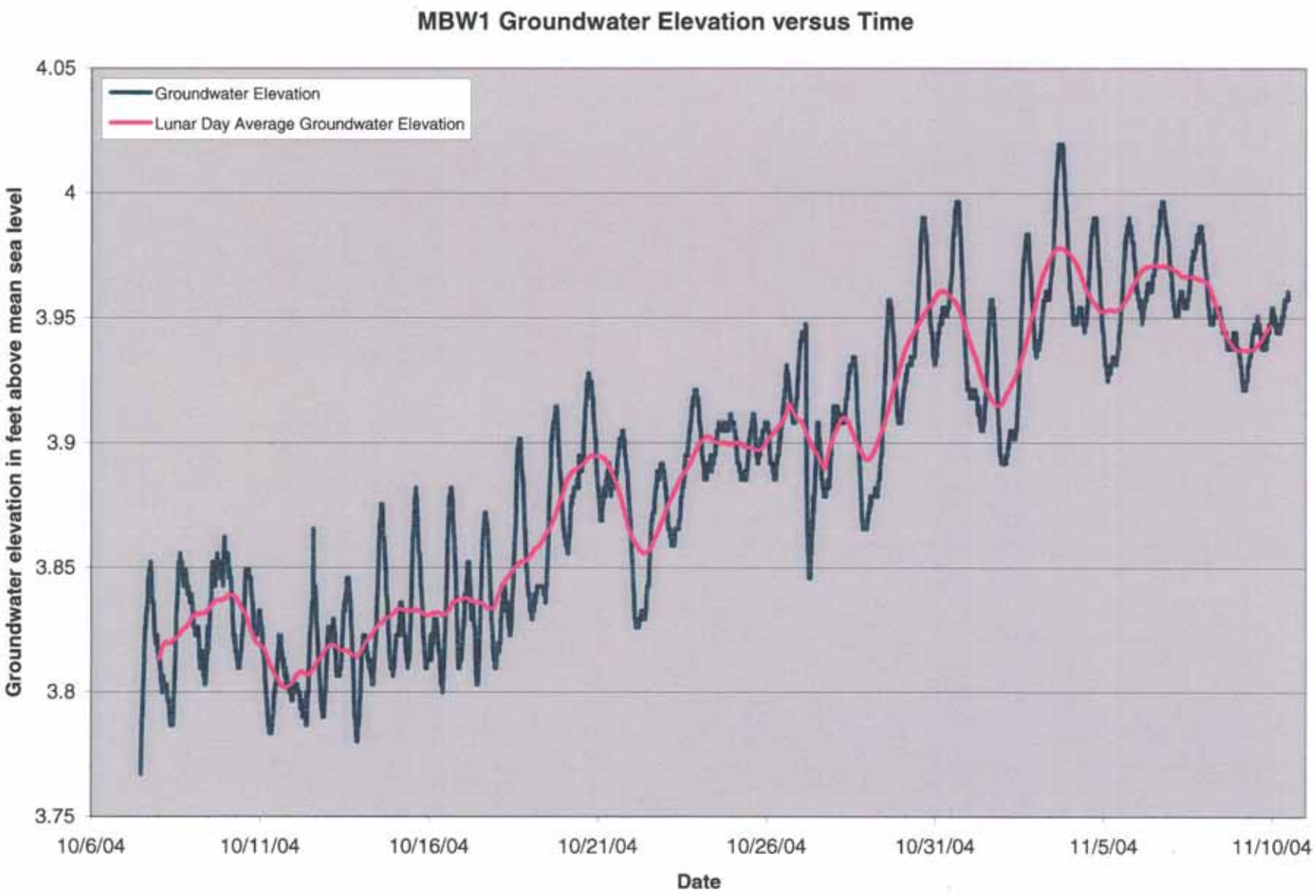
SCS2 Groundwater Elevation versus Time

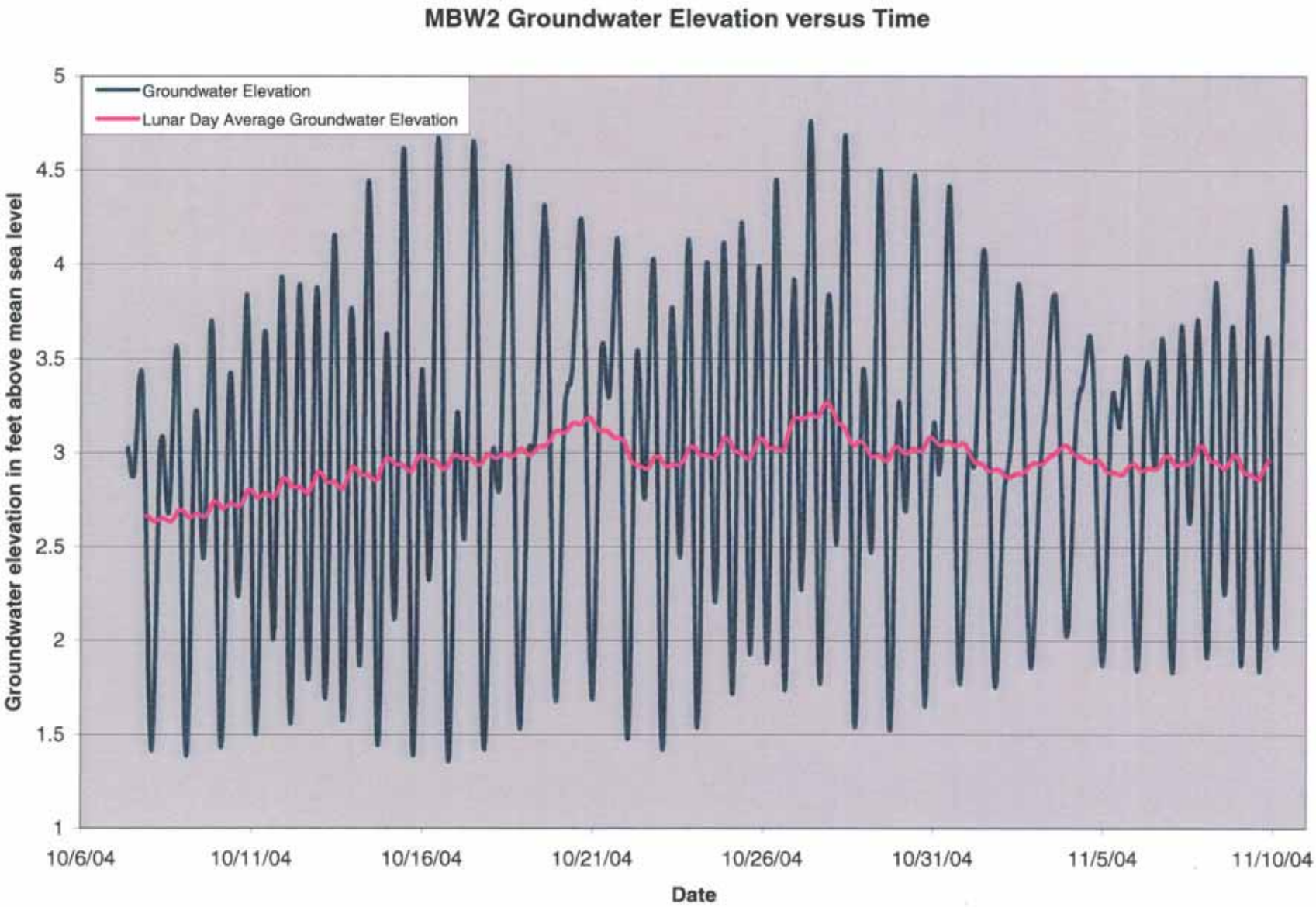


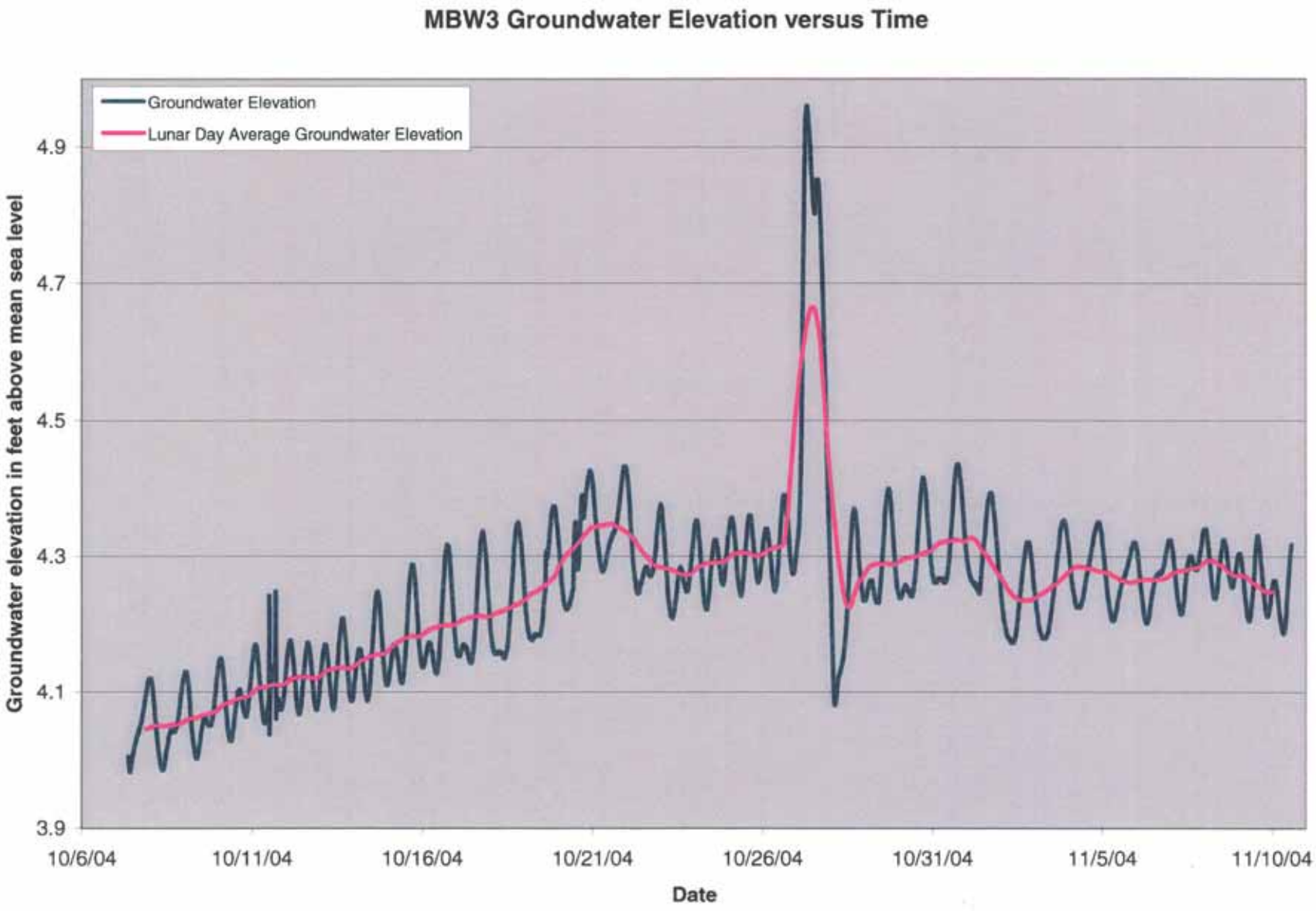
SCS3 Groundwater Elevation versus Time



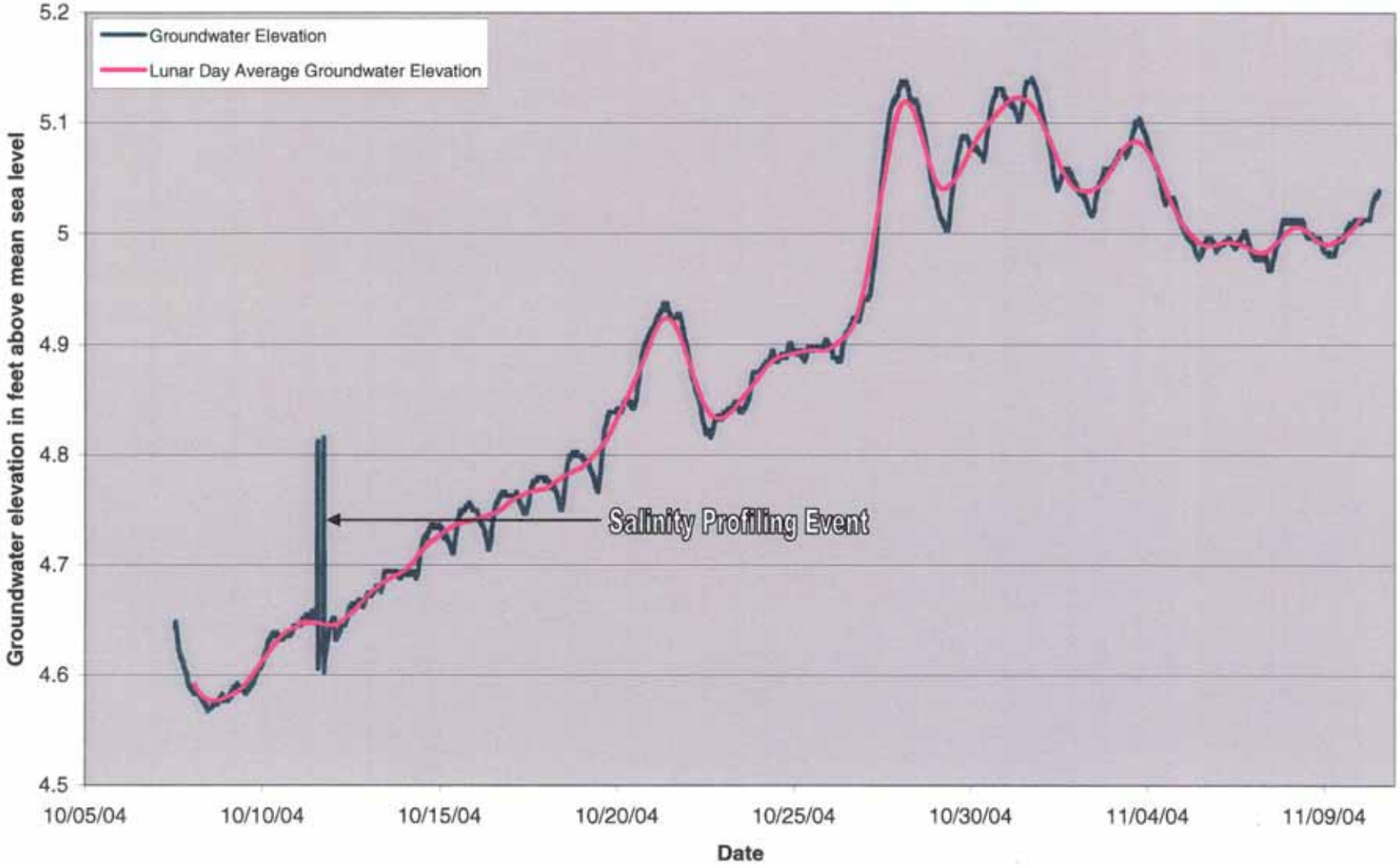

SCS4 Groundwater Elevation versus Time
Groundwater Elevation
Lunar Day Average Groundwater Elevation
Groundwater elevation in feet above mean sea level
4.5
4
3.5
3
2.5
Salinity Profiling Event
10/6/04
10/11/04
10/16/04
10/21/04
10/26/04
10/31/04
11/5/04
11/10/04
Date

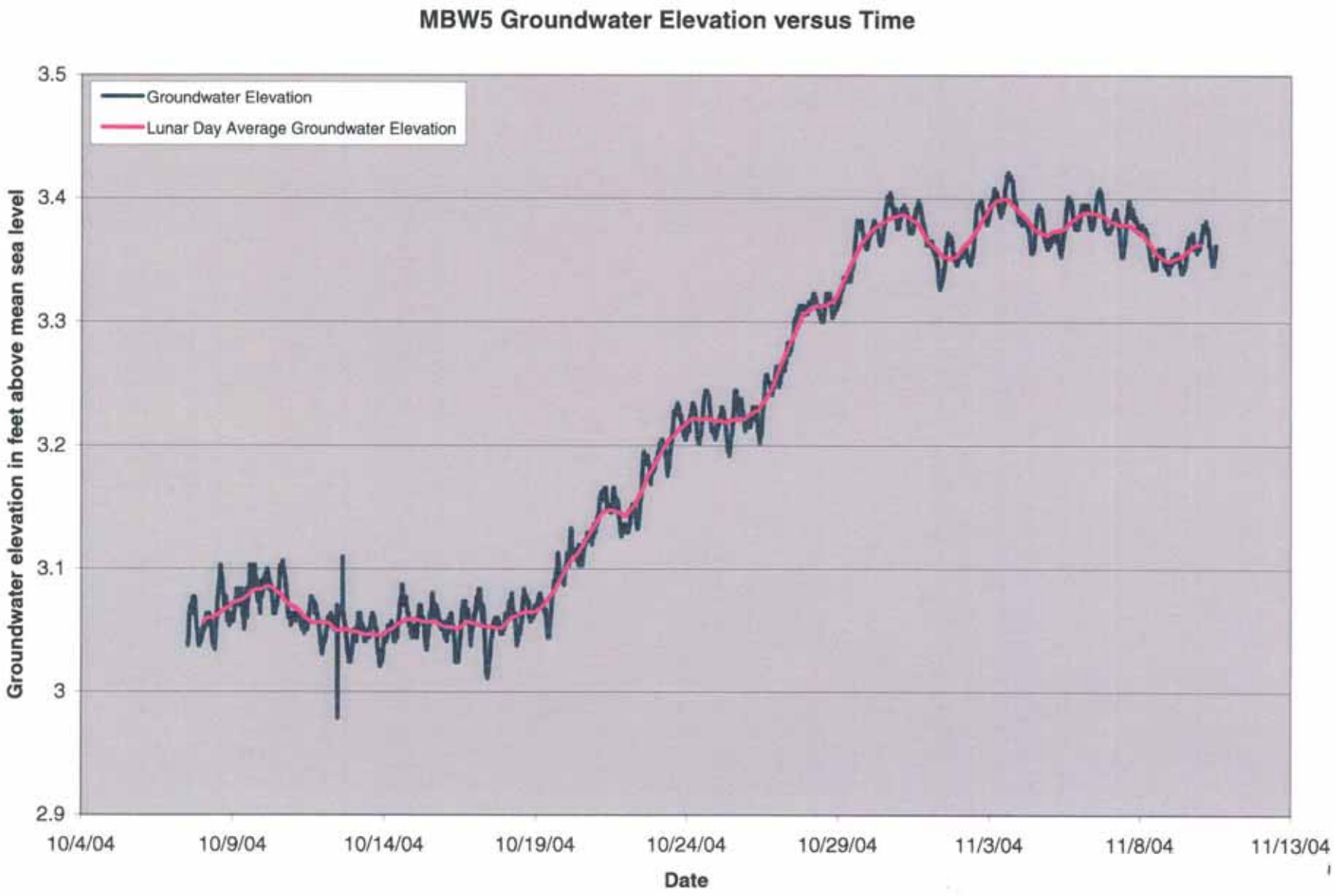

MBW1 Groundwater Elevation versus Time
Groundwater Elevation
Lunar Day Average Groundwater Elevation
Groundwater elevation in feet above mean sea level
4.05
4
3.95
3.9
3.85
3.8
3.75
10/6/04
10/11/04
10/16/04
10/21/04
10/26/04
10/31/04
11/5/04
11/10/04
Date

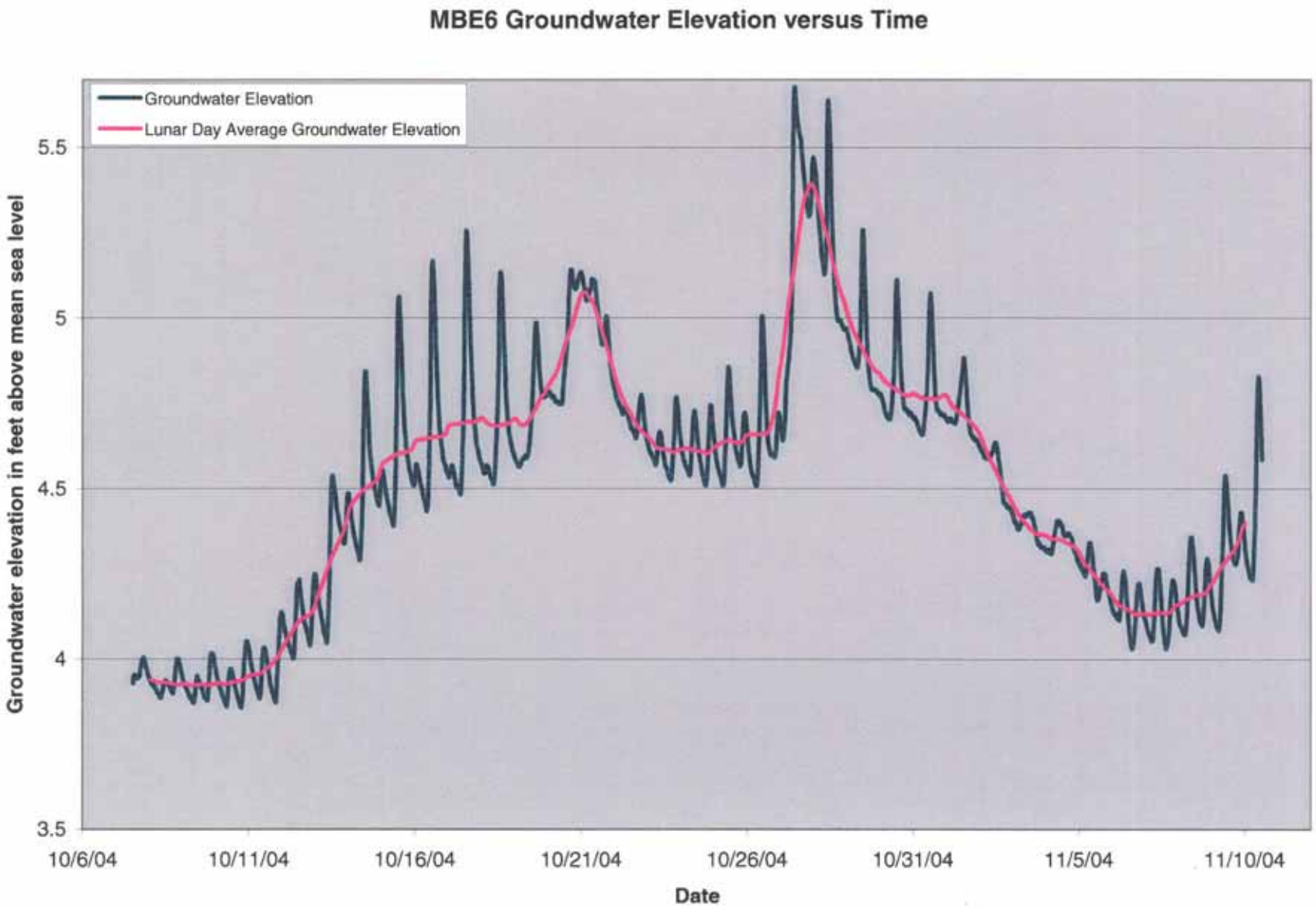

MBW2 Groundwater Elevation versus Time
Groundwater Elevation
Lunar Day Average Groundwater Elevation
Groundwater elevation in feet above mean sea level
5
4.5
4
3.5
3
2.5
2
1.5
1
10/6/04
10/11/04
10/16/04
10/21/04
10/26/04
10/31/04
11/5/04
11/10/04
Date

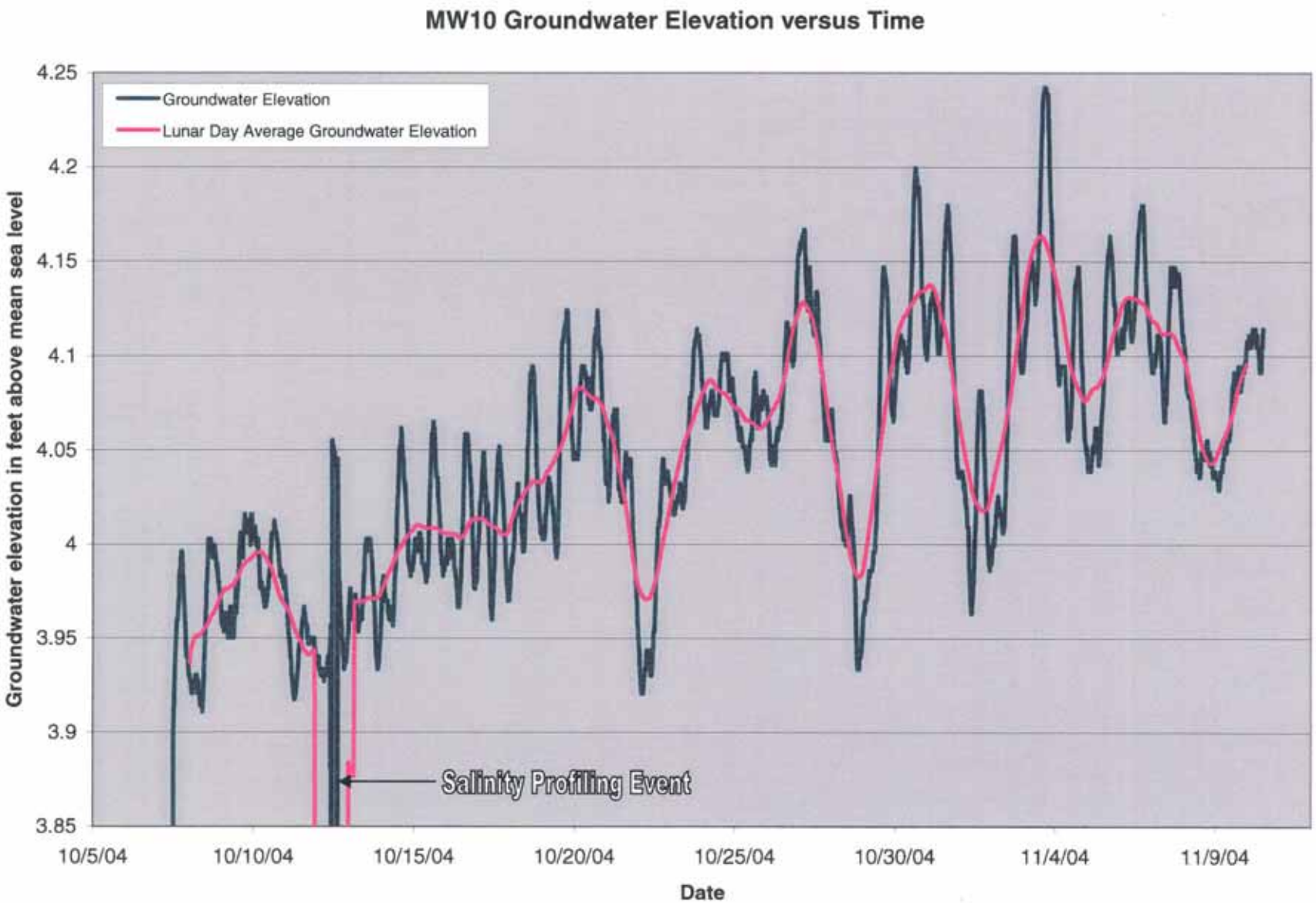

MBW3 Groundwater Elevation versus Time
Groundwater Elevation
Lunar Day Average Groundwater Elevation
Groundwater elevation in feet above mean sea level
4.9
4.7
4.5
4.3
4.1
3.9
10/6/04
10/11/04
10/16/04
10/21/04
10/26/04
10/31/04
11/5/04
11/10/04
Date

MBE4 Groundwater Elevation versus Time




MBW5 Groundwater Elevation versus Time
Groundwater Elevation
Lunar Day Average Groundwater Elevation
Groundwater elevation in feet above mean sea level
3.5
3.4
3.3
3.2
3.1
3
2.9
10/4/04
10/9/04
10/14/04
10/19/04
10/24/04
10/29/04
11/3/04
11/8/04
11/13/04
Date


MBE6 Groundwater Elevation versus Time
Groundwater Elevation
Lunar Day Average Groundwater Elevation
Groundwater elevation in feet above mean sea level
5.5
5
4.5
4
3.5
10/6/04
10/11/04
10/16/04
10/21/04
10/26/04
10/31/04
11/5/04
11/10/04
Date

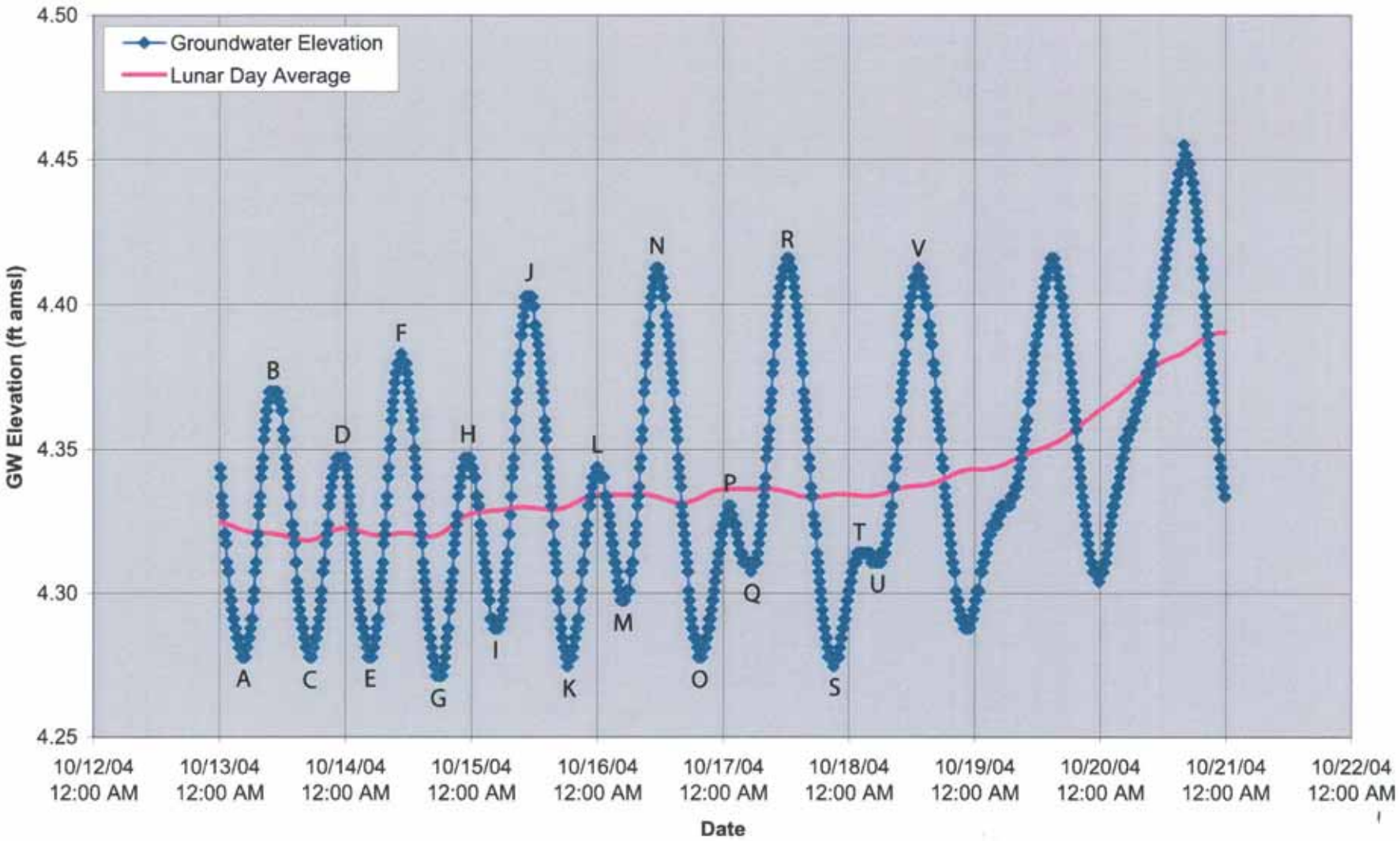

MW10 Groundwater Elevation versus Time
Groundwater Elevation
Lunar Day Average Groundwater Elevation
Salinity Profiling Event
Groundwater elevation in feet above mean sea level
4.25
4.2
4.15
4.1
4.05
4
3.95
3.9
3.85
10/5/04
10/10/04
10/15/04
10/20/04
10/25/04
10/30/04
11/4/04
11/9/04
Date

SCS1 Preflood Analysis

SCS1

									x	x^2		
							distance, (ft):		125	15625		
			Data from tide table									
	WL	date time: at well	date time: TIDE	WL	lag, days	WL rise	Tide rise	TE	period, in days		T/S for TE	T/S for lag
			10/12/04 20:58	5.4								
a	4.278	10/13/04 4:35 AM	10/13/04 3:02	0.4	0.0652							
b	4.370	10/13/04 10:15 AM	10/13/04 9:16	5.9	0.0416	0.092	5.5	0.016702	0.522		5.61E+03	3.76E+05
c	4.278	10/13/04 5:25 PM	10/13/04 15:34	0.1	0.0777							
d	4.347	10/13/04 11:05 PM	10/13/04 21:38	5.2	0.0610	0.069	5.1	0.013509	0.497		5.34E+03	1.66E+05
e	4.278	10/14/04 4:45 AM	10/14/04 3:29	0.7	0.0534							
f	4.383	10/14/04 10:35 AM	10/14/04 9:43	6.2	0.0367	0.105	5.5	0.019088	0.531		5.90E+03	4.90E+05
g	4.271	10/14/04 6:05 PM	10/14/04 16:13	-0.2	0.0784							
h	4.347	10/14/04 11:15 PM	10/14/04 22:22	4.9	0.0374	0.075	5.1	0.014796	0.487		5.68E+03	4.33E+05
i	4.288	10/15/04 4:45 AM	10/15/04 3:54	1	0.0360							
j	4.403	10/15/04 11:05 AM	10/15/04 10:12	6.4	0.0374	0.115	5.4	0.021265	0.544		6.09E+03	4.84E+05
k	4.275	10/15/04 6:15 PM	10/15/04 16:57	-0.4	0.0547							
l	4.344	10/15/04 11:55 PM	10/15/04 23:10	4.5	0.0318	0.069	4.9	0.014061	0.476		5.67E+03	5.84E+05
m	4.298	10/16/04 4:55 AM	10/16/04 4:22	1.5	0.0235							
n	4.412	10/16/04 11:35 AM	10/16/04 10:44	6.5	0.0360	0.115	5	0.022966	0.560		6.16E+03	5.37E+05
o	4.278	10/16/04 7:35 PM	10/16/04 17:48	-0.4	0.0749							
p	4.330	10/17/04 1:25 AM	10/17/04 0:06	3.9	0.0554	0.052	4.3	0.012208	0.460		5.49E+03	1.86E+05
q	4.307	10/17/04 5:15 AM	10/17/04 4:51	2.1	0.0172							
r	4.416	10/17/04 12:25 PM	10/17/04 11:21	6.3	0.0450	0.108	4.2	0.025778	0.579		6.33E+03	3.55E+05
s	4.275	10/17/04 9:05 PM	10/17/04 18:45	-0.2	0.0978							
t	4.314	10/18/04 2:55 AM	10/18/04 1:20	3.4	0.0666	0.039	3.6	0.010936	0.442		5.45E+03	1.24E+05
u	4.311	10/18/04 6:05 AM	10/18/04 5:21	2.6	0.0311							
v	4.412	10/18/04 1:15 PM	10/18/04 12:06	6	0.0485	0.102	3.4	0.029913	0.610		6.54E+03	3.22E+05
			10/18/04 19:59	0								
				average	0.050	0.086	4.7	0.018	0.519		**5.84E+03**	**3.69E+05**
				maximum	0.098	0.115	5.5	0.030	0.610		6.54E+03	5.84E+05
				minimum	0.017	0.039	3.4	0.011	0.442		5.34E+03	1.24E+05

SCS1 Pre Flood Groundwater Elevation



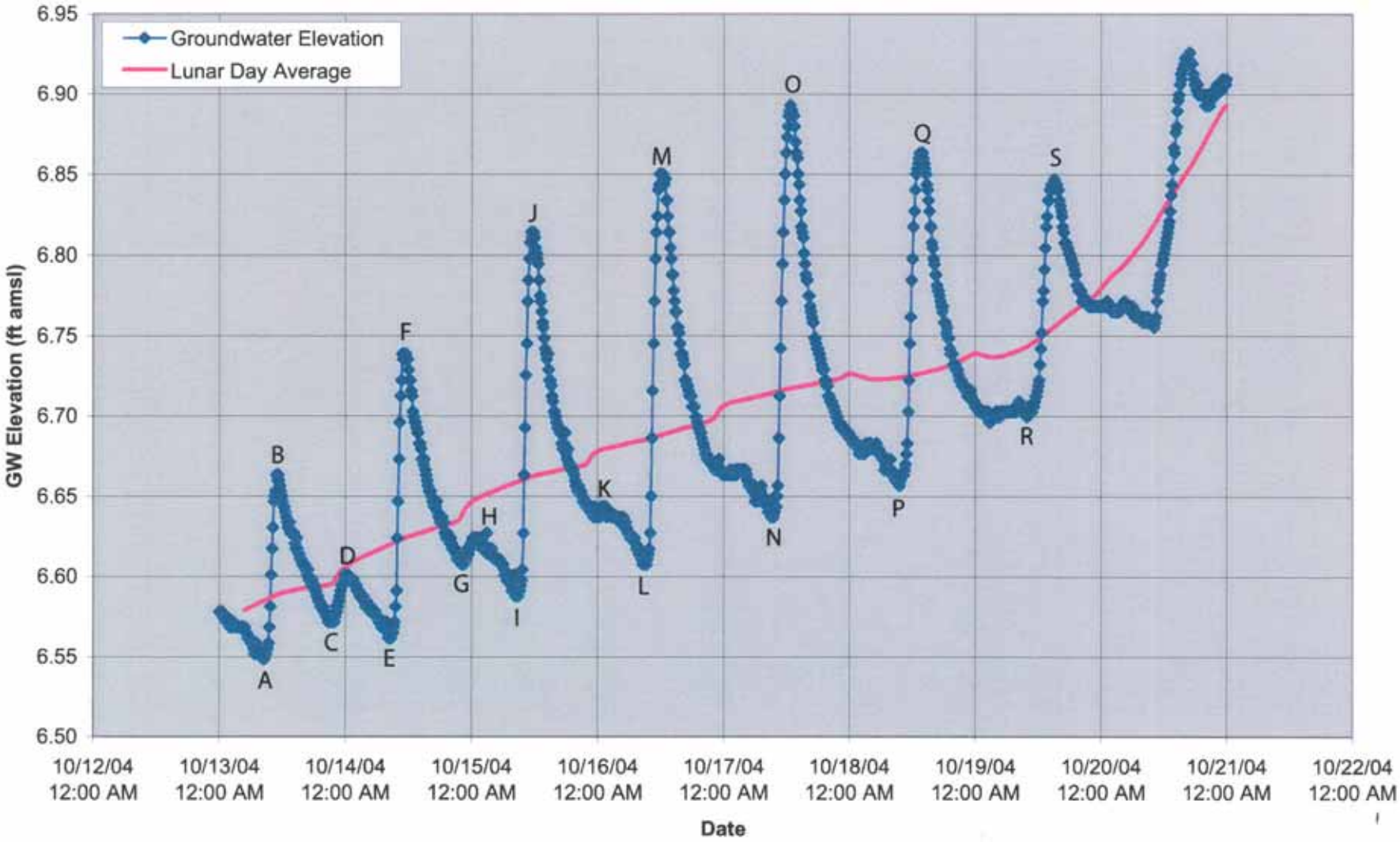
SCS3 Preflood Analysis

SCS3

	x	x^2
distance, (ft):	925	855625

	WL	date time: at well	Data from tide table date time: TIDE	WL	lag, days	WL rise	Tide rise	TE	period, in days	T/S for TE	T/S for lag
			10/12/04 20:58	5.4							
a	6.548	10/13/04 8:30 AM	10/13/04 3:02	0.4	0.2283						
b	6.663	10/13/04 11:10 AM	10/13/04 9:16	5.9	0.0797	0.115	5.5	0.020878	0.522	3.44E+05	5.59E+06
c	6.571	10/13/04 9:20 PM	10/13/04 15:34	0.1	0.2408						
d	6.601	10/14/04 12:30 AM	10/13/04 21:38	5.2	0.1200	0.030	5.1	0.00579	0.497	2.04E+05	2.35E+06
e	6.562	10/14/04 8:30 AM	10/14/04 3:29	0.7	0.2096						
f	6.739	10/14/04 11:20 AM	10/14/04 9:43	6.2	0.0679	0.177	5.5	0.032212	0.531	4.29E+05	7.83E+06
g	6.608	10/14/04 10:20 PM	10/14/04 16:13	-0.2	0.2554						
h	6.627	10/15/04 2:50 AM	10/14/04 22:22	4.9	0.1867	0.020	5.1	0.00386	0.487	1.79E+05	9.51E+05
i	6.588	10/15/04 8:50 AM	10/15/04 3:54	1	0.2061						
j	6.814	10/15/04 11:50 AM	10/15/04 10:12	6.4	0.0686	0.226	5.4	0.041922	1.019	2.62E+05	1.47E+07
l	6.608	10/16/04 9:20 AM	10/16/04 4:22	1.5	0.2075						
m	6.850	10/16/04 12:10 PM	10/16/04 10:44	6.5	0.0603	0.243	5	0.048556	1.020	2.88E+05	1.91E+07
n	6.637	10/17/04 9:30 AM	10/17/04 4:51	2.1	0.1943						
o	6.893	10/17/04 12:40 PM	10/17/04 11:21	6.3	0.0554	0.256	4.2	0.06093	1.021	3.36E+05	2.26E+07
p	6.660	10/18/04 9:40 AM	10/18/04 5:21	2.6	0.1804						
q	6.863	10/18/04 1:50 PM	10/18/04 12:06	6	0.0728	0.203	3.4	0.059827	0.610	5.56E+05	7.84E+06
r	6.699	10/19/04 9:50 AM	10/18/04 19:59	0	0.5776						
s	6.847	10/19/04 3:00 PM	10/19/04 13:12	5.5	0.0756	0.148	5.5	0.026843			
				average	0.168	0.157	5.0	0.033	0.713	**3.25E+05**	**1.01E+07**
				maximum	0.578	0.256	5.5	0.061	1.021	5.56E+05	2.26E+07
				minimum	0.055	0.020	3.4	0.004	0.487	1.79E+05	9.51E+05

SCS3 Pre Flood Groundwater Elevation



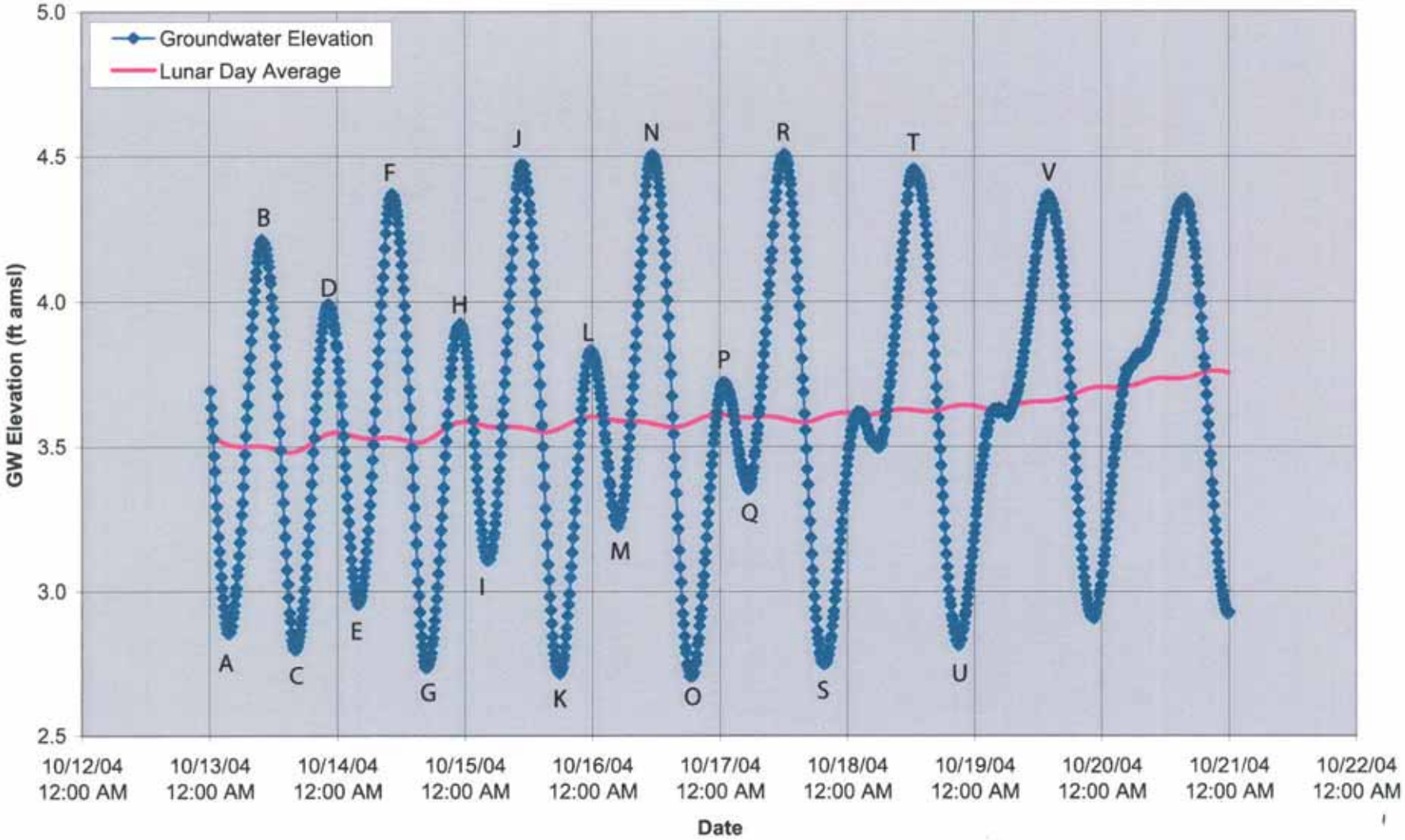
SCS4 Preflood Analysis

SCS4

	x	x^2
distance, (ft):	75	5625

	WL	date time: at well	Data from tide table date time: TIDE	WL	lag, days	WL rise	Tide rise	TE	period, in days	T/S for TE	T/S for lag
			10/12/04 20:58	5.4							
a	2.853	10/13/04 3:39 AM	10/13/04 3:02	0.4	0.0262						
b	4.212	10/13/04 9:49 AM	10/13/04 9:16	5.9	0.0234	1.358	5.5	0.246957	0.522	1.73E+04	4.27E+05
c	2.798	10/13/04 4:09 PM	10/13/04 15:34	0.1	0.0248						
d	3.989	10/13/04 10:19 PM	10/13/04 21:38	5.2	0.0289	1.191	5.1	0.233518	0.497	1.68E+04	2.65E+05
e	2.955	10/14/04 3:59 AM	10/14/04 3:29	0.7	0.0213						
f	4.369	10/14/04 10:19 AM	10/14/04 9:43	6.2	0.0255	1.414	5.5	0.257098	0.531	1.81E+04	3.66E+05
g	2.735	10/14/04 4:49 PM	10/14/04 16:13	-0.2	0.0255						
h	3.923	10/14/04 11:09 PM	10/14/04 22:22	4.9	0.0331	1.188	5.1	0.232875	0.487	1.71E+04	1.99E+05
i	3.106	10/15/04 4:19 AM	10/15/04 3:54	1	0.0178						
j	4.468	10/15/04 11:09 AM	10/15/04 10:12	6.4	0.0401	1.362	5.4	0.252138	0.544	1.71E+04	1.52E+05
k	2.716	10/15/04 5:49 PM	10/15/04 16:57	-0.4	0.0366						
l	3.831	10/15/04 11:39 PM	10/15/04 23:10	4.5	0.0206	1.115	4.9	0.227649	0.476	1.70E+04	5.01E+05
m	3.224	10/16/04 4:49 AM	10/16/04 4:22	1.5	0.0192						
n	4.504	10/16/04 11:29 AM	10/16/04 10:44	6.5	0.0317	1.280	5	0.255905	0.560	1.70E+04	2.49E+05
o	2.706	10/16/04 6:49 PM	10/16/04 17:48	-0.4	0.0428						
p	3.720	10/17/04 12:49 AM	10/17/04 0:06	3.9	0.0303	1.014	4.3	0.235762	0.460	1.84E+04	2.24E+05
q	3.352	10/17/04 5:19 AM	10/17/04 4:51	2.1	0.0199						
r	4.507	10/17/04 12:09 PM	10/17/04 11:21	6.3	0.0338	1.155	4.2	0.274965	0.079	1.34E+05	3.10E+04
s	2.7484	10/17/04 7:39 PM	10/17/04 6:45	-0.2	0.5380						
t	4.4544	10/18/04 12:29 PM	10/18/04 12:06	3.4	0.0164	1.706	3.6	0.473898	1.551	2.04E+04	2.57E+06
u	2.814	10/18/04 8:59 PM	10/18/04 19:59	2.6	0.0421						
v	4.366	10/19/04 1:59 PM	10/19/04 13:12	6	0.0331	1.552	3.4	0.456421			
				average	0.051	1.303	4.7	0.266	0.571	**2.93E+04**	**4.98E+05**
				maximum	0.538	1.706	5.5	0.474	1.551	1.34E+05	2.57E+06
				minimum	0.016	1.014	3.4	0.228	0.079	1.68E+04	3.10E+04

SCS4 Pre Flood Groundwater Elevation



MBW1 Preflood Analysis

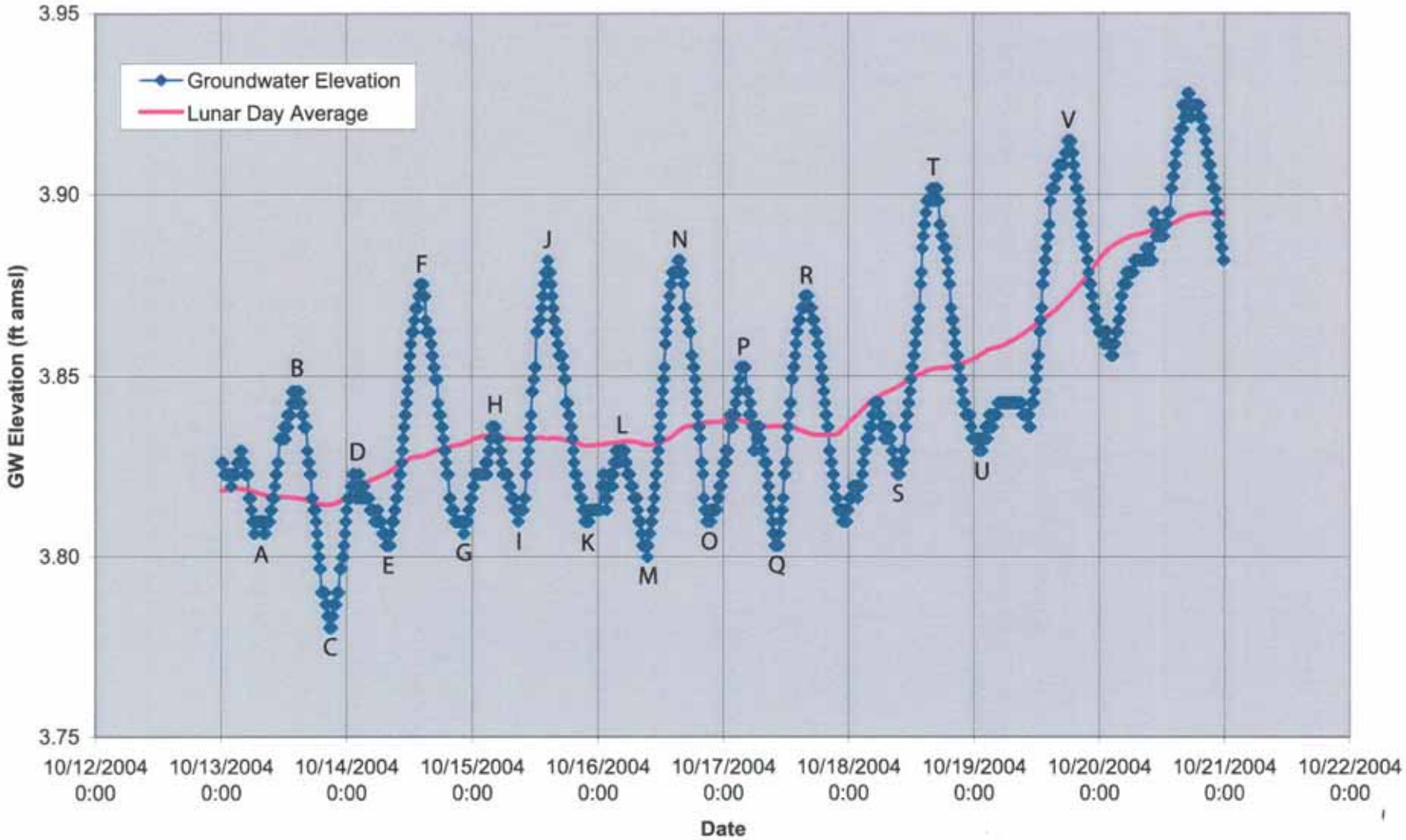
MBW1

	x	x^2
distance, (ft):	500	250000

	WL	date time: at well	Data from tide table date time: TIDE	WL	lag, days	WL rise	Tide rise	TE	period, in days	T/S for TE	T/S for lag
a	3.8064	10/13/2004 8:17	10/13/2004 3:02	0.4	0.2194						
b	3.8457	10/13/2004 14:57	10/13/2004 9:16	5.9	0.2375	0.039	5.5	0.007158	0.522	6.16E+04	1.84E+05
c	3.7801	10/13/2004 20:57	10/13/2004 15:34	0.1	0.2250						
d	3.8228	10/14/2004 2:27	10/13/2004 21:38	5.2	0.2013	0.043	5.1	0.008363	0.497	6.91E+04	2.44E+05
e	3.8031	10/14/2004 7:57	10/14/2004 3:29	0.7	0.1868						
f	3.8753	10/14/2004 14:17	10/14/2004 9:43	6.2	0.1909	0.072	5.5	0.013123	0.531	7.88E+04	2.90E+05
g	3.8064	10/14/2004 22:27	10/14/2004 16:13	-0.2	0.2604						
h	3.8359	10/15/2004 4:07	10/14/2004 22:22	4.9	0.2402	0.030	5.1	0.00579	0.487	6.08E+04	1.68E+05
i	3.8096	10/15/2004 8:47	10/15/2004 3:54	1	0.2041						
j	3.8818	10/15/2004 14:27	10/15/2004 10:12	6.4	0.1777	0.072	5.4	0.013366	0.544	7.76E+04	3.42E+05
k	3.8096	10/15/2004 22:07	10/15/2004 16:57	-0.4	0.2159						
l	3.8293	10/16/2004 4:47	10/15/2004 23:10	4.5	0.2347	0.020	4.9	0.004017	0.476	5.42E+04	1.72E+05
m	3.7998	10/16/2004 9:27	10/16/2004 4:22	1.5	0.2125						
n	3.8818	10/16/2004 15:47	10/16/2004 10:44	6.5	0.2111	0.082	5	0.016404	0.560	8.31E+04	2.50E+05
o	3.8096	10/16/2004 21:37	10/16/2004 17:48	-0.4	0.1597						
p	3.8523	10/17/2004 3:47	10/17/2004 0:06	3.9	0.1541	0.043	4.3	0.009919	0.460	8.02E+04	3.86E+05
q	3.8031	10/17/2004 10:17	10/17/2004 4:51	2.1	0.2270						
r	3.8720	10/17/2004 15:57	10/17/2004 11:21	6.3	0.1923	0.069	4.2	0.016404	1.021	4.55E+04	5.49E+05
s	3.8228	10/18/2004 9:37	10/18/2004 5:21	2.6	0.1784						
t	3.9015	10/18/2004 16:57	10/18/2004 12:06	6	0.2027	0.079	3.4	0.023159	0.610	9.09E+04	2.95E+05
u	3.8293	10/19/2004 1:27	10/18/2004 19:59	0	0.2284						
v	3.9146	10/19/2004 18:17	10/19/04 13:12	5.5	0.2125	0.085	5.5	0.015509			

average	0.208	0.058	4.9	0.012	0.571	**7.02E+04**	**2.88E+05**
maximum	0.260	0.085	5.5	0.023	1.021	9.09E+04	5.49E+05
minimum	0.154	0.020	3.4	0.004	0.460	4.55E+04	1.68E+05

MBW1 Pre Flood Groundwater Elevation



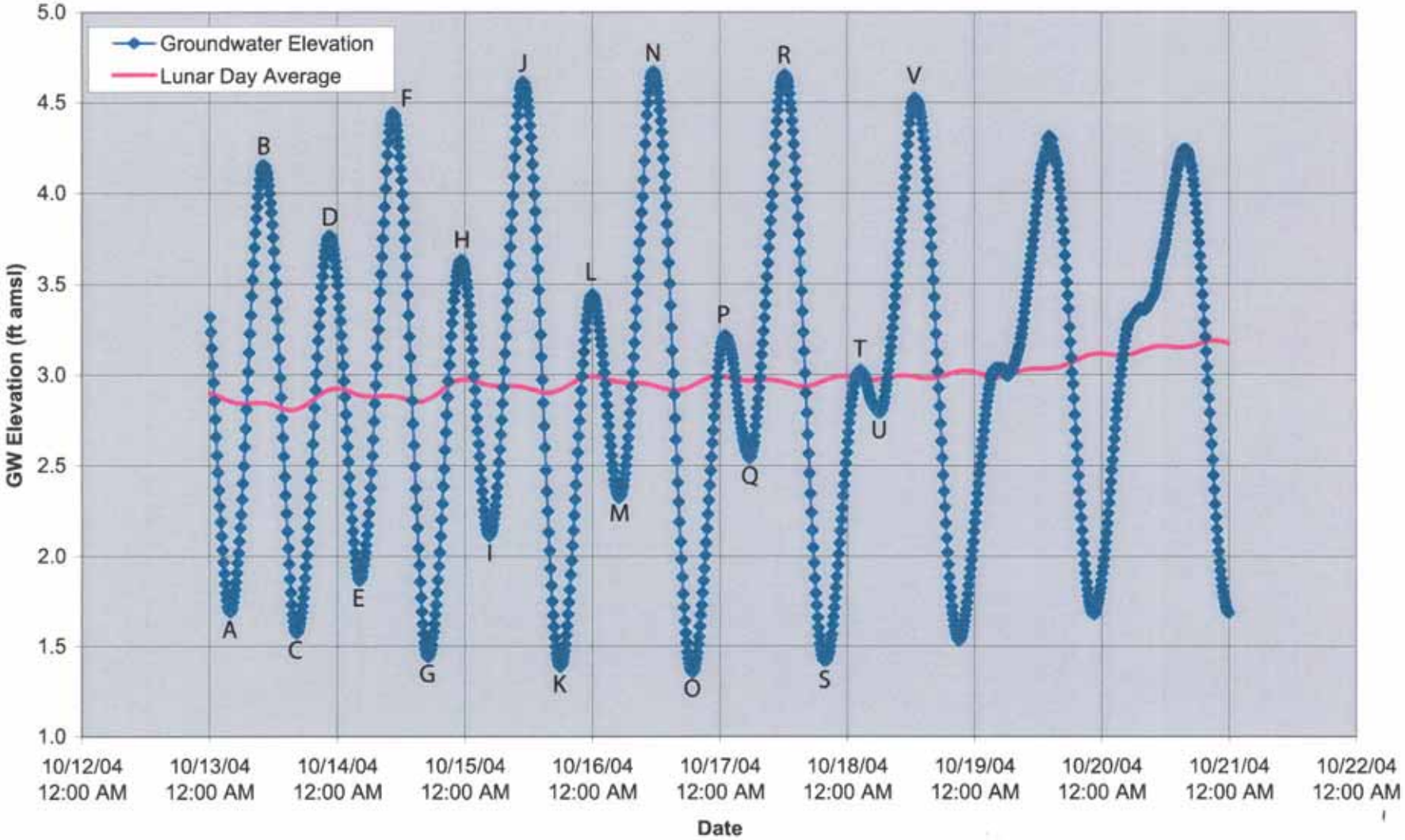
MBW2 Preflood Analysis

MBW2

	x	x^2
distance, (ft):	600	360000

	WL	date time: at well	Data from tide table date time: TIDE	WL	lag, days	WL rise	Tide rise	TE	period, in days	T/S for TE	T/S for lag
			10/12/04 20:58	5.4							
a	1.689	10/13/04 3:54 AM	10/13/04 3:02	0.4	0.0366						
b	4.153	10/13/04 10:04 AM	10/13/04 9:16	5.9	0.0338	2.464	5.5	0.447982	0.522	3.36E+06	1.31E+07
c	1.574	10/13/04 4:14 PM	10/13/04 15:34	0.1	0.0282						
d	3.766	10/13/04 10:24 PM	10/13/04 21:38	5.2	0.0324	2.192	5.1	0.429724	0.497	3.19E+06	1.35E+07
e	1.866	10/14/04 4:04 AM	10/14/04 3:29	0.7	0.0248						
f	4.441	10/14/04 10:24 AM	10/14/04 9:43	6.2	0.0289	2.575	5.5	0.468264	0.531	3.70E+06	1.82E+07
g	1.443	10/14/04 5:04 PM	10/14/04 16:13	-0.2	0.0359						
h	3.631	10/14/04 11:14 PM	10/14/04 22:22	4.9	0.0366	2.188	5.1	0.429081	0.487	3.25E+06	1.04E+07
i	2.112	10/15/04 4:34 AM	10/15/04 3:54	1	0.0282						
j	4.615	10/15/04 10:54 AM	10/15/04 10:12	6.4	0.0296	2.503	5.4	0.463569	0.544	3.52E+06	1.77E+07
k	1.387	10/15/04 5:54 PM	10/15/04 16:57	-0.4	0.0400						
l	3.441	10/16/04 12:04 AM	10/15/04 23:10	4.5	0.0380	2.054	4.9	0.419143	0.476	3.14E+06	9.46E+06
m	2.322	10/16/04 4:54 AM	10/16/04 4:22	1.5	0.0227						
n	4.671	10/16/04 11:24 AM	10/16/04 10:44	6.5	0.0282	2.349	5	0.469815	0.560	3.54E+06	2.01E+07
o	1.357	10/16/04 6:44 PM	10/16/04 17:48	-0.4	0.0394						
p	3.214	10/17/04 12:54 AM	10/17/04 0:06	3.9	0.0338	1.857	4.3	0.431849	0.460	3.48E+06	1.15E+07
q	2.539	10/17/04 5:34 AM	10/17/04 4:51	2.1	0.0303						
r	4.655	10/17/04 12:14 PM	10/17/04 11:21	6.3	0.0373	2.116	4.2	0.503842	0.579	4.16E+06	1.19E+07
s	1.420	10/17/04 7:44 PM	10/17/04 18:45	-0.2	0.0414						
t	3.024	10/18/04 2:34 AM	10/18/04 1:20	3.4	0.0519	1.604	3.6	0.445646	0.442	3.92E+06	4.71E+06
u	2.791	10/18/04 6:04 AM	10/18/04 5:21	2.6	0.0303						
v	4.520	10/18/04 12:34 PM	10/18/04 12:06	6	0.0199	1.729	3.4	0.508529	0.610	4.06E+06	4.41E+07
			10/18/04 19:59	0							
				average	0.033	2.148	4.7	0.456	0.519	**3.57E+06**	**1.59E+07**
				maximum	0.052	2.575	5.5	0.509	0.610	4.16E+06	4.41E+07
				minimum	0.020	1.604	3.4	0.419	0.442	3.14E+06	4.71E+06

MBW2 Pre Flood Groundwater Elevation



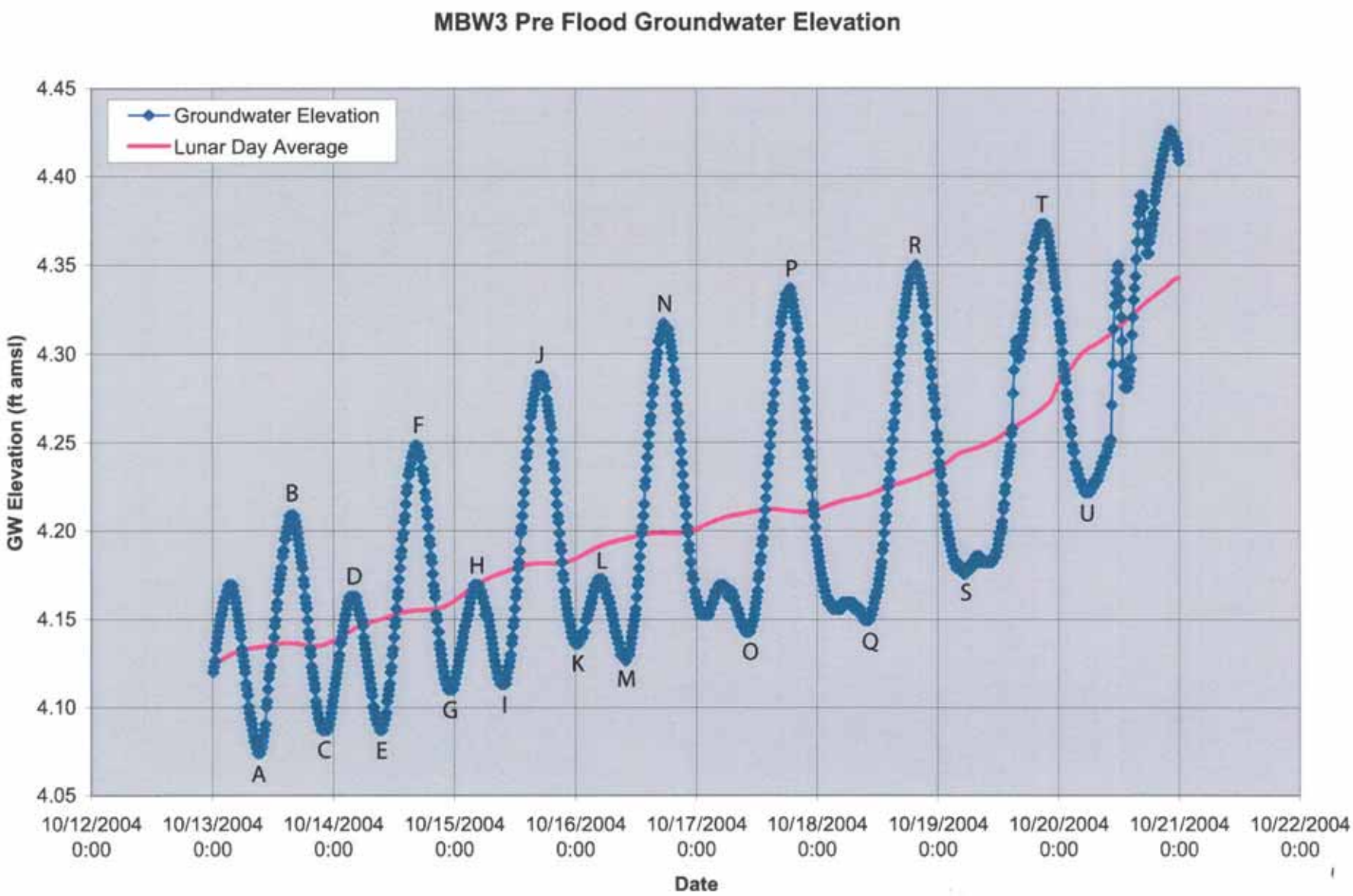
MBW3 Preflood Analysis

MBW3

	x	x^2
distance, (ft):	500	250000

	WL	date time: at well	Data from tide table date time: TIDE	WL	lag, days	WL rise	Tide rise	TE	period, in days	T/S for TE	T/S for lag
a	4.0741	10/13/2004 9:18	10/13/2004 3:02	0.4	0.2616						
b	4.2086	10/13/2004 15:48	10/13/2004 9:16	5.9	0.2727	0.135	5.5	0.024457	0.522	1.09E+05	1.40E+05
c	4.0873	10/13/2004 22:18	10/13/2004 15:34	0.1	0.2810						
d	4.1627	10/14/2004 3:48	10/13/2004 21:38	5.2	0.2574	0.075	5.1	0.014796	0.497	8.91E+04	1.49E+05
e	4.0873	10/14/2004 9:38	10/14/2004 3:29	0.7	0.2567						
f	4.2480	10/14/2004 16:28	10/14/2004 9:43	6.2	0.2817	0.161	5.5	0.029229	0.531	1.19E+05	1.33E+05
g	4.1102	10/14/2004 23:08	10/14/2004 16:13	-0.2	0.2886						
h	4.1693	10/15/2004 4:18	10/14/2004 22:22	4.9	0.2477	0.059	5.1	0.011579	0.487	8.12E+04	1.58E+05
i	4.1135	10/15/2004 9:38	10/15/2004 3:54	1	0.2393						
j	4.2874	10/15/2004 16:58	10/15/2004 10:12	6.4	0.2824	0.174	5.4	0.032201	0.544	1.22E+05	1.36E+05
k	4.1365	10/16/2004 0:18	10/15/2004 16:57	-0.4	0.3067						
l	4.1726	10/16/2004 4:58	10/15/2004 23:10	4.5	0.2421	0.036	4.9	0.007365	0.476	6.85E+04	1.61E+05
m	4.1266	10/16/2004 9:58	10/16/2004 4:22	1.5	0.2338						
n	4.3169	10/16/2004 17:28	10/16/2004 10:44	6.5	0.2810	0.190	5	0.038058	1.020	7.21E+04	2.57E+05
o	4.1430	10/17/2004 10:08	10/17/2004 4:51	2.1	0.2206						
p	4.3366	10/17/2004 18:38	10/17/2004 11:21	6.3	0.3039	0.194	4.2	0.046088	1.021	8.12E+04	2.20E+05
q	4.1496	10/18/2004 9:48	10/18/2004 5:21	2.6	0.1859						
r	4.3497	10/18/2004 19:38	10/18/2004 12:06	6	0.3143	0.200	3.4	0.058862	0.610	1.61E+05	1.23E+05
s	4.1758	10/19/2004 5:18	10/18/2004 19:59	0	0.3886						
t	4.3727	10/19/2004 20:48	10/19/2004 13:12	5.5	0.3171	0.197	5.5	0.035791	1.061	6.67E+04	2.10E+05
u	4.2218	10/20/2004 5:48	10/19/2004 21:27	0.1	0.3484						

average	0.277	0.142	5.0	0.030	0.677	**9.70E+04**	**1.69E+05**
maximum	0.389	0.200	5.5	0.059	1.061	1.61E+05	2.57E+05
minimum	0.186	0.036	3.4	0.007	0.476	6.67E+04	1.23E+05


MBW3 Pre Flood Groundwater Elevation
Groundwater Elevation
Lunar Day Average
GW Elevation (ft amsl)
4.45
4.40
4.35
4.30
4.25
4.20
4.15
4.10
4.05
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
10/12/2004 0:00
10/13/2004 0:00
10/14/2004 0:00
10/15/2004 0:00
10/16/2004 0:00
10/17/2004 0:00
10/18/2004 0:00
10/19/2004 0:00
10/20/2004 0:00
10/21/2004 0:00
10/22/2004 0:00
Date

MBE4 Preflood Analysis

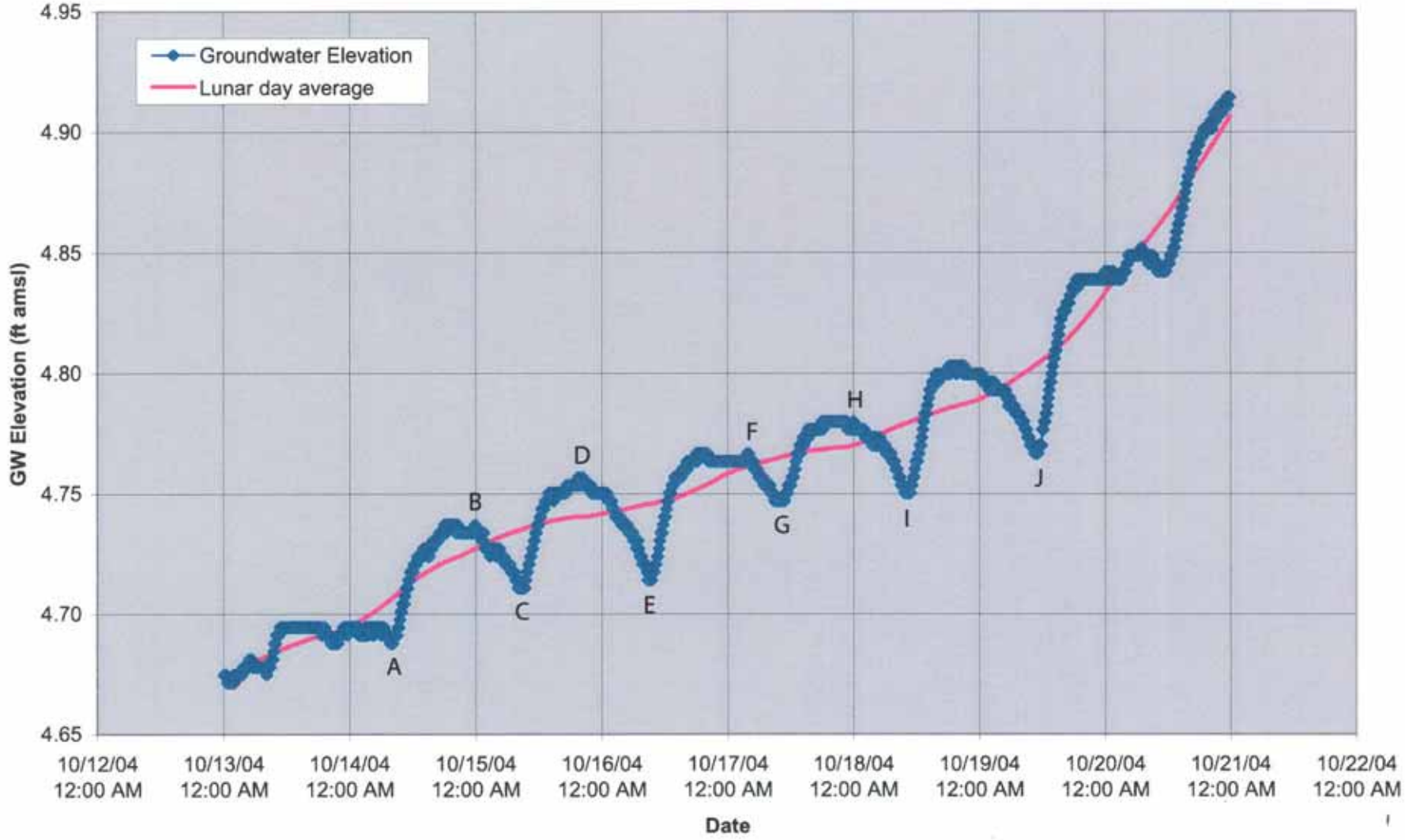
MBE4

	x	x^2
distance, (ft):	1000	1000000

	WL	date time: at well	Data from tide table date time: TIDE	WL	lag, days	WL rise	Tide rise	TE	period, in days	T/S for TE	T/S for lag
a	4.6878	10/14/04 8:02 AM	10/13/04 15:34	0.1	0.6865						
b	4.7370	10/14/04 11:52 PM	10/14/04 9:43	6.2	0.5899	0.049	6.1	0.008068	1.027	1.32E+05	2.35E+05
c	4.7108	10/15/04 8:52 AM	10/14/04 16:13	-0.2	0.6941						
d	4.7567	10/15/04 8:22 PM	10/15/04 10:12	6.4	0.4240	0.046	6.6	0.006959	1.031	1.24E+05	4.56E+05
e	4.7140	10/16/04 9:12 AM	10/15/2004 16:57	-0.4	0.6774						
f	4.7665	10/17/04 4:02 AM	10/16/2004 10:44	6.5	0.7212	0.052	6.9	0.007608	1.035	1.27E+05	1.58E+05
g	4.7468	10/17/04 9:52 AM	10/16/2004 17:48	-0.4	0.6698						
h	4.7796	10/18/04 12:02 AM	10/17/2004 11:21	6.3	0.5288	0.033	6.7	0.004897	1.040	1.07E+05	2.96E+05
i	4.7501	10/18/04 10:52 AM	10/17/2004 18:45	-0.2	0.6719						
j	4.7665	10/19/04 11:02 AM	10/18/2004 19:59	0	0.6274	0.016	0.2	0.082021			

average	0.629	0.039	5.3	0.022	1.033	**1.22E+05**	**2.86E+05**
maximum	0.721	0.052	6.9	0.082	1.040	1.32E+05	4.56E+05
minimum	0.424	0.016	0.2	0.005	1.027	1.07E+05	1.58E+05

MBE4 Pre Flood Groundwater Elevation



MBW5 Preflood Analysis

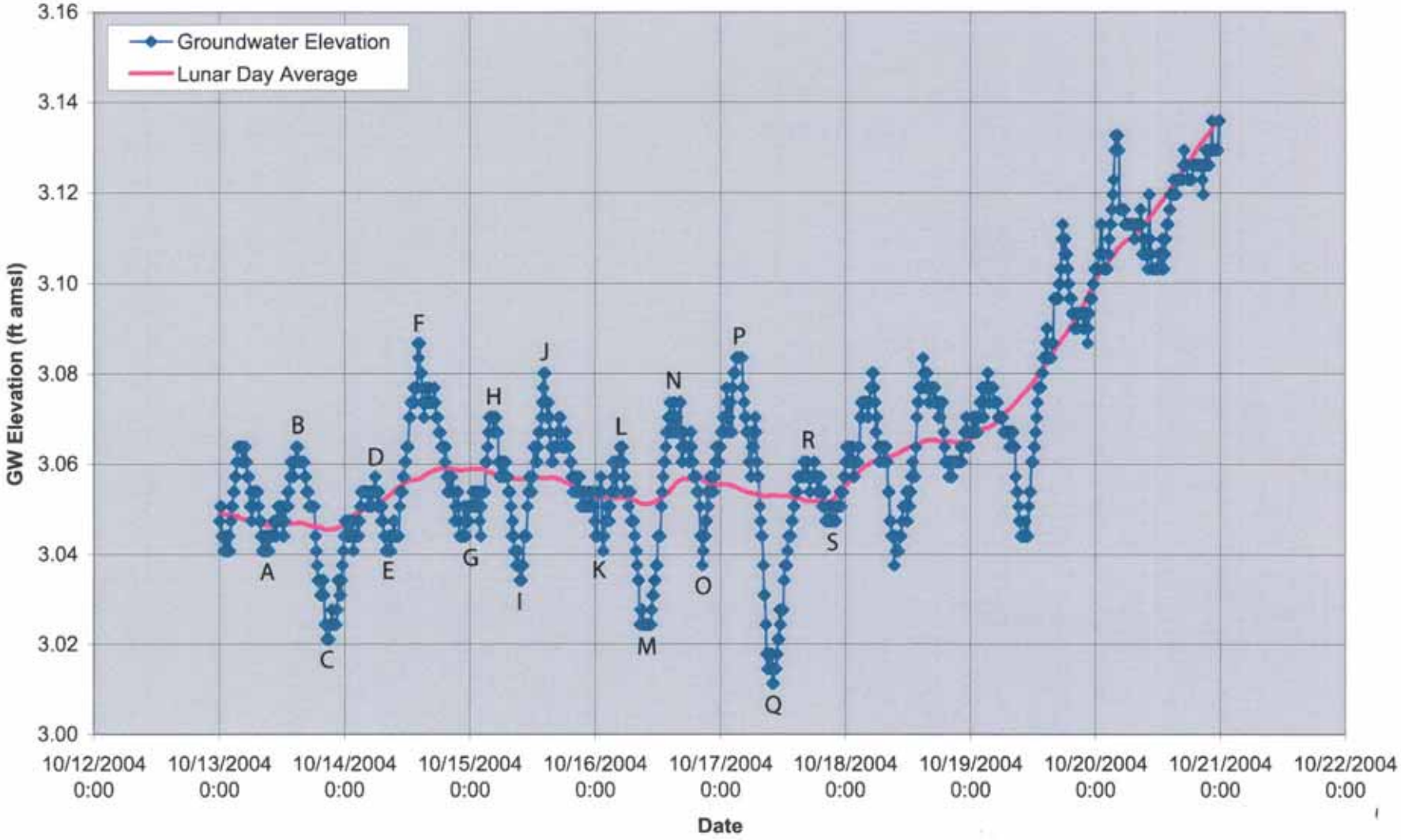
MBW5

	x	x^2
distance, (ft):	1300	1690000

	WL	date time: at well	Data from tide table date time: TIDE	WL	lag, days	WL rise	Tide rise	TE	period, in days	T/S for TE	T/S for lag
			10/12/04 20:58	5.4							
a	3.04076	10/13/2004 9:31	10/13/04 3:02	0.4	0.2702						
b	3.06373	10/13/2004 14:51	10/13/04 9:16	5.9	0.2327	0.023	5.5	0.004176	0.522	3.39E+05	1.30E+06
c	3.02108	10/13/2004 20:51	10/13/04 15:34	0.1	0.2202						
d	3.05388	10/14/2004 6:31	10/13/04 21:38	5.2	0.3702	0.033	5.1	0.006433	0.497	4.20E+05	4.87E+05
e	3.04076	10/14/2004 8:51	10/14/04 3:29	0.7	0.2237						
f	3.08669	10/14/2004 14:21	10/14/04 9:43	6.2	0.1931	0.046	5.5	0.008351	0.531	4.37E+05	1.91E+06
g	3.04404	10/15/2004 2:01	10/14/04 16:13	-0.2	0.4084						
h	3.07029	10/15/2004 5:01	10/14/04 22:22	4.9	0.2772	0.026	5.1	0.005146	0.487	3.93E+05	8.52E+05
i	3.03420	10/15/2004 9:41	10/15/04 3:54	1	0.2411						
j	3.08013	10/15/2004 14:21	10/15/04 10:12	6.4	0.1730	0.046	5.4	0.008506	0.544	4.30E+05	2.44E+06
k	3.04076	10/16/2004 1:31	10/15/04 16:57	-0.4	0.3570						
l	3.06373	10/16/2004 5:11	10/15/04 23:10	4.5	0.2508	0.023	4.9	0.004687	0.476	3.88E+05	1.02E+06
m	3.02436	10/16/2004 10:01	10/16/04 4:22	1.5	0.2355						
n	3.07357	10/16/2004 16:21	10/16/04 10:44	6.5	0.2341	0.049	5	0.009842	0.560	4.44E+05	1.37E+06
o	3.03748	10/16/2004 20:31	10/16/04 17:48	-0.4	0.1133						
p	3.08341	10/17/2004 3:41	10/17/04 0:06	3.9	0.1494	0.046	4.3	0.010682	0.460	5.60E+05	2.77E+06
q	3.01123	10/17/2004 10:11	10/17/04 4:51	2.1	0.2223						
r	3.06045	10/17/2004 18:01	10/17/04 11:21	6.3	0.2779	0.049	4.2	0.011717	0.579	4.64E+05	1.01E+06
s	3.04732	10/17/2004 22:01	10/17/04 18:45	-0.2	0.1362						
			10/18/04 1:20	3.4							

average	0.241	0.038	5.0	0.008	0.517	**4.30E+05**	**1.46E+06**
maximum	0.408	0.049	5.5	0.012	0.579	5.60E+05	2.77E+06
minimum	0.113	0.023	4.2	0.004	0.460	3.39E+05	4.87E+05

MBW5 Pre Flood Groundwater Elevation



MBE6 Preflood Analysis

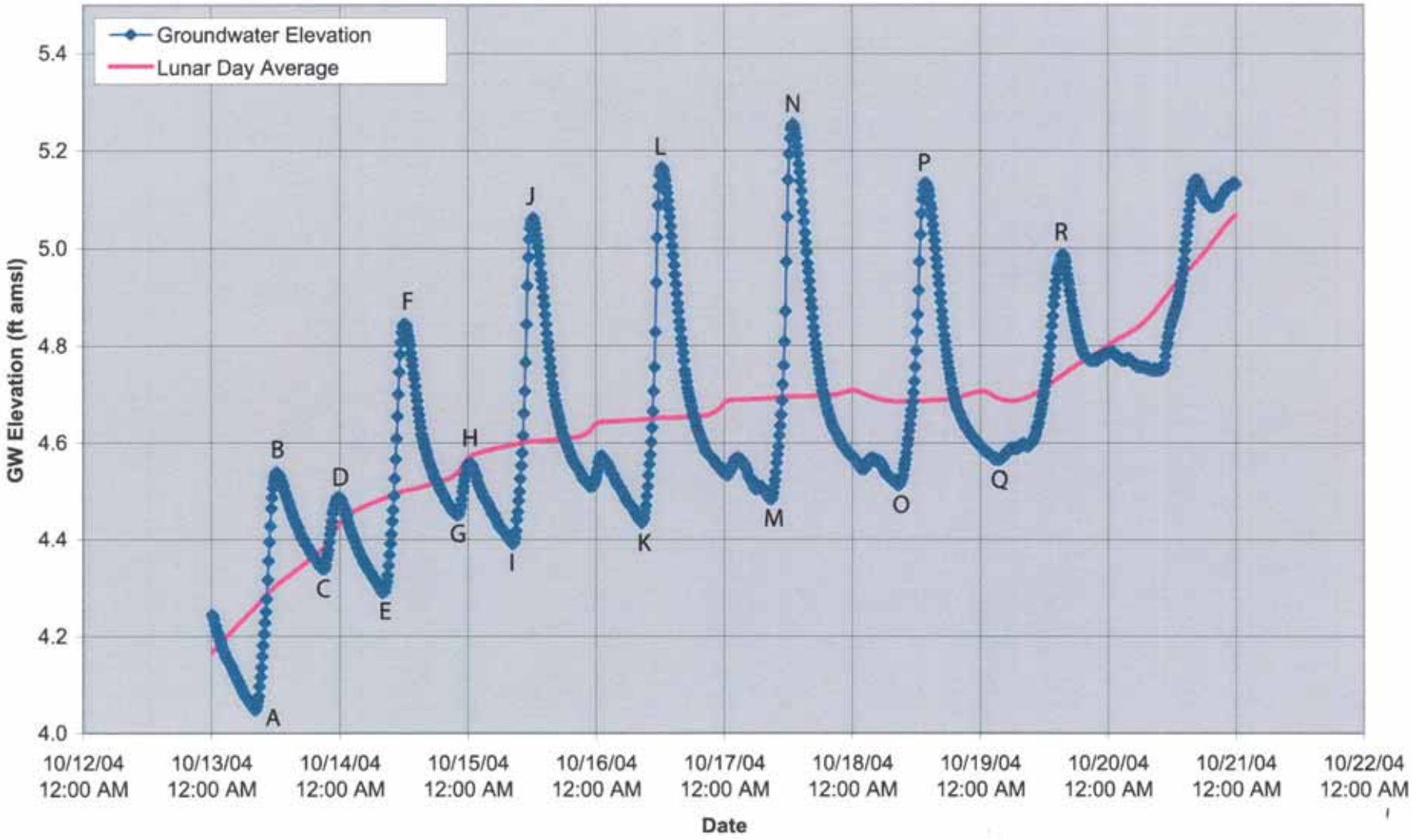
MBE6

	x	x^2
distance, (ft):	825	680625

	WL	date time: at well	Data from tide table date time: TIDE	WL	lag, days	WL rise	Tide rise	TE	period, in days	T/S for TE	T/S for lag
			10/12/04 20:58	5.4							
a	4.0471	10/13/04 8:07 AM	10/13/04 3:02	0.4	0.2120						
b	4.5392	10/13/04 12:07 PM	10/13/04 9:16	5.9	0.1190	0.492	5.5	0.089477	0.522	7.03E+05	2.00E+06
c	4.3390	10/13/04 9:07 PM	10/13/04 15:34	0.1	0.2315						
d	4.4867	10/13/04 11:47 PM	10/13/04 21:38	5.2	0.0898	0.148	5.1	0.028948	0.497	3.43E+05	3.34E+06
e	4.2931	10/14/04 8:17 AM	10/14/04 3:29	0.7	0.2002						
f	4.8443	10/14/04 12:07 PM	10/14/04 9:43	6.2	0.1002	0.551	5.5	0.100214	0.531	7.62E+05	2.86E+06
g	4.4506	10/14/04 9:57 PM	10/14/04 16:13	-0.2	0.2391						
h	4.5556	10/15/04 12:17 AM	10/14/04 22:22	4.9	0.0801	0.105	5.1	0.020586	0.487	2.91E+05	4.11E+06
i	4.3915	10/15/04 8:27 AM	10/15/04 3:54	1	0.1898						
j	5.0608	10/15/04 12:17 PM	10/15/04 10:12	6.4	0.0870	0.669	5.4	0.123942	1.019	4.81E+05	7.29E+06
k	4.4342	10/16/04 8:27 AM	10/16/04 4:22	-0.4	0.1703						
l	5.1658	10/16/04 12:17 PM	10/16/04 10:44	4.5	0.0648	0.732	4.9	0.149311	1.020	5.80E+05	1.32E+07
m	4.4834	10/17/04 8:37 AM	10/17/04 4:51	1.5	0.1572						
n	5.2544	10/17/04 12:47 PM	10/17/2004 11:21	6.3	0.0599	0.771	4.8	0.160624	1.021	6.26E+05	1.54E+07
o	4.5129	10/18/04 8:37 AM	10/18/2004 5:21	-0.2	0.1363						
p	5.1330	10/18/04 1:47 PM	10/18/2004 12:06	3.4	0.0703	0.620	3.6	0.172244	0.610	1.13E+06	6.67E+06
q	4.5654	10/19/04 3:27 AM	10/18/2004 19:59	2.6	0.3113						
r	4.9854	10/19/04 3:27 PM	10/19/2004 13:12	6	0.0940	0.420	3.4	0.123514			

average	0.145	0.501	4.8	0.108	0.713	**6.15E+05**	**6.85E+06**
maximum	0.311	0.771	5.5	0.172	1.021	1.13E+06	1.54E+07
minimum	0.060	0.105	3.4	0.021	0.487	2.91E+05	2.00E+06

MBE6 Pre Flood Groundwater Elevation

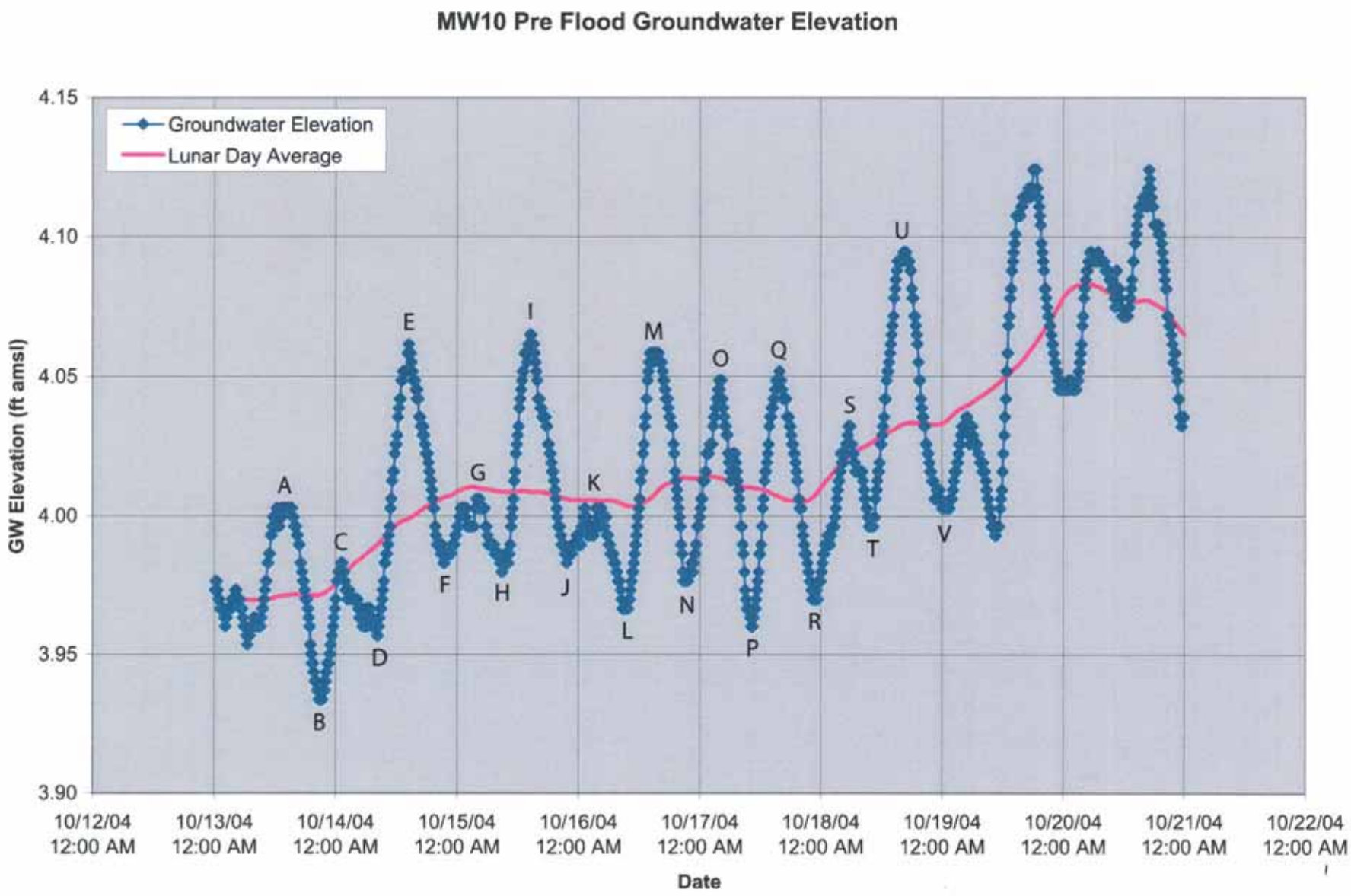


MW10 Preflood Analysis

MW10

	x	x^2
distance, (ft):	400	160000

	WL	date time: at well	Data from tide table date time: TIDE	WL	lag, days	WL rise	Tide rise	TE	period, in days	T/S for TE	T/S for lag
			10/12/04 20:58	5.4							
			10/13/04 3:02	0.4							
a	4.0026	10/13/04 2:29 PM	10/13/04 9:16	5.9	0.2176	#REF!	5.5	#REF!	0.522	#REF!	1.40E+05
b	3.9337	10/13/04 8:59 PM	10/13/04 15:34	0.1	0.2259						
c	3.9829	10/14/04 1:19 AM	10/13/04 21:38	5.2	0.1537	0.049	5.1	0.009649	0.497	4.70E+04	2.68E+05
d	3.9567	10/14/04 8:19 AM	10/14/04 3:29	0.7	0.2016						
e	4.0617	10/14/04 2:29 PM	10/14/04 9:43	6.2	0.1989	0.105	5.5	0.019088	0.531	6.05E+04	1.71E+05
f	3.9829	10/14/04 9:29 PM	10/14/04 16:13	-0.2	0.2197						
g	4.0059	10/15/04 4:29 AM	10/14/04 22:22	4.9	0.2551	0.023	5.1	0.004503	0.487	3.54E+04	9.52E+04
h	3.9797	10/15/04 8:59 AM	10/15/04 3:54	1	0.2121						
i	4.0650	10/15/04 2:39 PM	10/15/04 10:12	6.4	0.1857	0.085	5.4	0.015797	0.544	5.37E+04	2.01E+05
j	3.9829	10/15/04 9:39 PM	10/15/04 16:57	-0.4	0.1961						
k	4.0026	10/16/04 4:29 AM	10/15/04 23:10	4.5	0.2218	0.020	4.9	0.004017	0.476	3.47E+04	1.23E+05
l	3.9665	10/16/04 9:19 AM	10/16/04 4:22	1.5	0.2065						
m	4.0584	10/16/04 3:29 PM	10/16/04 10:44	6.5	0.1982	0.092	5	0.018373	0.560	5.62E+04	1.81E+05
n	3.9764	10/16/04 9:19 PM	10/16/04 17:48	-0.4	0.1468						
o	4.0485	10/17/04 4:19 AM	10/17/04 0:06	3.9	0.1759	0.072	4.3	0.016786	0.460	6.54E+04	1.89E+05
p	3.9600	10/17/04 10:19 AM	10/17/04 4:51	2.1	0.2280						
q	4.0518	10/17/04 3:49 PM	10/17/04 11:21	6.3	0.1864	0.092	4.2	0.021872	0.579	5.94E+04	2.12E+05
r	3.9698	10/17/04 11:19 PM	10/17/04 18:45	-0.2	0.1905						
s	4.0321	10/18/04 5:39 AM	10/18/04 1:20	3.4	0.1801	0.062	3.6	0.017315	0.442	6.92E+04	1.73E+05
t	3.9961	10/18/04 9:59 AM	10/18/04 5:21	2.6	0.1933						
u	4.0945	10/18/04 4:39 PM	10/18/04 12:06	6	0.1898	0.098	3.4	0.028948	0.610	6.57E+04	2.15E+05
v	4.0026	10/19/04 12:49 AM	10/18/04 19:59	0							
			average		0.199	0.070	4.7	0.016	0.519	**5.47E+04**	**1.79E+05**
			maximum		0.255	0.105	5.5	0.029	0.610	6.92E+04	2.68E+05
			minimum		0.147	0.020	3.4	0.004	0.442	3.47E+04	9.52E+04


MW10 Pre Flood Groundwater Elevation
Groundwater Elevation
Lunar Day Average
GW Elevation (ft amsl)
4.15
4.10
4.05
4.00
3.95
3.90
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
10/12/04 12:00 AM
10/13/04 12:00 AM
10/14/04 12:00 AM
10/15/04 12:00 AM
10/16/04 12:00 AM
10/17/04 12:00 AM
10/18/04 12:00 AM
10/19/04 12:00 AM
10/20/04 12:00 AM
10/21/04 12:00 AM
10/22/04 12:00 AM
Date