ANNUAL PERFORMANCE REPORT #1
LONG-TERM MONITORING PLAN

DEEP OVERBURDEN AND BEDROCK GROUNDWATER REMEDY

HONEYWELL STUDY AREA 7

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1 INTRODUCTION

This Annual Performance Report has been prepared in accordance with Section 4 of the Long-term Monitoring Plan (LTMP) for the Deep Overburden and Bedrock Ground Water Extraction and Treatment (GWET) remedy for the Honeywell Study Area 7 (SA-7) site. The purpose of this report is to present and assess the various data collected during the first year of GWET system operation and to recommend any changes to the monitoring network and/or frequency of collection. The period of record for this first report includes the pre-startup round of groundwater quality sampling conducted in November 2008, and the first annual sampling event conducted in November 2009. Hydraulic data cover the period from system startup on December 11, 2008 through December 31, 2009. Next year's annual performance report will cover calendar year 2010.

The Groundwater Remedy consists of deep overburden and bedrock groundwater extraction using three existing recovery wells, with treatment of the extracted water at Honeywell's treatment plant located on SA-7. The extraction wells are PW-1 (deep overburden zone), PW-2 (intermediate overburden zone), and 115-MW-203BR (bedrock). The two overburden wells are located near the downgradient end of the deep overburden plume and are intended to contain the plume from further off-site migration. Wells PW-1 and PW-2 are pumped at a nominal rate of 40 and 15 gpm, respectively in order to reverse hydraulic gradients in the deep overburden beneath the Hackensack River and pull back the river-ward portion of the plume. Once this has been accomplished, pumping rates may be reduced to maintain landward containment of the plume. The bedrock extraction well is located in the southwest corner of Site 115 and is pumped at approximately 7 gpm to contain the bedrock plume. Insert text here.

2 HYDRAULIC MONITORING

In accordance with the LTMP, hydraulic monitoring was conducted frequently during the first month after startup (short term hydraulic monitoring) and then monthly/quarterly thereafter (long term monitoring). The objectives of the hydraulic monitoring portion of the LTMP include the following:

1) Confirm the magnitude and extent of drawdown in the vicinity of the extraction wells during the startup period.

2) Track long-term changes in the direction of groundwater flow within the regional study area.

3) Monitor tidal fluctuations in the Hackensack River during water level measurement rounds for use in normalizing groundwater elevation measurements.

4) Document the rate of groundwater that is extracted and treated from the three recovery wells.

2.1 Groundwater Level Monitoring

2.1.1 Short-term Hydraulic Monitoring Results

Short-term hydraulic monitoring of the startup of the GWET system was conducted using pressure transducers and data loggers placed in selected monitoring wells in accordance with the Long Term Monitoring Plan (LTMP). Appendix A contains hydrographs from each of the monitored wells. The data logger monitoring period began 10 days prior to startup (December 1, 2008) and continued for approximately 7 weeks, ending on January 20, 2009. The data have been plotted in both raw form and using a 24-hour moving average. The results indicate that drawdown varied from a few tenths of a foot to nearly two feet and are consistent with the results from the pre-design aquifer testing.

Manual water level measurements were also made during the short-term on a monthly basis in selected monitoring wells in the vicinity of the pumping wells. Data from the March/April 2009 period, approximately 4 months after startup, were plotted in cross section to document groundwater elevations and drawdown. These maps were previously provided in the GWET Data Report (HydroQual, June 8, 2009) and have been copied in Appendix C for reference (Figure 1 and Figure 2). These data indicate that the combination of pumping from PW-1 and PW-2 has created a combined zone of low pressure that brings in water both laterally and vertically to the pumping wells.

Considering that the vertical anisotropy of the soils is on the order of 10:1, it is likely that the primary component of flow to the wells is horizontal rather than vertical. It should be noted that the cross-sections are drawn with a vertical exaggeration of 5X which tends to over-emphasize the vertical component of flow (i.e., the same cross-section drawn at true scale would more effectively illustrate that the majority of flow is horizontal).

2.1.2 Long-term Hydraulic Monitoring Results

The long-term hydraulic monitoring plan consisted of quarterly rounds of groundwater elevation measurement in all available wells. These data have been adjusted for tidal fluctuations using a time-series method developed by the U.S. Geological Survey (Halford, 2006) and are provided in Table 2-1. Data from the December 2009 round, one year after startup, are shown on the cross-sections on Figures 2-1 and 2-2. Groundwater well locations and elevations from the December 2009 quarterly water level round are provided in plan-view on Figures 2-3 through 2-6 for the shallow, intermediate, deep and bedrock zones, respectively. Figures 2-5 and 2-5 indicate that groundwater elevations in the Intermediate and Deep zones have rebounded on the order of 5 to 10 feet within the SA-7 perimeter wall to due to the cessation in pumping of the various depressurization wells during 2009. The data also illustrate that the groundwater depression in the vicinity of the GWET pumping wells is similar to that measured in March/April 2009 and creates a capture zone that fully encompasses the deep overburden plume in both the Intermediate and Deep zones. A comparison of the December 2009 data with that provided on Figures 4-1 and 4-2 of the Engineering Report for the GWET system design (HydroQual, December 2007), suggests that the GWET system has depressed groundwater levels at or below those predicted by the groundwater flow model and thus provides for an effective capture zone.

2.1.3 Monitoring of Hydraulic Gradients Across the Subsurface Containment Barrier (SCB)

The LTMP program included monitoring of the gradients across the subsurface containment barrier around the perimeter of SA-7. This was accomplished through monitoring of the head in each of the ten “perimeter pools” and comparing these data to groundwater elevations in various shallow piezometers located just outside of the SCB. The location of the perimeter pools and the design pool elevations are shown on Figure 2-7. Water levels through time are plotted on the hydrographs in Appendix D which indicate the average ground surface elevation, the design pool elevation, the measured pool elevation, and the groundwater elevation in the closest piezometer outside of the wall. Perimeter pools on the south side of the wall were not fully operational in 2009 and thus for pools S-2, S-3, and S-4, only one measured pool elevation in late December is shown.

Overall, the data indicate that with minor exceptions, water levels within the SA-7 pools are greater than those outside of the SCB and thus outward gradients are confirmed. The smallest head differences are in the vicinity of pools N-2 and N-3 in which water levels in

the outside piezometer is occasionally at or above the measured pool elevation. However, this difference has been relatively small, typically only a few inches, and considering the low permeability of the subsurface barrier, the potential for groundwater to actually migrate through the wall is quite low. For example, using a nominal wall thickness of three feet, an inward head difference of six inches, a wall permeability of 1.0 x 10 -7 cm/s (0.00028 ft/d), and a porosity of 0.3, the velocity of water moving through wall is calculated at 0.00015 feet per day. The time required for water to pass through the wall therefore is calculated at 20,000 days or over 54 years.

Going forward, the likelihood of continued elevated groundwater levels outside of the barrier wall is small. Recent groundwater levels have been impacted by the unusually wet weather and are expected to return to levels below the pool elevations. For the longer term, a low permeability cover is proposed for this area of SA-6 North as part of the soil containment cell. Groundwater modeling of this cell indicates that groundwater levels in this area will be lowered to an elevation at or below +4.0 feet above mean sea level.

2.2 Tidal Monitoring

During the reporting period, tidal monitoring was conducted using the automatic data recorder located on the SA-7 bulkhead. This tide gauge was maintained by Ocean Surveys Inc. (OSI) and was downloaded on a quarterly frequency. These data were used to correct groundwater elevations for tidal influences and to define the capture zones. In early 2010, river stage data will be measured using a replacement staff gauge operated by Cornerstone Environmental Group, LLC. The gauge will be established on the SA-7 bulkhead and a pressure transducer used to monitor river elevations. Tidal monitoring data will be automatically recorded every six minutes in NGVD-29 datum.

2.3 Flow Rate Monitoring

Flow rate monitoring was conducted on each of the three force mains using flow meters located within the treatment plant, prior to flow equalization. The flow rate was controlled by a manually-operated valve by the treatment plant operator and adjusted as necessary to maintain the design rates. In general, flow from the wells was found to be quite steady, and thus design rates were easily maintained on a day-to-day basis with the exception of periodic shutdowns due to system maintenance. Figure 2-8 identifies the various events which resulted in the system being shut down for more than 8 hours. Table 2-2 provides an explanation of the reason for the shutdown. The largest cessation in pumping was when the bedrock well was taken out of service to allow for the completion of soil removal operations within SA-7. Shutdowns of the two overburden pumping wells were primarily due to scheduled cleaning of the PW-2 forcemain due to clogging of the pipe. The clogging has been attributed to the highly mineralized water quality in the Intermediate zone in which PW-2 is screened.

3 GROUNDWATER QUALITY MONITORING

In accordance with the LTMP, the objectives of groundwater quality monitoring are to:

1) Establish baseline groundwater quality by sampling each of the 45 wells identified in the water quality monitoring plan prior to system startup.

2) Confirm that the horizontal and vertical extent of the plume is within the capture zone of the Groundwater Remedy by monitoring wells around the perimeter of the plume.

3) Monitor the effluent quality of the discharged water from each of the three extraction wells.

4) Assess the effectiveness of the GWET system at pulling back the river-ward portion of the deep overburden plume by periodically sampling groundwater from beneath the soft riverbed sediments.

5) Monitor the water quality in the vicinity of the "plume diversion area" south of the SA-7 barrier wall. This will be accomplished through monitoring of selected perimeter wells around this portion of the plume.

3.1 Monitoring Well Sampling

A total of 28 monitoring wells and three pumping wells were sampled prior to system startup (December 2008) and again one year after startup (December 2009). The monitoring wells are screened in the Intermediate, Deep, and Upper Bedrock zones. Monitoring of the Shallow zone is not within the scope of the LTMP. The wells are generally located on the perimeter of the chromium plume in each layer in order to document that the plumes are not expanding in a horizontal direction through time. Since the GWET system is designed to provide downgradient containment, there is no expectation of significant changes in the extent of the plume, nor in the distribution of chromium concentrations within the plumes. Thus, groundwater monitoring within the plumes is not incorporated into the LTMP. Groundwater quality data from the pre-startup and first annual rounds are provided in Table 3-1.

3.1.1 Bedrock Zone

Groundwater quality within the bedrock was monitored using ten perimeter wells. Hexavalent chromium and total chromium concentrations in unfiltered samples are

shown on Figures 3-1 and 3-2, respectively. The maps contain data from both the pre-startup round and the first annual round to allow a side-by-side comparison. The extent of the bedrock plume as determined in 2006 (refer to the Final Groundwater Investigation Report [HydroQual, 2007]) has also been shown on the figures for reference.

The data on Figure 3-1 indicate that hexavalent chromium was not detected in any of the wells on either of the two dates, including well 090-MW-18BR. This well reported hexavalent chromium at 0.23 ppm in 2006 but has since been found to be clean. The data on Figure 3-2 indicates that total chromium was also non-detect in each of the bedrock wells with the exception of 090-MW-18BR. Reported concentration in the unfiltered samples declined from 0.367 ppm in 2006 to 0.039 ppm in 2008 to 0.012 ppm in 2009. The two most recent results (2008 and 2009) are below the NJ Ground Water Quality Standard of 0.07 ppm.

3.1.2 Intermediate Overburden Zone

Groundwater quality data from the Intermediate overburden water-bearing zone is provided on Figures 3-3 and 3-4. Hexavalent chromium (Figure 3-3) was detected in only one of the six wells monitored (117-MW-I5) with the reported concentrations being on par with those reported in 2006. Total chromium concentrations (Figure 3-4) were similar, with the exception of minor detections (below NJGWQC) in wells SA6-MW-AA1D and 117-MW-I1. Both hexavalent and total chromium concentrations in well 117-MW-15 indicate declining trends. Total chromium concentrations for example, declined from 0.84 ppm in 2006 to 0.529 ppm in 2008 to 0.401 ppm in 2009.

3.1.3 Deep Overburden Zone/Plume Diversion Area

Groundwater quality data from the Deep overburden water-bearing zone is provided on Figures 3-5 and 3-6. Hexavalent chromium (Figure 3-5) was detected in only one of the eleven wells monitored (124-MW-104T) with the reported concentrations being on par with those reported in 2006 and below the NJGWQC. This well is in the plume diversion area and thus these data confirm that hexavalent chromium has not expanded due to the construction of the SA-7 perimeter cutoff wall. Total chromium concentrations (Figure 3-6) were similar to those measured in 2006 (refer to Figure 4.5-6 of the FGIR) and are shown to vary slightly from event to event. This is likely do to the presence of trivalent chromium sorbed onto soil particles that become dislodged from the well during sampling and end up in the non-filtered sample.

3.2 Pumping well sampling

Groundwater discharged from the three GWET pumping wells was sampled on a monthly frequency on a volunteer basis by Honeywell. The LTMP only requires quarterly sampling. Samples were analyzed for total and hexavalent chromium and volatile organic chemicals (VOC). The results for hexavalent chromium are plotted on a time-

series chart on Figure 3-7 and are tabulated in Table 3-2. These data indicate that concentrations in the Deep zone (PW-1) have declined from pre-startup levels and have reached a quasi-equilibrium concentration of approximately 65 ppm. Data from the Intermediate zone (PW-2) initially increased from 5 ppm to 40 ppm, but have since also declined to approximately 25 ppm. The observed slow decline in concentration is likely due to cleaner water being pulled into the pumping wells as the capture zone establishes itself. The cleaner water originates at the margins of the capture zone including beneath the river as the plume is pulled back. Hexavalent chromium concentrations in the bedrock have been generally stable, ranging from 10 to 15 ppm.

VOC data from the pumping wells is provided in Table 3-2. With the exception of carbon tetrachloride and occasionally chloroform, VOC have not been detected in the bedrock pumping well. Deep overburden pumping well PW-1 contains the highest VOC concentrations with the most prevalent compounds being chlorinated volatile organics such as trichloroethene (TCE) and its daughter products cis- and trans-dichloroethene and vinyl chloride. These same constituents were detected in the Intermediate zone pumping well PW-2 albeit at lower concentrations. Benzene was also detected in relatively low concentrations in PW-1 and PW-2 with the gasoline-related constituents toluene, ethylbenzene, and xylene (BTEX) being present in PW-2.

Figure 3-8 illustrates a time-series plot of TCE in each of the GWET pumping wells. The data indicate that concentrations increased during the first 5 months of pumping and then began to recede. Currently TCE concentrations in both PW-1 and PW-2 are relatively stable at about 200 ppm after a peak of more than 350 ppm in PW-1. The source of the VOC's in the groundwater is not related to Honeywell.

4 RECOMMENDATIONS

Based on the results of the LTMP for the first year of GWET system operation, the following modifications to the sampling plan are proposed.

- Reduce the frequency of groundwater level measurements from quarterly to semi-annually (every 6 months). Since the GWET system has now reached hydraulic equilibrium, changes in the overall groundwater elevations are minimal. The frequency could be returned to quarterly in the event of changes in the GWET pumping rates or implementation of other remedial actions that may influence groundwater such as remediation of SA-5, SA-6 north/south, etc.

- Resume a biennial (every two years) frequency of groundwater quality sampling in accordance with the LTMP. Annual sampling was conducted in November 2009 on a volunteer basis by Honeywell. Since the wells are located on the perimeter of the plume and no horizontal expansion is expected, confirmation sampling on an annual basis is not warranted.

- Integrate the various groundwater monitoring plans that have been developed for the different remedial programs associated with SA-5, SA-6, and SA-7. This integration would reduce the duplicity of effort in the field and allow a single periodic assessment of subsurface conditions.

- Assess the impact of reducing the pumping rate of PW-2 on the capture zone as provided for in Section 3.1 of the Engineering Report for the GWET system (HydroQual 2007). Conduct groundwater model simulations to estimate the distance the plume has been pulled back from beneath the Hackensack River to date and what rate would be needed to continue this effort.

APPENDIX A

TABLES

Table 2-1

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	Approximate Screen Depth ft, bgs	2-Dec-08 GW Elevation ft, msl	25-Mar-09 GW Elevation ft, msl	22-Jun-09 GW Elevation ft, msl	30-Sep-09 GW Elevation ft, msl	12/17/2009[1] GW Elevation ft, msl
073-MW-10BR-1	Rock	80 - 130		-1.87	0.89	-1.92	-1.15
073-MW-10BR-2	Rock	80 - 130		-0.79	0.87	-1.59	-1.08
073-MW-10BR-3	Rock	80 - 130		-0.75	1.26	-1.01	-0.54
073-MW-10BR-4	Rock	80 - 130		-0.09	1.44	-0.06	0.27
073-MW-10BR-5	Rock	80 - 130			5.62	6.76	
073-MW-1BR-1	Rock	80 - 130		-2.13	1.88	4.24	-1.27
073-MW-1BR-2	Rock	80 - 130		-1.55	1.96	-1.02	-1.11
073-MW-1BR-3	Rock	80 - 130		-0.34	2.27	0.22	3.57
073-MW-1BR-4	Rock	80 - 130		-0.30	1.83	0.20	-0.01
073-MW-1BR-5	Rock	80 - 130		-0.06	1.18	0.32	0.73
073-MW-BB11	Shallow	10 - 20		3.22	3.95	2.35	3.52
073-MW-Y10	Shallow	10 - 20		3.83	4.21	3.90	4.02
079-MW-13BR-1	Rock	80 - 130		6.29	7.38	7.19	7.70
079-MW-13BR-2	Rock	80 - 130		7.22	7.46	7.55	7.90
079-MW-13BR-3	Rock	80 - 130		6.93	7.12	7.17	7.28
079-MW-A2	Shallow	10 - 20		2.30		3.28	3.07
079-MW-C6	Shallow	10 - 20		5.21	5.91	5.70	5.88
087-MW-001	Shallow	10 - 20		6.18	7.41	6.50	7.31
087-MW-01	Deep	60 - 90	2.94	2.33		3.50	3.37
087-MW-03	Deep	60 - 90	2.00	1.11		2.36	2.19
087-MW-08	Deep	60 - 90		0.18	1.05	0.98	0.76
087-MW-101	Shallow	10 - 20		1.80	2.98	3.21	2.91
087-MW-102	Shallow	10 - 20		1.76	2.93	3.15	2.85
087-MW-119	Shallow	10 - 20			4.55	5.08	4.73
087-MW-120	Shallow	10 - 20			4.08	4.05	
087-MW-121	Shallow	10 - 20			2.63	2.95	2.62
087-MW-13	Intermediate	20 - 40	1.05	-2.54	-2.71	-1.56	-1.91
087-MW-14	Rock	80 - 130	2.33	3.03	1.84	2.30	
087-MW-34	Deep	60 - 90		-1.58	-0.75	-0.71	-0.86

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	Approximate Screen Depth ft, bgs	2-Dec-08 GW Elevation ft, msl	25-Mar-09 GW Elevation ft, msl	22-Jun-09 GW Elevation ft, msl	30-Sep-09 GW Elevation ft, msl	12/17/2009[1] GW Elevation ft, msl
087-MW-35	Intermediate	20 - 40	0.71	0.62	1.04	1.09	0.48
087-MW-A26	Shallow	10 - 20		2.35	3.24	3.47	3.35
087-MW-A26D	Intermediate	20 - 40	2.39	2.15	2.98	3.27	3.09
087-MW-A26T	Deep	60 - 90	2.41	2.12	2.95	3.12	3.01
087-MW-I30	Shallow	10 - 20		3.37	3.93	4.12	3.86
087-MW-I30T	Rock	80 - 130		2.18	1.93	2.60	1.86
087-MW-O19	Shallow	10 - 20	6.86	6.76	7.84	6.90	7.60
087-MW-O23	Shallow	10 - 20		6.09	5.87	6.03	5.84
087-MW-O29	Shallow	10 - 20		0.73	3.99	4.22	4.03
087-MW-O29D	Intermediate	20 - 40	1.69	0.36	1.15	1.19	0.92
087-MW-O29T	Rock	80 - 130	2.46	1.23	2.28	1.92	1.70
087-MW-S19	Shallow	10 - 20		7.29	7.59	7.27	7.61
087-MW-U28	Shallow	10 - 20		5.85	5.53	5.46	5.43
087-MW-W25	Shallow	10 - 20		4.60	4.73	4.57	4.51
087-MW-W25D	Intermediate	20 - 40	0.74	0.65		1.13	0.44
087-MW-W25T	Deep	60 - 90	1.44	0.21	1.20	1.06	0.91
087-MW-Y20	Shallow	10 - 20	2.36	2.81	3.42	2.97	2.77
087-OBS-1D	Intermediate	20 - 40	0.64	1.12	1.58	1.30	0.74
087-OBS-1L	Deep	60 - 90	2.38	0.87	2.58	0.90	0.61
087-OBS-1T	Deep	60 - 90	1.68	0.43	1.22	1.28	0.67
087-OBS-2D	Intermediate	20 - 40	1.01	-2.64	-1.04	-2.29	-2.63
087-OBS-3L	Deep	60 - 90	2.44	-2.39	-0.63	-1.32	-2.62
087-OBS-4T	Deep	60 - 90			0.65	0.76	0.68
087-OBS-5D	Intermediate	20 - 40	1.64	-0.47	1.56	-0.28	-0.92
087-OBS-5T	Deep	60 - 90	1.04	-1.15	0.70	-0.67	-1.15
087-OBS-6D	Intermediate	20 - 40				3.01	2.76
087-PW-1	Deep	60 - 90	2.06		-17.67	-19.63	-19.95
087-PW-2	Intermediate	20 - 40	1.52	-20.01	-10.68	-15.48	-20.92
087-PZ-001	Shallow	10 - 20		3.62	4.01	4.02	4.26
087-PZ-002	Intermediate	20 - 40		0.72	2.13	1.60	2.06

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	Approximate Screen Depth ft, bgs	2-Dec-08 GW Elevation ft, msl	25-Mar-09 GW Elevation ft, msl	22-Jun-09 GW Elevation ft, msl	30-Sep-09 GW Elevation ft, msl	12/17/2009[1] GW Elevation ft, msl
087-PZ-003	Shallow	10 - 20		5.29	5.42	5.27	5.65
087-PZ-004	Intermediate	20 - 40		1.37	2.32	2.36	2.48
087-PZ-005	Shallow	10 - 20		7.18	7.36	6.83	7.52
087-PZ-006	Intermediate	20 - 40		0.99	2.04	1.80	1.72
088-MW-001	Shallow	10 - 20	3.62	3.15	5.22	5.25	5.75
088-MW-002	Shallow	10 - 20	5.72	5.73	6.96	7.30	6.81
088-MW-101	Shallow	10 - 20	2.34		3.64		3.16
088-MW-102	Shallow	10 - 20	2.14	1.89	4.39	4.79	3.44
088-MW-103	Shallow	10 - 20	2.25	1.45	2.98	3.91	2.64
088-MW-15	Intermediate	20 - 40		1.51		2.83	2.61
088-MW-G19T	Deep	60 - 90		2.35		3.37	3.15
088-PZ-001	Shallow	10 - 20		4.69	5.76	5.50	5.87
088-PZ-002	Intermediate	20 - 40		2.88	4.07	4.31	4.06
088-PZ-003	Shallow	10 - 20		5.66	5.85	6.00	5.84
088-PZ-004	Intermediate	20 - 40		1.49	2.33	2.69	3.10
090-MW-010	Shallow	10 - 20		7.23	7.03	7.66	8.06
090-MW-011	Shallow	10 - 20		7.12	8.07	7.84	8.19
090-MW-07	Intermediate	20 - 40	5.61	7.84	8.55	8.99	8.75
090-MW-09	Deep	60 - 90	6.81	5.67	5.55	6.82	6.68
090-MW-18BR	Rock	80 - 130		7.39	7.34	7.95	0.03
090-MW-7BR-1	Rock	80 - 130	3.74		4.47	4.95	5.18
090-MW-7BR-2	Rock	80 - 130			4.97	5.31	5.26
090-MW-7BR-3	Rock	80 - 130			4.86	4.80	5.01
090-MW-8A	Shallow	10 - 20		8.53	10.45	9.79	9.97
090-MW-E01	Shallow	10 - 20			7.15	7.12	7.40
090-MW-F14	Shallow	10 - 20			12.46	12.11	12.41
090-PZ-105	Shallow	10 - 20		6.93	8.00	7.30	7.83
090-PZ-106A	Shallow	10 - 20		3.69	6.62	6.69	6.93
090-PZ-106B	Intermediate	20 - 40		6.16	-1.04	4.32	4.53
090-PZ-115A	Shallow	10 - 20		6.21	7.38	6.74	6.97

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	Approximate Screen Depth ft, bgs	2-Dec-08 GW Elevation ft, msl	25-Mar-09 GW Elevation ft, msl	22-Jun-09 GW Elevation ft, msl	30-Sep-09 GW Elevation ft, msl	12/17/2009[1] GW Elevation ft, msl
090-PZ-115B	Intermediate	20 - 40	8.36	3.59	4.61	5.46	4.99
090-PZ-119	Shallow	10 - 20		6.86	7.31	7.24	7.59
115-E1-DI	Intermediate	20 - 40				2.33	2.47
115-E1-DO	Intermediate	20 - 40				3.10	3.12
115-E1-SO	Shallow	10 - 20				4.51	4.32
115-E2-DO	Intermediate	20 - 40	3.97		4.79	5.15	5.12
115-E2-SO	Shallow	10 - 20	5.30		5.83	6.31	6.03
115-E3-DO	Intermediate	20 - 40	4.84	6.06	5.69	5.96	5.89
115-E3-SO	Shallow	10 - 20	5.66	5.15	6.27	6.88	
115-E4-DO	Intermediate	20 - 40	2.47	2.53	3.54	3.81	3.67
115-E5-DO	Intermediate	20 - 40	1.62	1.33	2.37	2.69	2.47
115-E6-DI	Intermediate	20 - 40				2.34	2.44
115-E6-DO	Intermediate	20 - 40				-3.86	1.62
115-MW-21	Deep	60 - 90				0.36	0.25
115-MW-203BR	Rock	80 - 130	2.18	-3.17			
115-MW-215BR	Rock	80 - 130		-2.93	-1.30	-3.78	-3.54
115-MW-216BR	Rock	80 - 130	4.03		4.02	3.88	3.95
115-MW-E14D	Intermediate	20 - 40			-2.96	0.26	2.16
115-MW-E14T	Deep	60 - 90			1.06	-1.25	-1.37
115-W1-DO	Intermediate	20 - 40	1.70		1.17	1.50	1.63
115-W1-SO	Shallow	10 - 20				7.37	7.74
115-W4-DO	Intermediate	20 - 40				2.26	1.85
117-MW-3BR-1	Rock	80 - 130		5.09		6.15	5.75
117-MW-3BR-2	Rock	80 - 130			9.99	6.77	6.59
117-MW-8BR	Rock	80 - 130	5.39	5.11	3.82	5.66	5.73
117-MW-A05	Shallow	10 - 20			7.49	8.01	7.95
117-MW-A14	Shallow	10 - 20		5.27	5.23	5.81	5.66
117-MW-A62	Shallow	10 - 20		7.34		8.23	8.05
117-MW-A85	Shallow	10 - 20		5.57	5.40	6.49	6.14

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	Approximate Screen Depth ft, bgs	2-Dec-08 GW Elevation ft, msl	25-Mar-09 GW Elevation ft, msl	22-Jun-09 GW Elevation ft, msl	30-Sep-09 GW Elevation ft, msl	12/17/2009[1] GW Elevation ft, msl
117-MW-A89	Shallow	10 - 20		4.31	4.92	5.11	5.06
117-MW-A99	Shallow	10 - 20		6.62	7.07	8.00	
117-MW-D1	Deep	60 - 90	3.34	3.35	3.65	3.85	4.10
117-MW-D2	Deep	60 - 90	4.68	4.81	5.21	5.68	5.69
117-MW-D3	Deep	60 - 90	8.02	5.91	6.55	6.67	6.75
117-MW-I1	Intermediate	20 - 40	3.58	3.48	3.83	4.03	4.11
117-MW-I2	Intermediate	20 - 40	5.29	5.45	5.39	6.40	6.69
117-MW-I3	Intermediate	20 - 40	3.09	5.16	5.94	6.34	6.18
117-MW-I4	Intermediate	20 - 40		5.38	6.05	6.36	6.29
117-MW-I4S	Shallow	10 - 20				8.44	8.53
117-MW-I5	Intermediate	20 - 40	5.81	8.00	9.18	9.07	9.13
119-MW-01T	Deep	60 - 90	2.71	2.63	2.97	3.15	2.48
119-MW-02T	Deep	60 - 90	3.11	3.00	3.27	3.42	3.57
119-MW-11BR	Rock	80 - 130	4.18	2.98	4.32	5.18	3.73
119-MW-12BR	Rock	80 - 130	4.02	4.76	5.32	5.30	5.32
119-MW-16BR-1	Rock	80 - 130	4.49	4.33	4.58	4.70	
119-MW-16BR-2	Rock	80 - 130		3.91	4.46	4.32	4.35
119-MW-16BR-3	Rock	80 - 130		3.97	4.31	4.29	4.31
119-MW-2BR-1	Rock	80 - 130		-1.02		-1.08	-1.52
119-MW-2BR-2	Rock	80 - 130		-1.39	0.95	-0.63	-0.88
119-MW-2BR-3	Rock	80 - 130			1.23	-0.09	-0.11
119-MW-4BR-1	Rock	80 - 130		3.38	3.93	3.89	3.79
119-MW-4BR-2	Rock	80 - 130		5.06	4.05	3.95	3.76
119-MW-4BR-3	Rock	80 - 130		3.49	4.15	4.11	4.14
124-MW-02	Shallow	10 - 20		6.02	7.29	7.07	6.06
124-MW-06	Deep	60 - 90	1.69	2.34	3.05	3.32	3.36
124-MW-102D	Intermediate	20 - 40	2.47	2.45	2.78	3.02	3.06
124-MW-102T	Deep	60 - 90	1.55	2.59	3.34	3.70	3.67
124-MW-103D	Intermediate	20 - 40	2.04	1.96	2.35	2.61	2.62
124-MW-103L	Deep	60 - 90		2.25	2.91	3.29	3.30

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	Approximate Screen Depth ft, bgs	2-Dec-08 GW Elevation ft, msl	25-Mar-09 GW Elevation ft, msl	22-Jun-09 GW Elevation ft, msl	30-Sep-09 GW Elevation ft, msl	12/17/2009[1] GW Elevation ft, msl
124-MW-104D	Intermediate	20 - 40	2.68	2.66	2.84	3.12	3.19
124-MW-104L	Deep	60 - 90		3.09	3.47	3.71	3.76
124-MW-104T	Deep	60 - 90	2.54	2.68	2.98	3.65	3.75
124-MW-105D	Intermediate	20 - 40	2.62	2.74	2.48	3.40	4.43
124-MW-105T	Deep	60 - 90	1.89	2.42	2.40	3.27	3.29
124-MW-106T	Deep	60 - 90	0.03	-0.95	-0.87	2.26	2.49
124-MW-107T	Deep	60 - 90	-0.48	1.02	2.28	2.77	2.89
124-MW-17BR-1	Rock	80 - 130			4.35	3.85	6.91
124-MW-17BR-2	Rock	80 - 130			4.18	3.77	3.66
124-MW-G02D	Intermediate	20 - 40	2.70	2.71	2.57	7.12	3.16
124-MW-G02T	Deep	60 - 90	1.57	2.11	2.70	3.08	4.65
125-MW-01	Shallow	10 - 20		5.99	6.78	6.39	6.38
134-MW-Q08	Shallow	10 - 20		6.33	6.45	6.10	6.47
134-MW-V09	Shallow	10 - 20		5.50	5.97	5.40	5.58
140-MW-04	Shallow	10 - 20			5.51	4.94	5.18
140-MW-06	Shallow	10 - 20		6.63	7.06	6.64	7.13
140-MW-07	Shallow	10 - 20		5.53	5.63	5.31	5.70
140-MW-1R	Shallow	10 - 20			5.31	5.13	5.39
140-MW-9BR-1	Rock	80 - 130	2.55	1.16	3.06		
140-MW-9BR-2	Rock	80 - 130		3.47	3.27		
140-MW-9BR-3	Rock	80 - 130		2.62	3.24		
140-MW-P05D	Intermediate	20 - 40	1.97	1.89	1.98	2.87	2.32
153-MW-A13	Shallow	10 - 20		4.70	4.44	4.65	4.70
153-MW-A13T	Deep	60 - 90	3.75	2.85	3.62	3.47	3.87
153-MW-A15	Shallow	10 - 20			3.07	3.16	
154-MW-A01	Shallow	10 - 20		11.51	11.65	11.14	11.73
154-MW-A06	Shallow	10 - 20		12.21	14.46	11.49	13.73
154-MW-A5A	Shallow	10 - 20		11.60	11.86	11.13	11.82
154-MW-B6A	Shallow	10 - 20				12.18	13.28
154-MW-C6A	Shallow	10 - 20		12.29	12.82	11.79	12.57

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	Approximate Screen Depth ft, bgs	2-Dec-08 GW Elevation ft, msl	25-Mar-09 GW Elevation ft, msl	22-Jun-09 GW Elevation ft, msl	30-Sep-09 GW Elevation ft, msl	12/17/2009[1] GW Elevation ft, msl
154-MW-D01	Shallow	10 - 20		12.68	12.98	11.98	12.68
154-MW-E08	Shallow	10 - 20		13.17	14.00	12.62	13.83
163-MW-CC08	Shallow	10 - 20		2.46	3.09	0.00	
163-MW-R05	Shallow	10 - 20			5.50		
184-MW-001	Shallow	10 - 20			8.27	7.97	8.09
184-MW-002	Shallow	10 - 20		2.95	3.70	4.02	3.72
184-MW-C10	Shallow	10 - 20		9.85	10.44	10.21	10.48
184-PZ-116A	Shallow	10 - 20		4.44	4.24	4.76	4.95
184-PZ-116B	Intermediate	20 - 40	2.39	3.25	4.04	4.54	4.33
184-PZ-118	Shallow	10 - 20		4.34		5.24	5.15
184-PZ-120	Shallow	10 - 20		4.62	4.78	5.17	5.07
KP-MW-6BR-1	Rock	80 - 130			4.34	0.60	-0.46
KP-MW-6BR-2	Rock	80 - 130			4.96	5.33	-0.53
KP-MW-6BR-3	Rock	80 - 130			5.67	5.00	
SA6-MW-14BR	Rock	80 - 130	3.33	2.89	3.54	3.37	3.28
SA6-MW-15BR	Rock	80 - 130	1.55	0.65	2.27	1.38	1.49
SA6-MW-5BR-1	Rock	80 - 130		1.72	2.32		1.96
SA6-MW-5BR-2	Rock	80 - 130		2.43	3.05		2.70
SA6-MW-5BR-3	Rock	80 - 130		2.71	3.26	3.25	3.08
SA6-MW-5BR-4	Rock	80 - 130		3.15	3.59		3.27
SA6-MW-5BR-5	Rock	80 - 130			3.68		3.48
SA6-MW-AA1	Shallow	10 - 20			4.31	3.69	4.21
SA6-MW-AA1D	Intermediate	20 - 40	1.74	0.17	1.08	1.10	0.67
SA6-MW-AA1T	Deep	60 - 90	1.74	0.32	1.08	1.04	0.69

Note: 1. Water level measurements from the wells screened in the Rock Zone were taken on December 22nd, 2009.

Table 2-2

GWET Pumping Outages in 2009

Well ID	Start Date	End Date	Duration		Comment
			Days	Hours	
087-PW-1	12-Apr-09	16-Apr-09	4	8	Due to a damaged power lead in the well and resultant level switch problem.
087-PW-2	16-Apr-09	17-Apr-09	--	20	Due to pump and pump controller issues (both replaced).
087-PW-2	23-Apr-09	23-Apr-09	--	9	Due to silt accumulation
115-MW-203BR	15-Jun-09	31-Jul-09	46	5	Shut down for excavation access, with SA7 piping and conduit removed.
087-PW-2	23-Jun-09	2-Jul-09	9	4	Shut down for line jetting.
087-PW-2	6-Jul-09	10-Jul-09	3	21	Shut down for line jetting.
087-PW-1	6-Oct-09	7-Oct-09	1	9	Shut down for acid line cleaning pump and soak; needs new o-ring (replaced).
087-PW-2	6-Oct-09	7-Oct-09	1	9	Shut down for acid line cleaning pump and soak.
087-PW-1	21-Oct-09	26-Oct-09	5	--	Shut down as a safety precaution due to continued Entact digging near forcemanis.
087-PW-2	21-Oct-09	26-Oct-09	5	--	Shut down as a safety precaution due to continued Entact digging near forcemanis.
115-MW-203BR	21-Oct-09	26-Oct-09	5	1	Entact damages 2" Teal's conduit to 115-MW-203BR traffic box with excavator.
115-MW-203BR	29-Oct-09	30-Oct-09	1	2	Turned off after clean-out cap found dripping; needs new pump O-ring (replaced).
087-PW-1	13-Nov-09	13-Nov-09	--	9	Due to starter overload trip; repeated resets are unsuccessful; failed 3-phase pump motor (replaced).
087-PW-1	15-Nov-09	16-Nov-09	1	3	Shut down for PW-2 acid line cleaning pump and soak.
087-PW-2	15-Nov-09	16-Nov-09	1	3	Shut down for acid line cleaning pump and soak.
115-MW-203BR	15-Nov-09	16-Nov-09	--	20	Shut down for PW-2 acid line cleaning pump and soak.

Table 3-1

Summary of Ground Water Quality Data from Monitoring Wells

	November 2008				November 2009			
	Unfiltered		Filtered		Unfiltered		Filtered	
Well	Total Cr (mg/L)	Hex Cr. (mg/L)	Total Cr. (mg/L)	Hex Cr. (mg/L)	Total Cr (mg/L)	Hex Cr. (mg/L)	Total Cr. (mg/L)	Hex Cr. (mg/L)
079-MW-13BR-2	ND	ND	ND	ND	ND	ND	ND	ND
087-MW-A26D	ND	ND	ND	ND	ND	ND	ND	ND
087-MW-A26T	ND	ND	ND	ND	ND	ND	ND	ND
087-MW-W25D	ND	ND	ND	ND	ND	ND	ND	ND
087-MW-W25T	ND	ND	ND	ND	ND	ND	ND	ND
090-MW-18BR	0.0389	ND	ND	ND	0.0112	ND	ND	ND
117-MW-8BR	ND	ND	ND	ND	ND	ND	ND	ND
117-MW-D3	ND	ND	ND	ND	ND	ND	0.0336	ND
117-MW-I1	ND	ND	ND	ND	0.0228	ND	ND	ND
117-MW-I5	0.529	0.51	0.593	0.52	0.401	0.37	0.392	0.36
119-MW-01T	0.0325	ND	ND	ND	0.0325	ND	ND	ND
119-MW-02T	ND	ND	ND	ND	ND	ND	ND	ND
119-MW-16BR-1	ND	ND	ND	ND	ND	ND	ND	ND
119-MW-2BR-2	ND	ND	ND	ND	ND	ND	ND	ND
124-MW-102D	N/A	N/A	N/A	N/A	ND	ND	ND	ND
124-MW-102T	ND	ND	ND	ND	ND	ND	ND	ND
124-MW-104T	0.0151	ND	ND	ND	0.0472	0.046	0.0533	0.05
124-MW-106T	ND	ND	ND	ND	0.0126	ND	ND	ND
124-MW-107T	ND	ND	ND	ND	0.191	ND	ND	ND
124-MW-8BR	N/A	N/A	N/A	N/A	ND	ND	ND	ND
124-MW-G02T	ND	ND	ND	ND	ND	ND	ND	ND
140-MW-9BR-1	ND	ND	ND	ND	ND	ND	ND	ND
KP-MW-6BR-1	ND	ND	ND	ND	ND	ND	ND	ND
SA6-MW-14BR	ND	ND	ND	ND	ND	ND	ND	ND
SA6-MW-15BR-1	ND	ND	ND	ND	ND	ND	ND	ND
SA6-MW-AA1D	0.0178	ND	ND	ND	ND	ND	ND	ND
SA6-MW-AA1T	0.0212	ND	ND	ND	ND	ND	ND	ND

Table 3-2
Summary of Groundwater Quality Data from GWET Wells

	12-Dec-08			30-Jan-09			19-Feb-09		
Parameter	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)
Benzene	3.9	0.76	ND	3.8	3.2	ND	5.3	7.7	1.2
Carbon Tetrachloride	34	1.7	0.73	27.9	7.3	0.91 J	24.4	8	0.9J
Chloroform	34.8	21.7	ND	19.3	102	ND	21.7	149	ND
1,1-Dichloroethene	1.4	ND	ND	1.5	ND	ND	2	0.24J	ND
cis-1,2-Dichloroethene	118	1.8	ND	158	4.1	ND	124	11.8	ND
trans-1,2-Dichloroethene	8.5	0.39	ND	17.1	ND	ND	17.3	ND	ND
Toluene	ND	ND	ND	ND	0.45 J	ND	ND	0.58J	ND
Trichloroethene	121	37.6	ND	263	61.9	ND	214	117	ND
1,1-Dichloroethane	0.27	ND	ND	0.51 J	ND	ND	0.57J	ND	ND
Methylene chloride	1.3	ND	ND	0.7 J	2.6	ND	0.7J	6.3	ND
Vinyl chloride	16.4	ND	ND	19.5	1.1 J	ND	18.7	3.3	ND
1,2-Dichlorobenzene	ND	ND	ND	0.95 J	ND	ND	1.1	ND	ND
Chlorobenzene	ND	ND	ND	0.48 J	ND	ND	0.55J	ND	ND
Ethylbenzene	ND	ND	ND	ND	0.8 J	ND	ND	1	ND
Xylenes (total)	ND	ND	ND	ND	1.1	ND	ND	1.7	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium	148,000	3,700	7,600	NT	NT	NT	112,000	34,700	9,400
Total Chromium	142,000	6,680	7,490	NT	NT	NT	111,000	35,400	10,400

NA = Not Available for Testing due to COPR excavation activities.
NT = Not Tested
ND = Not detected above reporting limit.

Table 3-2 (continued)
Summary of Groundwater Quality Data from GWET Wells

	16-Mar-09			14-Apr-09			18-May-09		
Parameter	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)
Benzene	5.4	11.1	ND	NT	13.1	ND	5.5	16.6	ND
Carbon Tetrachloride	28.5	9.1	1.4	NT	8.8	1.5	25.7	7.8	2.2
Chloroform	22.9	286	ND	NT	312	0.17	22.1	459	ND
1,1-Dichloroethene	0.58J	ND	ND	NT	0.21	ND	1.9	ND	ND
cis-1,2-Dichloroethene	191	18.7	ND	NT	22.4	ND	241	27	ND
trans-1,2-Dichloroethene	18.1	ND	ND	NT	ND	ND	19	ND	ND
Toluene	ND	0.39J	ND	NT	ND	ND	ND	ND	ND
Trichloroethene	312	181	ND	NT	178	ND	378	237	ND
1,1-Dichloroethane	2.2	ND	ND	NT	0.11	ND	0.67	ND	ND
Methylene chloride	ND	10.2	ND	NT	11.7	ND	ND	18	ND
Vinyl chloride	21.6	5.6	ND	NT	6.6	ND	20.2	6.7	ND
1,2-Dichlorobenzene	1.1	ND	ND	NT	ND	ND	ND	ND	ND
Chlorobenzene	0.58J	ND	ND	NT	ND	ND	0.64	ND	ND
Ethylbenzene	ND	0.98J	ND	NT	0.81	ND	ND	0.46	ND
Xylenes (total)	ND	1.7	ND	NT	1.5	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	NT	ND	ND	ND	ND	ND
Hexavalent Chromium	93,800	32,400	11,200	NT	39,800	13,000	76,400	29,200	12,000
Total Chromium	104,000	35,400	10,600	NT	30,500	11,800	77,600	32,600	13,400

NA = Not Available for Testing due to COPR excavation activities.
NT = Not Tested
ND = Not detected above reporting limit.

Table 3-2 (continued)
Summary of Groundwater Quality Data from GWET Wells

	17-Jun-09			15-Jul-09			18-Aug-09		
Parameter	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)
Benzene	5.6	18.4	NA	4.3	16.0	NA	4.0	14.6	ND
Carbon Tetrachloride	24.6	8.9	NA	12.1	6.6	NA	12.8	6.7	1.5
Chloroform	23.0	447	NA	17.2	382	NA	18.2	374	ND
1,1-Dichloroethene	2.3	ND	NA	1.3	ND	NA	1.2	ND	ND
cis-1,2-Dichloroethene	232	35.1	NA	195	32.4	NA	196	29.7	ND
trans-1,2-Dichloroethene	20.3	ND	NA	12.9	ND	NA	12.9	0.2	ND
Toluene	ND	ND	NA	ND	ND	NA	ND	ND	ND
Trichloroethene	339	250	NA	249	213	NA	199	191	ND
1,1-Dichloroethane	0.73	ND	NA	0.56	ND	NA	0.56	ND	ND
Methylene chloride	ND	17.6	NA	ND	15.2	NA	ND	14.3	ND
Vinyl chloride	23.7	8.7	NA	11.9	5.9	NA	16.2	7.0	ND
1,2-Dichlorobenzene	1.2	ND	NA	1.2	ND	NA	1.0	ND	ND
Chlorobenzene	0.73	ND	NA	0.63	ND	NA	0.61	ND	ND
Ethylbenzene	ND	0.52	NA	ND	0.49	NA	ND	0.43	ND
Xylenes (total)	ND	0.93	NA	ND	0.95	NA	ND	0.72	ND
Bromodichloromethane	ND	ND	NA	ND	ND	NA	ND	ND	ND
Hexavalent Chromium	72,500	30,100	NA	72,600	31,400	NA	68,300	28,900	13,800
Total Chromium	68,000	29,100	NA	69,600	32,500	NA	73,900	30,900	13,400

NA = Not Available for Testing due to COPR excavation activities.
NT = Not Tested
ND = Not detected above reporting limit.

Table 3-2 (continued)
Summary of Groundwater Quality Data from GWET Wells

	24-Sep-09			15-Oct-09			23-Nov-09		
Parameter	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)
Benzene	4.5	11.9	ND	5.0	15.4	ND	4.5	12.8	ND
Carbon Tetrachloride	15.2	5.6	1.8	15.9	7.9	2.1	18.3	6.8	1.6
Chloroform	19.9	355	ND	21.7	381	ND	23.8	333	0.25
1,1-Dichloroethene	ND	ND	ND	1.2	ND	ND	1.4	ND	ND
cis-1,2-Dichloroethene	196	24.5	ND	234	34.9	ND	170	27.5	ND
trans-1,2-Dichloroethene	14.3	ND	ND	12.9	ND	ND	12.9	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	247	169	ND	288	229	ND	227	186	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	0.67	ND	ND
Methylene chloride	ND	16.2	ND	ND	13.2	ND	ND	11.2	ND
Vinyl chloride	18.4	ND	ND	17.6	5.8	ND	23.4	6.1	ND
1,2-Dichlorobenzene	ND	ND	ND	1.5	ND	ND	1.1	ND	ND
Chlorobenzene	ND	ND	ND	0.8	ND	ND	0.7	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	1.2	ND
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND	3.4	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium	67,300	28,200	14,700	64,100	26,100	13,300	64,000	25,100	14,800
Total Chromium	64,100	27,700	14,400	66,700	26,500	14,000	65,900	25,700	15,000

NA = Not Available for Testing due to COPR excavation activities.
NT = Not Tested
ND = Not detected above reporting limit.

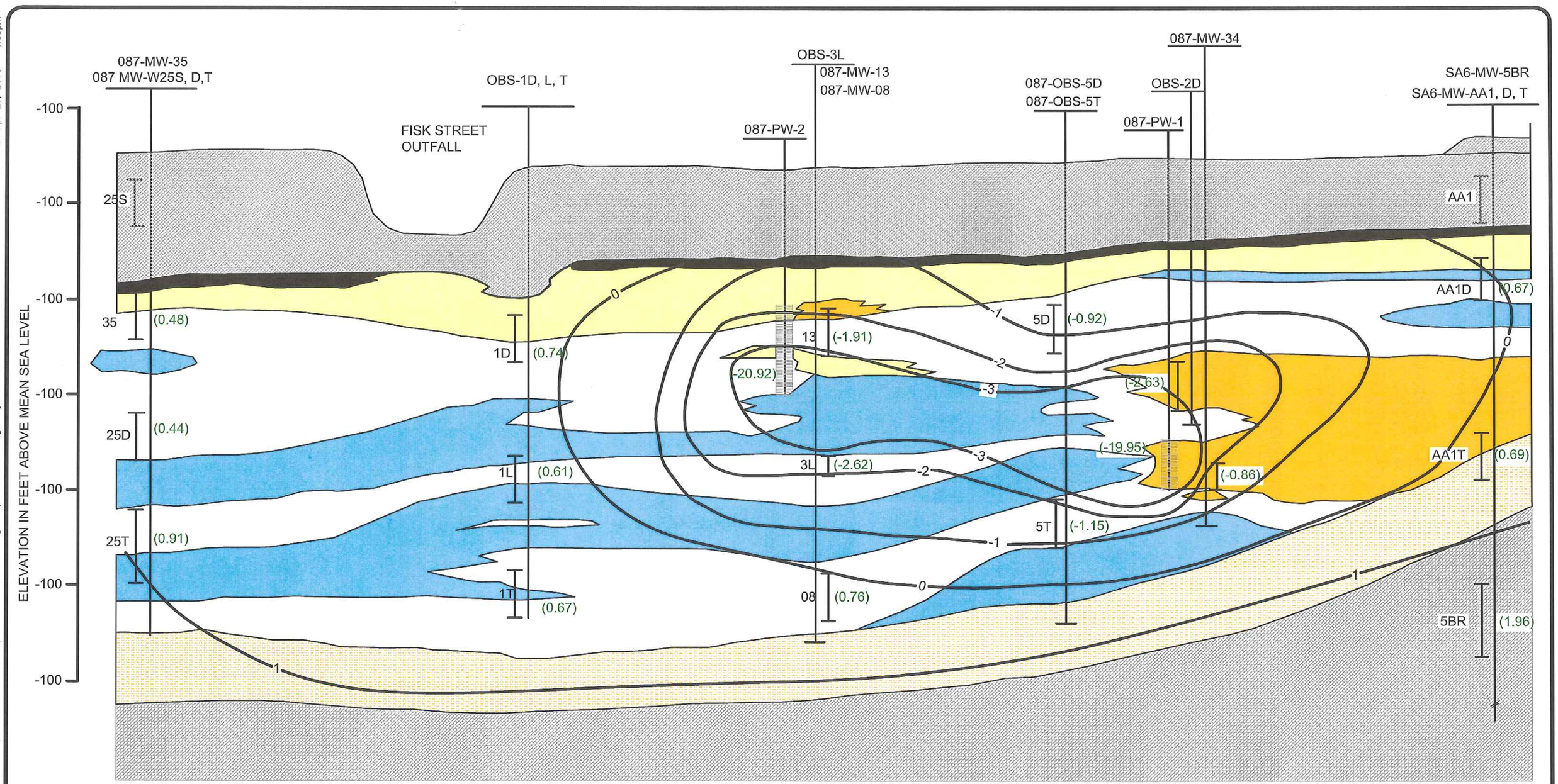
Table 3-2 (continued)
Summary of Groundwater Quality Data from GWET Wells

	21-Dec-09		
Parameter	**PW-1** (ug/L)	**PW-2** (ug/L)	**115-MW-203BR** (ug/L)
Benzene	4.8	16.8	ND
Carbon Tetrachloride	11.8	6.9	1.6
Chloroform	22.3	353	0.18
1,1-Dichloroethene	1.2	ND	ND
cis-1,2-Dichloroethene	208	37.6	ND
trans-1,2-Dichloroethene	12.4	0.42	ND
Toluene	ND	ND	ND
Trichloroethene	201	206	ND
1,1-Dichloroethane	0.69	ND	ND
Methylene chloride	ND	16.2	ND
Vinyl chloride	17.4	7.1	ND
1,2-Dichlorobenzene	1.2	ND	ND
Chlorobenzene	0.73	ND	ND
Ethylbenzene	ND	0.36	ND
Xylenes (total)	ND	0.55	ND
Bromodichloromethane	ND	ND	ND
Hexavalent Chromium	61,000	27,500	15,100
Total Chromium	55,900	25,600	13,700

NA = Not Available for Testing due to COPR excavation activities.
NT = Not Tested
ND = Not detected above reporting limit.

APPENDIX B

FIGURES



LEGEND:

- FILL
- MEADOW MAT
- FINE TO MEDIUM SAND
- FINE, MEDIUM TO COARSE SAND
- INTERBED SILTS AND CLAYS
- GLACIAL TILL
- PASSAIC FORMATION
- FINE TO VERY FINE SAND

087-MW-W25T — WELL DESIGNATION

GROUND SURFACE

25-T — SCREENED INTERVAL

0 100 200

SCALE IN FEET

CORNERSTONE Environmental Group, LLC

HONEYWELL
STUDY AREA 7

GROUNDWATER ELEVATIONS
DECEMBER 17, 2009

FIGURE NO.
2-1
PROJECT NO.
090354

087-MW-35
087 MW-W25S, D,T

OBS-1D, L, T

FISK STREET
OUTFALL

087-PW-2

OBS-3L
087-MW-13
087-MW-08

087-OBS-5D
087-OBS-5T

087-PW-1

OBS-2D

087-MW-34

SA6-MW-5BR
SA6-MW-AA1, D, T

ELEVATION IN FEET ABOVE MEAN SEA LEVEL

-100

25S

AA1

35 (1.14)

1D (1.66)

13 (1.52)

5D (3.24)

AA1D (0.36)

(23.47)

(5.28)

25D (1.05)

1L (1.75)

3L (5.04)

(22.57)

(3.51)

AA1T (0.73)

25T (0.94)

5T (3.80)

1T (1.75)

08 (2.02)

5BR (0.50)

1

2

3

4

5

LEGEND:

- FILL
- MEADOW MAT
- FINE TO MEDIUM SAND
- FINE, MEDIUM TO COARSE SAND
- INTERBED SILTS AND CLAYS
- GLACIAL TILL
- PASSAIC FORMATION
- FINE TO VERY FINE SAND

087-MW-W25T — WELL DESIGNATION

GROUND SURFACE

25-T — SCREENED INTERVAL

0 100 200

SCALE IN FEET

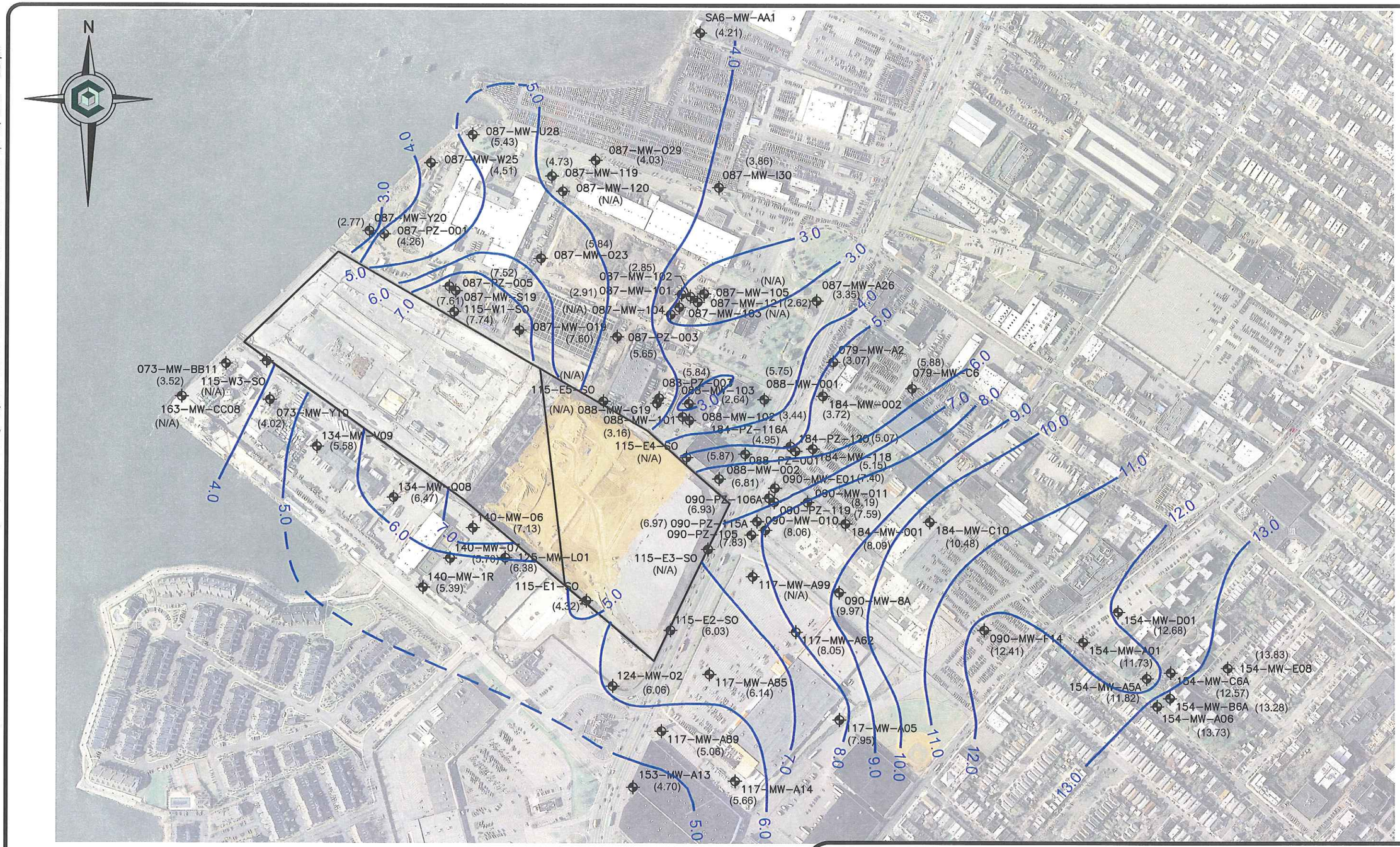
CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

DRAWDOWN VALUES
DECEMBER 17, 2009

FIGURE NO.
2-2
PROJECT NO.
090354

File: X:\PROJECTS\HONEYWELL - SA7 - 090354_PROJECT DRAWINGS\2009- 4Q - Annual Figures\MIHONSF-06.dwg Layout: FIGURE 2-2 DRAWDOWN User: SAM.WAIZENEGGER Apr 20, 2010 - 4:22pm



LEGEND:

154-MW-E08	SHALLOW MONITORING WELL
(13.83)	WATER LEVEL ELEVATION (FT, MSL)
1.0	GROUNDWATER CONTOUR (FT, MSL)

0 400 800

SCALE IN FEET

CORNERSTONE Environmental Group, LLC

HONEYWELL
STUDY AREA 7

GROUNDWATER ELEVATION CONTOURS SHALLOW ZONE - DECEMBER 17 2009

FIGURE NO. **2-3**

PROJECT NO. 090354

File: X:\PROJECTS\HONEYWELL - SA7 - 090354_PROJECT DRAWINGS\2009- 4Q - Annual Figures\MIHONSF-01.dwg Layout: FIGURE 5 SHALLOW ZONE User: SAM.WAITZENEGGER Apr 20, 2010 - 2:26pm

N

SA6-MW-AA1D (0.67)
087-OBS-1D (0.74)
087-PW-2 (-20.92)
087-MW-13 (-1.91)
087-OBS-2D (-2.63)
087-OBS-3D (-0.92)
(0.44)
087-MW-W25D
087-MW-35 (0.48)
087-MW-029D (0.92)
087-PZ-002 (2.06)
087-PZ-006 (1.72)
115-W1-DO (1.63)
115-W1-DI (N/A)
087-MW-A26D (3.09)
087-PZ-004 (2.48)
087-OBS-6D (2.76)
088-MW-15 (2.61)
088-PZ-004 (3.10)
(2.47)
115-E5-DO
115-E5-DI (N/A)
115-W4-DI (N/A)
115-W4-DO (1.85)
(3.67)
115-E4-DO
115-E4-DI (N/A)
088-PZ-002 (4.06)
184-PZ-116B (4.33)
115-MW-E14D (2.16)
090-PZ-106B (4.53)
090-PZ-115B (5.89)
(4.99)
115-E3-DI (N/A)
115-E3-DO
117-MW-I4 (6.29)
117-MW-I3 (6.18)
140-MW-P05D (2.32)
115-E1-DI (2.47)
(3.12)115-E1-DO
124-MW-103D (2.62)
115-E2-DI
115-E2-DO (5.12)
117-MW-I5 (9.13)
124-MW-102D
117-MW-I2 (6.69)
124-MW-105D (4.43)
(3.06)
124-MW-G02D (4.71)
124-MW-104D (3.19)
117-MW-I1 (4.11)

1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0

LEGEND:

087-MW-029D	INTERMEDIATE ZONE MONITORING WELL
(1.27)	WATER LEVEL ELEVATION (FT, MSL)
1.0	GROUNDWATER CONTOUR (FT, MSL)

0 400 800
SCALE IN FEET

CORNERSTONE Environmental Group, LLC

HONEYWELL
STUDY AREA 7

GROUNDWATER ELEVATION CONTOURS INTERMEDIATE ZONE - DECEMBER 17, 2009

FIGURE NO. **2-4**

PROJECT NO. 090354

File: X:\PROJECTS\HONEYWELL - SA7 - 090354_PROJECT DRAWINGS\2009- 4Q - Annual Figures\MIHONSF-02.dwg Layout: FIGURE 2 INTERMEDIATE ZONE User: SAM.WAIZENEGGER Apr 20, 2010 - 3:16pm

N

SA6-MW-AA1T
(0.69)

(0.76)
087-MW-08

(-2.62)
087-OBS-3L

(-19.95)
087-PW-1

087-MW-34
(-0.86)

(0.61)
087-OBS-1L

087-OBS-1T
(0.67)

087-OBS-5T
(-1.15)

087-OBS-4T
(0.68)

087-MW-W25T
(0.91)

087-MW-03
(2.19)

087-MW-A26T
(3.01)

087-MW-01
(3.37)

088-MW-G19T
(3.15)

(-1.37)
115-MW-E14T

115-MW-21
(0.25)

090-MW-09
(6.68)

124-MW-107T
(2.89)

(3.36)
124-MW-06

124-MW-106T
(2.49)

(3.30)
124-MW-103T

(3.67)
124-MW-102T

117-MW-D3
(6.75)

117-MW-D2
(5.69)

(3.29)
124-MW-105T

124-MW-G02T
(3.10)

124-MW-104T
(3.75)

(3.75)
124-MW-104L

119-MW-01T
(2.48)

(4.10)
117-MW-D1

119-MW-02T
(3.57)

(3.87)
153-MW-A13T

0 1.0 2.0 3.0 4.0 5.0 6.0 7.0

LEGEND:

087-MW-01 — DEEP ZONE MONITORING WELL

(3.37) — WATER LEVEL ELEVATION (FT, MSL)

1.0 — GROUNDWATER CONTOUR (FT, MSL)

0 400 800
SCALE IN FEET

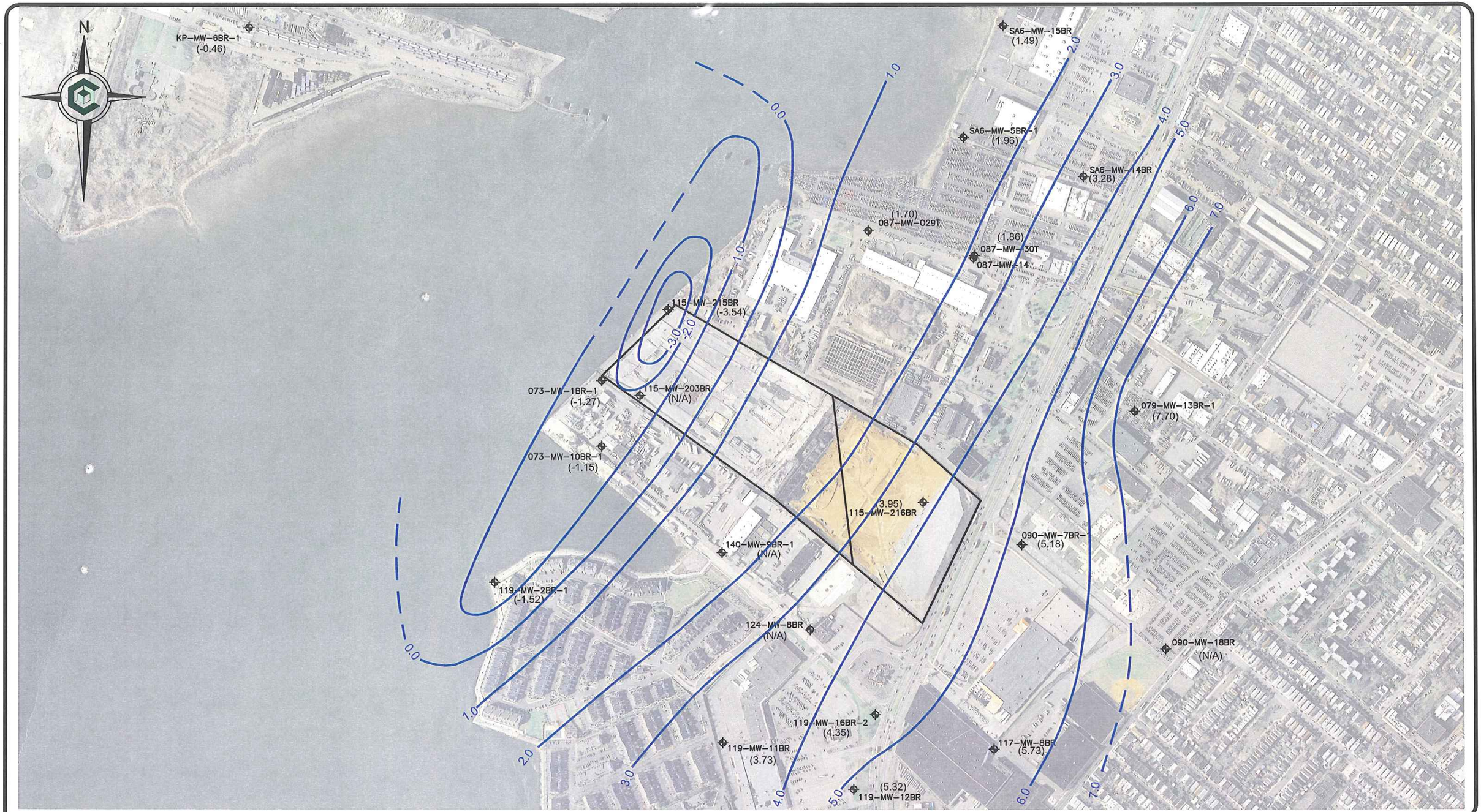
CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

GROUNDWATER ELEVATION CONTOURS
DEEP ZONE - DECEMBER 17, 2009

FIGURE NO.
2-5
PROJECT NO.
090354

File: X:\PROJECTS\HONEYWELL - SA7 - 090354_PROJECT DRAWINGS\2009- 4Q - Annual Figures\Figures\MIHONSF-03.dwg Layout: FIGURE 2-5 DEEP ZONE User: SAM.WAIZENEGGER Apr 20, 2010 - 3:21pm



LEGEND:

119-MW-11BR	BEDROCK ZONE MONITORING WELL
(3.73)	WATER LEVEL ELEVATION (FT, MSL)
1.0	GROUNDWATER CONTOUR (FT, MSL)

0 500 1000

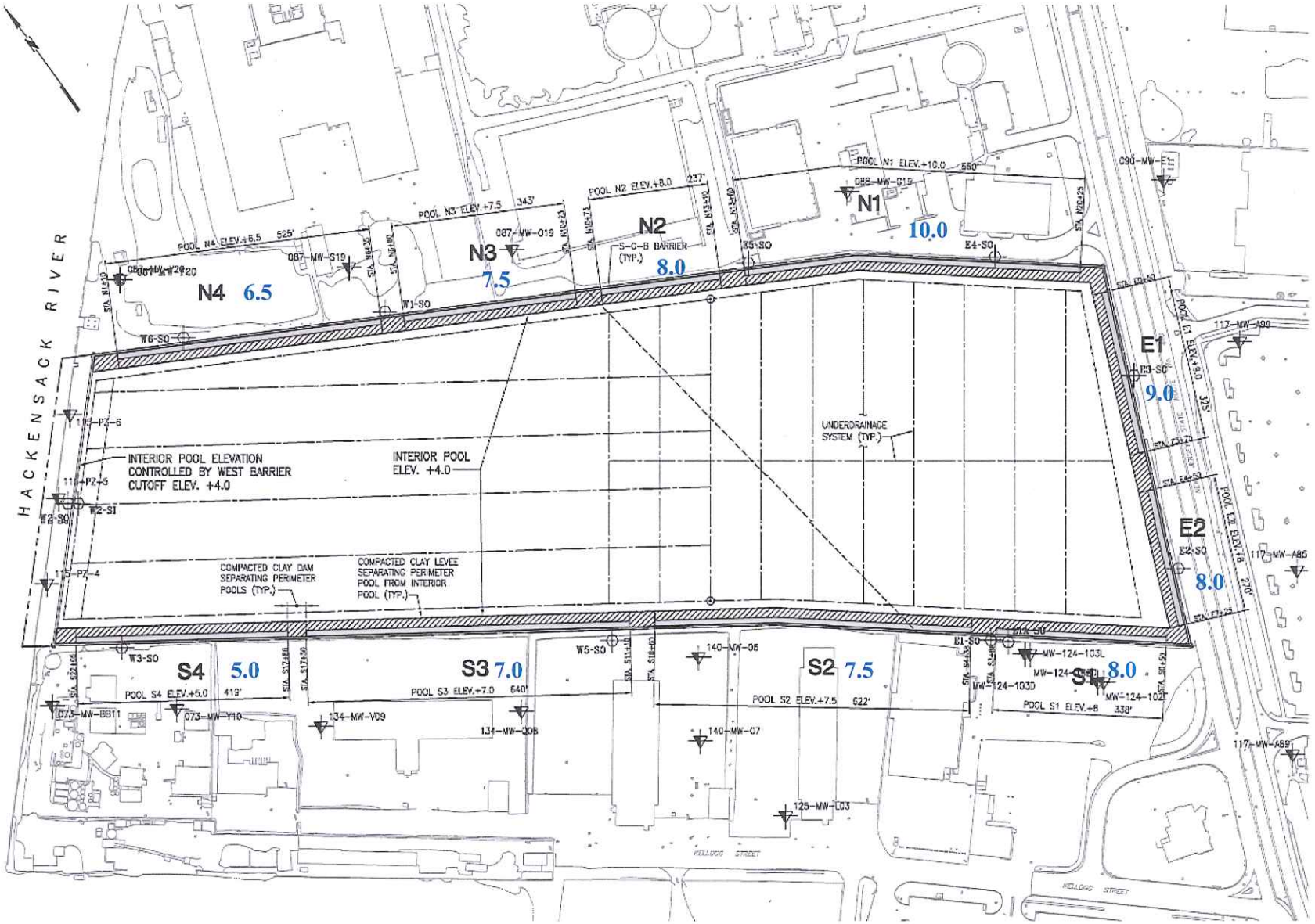
SCALE IN FEET

CORNERSTONE Environmental Group, LLC

HONEYWELL
STUDY AREA 7

GROUNDWATER ELEVATION CONTOURS BEDROCK ZONE - DECEMBER 22, 2009

FIGURE NO.
2-6
PROJECT NO.
090354



LEGEND:

N2 – Perimeter Pool

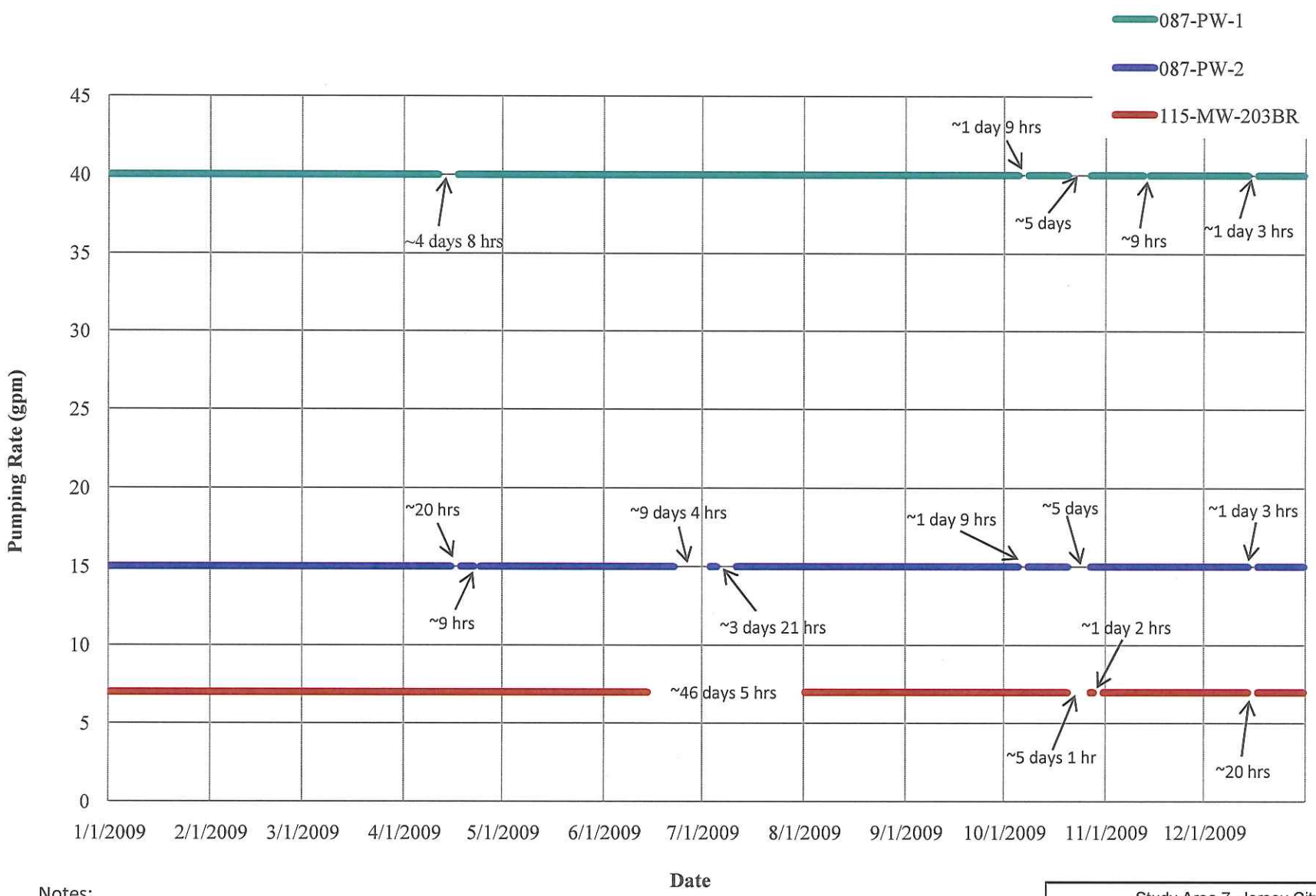
8.0 – Design Elevation of Perimeter Pool Water Level (ft, msl)

Study Area 7, Jersey City, NJ
Annual Progress Report

Figure 2-7

Location of SA-7 Perimeter Pools

CORNERSTONE Environmental Group, LLC



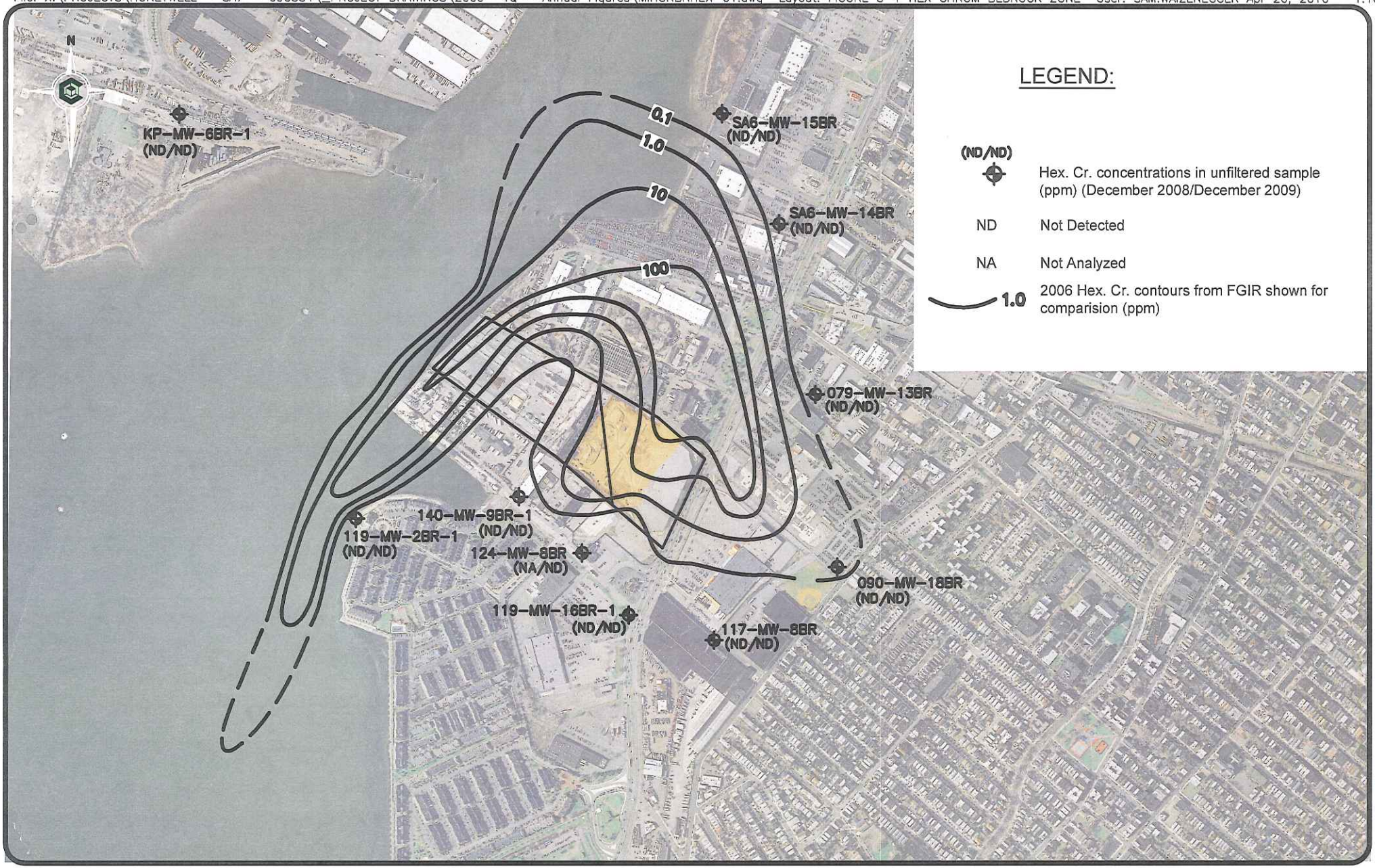
Notes:
1. Outages exceeding 8 hour duration shown on graph.
2. For outages details see Table X-X.

Study Area 7, Jersey City, NJ
Annual Progress Report

Figure 2-8

GWET Pumping Rates in 2009

CORNERSTONE Environmental Group, LLC



0 1000 2000

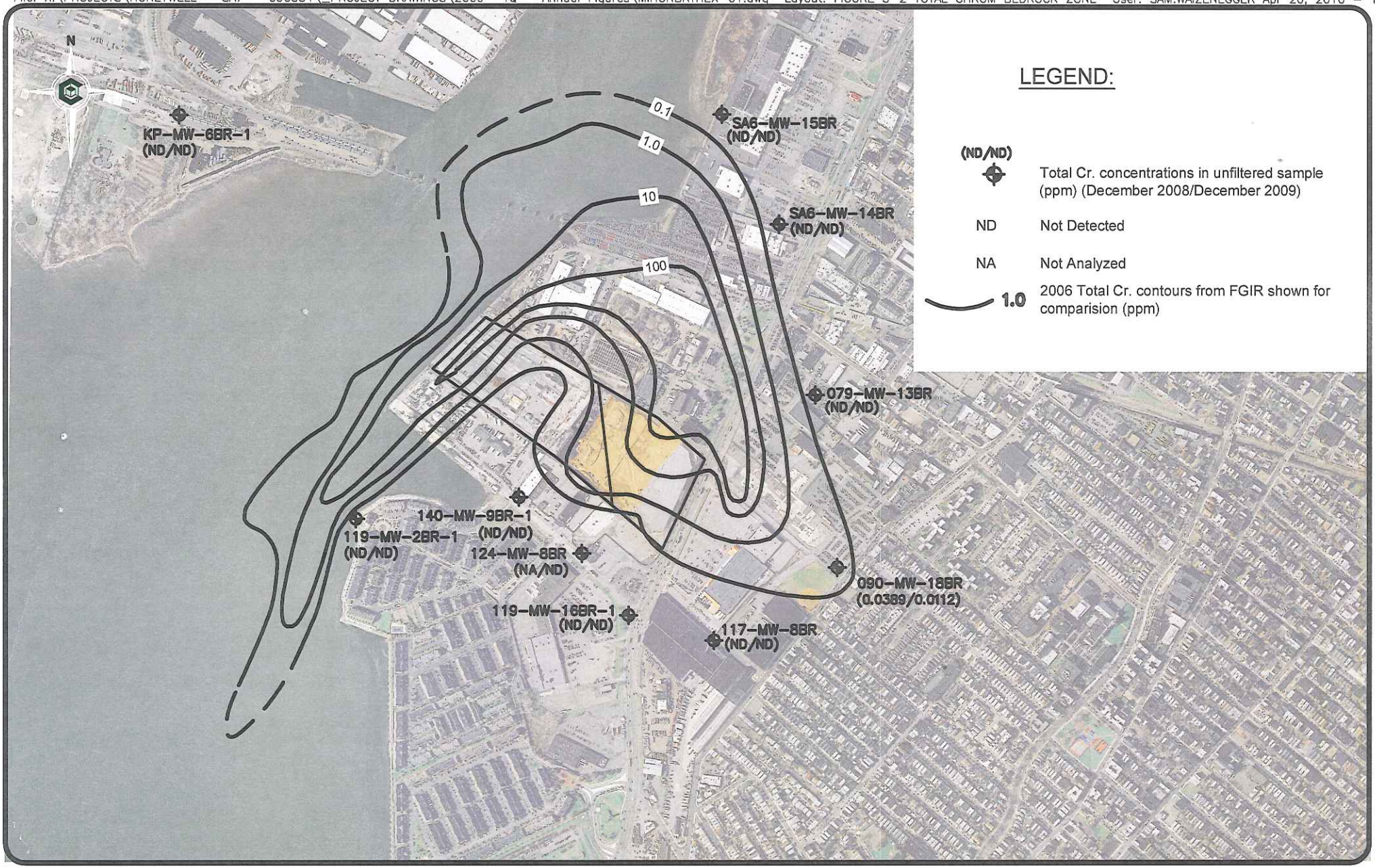
SCALE IN FEET

CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Hexavalent Chromium Concentrations in Bedrock Groundwater

FIGURE NO.
3-1
PROJECT NO.
090354



0 1000 2000

SCALE IN FEET

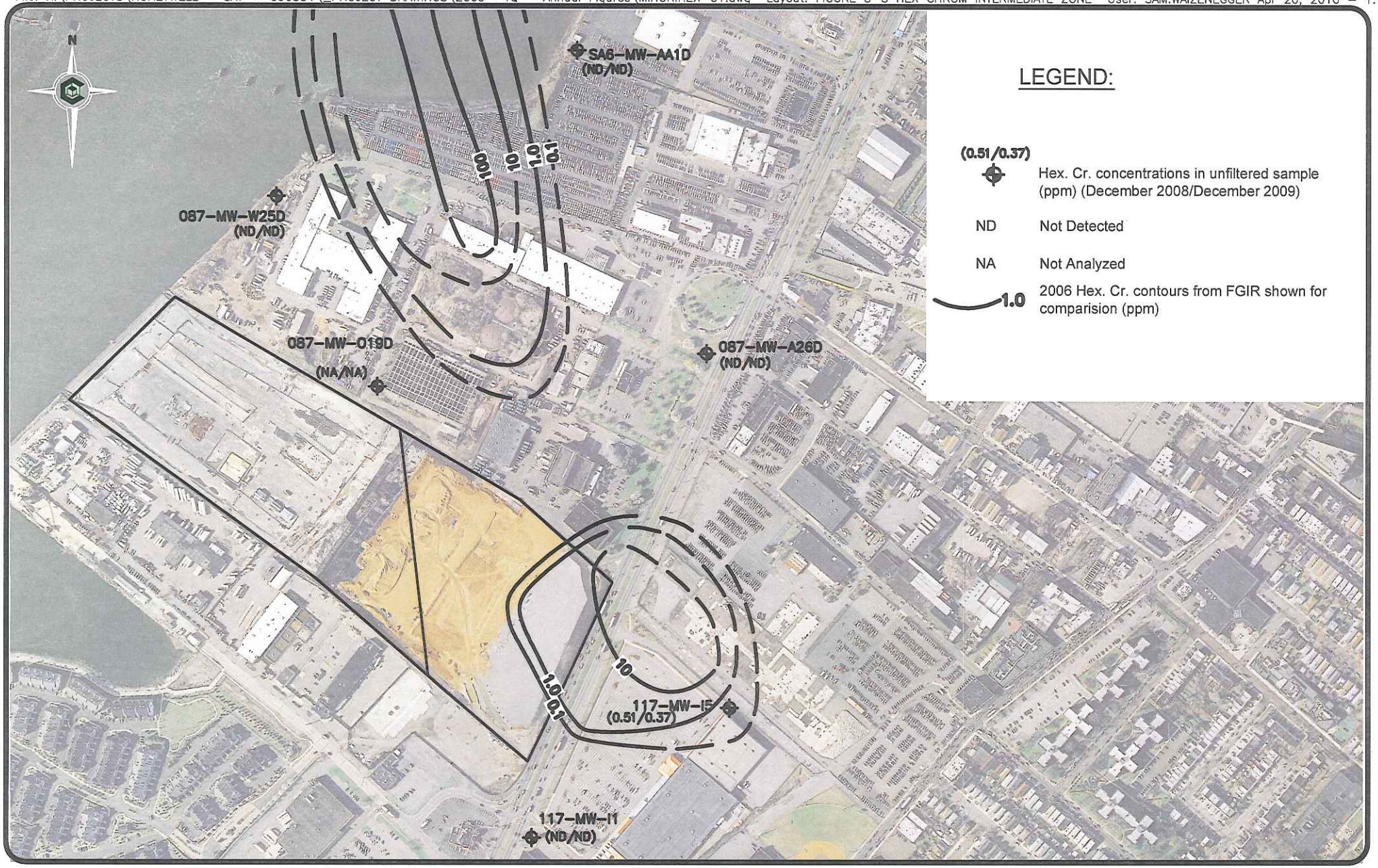
CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Total Chromium Concentrations in Bedrock Groundwater

FIGURE NO.
3-2
PROJECT NO.
090354

File: X:\PROJECTS\HONEYWELL - SA7 - 090354_PROJECT DRAWINGS\2009- 4Q - Annual Figures\MIHONIHEX-01.dwg Layout: FIGURE 3-3 HEX CHROM INTERMEDIATE ZONE User: SAM.WAIZENEGGER Apr 20, 2010 - 1:



0 500 1000

SCALE IN FEET

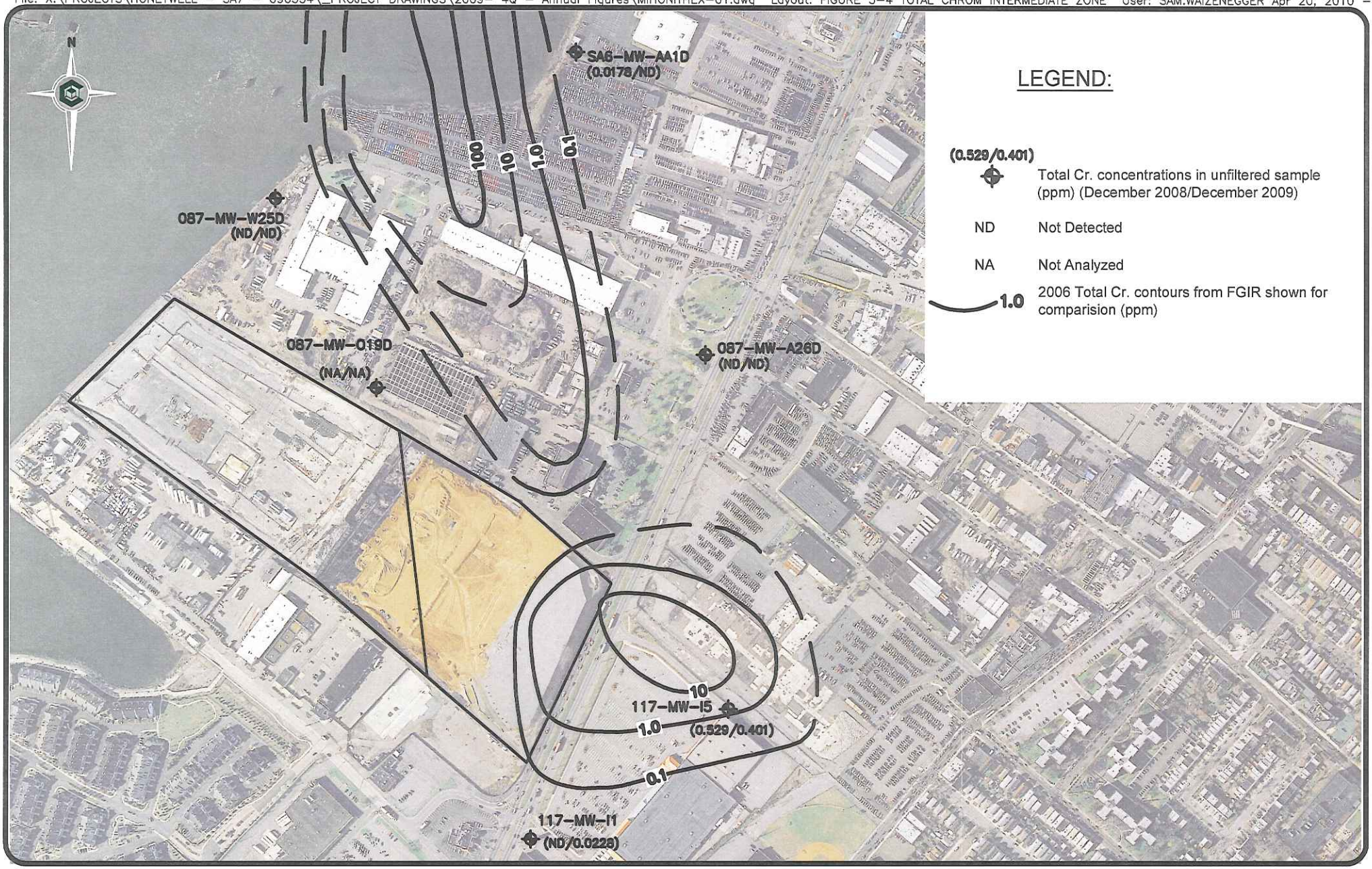
CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Hexavalent Chromium Concentrations in Intermediate Zone Groundwater

FIGURE NO.
3-3
PROJECT NO.
090354

File: X:\PROJECTS\HONEYWELL - SA7 - 090354_PROJECT DRAWINGS\2009- 4Q - Annual Figures\MIHONITHEX-01.dwg Layout: FIGURE 3-4 TOTAL CHROM INTERMEDIATE ZONE User: SAM.WAIZENEGGER Apr 20, 2010 -



0 500 1000

SCALE IN FEET

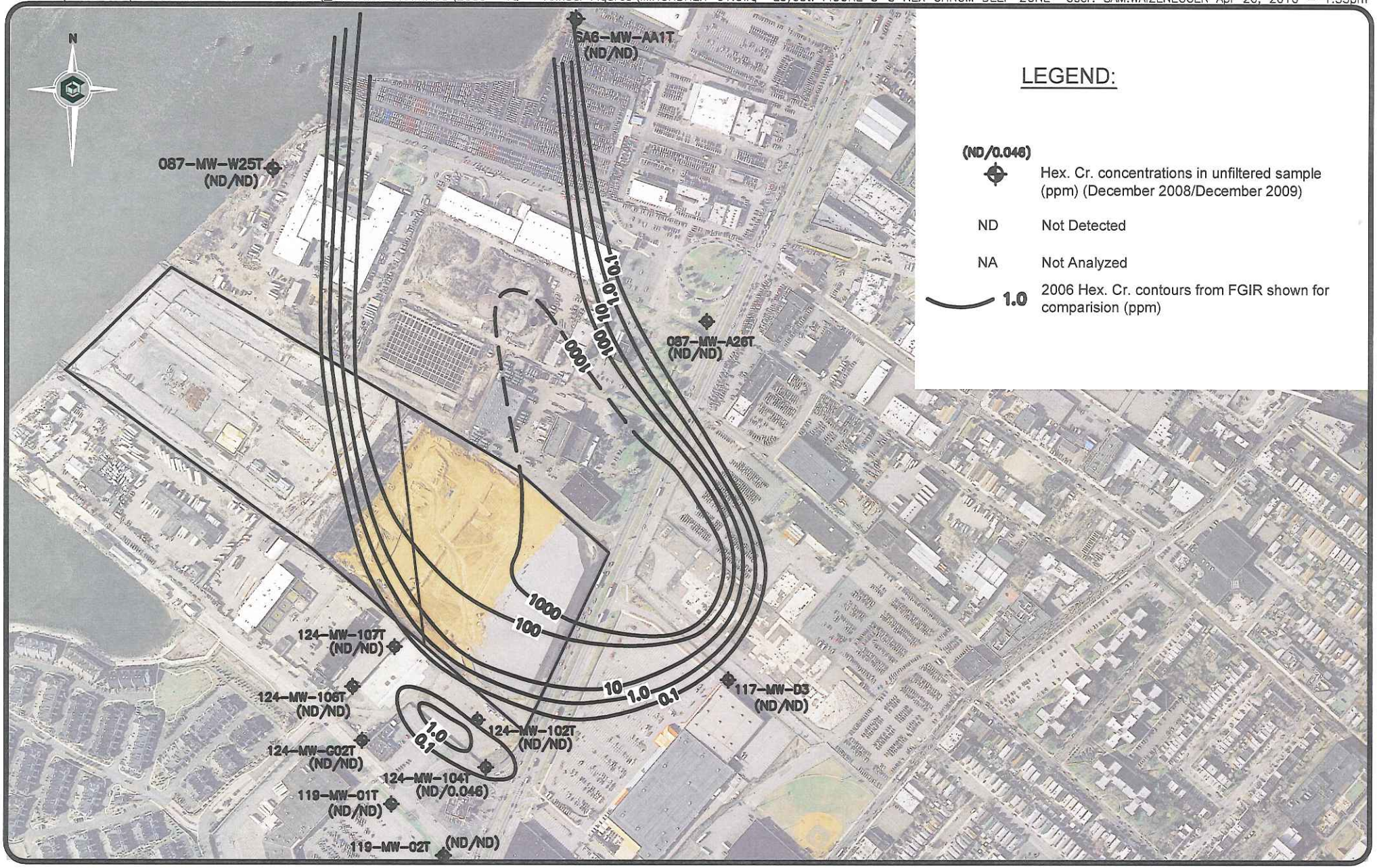
CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Total Chromium Concentrations in Intermediate Zone Groundwater

FIGURE NO.
3-4
PROJECT NO.
090354

File: X:\PROJECTS\HONEYWELL - SA7 - 090354_PROJECT DRAWINGS\2009- 4Q - Annual Figures\MIHONDHEX-01.dwg Layout: FIGURE 3-5 HEX CHROM DEEP ZONE User: SAM.WAIZENEGGER Apr 20, 2010 - 1:53pm



0 500 1000

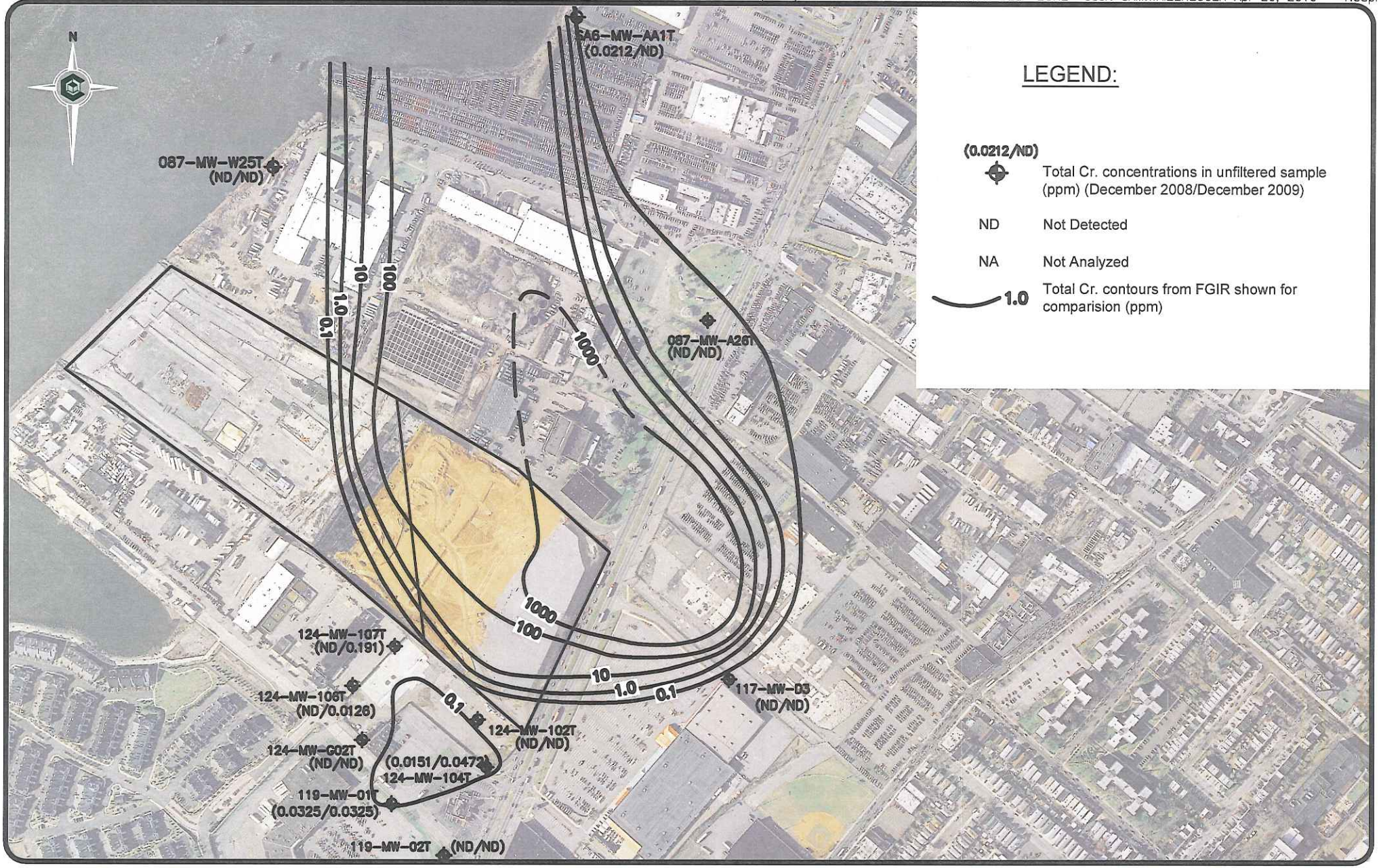
SCALE IN FEET

CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Hexavalent Chromium Concentrations in Deep Groundwater

FIGURE NO.
3-5
PROJECT NO.
090354



0 500 1000

SCALE IN FEET

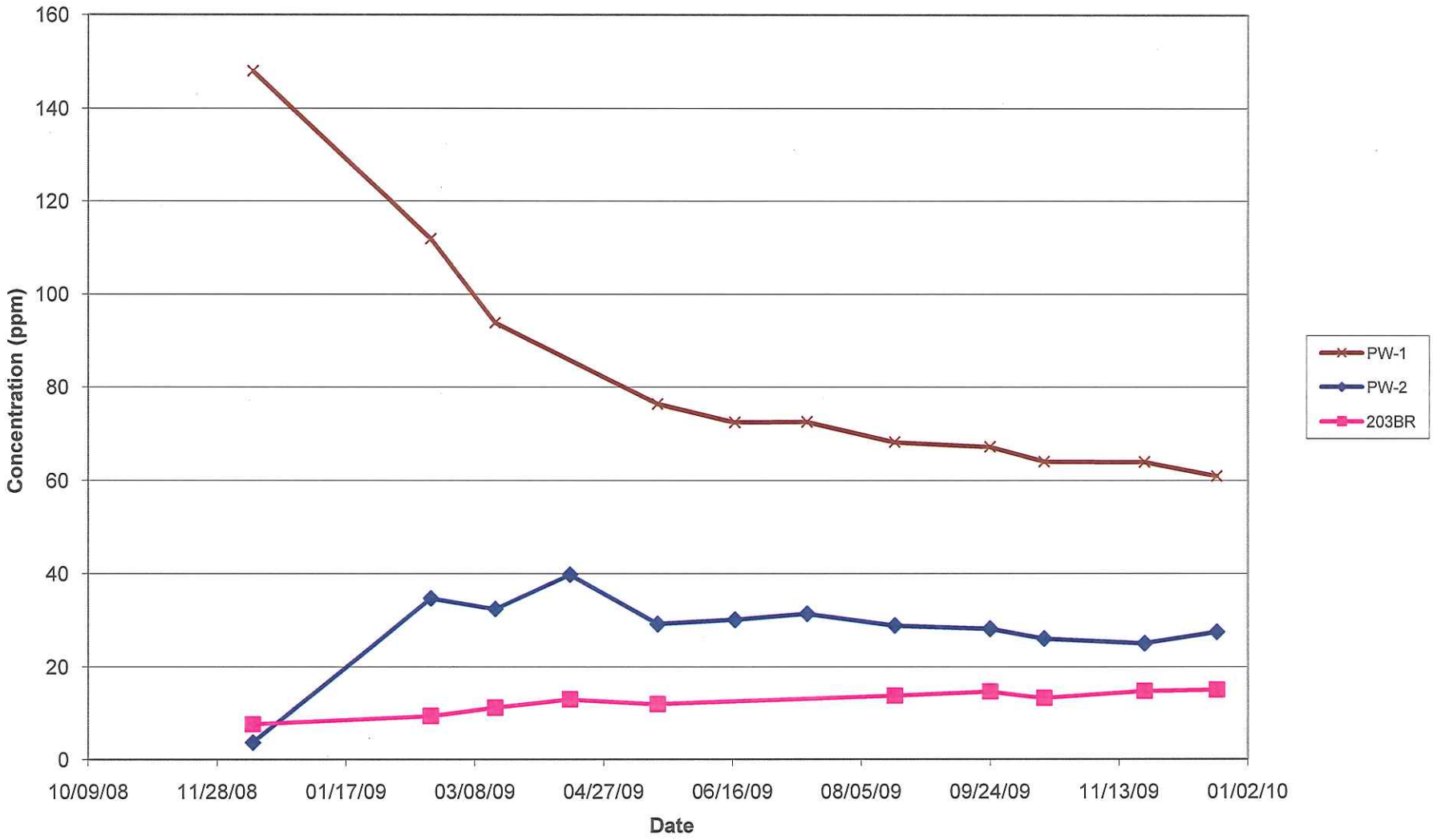
CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Total Chromium Concentrations in Deep Groundwater

FIGURE NO.
3-6
PROJECT NO.
090354

Hexavalent Chromium in GWET Wells

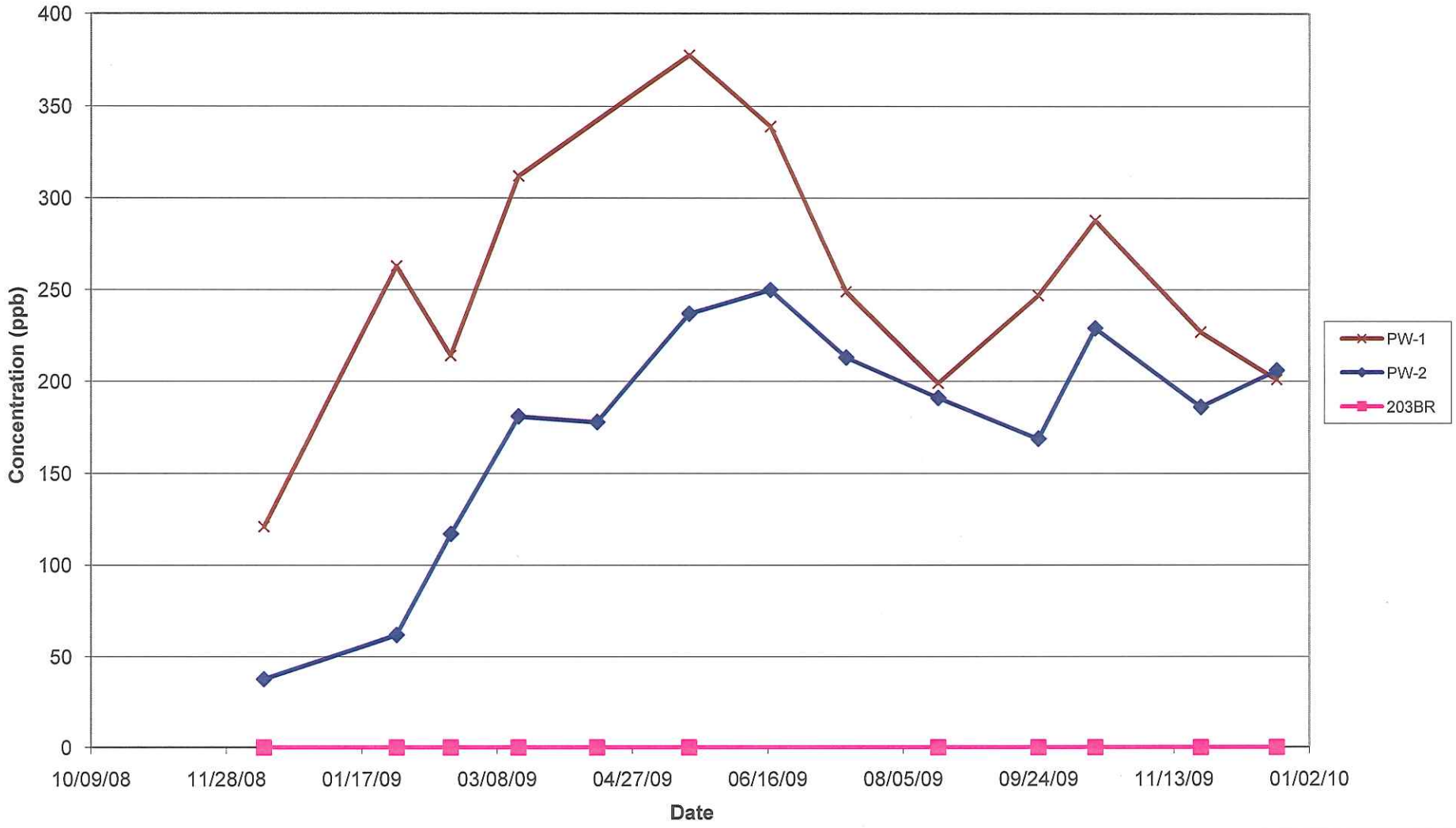


Study Area 7, Jersey City, NJ
Annual Progress Report

Figure 3-7

Hexavalent Chromium Concentrations in GWET Pumping Wells

CORNERSTONE Environmental Group, LLC



Study Area 7, Jersey City, NJ
Annual Progress Report

Figure 3-8

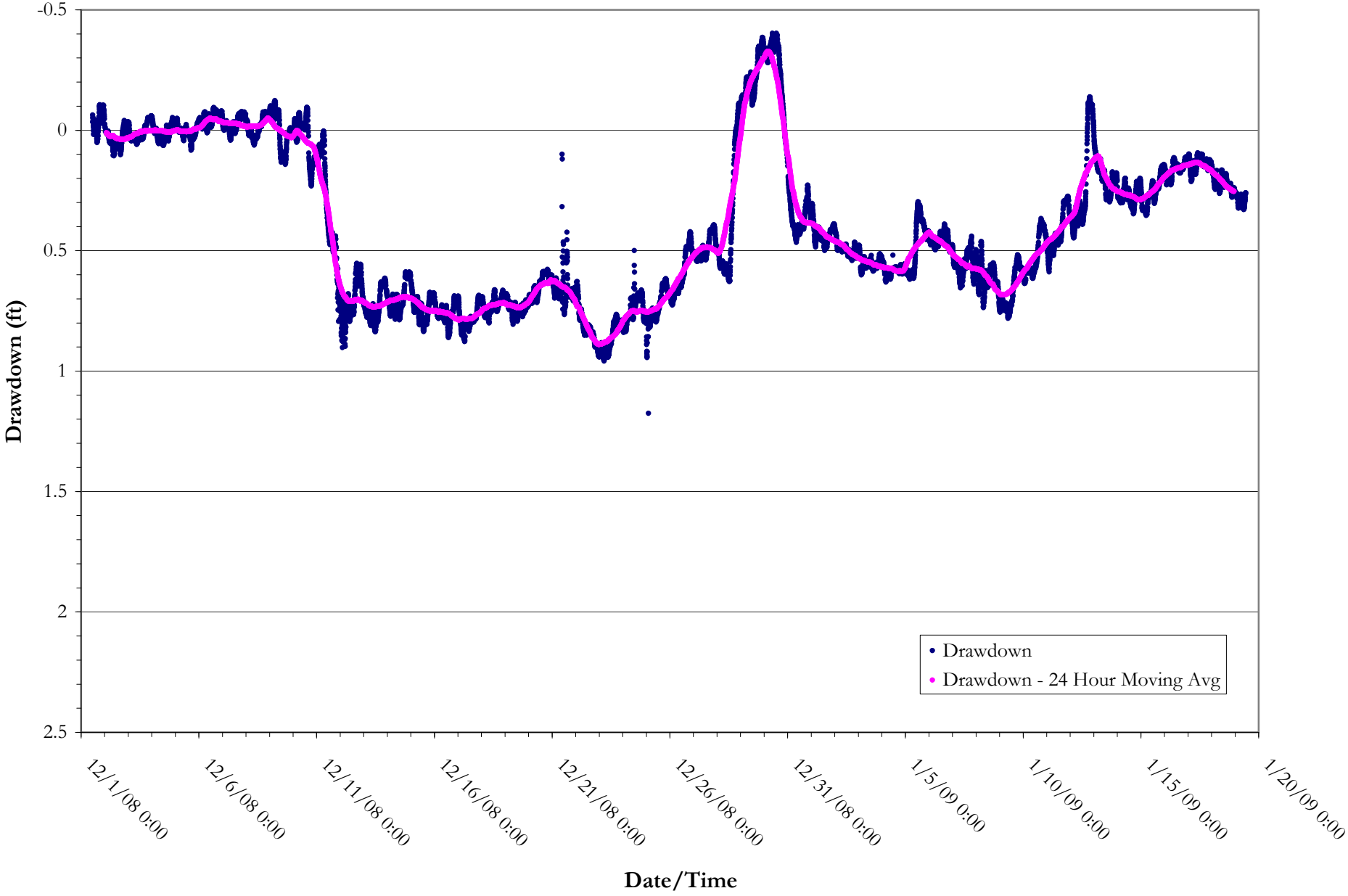
Trichloroethylene Concentrations
in GWET Pumping Wells

CORNERSTONE
Environmental Group, LLC

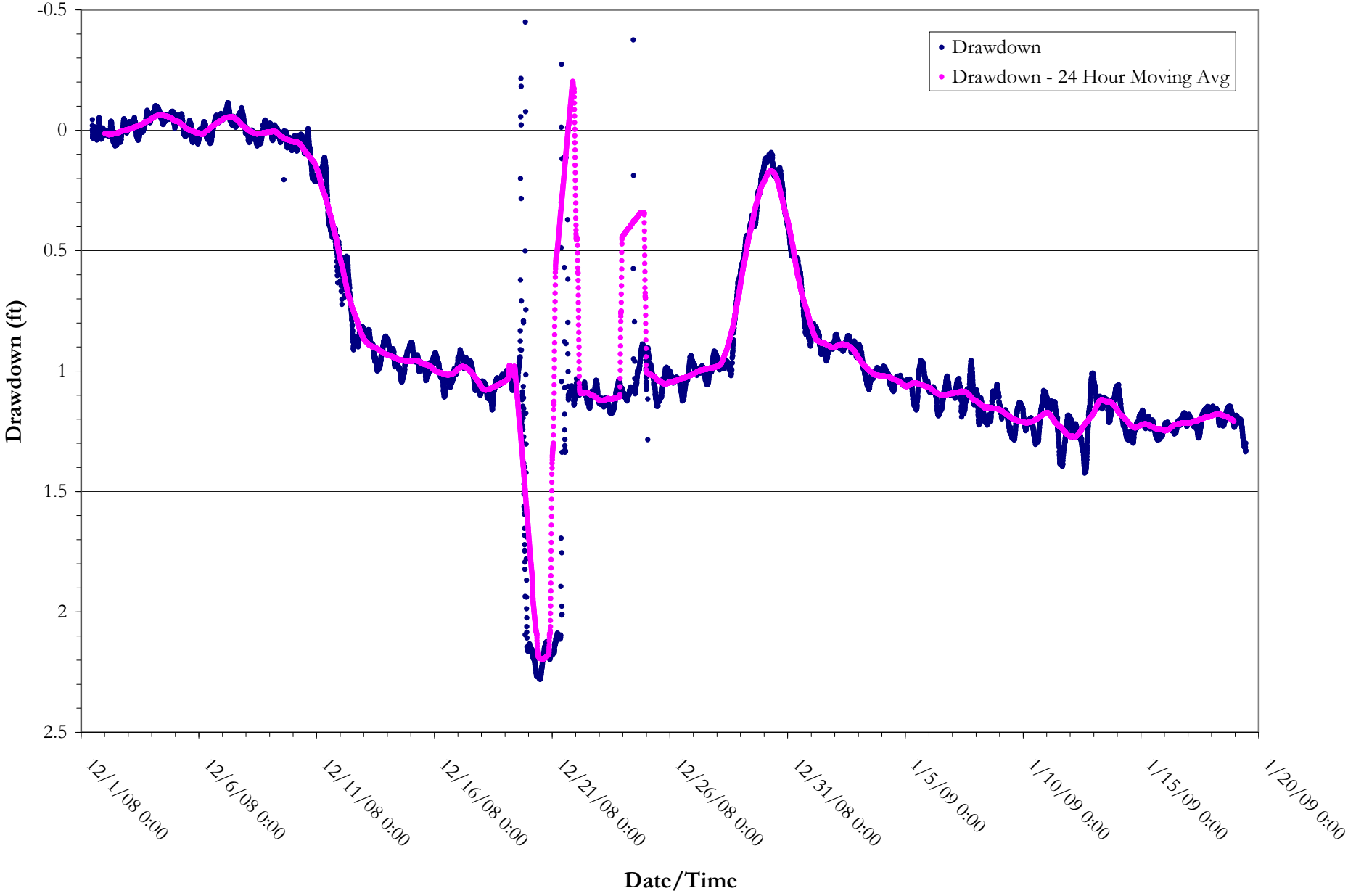
APPENDIX C

RESULTS FROM SHORT-TERM HYDRAULIC MONITORING PROGRAM

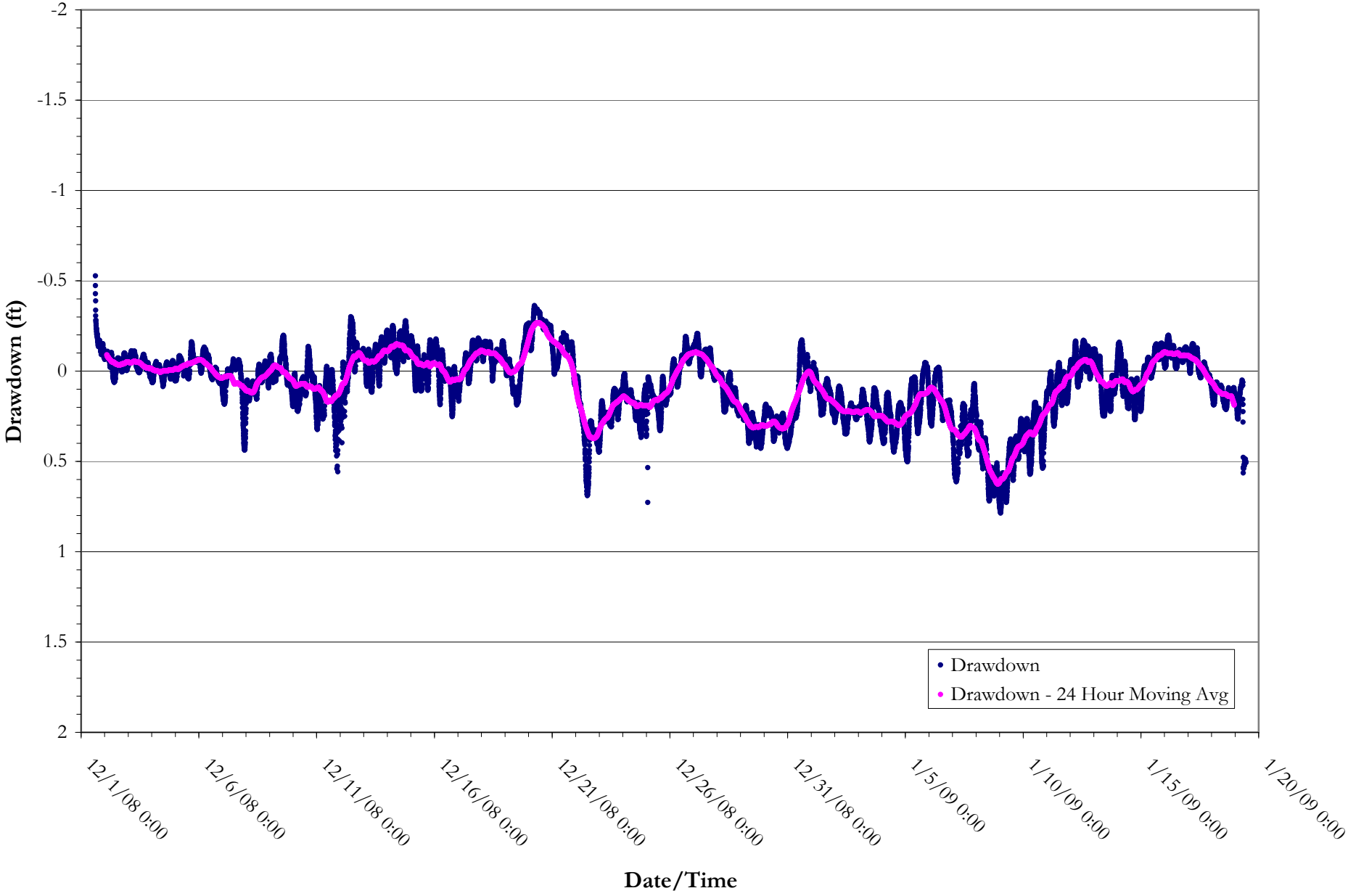
Honeywell Short-Term Hydraulic Monitoring
087-MW-O29D Drawdown



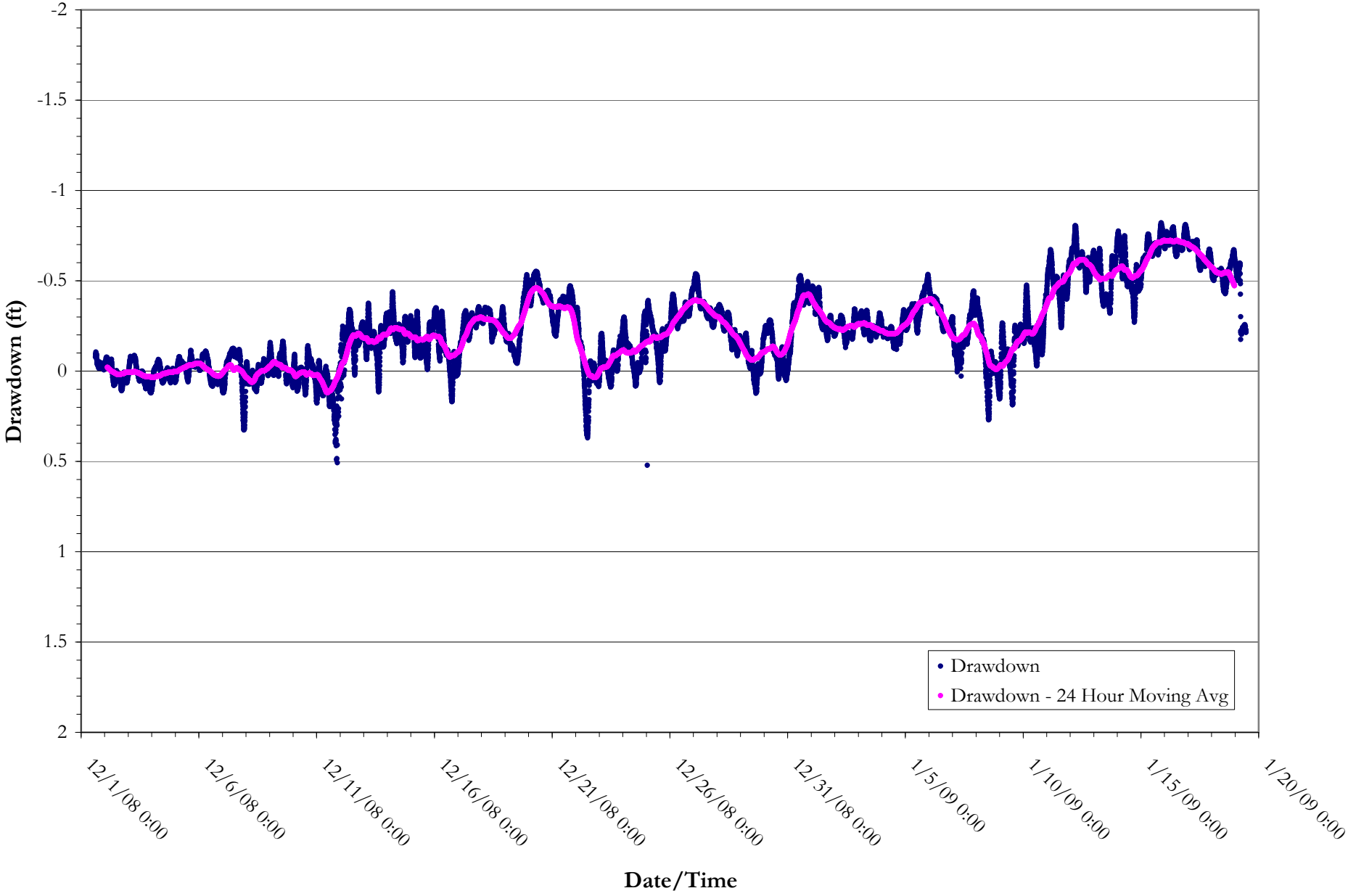
Honeywell Short-Term Hydraulic Monitoring
087-MW-O29T Drawdown



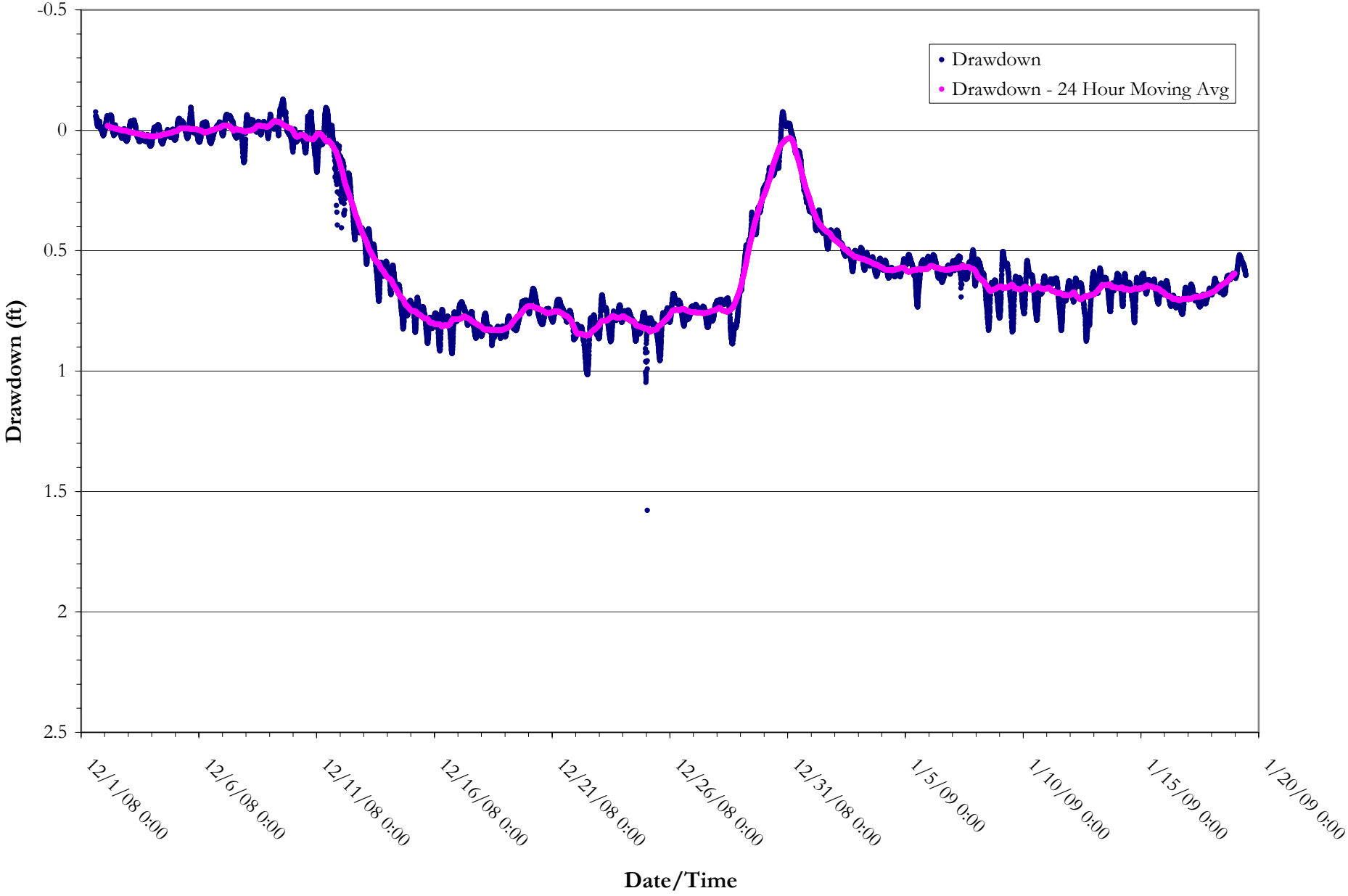
Honeywell Short-Term Hydraulic Monitoring
087-MW-35 Drawdown



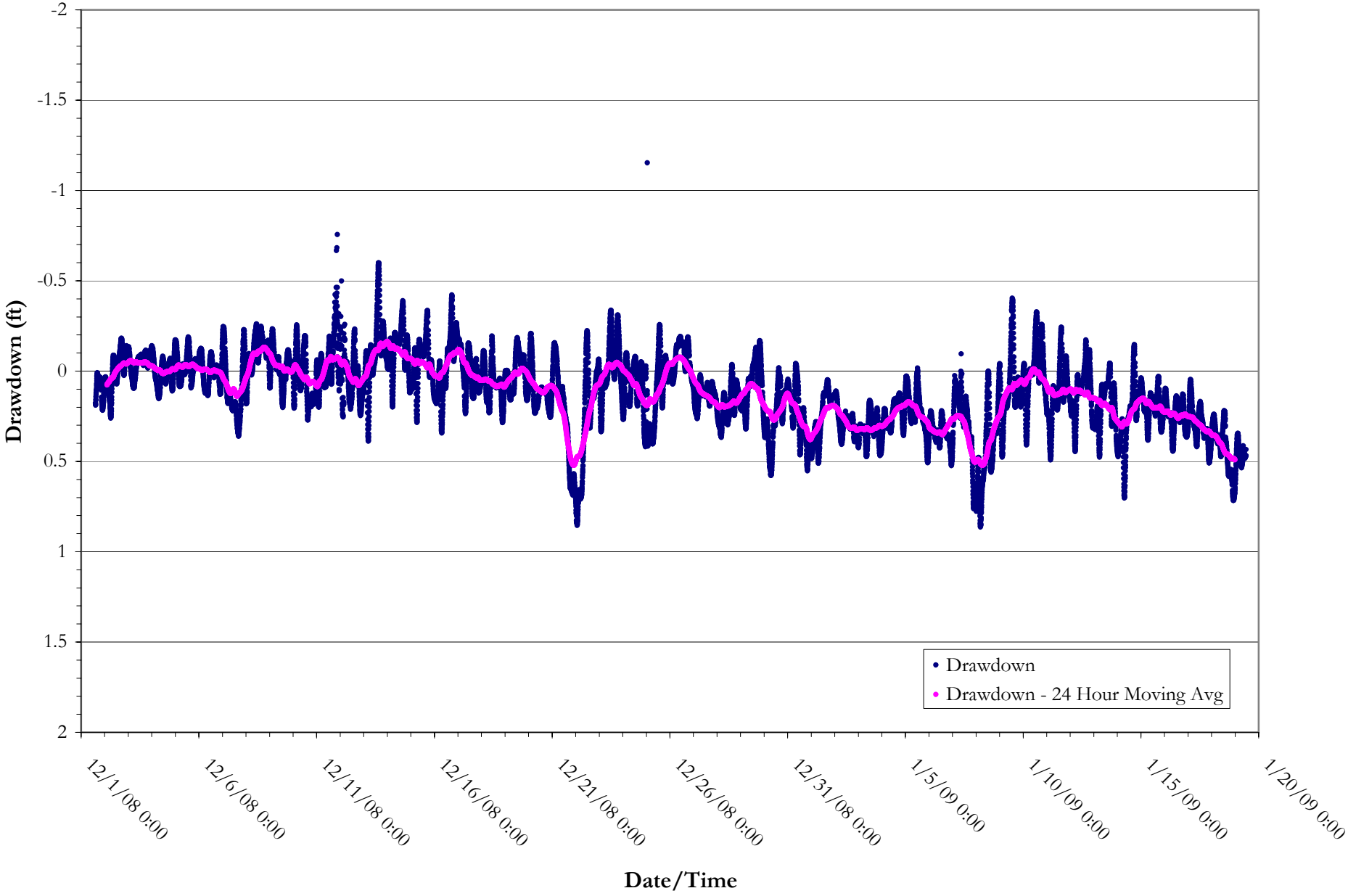
Honeywell Short-Term Hydraulic Monitoring
087-MW-W25D Drawdown



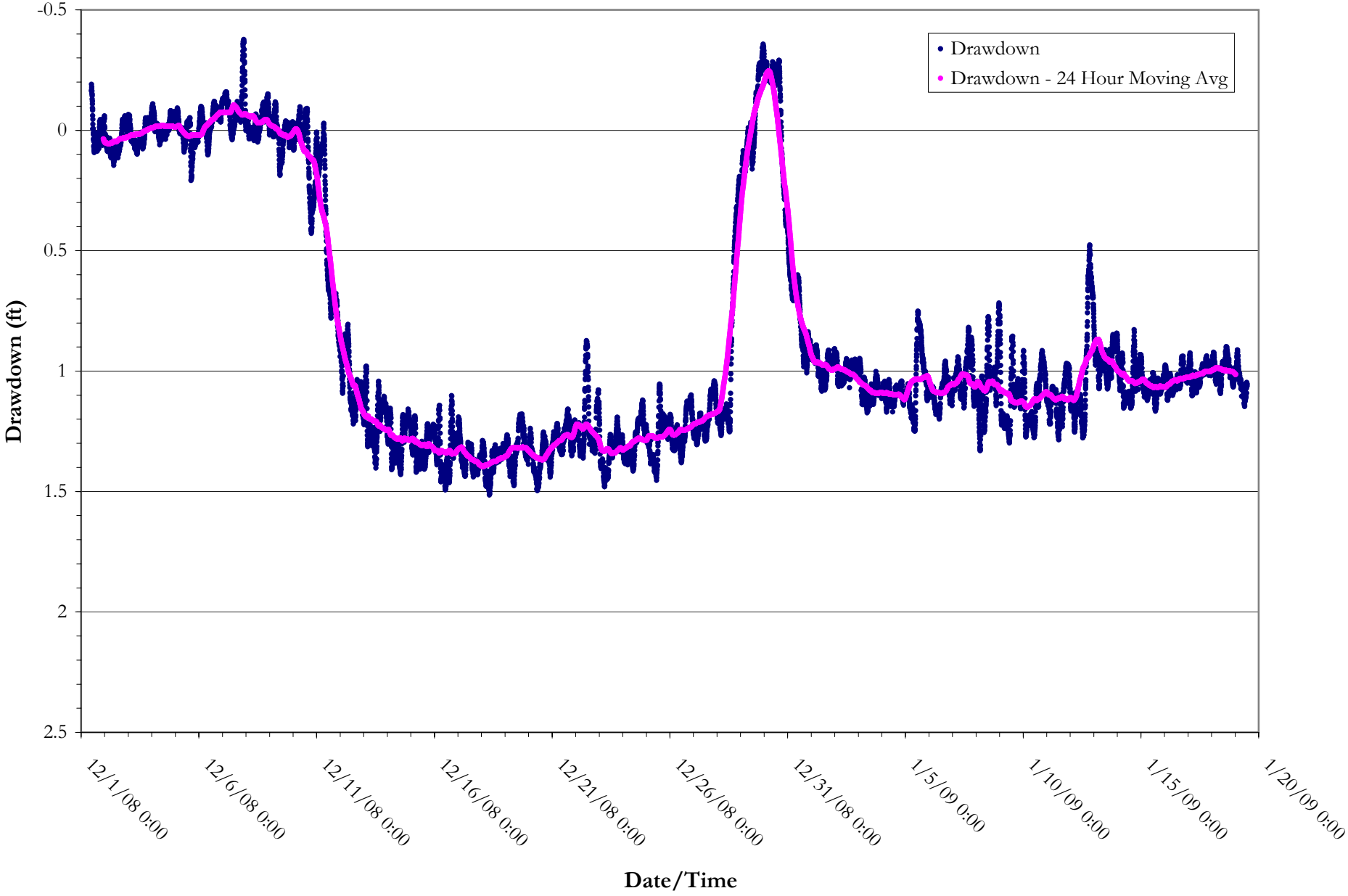
Honeywell Short-Term Hydraulic Monitoring
087-MW-W25T Drawdown



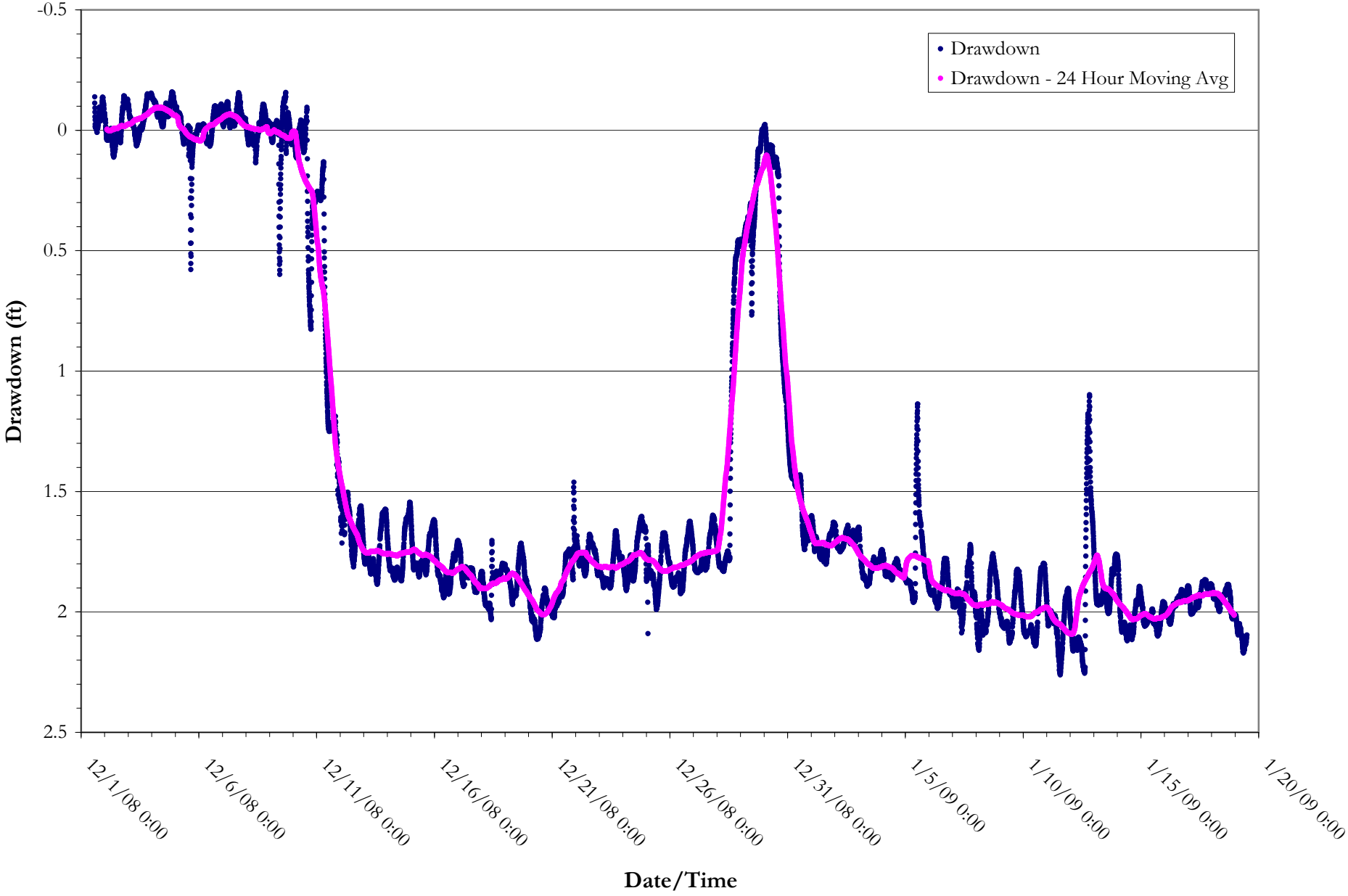
Honeywell Short-Term Hydraulic Monitoring
087-OBS-1D Drawdown



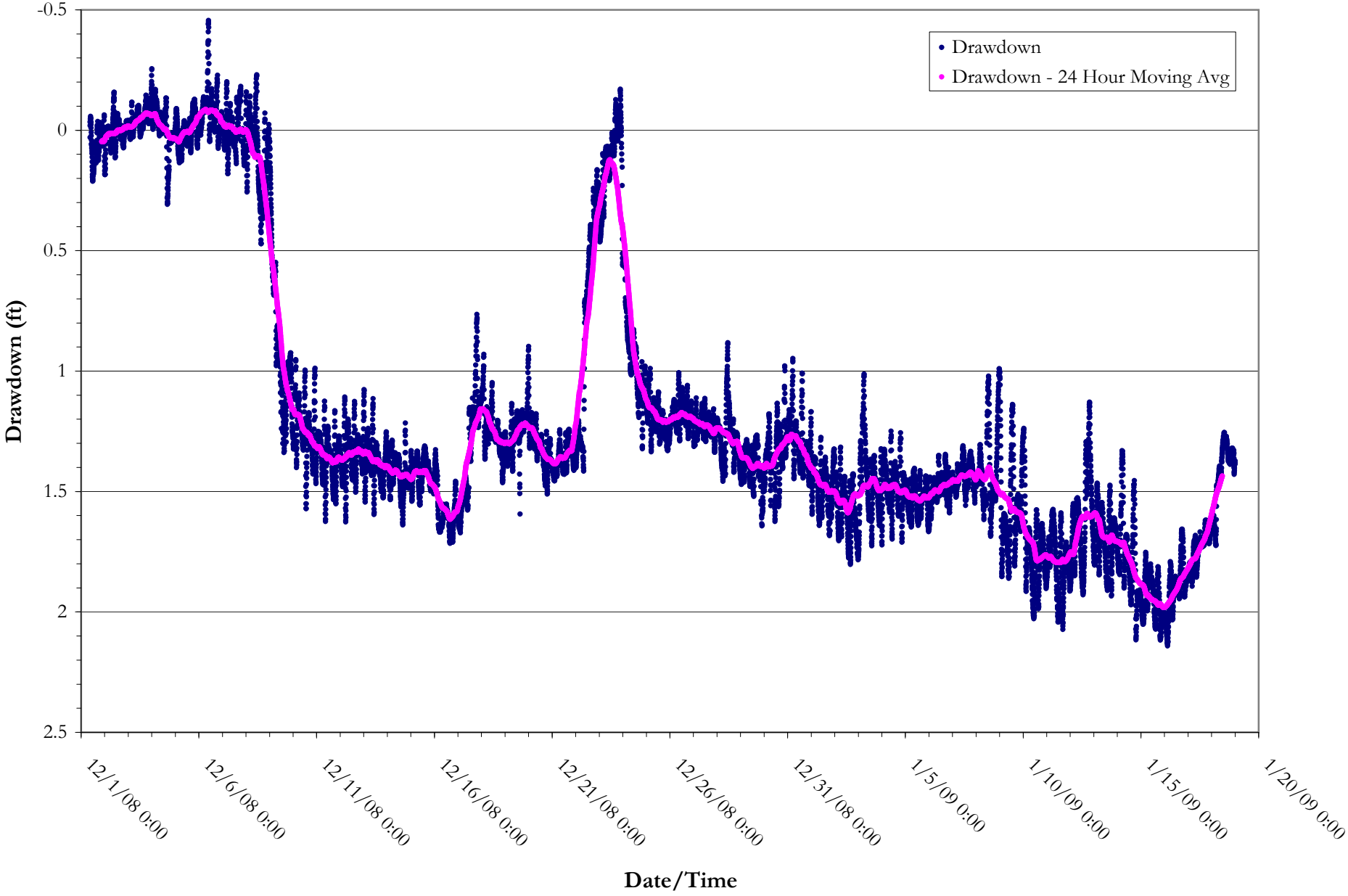
Honeywell Short-Term Hydraulic Monitoring
087-OBS-1T Drawdown



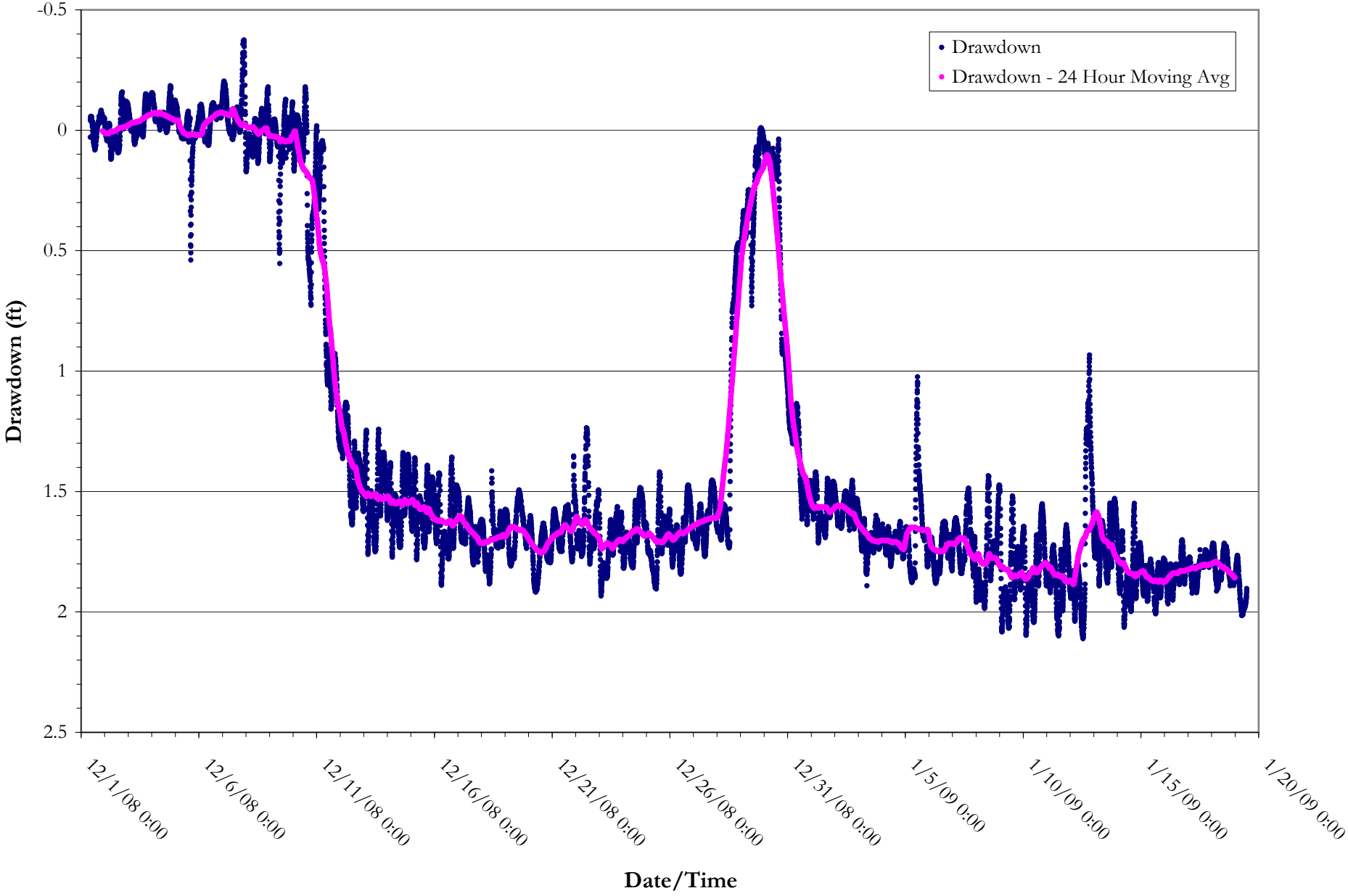
Honeywell Short-Term Hydraulic Monitoring
087-OBS-4T Drawdown

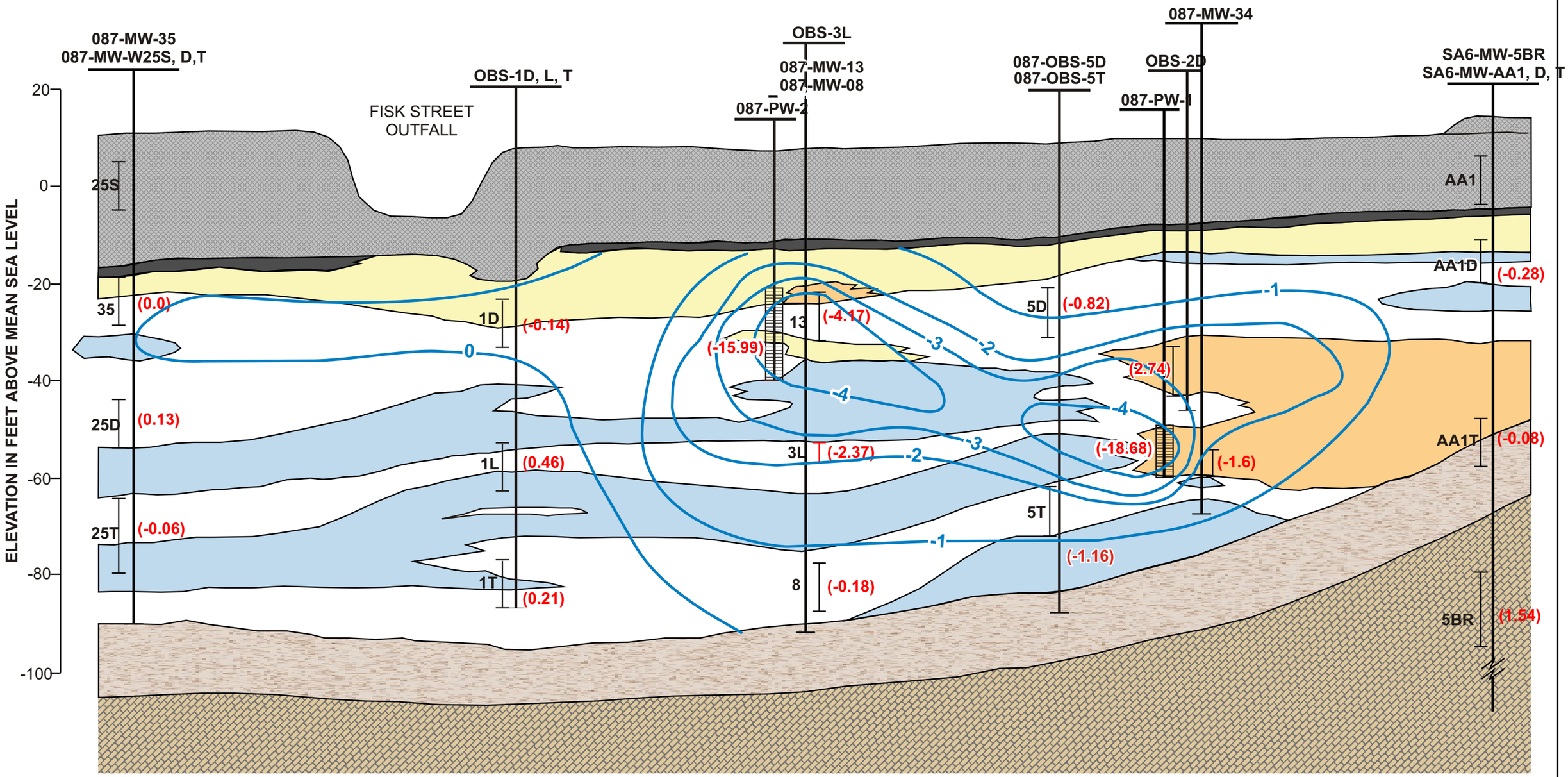


Honeywell Short-Term Hydraulic Monitoring
SA6-MW-AA1D Drawdown



Honeywell Short-Term Hydraulic Monitoring
SA6-MW-AA1T Drawdown





LEGEND:

- FILL
- MEADOW MAT
- FINE TO MEDIUM SAND
- FINE, MEDIUM TO COARSE SAND
- INTERBEDDED SILTS AND CLAYS
- GLACIAL TILL
- PASSAIC FORMATION
- FINE TO VERY FINE SAND

087-MW-W25T WELL DESIGNATION

GROUND SURFACE

25T — SCREENED INTERVAL

0 100 200

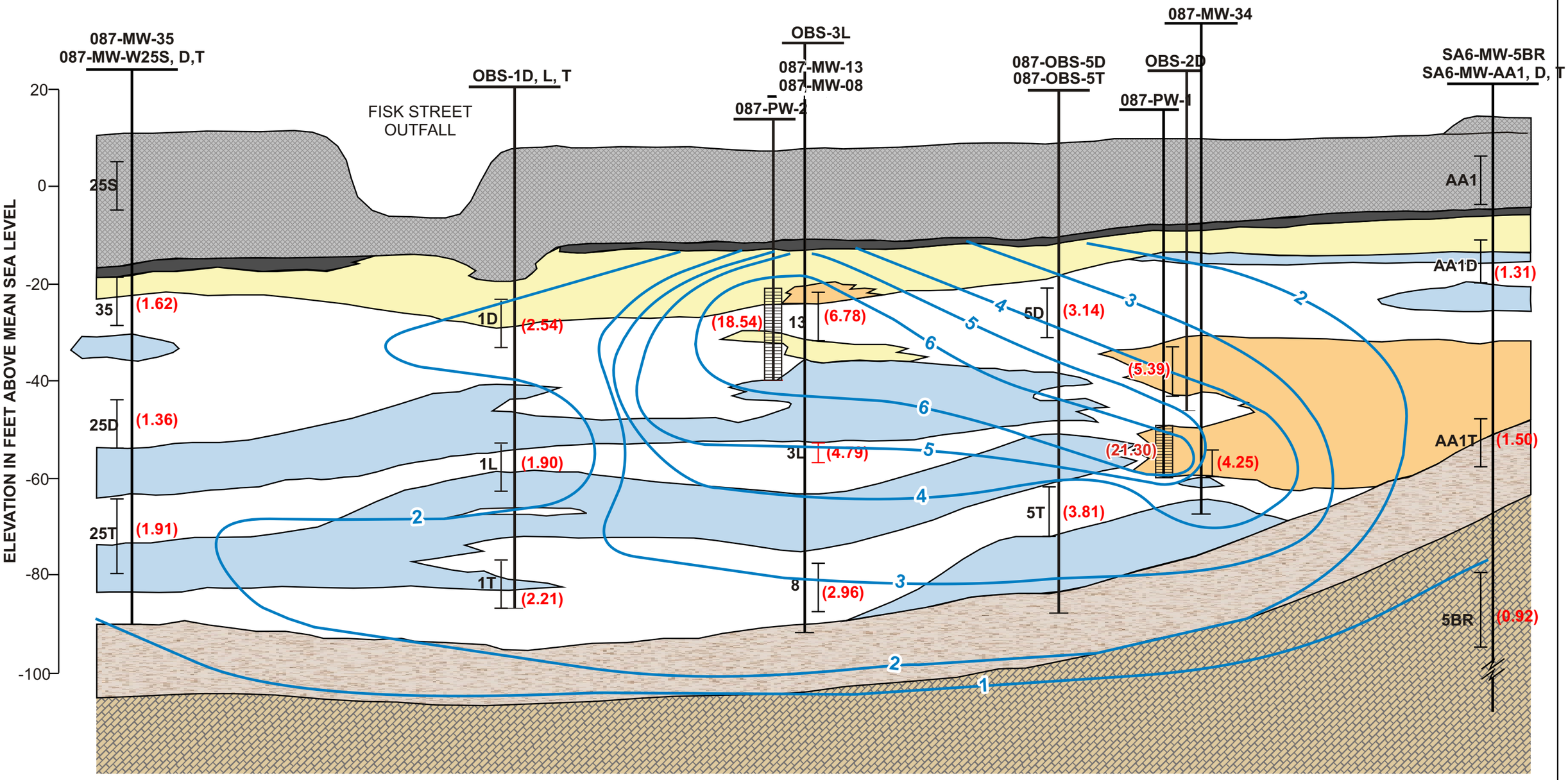
SCALE IN FEET

HydroQual

HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

Figure 1
Groundwater Elevations
April 22, 2009

HONEYWELL STUDY AREA 7
JERSEY CITY, NJ



LEGEND:

- FILL
- MEADOW MAT
- FINE TO MEDIUM SAND
- FINE, MEDIUM TO COARSE SAND
- INTERBEDDED SILTS AND CLAYS
- GLACIAL TILL
- PASSAIC FORMATION
- FINE TO VERY FINE SAND

087-MW-W25T WELL DESIGNATION

GROUND SURFACE

25T SCREENED INTERVAL

0 100 200

SCALE IN FEET

HydroQual

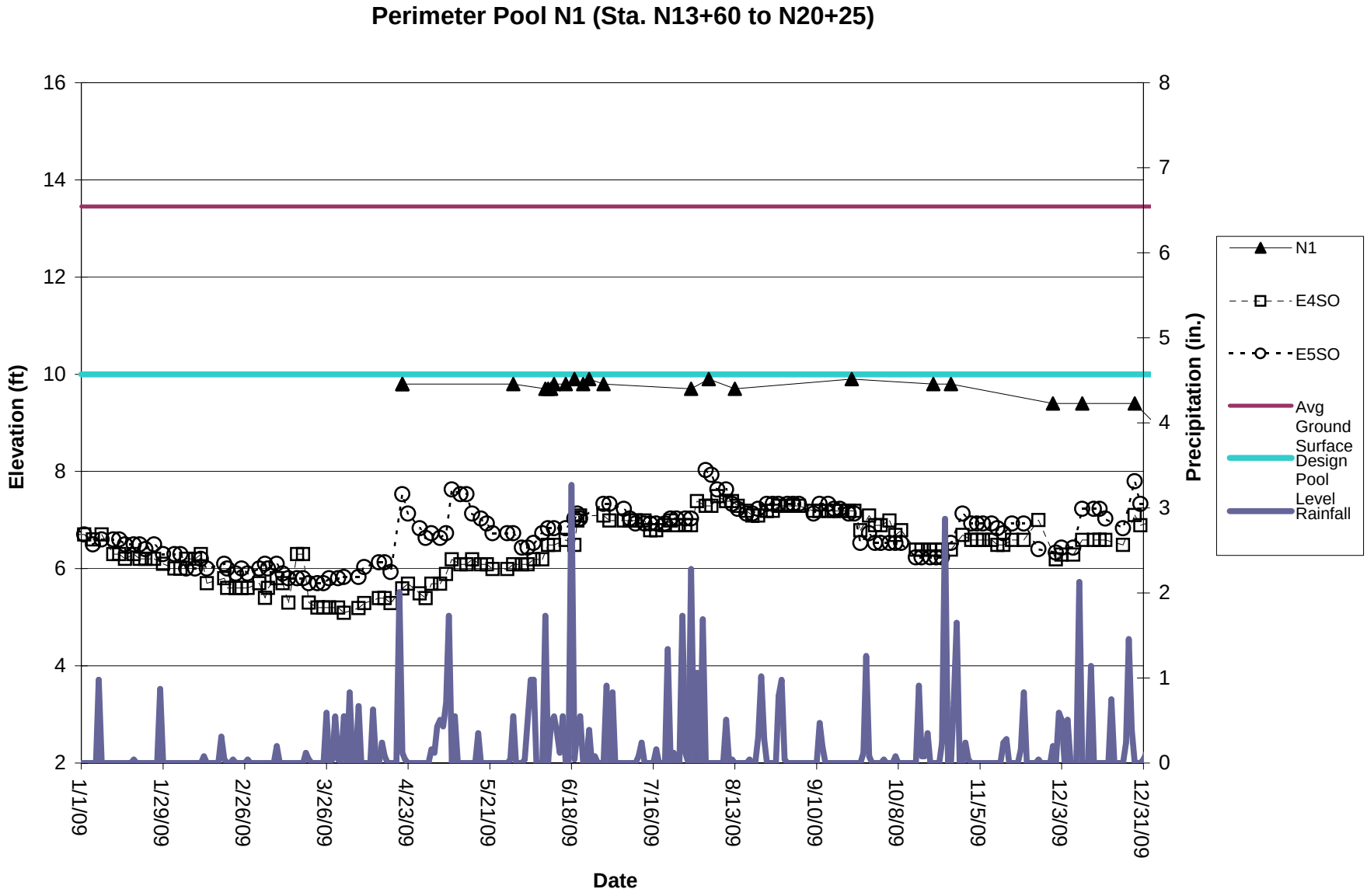
HYDROQUAL, INC.
1200 MACARTHUR BOULEVARD
MAHWAH, NEW JERSEY 07430
(201) 529-5151 F: 529-5728

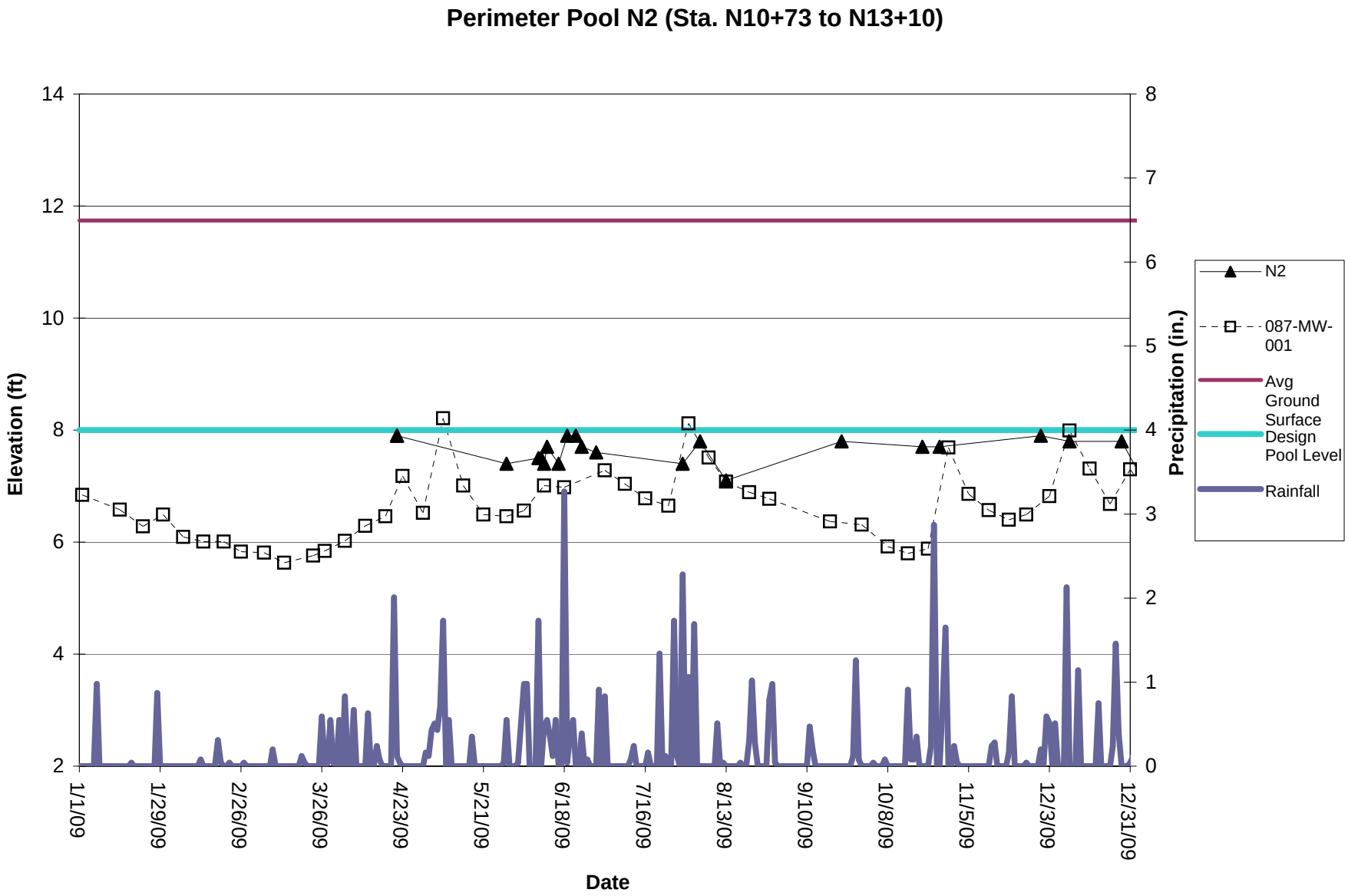
Figure 2
Drawdown Values
April 22, 2009

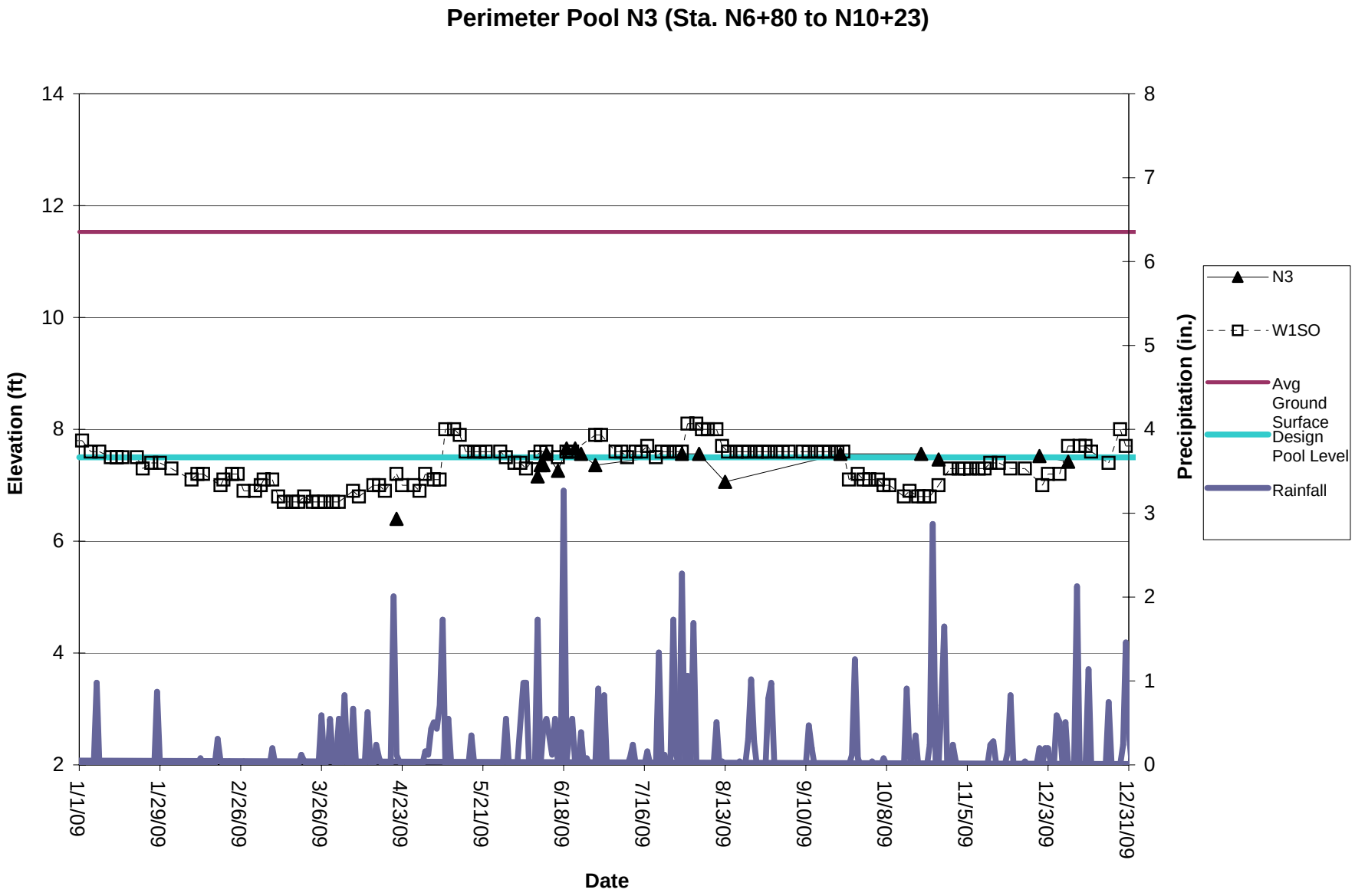
HONEYWELL STUDY AREA 7
JERSEY CITY, NJ

APPENDIX D

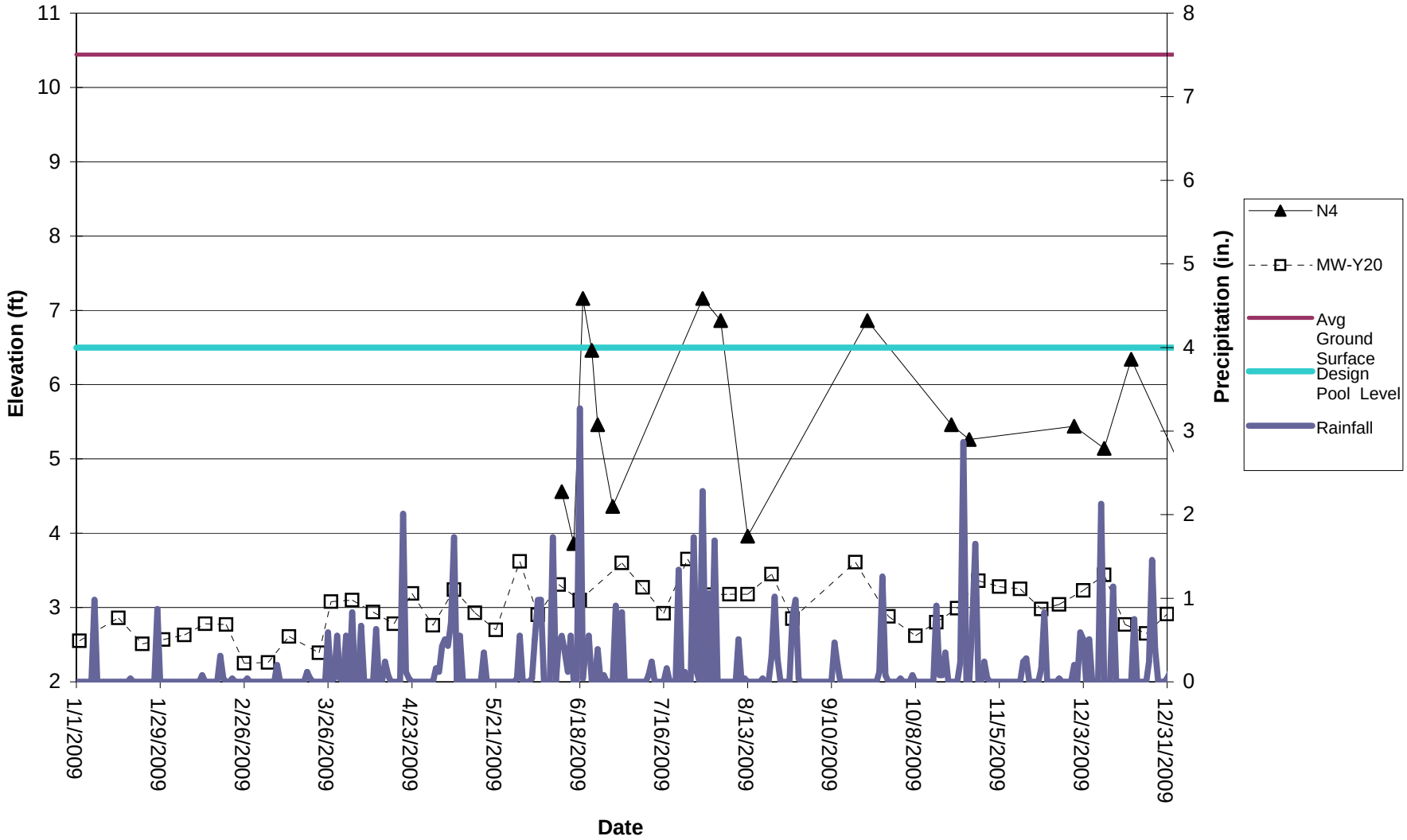
SA-7 PERIMETER POOL HYDROGRAPHS


Perimeter Pool N1 (Sta. N13+60 to N20+25)
Elevation (ft)
Precipitation (in.)
Date
16
14
12
10
8
6
4
2
8
7
6
5
4
3
2
1
0
1/1/09
1/29/09
2/26/09
3/26/09
4/23/09
5/21/09
6/18/09
7/16/09
8/13/09
9/10/09
10/8/09
11/5/09
12/3/09
12/31/09
N1
E4SO
E5SO
Avg Ground Surface
Design Pool Level
Rainfall

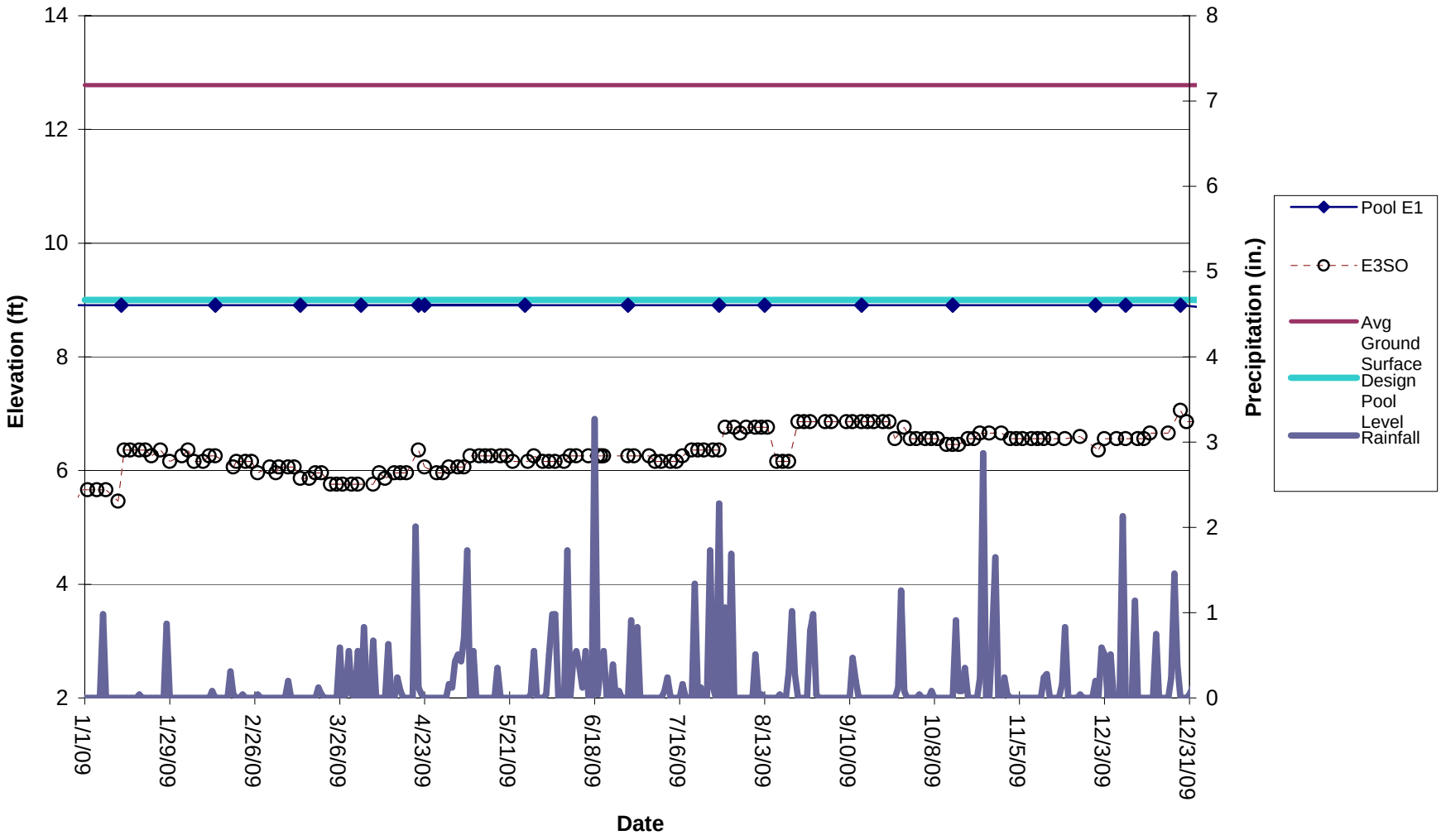

Perimeter Pool N2 (Sta. N10+73 to N13+10)
Elevation (ft)
Precipitation (in.)
Date
14
12
10
8
6
4
2
8
7
6
5
4
3
2
1
0
1/1/09
1/29/09
2/26/09
3/26/09
4/23/09
5/21/09
6/18/09
7/16/09
8/13/09
9/10/09
10/8/09
11/5/09
12/3/09
12/31/09
N2
087-MW-001
Avg Ground Surface
Design Pool Level
Rainfall

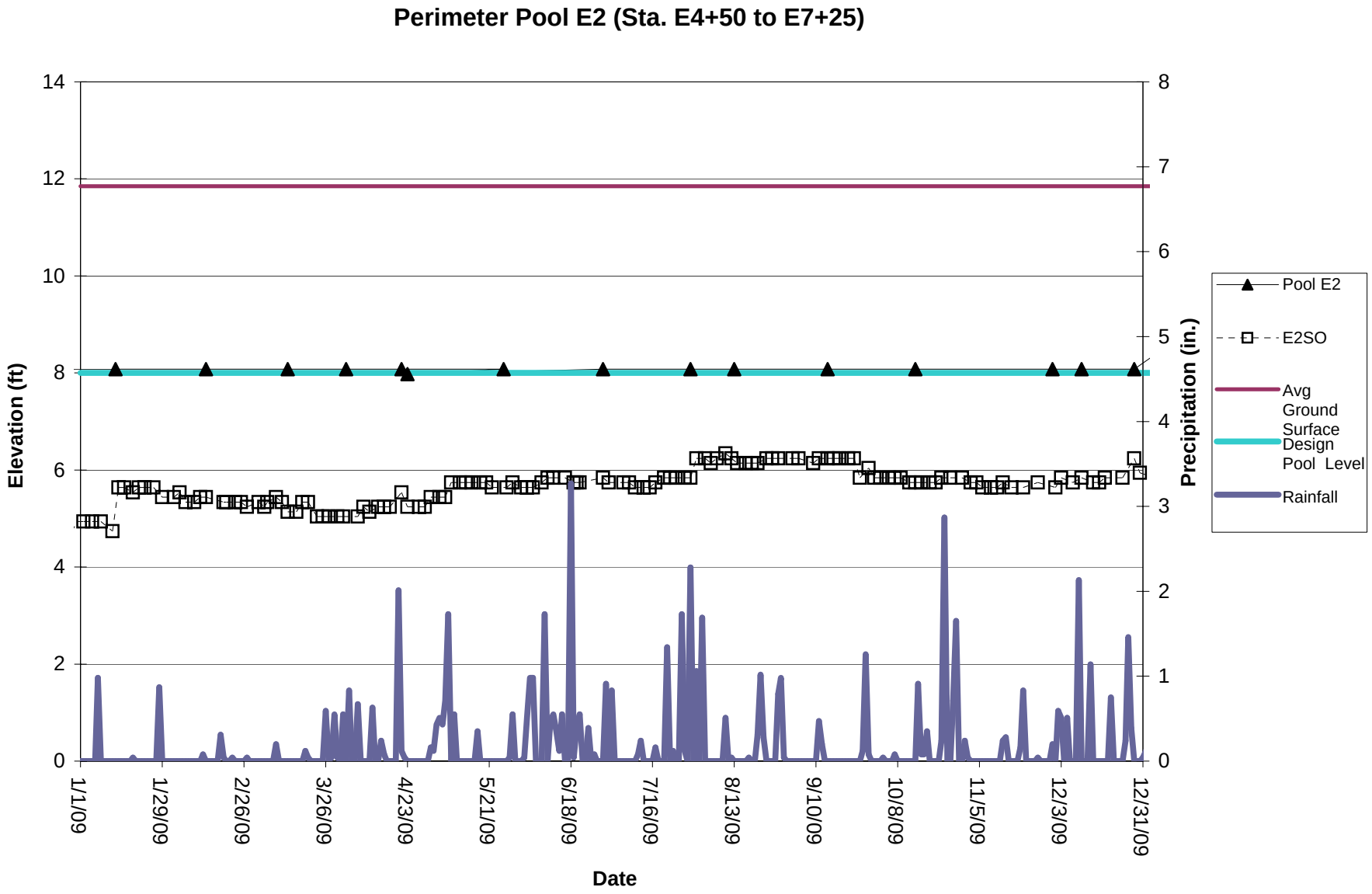

Perimeter Pool N3 (Sta. N6+80 to N10+23)
Elevation (ft)
Precipitation (in.)
Date
14
12
10
8
6
4
2
8
7
6
5
4
3
2
1
0
1/1/09
1/29/09
2/26/09
3/26/09
4/23/09
5/21/09
6/18/09
7/16/09
8/13/09
9/10/09
10/8/09
11/5/09
12/3/09
12/31/09
N3
W1SO
Avg Ground Surface
Design Pool Level
Rainfall

Perimeter Pool N4 (Sta. N1+10 to N6+35)

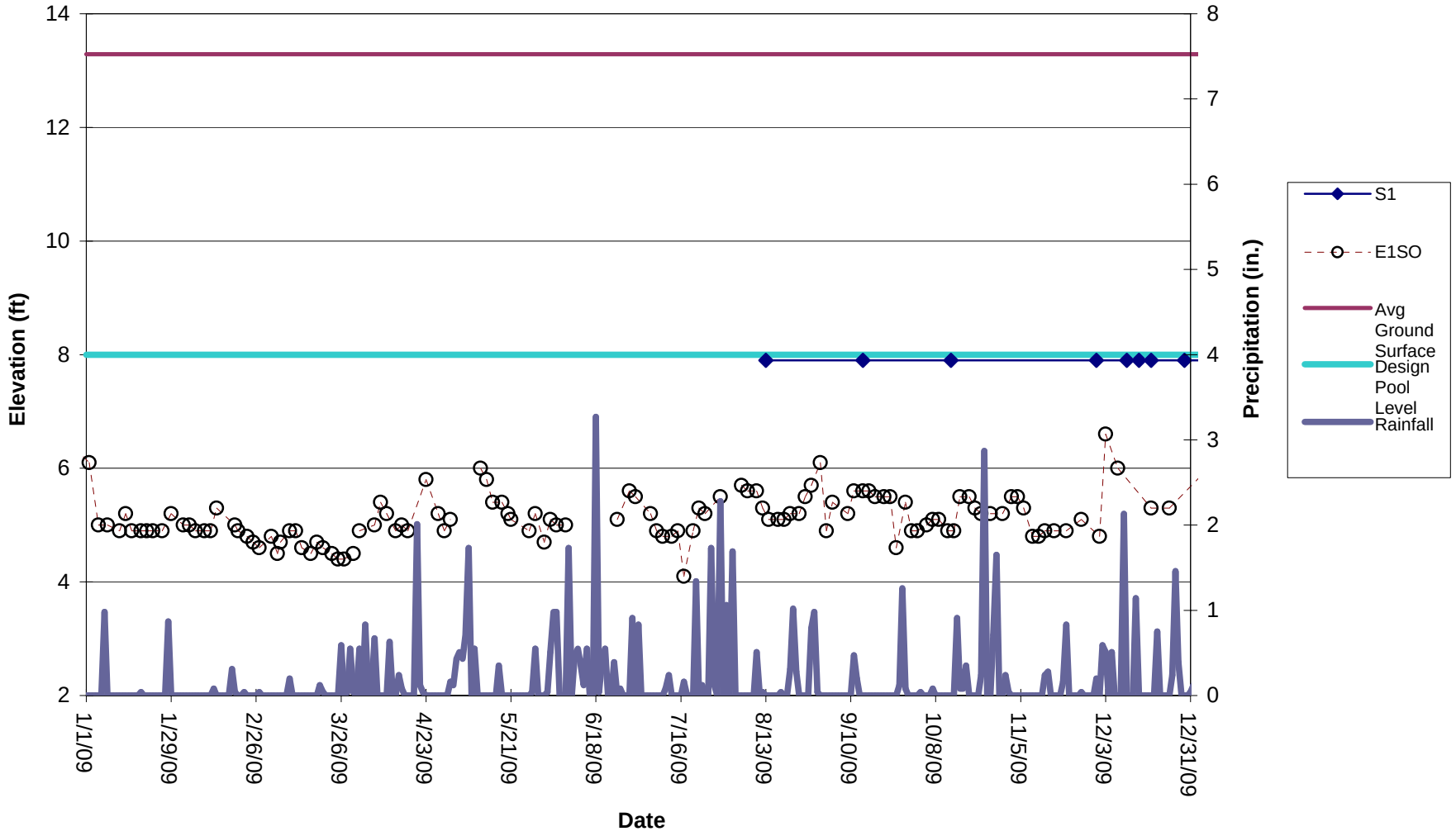


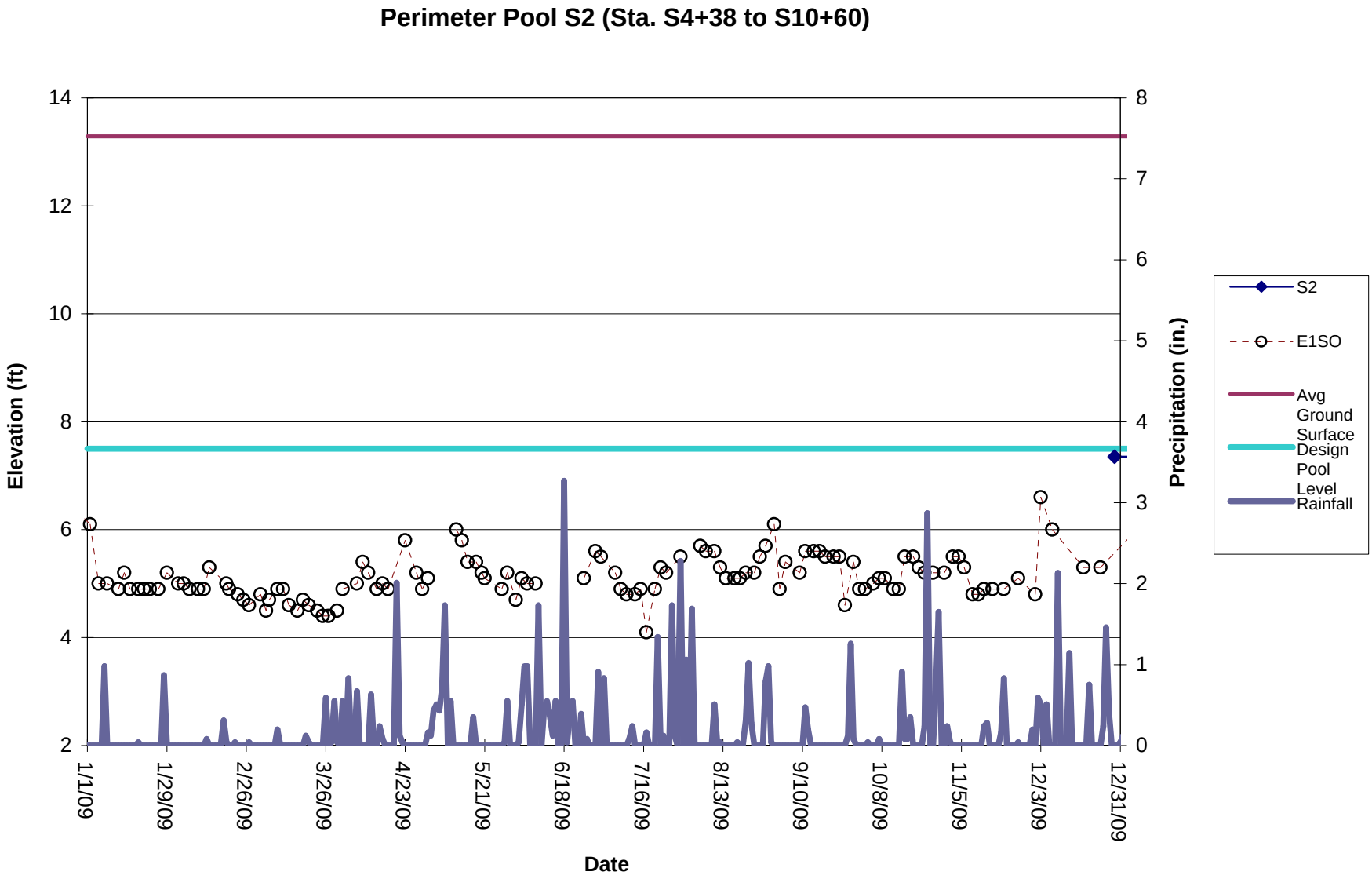
Perimeter Pool E1 (Sta. E0+50 to E3+75)



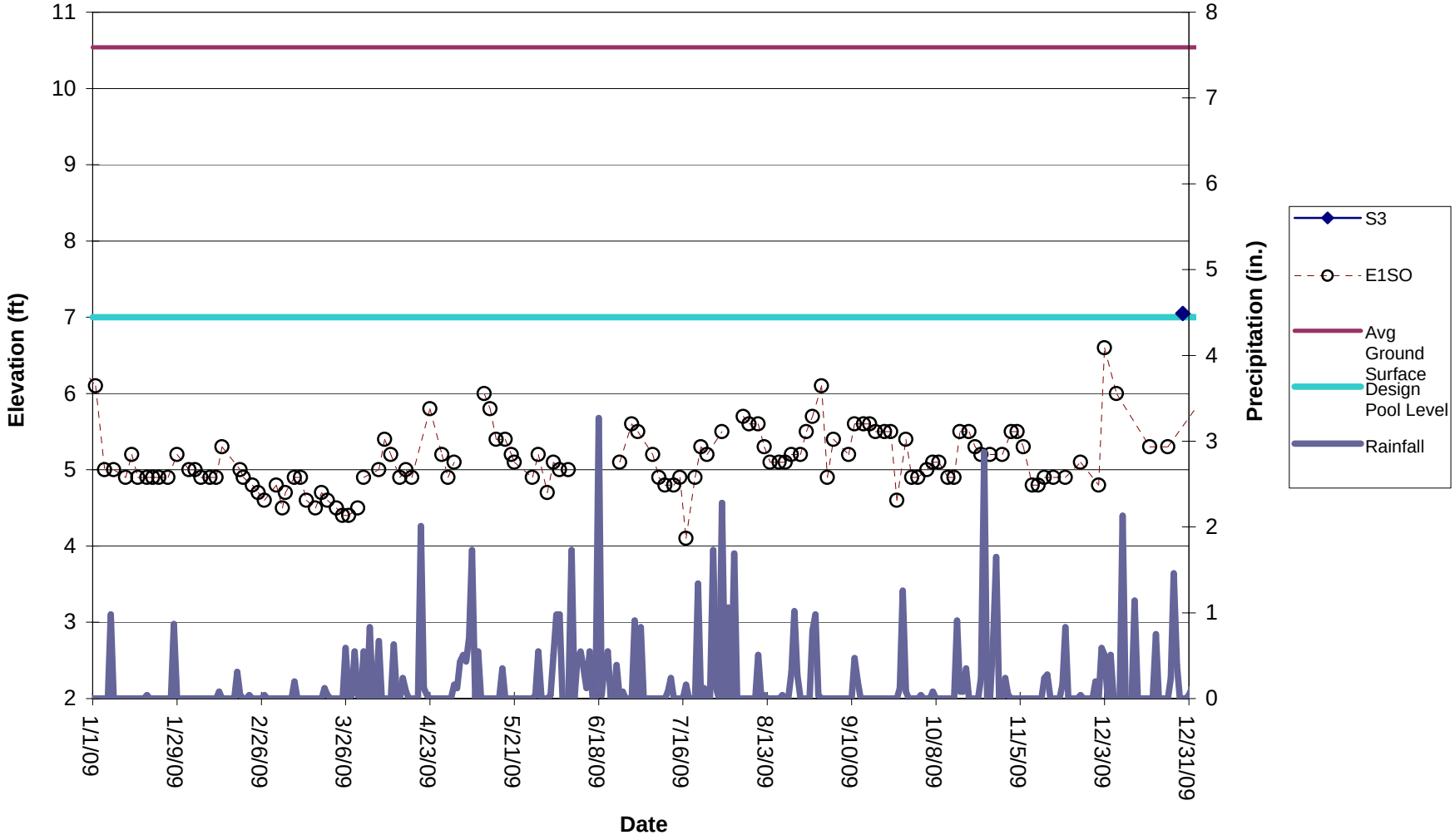

Perimeter Pool E2 (Sta. E4+50 to E7+25)
Elevation (ft)
Precipitation (in.)
Date
14
12
10
8
6
4
2
0
8
7
6
5
4
3
2
1
0
1/1/09
1/29/09
2/26/09
3/26/09
4/23/09
5/21/09
6/18/09
7/16/09
8/13/09
9/10/09
10/8/09
11/5/09
12/3/09
12/31/09
Pool E2
E2SO
Avg Ground Surface
Design Pool Level
Rainfall

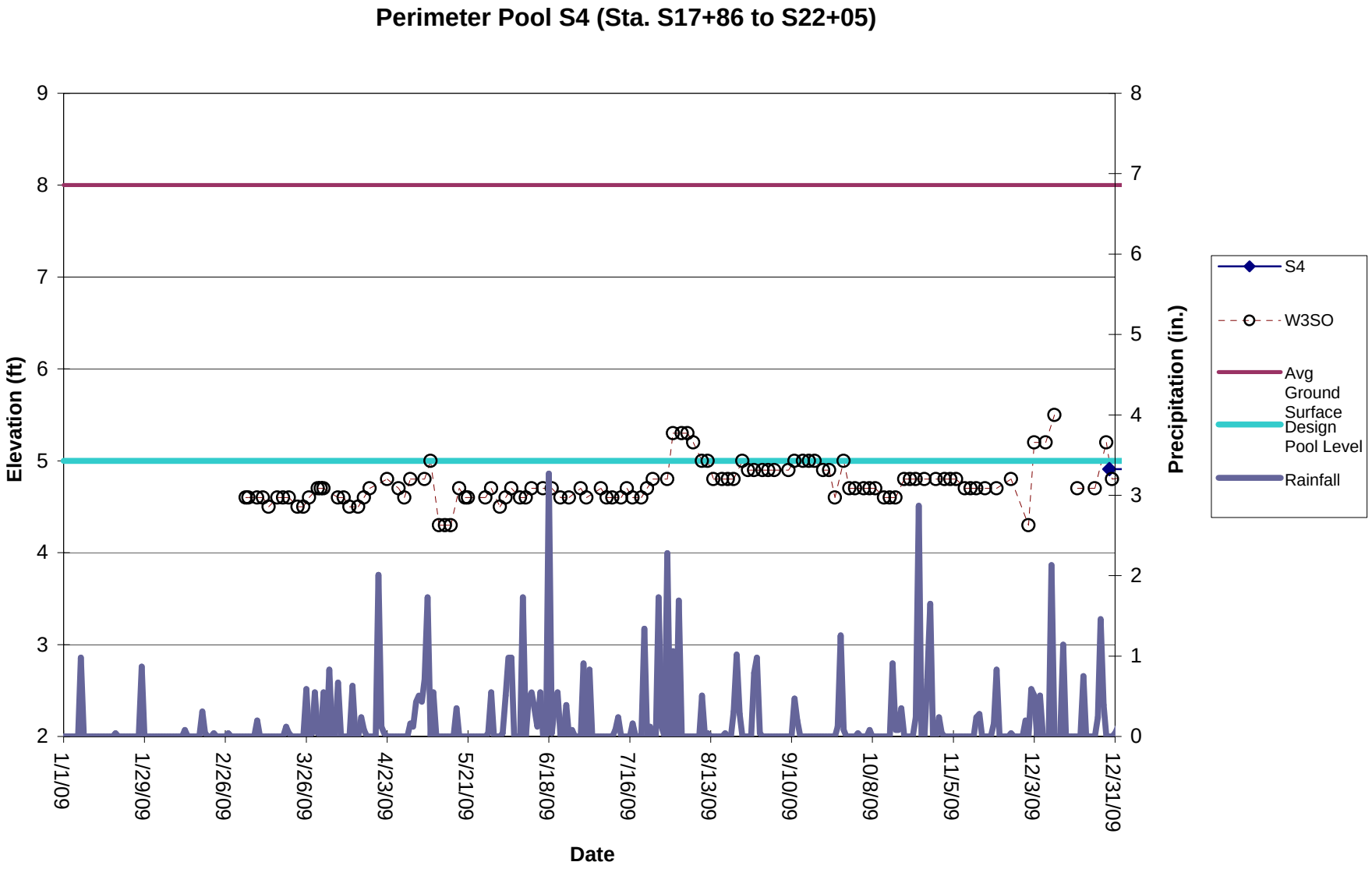
Perimeter Pool S1 (Sta. S0+50 to S3+88)




Perimeter Pool S2 (Sta. S4+38 to S10+60)
Elevation (ft)
Precipitation (in.)
Date
14
12
10
8
6
4
2
8
7
6
5
4
3
2
1
0
1/1/09
1/29/09
2/26/09
3/26/09
4/23/09
5/21/09
6/18/09
7/16/09
8/13/09
9/10/09
10/8/09
11/5/09
12/3/09
12/31/09
S2
E1SO
Avg Ground Surface Design Pool Level
Rainfall

Perimeter Pool S3 (Sta. S11+10 to S17+50)




Perimeter Pool S4 (Sta. S17+86 to S22+05)
Elevation (ft)
Precipitation (in.)
Date
9
8
7
6
5
4
3
2
8
7
6
5
4
3
2
1
0
1/1/09
1/29/09
2/26/09
3/26/09
4/23/09
5/21/09
6/18/09
7/16/09
8/13/09
9/10/09
10/8/09
11/5/09
12/3/09
12/31/09
S4
W3SO
Avg Ground Surface
Design Pool Level
Rainfall