ANNUAL PERFORMANCE REPORT #2
LONG-TERM MONITORING PLAN

STUDY AREA 7
DEEP OVERBURDEN AND BEDROCK
GROUNDWATER REMEDY

HONEYWELL
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1 INTRODUCTION

This second 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 second year of GWET system operation and to recommend any changes to the monitoring network and/or frequency of collection. The GWET system began operation on December 14, 2008 and consists of deep overburden and bedrock groundwater extraction from three recovery wells, with treatment of the extracted water at Honeywell's treatment plant located on Kellogg Street. The extraction wells are PW-1 (Deep overburden zone), PW-2 (Intermediate overburden zone), and 115-MW-203BR (Upper Bedrock zone). The two overburden wells are located near the downgradient end of the deep overburden plume and contain the plume from further off-site migration. The wells also cause a reversal of the hydraulic gradient in the deep overburden beneath the Hackensack River and pull back the river-ward portion of the plume. The bedrock extraction well is located in the southwest corner of Site 115 and serves to contain the bedrock plume.

2 HYDRAULIC MONITORING

In accordance with the LTMP, hydraulic monitoring was conducted quarterly during this second year of monitoring to:

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

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

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

2.1 Groundwater Level Monitoring

2.1.1 Hydraulic Monitoring Results

Hydraulic monitoring consisted of quarterly rounds of groundwater elevation measurement in all available wells in March, June, September, and December, 2010. 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. Groundwater elevations from the December 2010 round, two years after startup, are shown on the cross-section on Figure 2-1. This cross-section is drawn in the vicinity of the overburden portion of the GWET system and illustrates the impact of pumping on groundwater levels near the river. Groundwater elevations and well locations in the Shallow, Intermediate, Deep, and Bedrock zones are shown in plan-view on Figures 2-2 through 2-5, respectively. All groundwater elevation data are reported in units of feet above mean sea level (amsl) in the NGVD-29 vertical datum.

Cross-Section. Figure 2-1 illustrates that pumping from PW-1 and PW-2 creates a combined zone of influence causing groundwater to flow both laterally and vertically into the capture zone of the wells. The capture zone spans the various semi-confining layers but considering that the vertical anisotropy of the soil 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-section is 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).

Shallow Zone. Groundwater elevations in the Shallow zone range from over 12 feet amsl on Site 154 to less than 3 feet amsl near the Hackensack River. As a point of reference, the river has a mean tide elevation of approximately 1.2 feet relative to the NGVD-29 datum. As shown on Figure 2-2, shallow groundwater flow is generally from east to west across the region, but is locally impacted by subsurface features such as the SA-7 barrier wall, deep sewer lines that run beneath Route 440, and shallower storm sewers that run along most of the side streets. A subsurface barrier wall was also constructed along the south and west borders of Sites 090 and 184 in Study Area 5. Dewatering of the groundwater for the Building 5 and 6 excavations began in late October 2010 and, as shown on Figure 2-2, has depressed groundwater levels north of the wall to approximately three feet amsl.

Groundwater flow that is diverted around the SA-7 barrier wall moves onto SA-6 North and SA-6 South, ultimately discharging to the River or into subsurface sewers that serve as local groundwater sinks. Areas of locally elevated groundwater are observed in both SA-6 North and SA-6 South along the SA-7 perimeter wall. These elevated zones are likely caused by the lower hydraulic conductivity associated with COPR material that extended slightly past the northern and southern boundaries of SA-7. The combination of these elevated zones and the adjacent subsurface utilites (groundwater sinks) on SA-6 North, results in a quasi-radial flow pattern as shown on Figure 2-2.

Intermediate Zone. Groundwater elevations in the Intermediate zone are shown on Figure 2-3 and range from over 6 feet above msl to less than 2 feet below msl in the vicinity of the GWET pumping wells. Goundwater is diverted around the SA-7 barrier wall but is not impacted by near-surface features on SA-6 North to the same degree as in the Shallow zone. A local depression in the contours is observed at SA-5 due to the dewatering activities discussed above. Reported groundwater elevations measured in Building 5 observation wells (not shown) were on the order of 3 feet amsl on December 20, 2010. Groundwater within the SA-7 barrier wall are relatively stable at an elevation of two feet amsl. Vertically, heads within the Intermediate zone are generally one to four feet lower than in the Shallow zone, which indicates a significant downward vertical gradient across the Meadow Mat. This is especially the case west of Route 440 where the Meadow Mat is nearly continuous across the site. Figure 2-3 also illustrates that the combined groundwater depression in the vicinity of the GWET pumping wells fully encompasses the deep overburden plume and provides an effective capture zone in these upper lacustrine soils.

Deep Zone. Groundwater elevations in the Deep zone (Figure 2-4) are similar to those in the overlying Intermediate zone, although the influence of the SA-7 barrier wall and the dewatering operations on SA-5 are not as prominent. As noted in various prior reports, groundwater flow in the Deep zone is able to move beneath the SA-7 barrier wall through

gravel lenses in the underlying glacial till/ice contact deposits and thus is not completely diverted around the wall. At SA-5, the barrier wall does not extend down to the Deep zone and although vertical impact of the dewatering pumping is evident, it is subduded relative to that in the Intermediate zone. The area of influence of the GWET pumping wells on groundwater flow in the Deep zone is also illustrated on Figure 2-4. This zone is wider than that in the Intermediate zone due to the larger pumping rate and the more permeable S-3 formation. The resulting combined groundwater depression in the vicinity of the GWET pumping wells fully encompasses the deep overburden plume and provides effective capture in this deeper flow zone.

Upper Bedrock Zone. Groundwater elevation contours in the Upper Bedrock zone are shown on Figure 2-5 and are quite uniform compared to those in the overlying lacustirne units. The steeper contour intervals east of Route 440 reflect the generally lower hydraulic conductivity in that direction, whereas the more widely spaced contours to the west reflect an increased fracture spacing in the bedrock in this area. The impact of the GWET pumping well 115-MW-203BR on groundwater flow is also evident from the closed contours along the western border of SA-7. This area is characterized by the southwest-northeast trending high-permeability fracture zone which aids in the propagation of the capture zone parallel to the bulkhead as shown on Figure 2-5.

2.1.2 Monitoring of Hydraulic Gradients Across the Subsurface Containment Barrier

The LTMP program includes monitoring of the hydraulic gradients across the subsurface containment barrier (SCB) around the perimeter of SA-7. This is 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 2-6. Water level trends are plotted on the hydrographs in Appendix C 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.

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 exceptions include pools N-3, N-4, and S-3 in which water levels in the outside piezometer were occasionally at or above the measured pool elevation. However, a review of the trends in Appendix C reveals that the majority of these exceedances occurred in the spring of 2010 during which time record rainfall was documented in the Jersey City area. In fact, only the S-3 pool had inward gradients after May 2010, which was short-lived following a 5-inch rainfall event in September 2010.

The direct (and rapid) correlation between rainfall and water level rise suggests that the permeability of the soil adjacent to the SA-7 barrier wall is relatively low and thus 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 significant or sustained inward gradients across the barrier wall is small. Recent groundwater levels (after May 2010) have returned to normal and are below the pool elevations. For the longer term, a low permeability cover is proposed for this area of SA-6 North and SA-6 South as part of the soil remedy/ redevelopment plans. Groundwater modeling of these cells indicates that groundwater levels will be lowered to an elevation at or below +4.0 feet above mean sea level. If this is not the case, contingent groundwater pumping is proposed to achieve this objective.

2.2 Tidal Monitoring

Tidal monitoring was conducted using an automatic data recorder located on the SA-7 bulkhead. During the first three months of the reporting period, the tide gauge was maintained by Ocean Surveys Inc. (OSI) and was downloaded on a quarterly frequency. Beginning in April 2010, river stage data was measured using a replacement staff gauge operated by Cornerstone. The gauge was established on the SA-7 bulkhead at the same location, and a pressure transducer used to monitor river elevations. Both gauges were monitored for a one-month overlap period and the data compared to confirm that the results were consistent. Tidal monitoring data was automatically recorded every six minutes in NGVD-29 datum and used to correct groundwater elevations for tidal influences.

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 rates were controlled by a manually-operated valve by the treatment plant operator and adjusted as necessary to maintain design rates of 7.5 and 40 gpm for wells 115-MW-203BR and PW-1, respectively. The flow rate for PW-2 was reduced from the design rate of 15 gpm to 7.5 gpm on March 22, 2010. This change was made primarily to alleviate chronic fouling in both the PW-2 force main and in the well itself due to the groundwater geochemistry in the Intermediate Zone. This change was also made in accordance with the approved Engineering Report which anticipated such a reduction as the Deep Overburden Plume is pulled back from under the River. Groundwater modeling (refer to Cornerstone Technical Memorandum dated May 18, 2010) indicated that pumping to date has pulled the plume back approximately one third of the distance from the discharge point beneath the river to the shoreline and that continued pumping from PW-2 at 7.5 gpm will be sufficient to provide pull-back and capture the remaining chromium plume. Figure 2-7 ilustrates the pumping history during 2010 and 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 reasons for the shutdowns.

3 GROUNDWATER QUALITY MONITORING

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

1) 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.

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

3) Assess the effectiveness of the GWET system at pulling back the river-ward portion of the deep overburden plume.

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

3.1 Monitoring Well Sampling

A total of 26 monitoring wells and three pumping wells were sampled in December 2010, two years after startup of the GWET system. 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. Bedrock well 119-MW-2BR located on Droyer's Point could not be sampled due to a temporary access restriction by the property owner. This well will be scheduled for sampling as soon as feasible and the data provided in a followup memorandum.

The wells are generally located on the perimeter of the chromium plume in each layer to assess if the plumes have expanded in a horizontal direction since the last sampling event. 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 this second annual round are provided in Table 3-1 and are shown on Figures 3-1 through 3-6. Data from the pre-startup round (November 2008) and the first annual round (December 2009) are also shown on the Figures for reference, as are the original plume contours taken from the Final Groundwater Investigation Report (FGIR) [HydroQual, 2007].

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 data on Figure 3-1 indicate that hexavalent chromium was not detected in any of the wells on this, or either of the two pervious sampling dates. This includes well 090-MW-18BR which reported hexavalent chromium at 0.23 ppm in 2006 but has since been found to be non-detect. 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 below the NJ Ground Water Quality Standard of 0.07 ppm in each of the subsequent rounds.

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 previous rounds. 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 stable concentrations in the 0.4 to 0.6 ppm range.

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 during the past two years. Well 124-MW-104T had a reported concentration of 0.029 ppm which is on par with previous results 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 previous rounds are shown to vary slightly from event to event. This is likely due 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.

Deep zone monitoring well 115-MW-E08T was destroyed during the SA-7 soil remedy and replaced in July 2010 with well 115-MW-EO8TR. Although this well is in the center of the deep plume, it was voluntarily included in this sampling event to provide baseline data for future comparisons if needed. Total and hexavalent chromium were reported at concentrations of 11.6 ppm and 12.1 ppm, respectively, which match well with the overall configuration of the plume as originally mapped in 2006 as shown on Figures 3-5 and 3-6.

3.2 Pumping well sampling

Groundwater discharged from the three GWET pumping wells was sampled on a monthly frequency on a voluntary 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. Concentrations in the Deep zone (PW-1) have declined in an asymptotic fashion from pre-startup levels of 150 ppm to approximately 50 ppm. Data from the Intermediate zone (PW-2) initially increased from 5 ppm to 40 ppm, but have since also declined to approximately 20 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, VOCs 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.

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 in the 100 to 200 ppb range and are continuing to decline slowly. The source of the VOCs 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.

- Annual groundwater quality sampling was conducted in 2009 and 2010, and will be conducted again in 2011. Should the data from these events confirm that there has been no horizontal expansion of the plumes, it is recommended that the sampling frequency be reduced to once every two years.

- 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.

APPENDIX A

TABLES

Table 2-1

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	10-Mar-10 GW Elevation ft, msl	29-Jun-10 GW Elevation ft, msl	21-Sep-10 GW Elevation ft, msl	21-Dec-10 GW Elevation ft, msl
073-MW-10BR-1	Rock	-0.91	-0.57	-1.39	-1.96
073-MW-10BR-2	Rock	-0.93	-0.53	-1.35	-1.96
073-MW-10BR-3	Rock	-0.23	-0.44	-0.89	NA
073-MW-10BR-4	Rock	0.78	0.74	-0.20	-0.44
073-MW-10BR-5	Rock	6.17	NA	NA	NA
073-MW-1BR-1	Rock	-1.83	-1.78	-1.43	-2.22
073-MW-1BR-2	Rock	-1.30	-1.32	-1.11	-1.66
073-MW-1BR-3	Rock	-0.16	-0.20	0.02	-0.48
073-MW-1BR-4	Rock	-0.05	-0.23	-0.14	-0.62
073-MW-1BR-5	Rock	0.73	0.68	0.14	0.09
073-MW-BB11	Shallow	3.58	3.48	3.16	3.31
073-MW-Y10	Shallow	4.34	3.69	3.57	3.97
073-PZ-001	Shallow	NA	NA	NA	3.69
073-PZ-002	Intermediate	NA	NA	NA	2.34
079-MW-13BR-1	Rock	7.55	7.31	6.54	5.39
079-MW-13BR-2	Rock	8.27	7.73	7.05	7.00
079-MW-13BR-3	Rock	7.43	7.73	6.96	6.98
079-MW-A2	Shallow	3.63	2.85	2.84	2.88
079-MW-C6	Shallow	6.40	6.32	5.28	NA
087-MW-001	Shallow	3.59	6.20	5.34	6.28
087-MW-01	Deep	5.42	3.44	2.95	2.65
087-MW-03	Deep	2.69	2.53	NA	1.73
087-MW-08	Deep	1.10	1.24	0.99	0.62
087-MW-101	Shallow	3.40	3.11	2.59	2.15
087-MW-102	Shallow	3.38	3.06	2.52	2.12
087-MW-119	Shallow	5.00	4.54	4.38	4.43
087-MW-120	Shallow	4.67	4.24	NA	4.18
087-MW-121	Shallow	3.09	3.01	2.47	2.00
087-MW-13	Intermediate	-1.79	-1.26	0.86	-1.94
087-MW-14	Rock	4.52	3.69	2.85	1.97
087-MW-34	Deep	-0.54	-0.50	-0.79	-1.05
087-MW-35	Intermediate	1.11	1.47	1.64	1.35
087-MW-A26	Shallow	4.03	3.32	2.78	2.46
087-MW-A26D	Intermediate	3.60	3.14	NA	2.24
087-MW-A26T	Deep	3.21	3.11	2.63	2.21
087-MW-I30	Shallow	4.40	2.63	3.60	3.41
087-MW-I30T	Rock	3.36	2.60	3.06	1.16
087-MW-O19	Shallow	5.83	6.83	5.99	6.75

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	10-Mar-10 GW Elevation ft, msl	29-Jun-10 GW Elevation ft, msl	21-Sep-10 GW Elevation ft, msl	21-Dec-10 GW Elevation ft, msl
087-MW-O23	Shallow	4.08	6.02	3.78	5.62
087-MW-O29	Shallow	4.52	4.01	3.58	3.53
087-MW-O29D	Intermediate	1.34	1.79	1.57	1.17
087-MW-O29T	Rock	1.55	1.76	1.60	1.45
087-MW-S19	Shallow	8.35	6.64	NA	NA
087-MW-U28	Shallow	5.53	5.26	4.88	8.16
087-MW-W25	Shallow	4.41	4.58	4.28	4.67
087-MW-W25D	Intermediate	1.12	1.47	1.64	0.36
087-MW-W25T	Deep	1.18	1.21	1.17	0.81
087-MW-Y20	Shallow	3.41	3.02	2.63	2.83
087-OBS-1D	Intermediate	1.34	1.78	1.85	1.80
087-OBS-1L	Deep	1.12	2.38	1.11	0.77
087-OBS-1T	Deep	1.37	1.69	1.36	1.03
087-OBS-2D	Intermediate	-2.10	-1.17	-2.62	-2.06
087-OBS-3L	Deep	-2.68	0.30	-0.92	-0.60
087-OBS-4T	Deep	0.99	0.99	0.64	0.48
087-OBS-5D	Intermediate	-0.20	1.68	-0.19	1.04
087-OBS-5T	Deep	0.46	0.62	-0.83	-0.34
087-OBS-6D	Intermediate	4.73	2.61	2.22	1.76
087-PW-1	Deep	-19.93	-20.64	-22.45	-21.65
087-PW-2	Intermediate	-25.01	-9.44	-12.25	-10.14
087-PZ-001	Shallow	16.95	4.02	3.50	3.65
087-PZ-002	Intermediate	0.97	1.77	1.31	2.00
087-PZ-003	Shallow	5.70	5.28	4.37	5.01
087-PZ-004	Intermediate	2.41	2.46	2.27	1.82
087-PZ-005	Shallow	8.04	7.37	6.73	6.66
087-PZ-006	Intermediate	1.34	1.67	1.64	1.89
088-MW-001	Shallow	5.79	3.54	4.18	3.60
088-MW-002	Shallow	7.64	6.32	5.90	5.60
088-MW-101	Shallow	3.88	3.34	2.71	2.23
088-MW-102	Shallow	4.97	3.92	3.03	2.33
088-MW-103	Shallow	3.01	3.62	2.90	1.79
088-MW-15	Intermediate	3.02	NA	NA	NA
088-MW-G19T	Deep	3.27	3.12	2.91	2.41
088-PZ-001	Shallow	6.64	5.37	4.86	4.45
088-PZ-002	Intermediate	4.29	4.08	3.84	2.85
088-PZ-003	Shallow	6.04	5.80	4.85	4.26
088-PZ-004	Intermediate	3.06	2.80	2.72	1.79

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	10-Mar-10 GW Elevation ft, msl	29-Jun-10 GW Elevation ft, msl	21-Sep-10 GW Elevation ft, msl	21-Dec-10 GW Elevation ft, msl
090-MW-07[1]	Intermediate	9.00	8.69	8.47	NA
090-MW-09	Deep	7.13	6.81	6.77	4.59
090-MW-010[1]	Shallow	8.53	7.50	6.99	NA[1]
090-MW-011[1]	Shallow	8.53	7.64	NA	NA[1]
090-MW-18BR	Rock	7.16	7.94	7.38	9.88
090-MW-7BR-1	Rock	5.36	4.83	4.38	NA
090-MW-7BR-2	Rock	6.11	5.17	5.02	NA
090-MW-7BR-3	Rock	5.26	4.86	4.43	NA
090-MW-8A[1]	Shallow	11.42	9.64	8.85	NA[1]
090-MW-E01[1]	Shallow	7.72	6.87	6.66	NA[1]
090-MW-F14	Shallow	13.49	12.36	11.37	10.48
090-PZ-105[1]	Shallow	8.43	7.06	NA	NA[1]
090-PZ-106A[1]	Shallow	7.44	6.43	3.55	NA[1]
090-PZ-106B[1]	Intermediate	5.27	4.10	6.08	NA[1]
090-PZ-115A[1]	Shallow	7.62	6.52	6.11	NA[1]
090-PZ-115B[1]	Intermediate	5.77	4.42	5.21	NA[1]
090-PZ-119[1]	Shallow	7.90	7.10	6.65	NA[1]
115-E1-DI	Intermediate	2.99	3.06	2.50	1.98
115-E1-DO	Intermediate	3.38	3.06	2.78	2.63
115-E1-SO	Shallow	6.52	3.85	5.97	5.55
115-E2-DO	Intermediate	5.47	5.33	4.79	4.18
115-E2-SO	Shallow	6.45	6.34	5.98	5.55
115-E3-DO	Intermediate	6.33	6.08	5.51	4.52
115-E3-SO	Shallow	7.42	6.95	6.44	5.95
115-E4-DO	Intermediate	4.04	3.78	3.31	2.59
115-E5-DO	Intermediate	2.86	2.75	2.30	1.90
115-E6-DI	Intermediate	2.97	2.98	2.44	1.94
115-E6-DO	Intermediate	2.54	2.85	2.62	2.11
115-MW-20	Deep	NA	2.53	2.61	2.17
115-MW-203BR	Rock	-1.04	-0.78	-1.37	-1.09
115-MW-211BR	Rock	3.96	3.70	3.28	3.14
115-MW-215BR	Rock	-3.27	-3.02	-3.71	-4.45
115-MW-216BR	Rock	3.10	3.82	3.42	3.23
115-MW-E14D	Intermediate	2.60	3.49	2.04	1.56
115-MW-E14T	Deep	3.10	3.05	2.51	2.00
115-OMW-E08TR	Deep	NA	NA	2.78	2.28

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	10-Mar-10 GW Elevation ft, msl	29-Jun-10 GW Elevation ft, msl	21-Sep-10 GW Elevation ft, msl	21-Dec-10 GW Elevation ft, msl
115-PW-21	Deep	3.04	2.97	2.43	1.95
115-W1-DO	Intermediate	1.47	2.02	1.55	1.33
115-W1-SO	Shallow	8.17	7.29	6.56	6.75
115-W4-DO	Intermediate	2.42	2.55	2.36	2.40
117-MW-3BR-1	Rock	5.84	5.39	9.74	4.90
117-MW-3BR-2	Rock	6.74	6.30	5.88	5.74
117-MW-8BR	Rock	6.64	5.59	5.12	4.98
117-MW-A05	Shallow	8.49	NA	7.65	6.93
117-MW-A14	Shallow	6.15	5.55	5.28	5.07
117-MW-A62	Shallow	8.37	8.27	7.63	6.26
117-MW-A85	Shallow	6.75	6.65	6.04	5.40
117-MW-A89	Shallow	5.37	4.82	4.43	4.19
117-MW-A99	Shallow	7.77	8.05	7.35	6.07
117-MW-D1	Deep	4.20	3.76	3.39	3.13
117-MW-D2	Deep	5.97	5.71	5.27	4.67
117-MW-D3	Deep	7.68	6.72	6.46	3.85
117-MW-I1	Intermediate	4.36	3.89	3.58	3.34
117-MW-I2	Intermediate	6.73	7.63	6.04	6.28
117-MW-I3	Intermediate	6.59	6.33	5.78	4.67
117-MW-I4	Intermediate	6.74	6.34	5.92	3.61
117-MW-I4S	Shallow	8.79	8.34	7.61	5.84
117-MW-I5	Intermediate	9.50	8.98	8.94	5.69
119-MW-01T	Deep	3.52	3.13	2.81	2.72
119-MW-02T	Deep	3.80	3.23	3.03	2.95
119-MW-11BR	Rock	3.87	3.66	3.33	3.16
119-MW-12BR	Rock	5.59	5.19	4.78	4.62
119-MW-16BR-1	Rock	4.72	4.39	5.66	5.29
119-MW-16BR-2	Rock	4.57	4.45	4.15	3.77
119-MW-16BR-3	Rock	4.60	4.29	3.85	3.66
119-MW-2BR-1	Rock	-0.96	-1.16	-1.16	NA
119-MW-2BR-2	Rock	-0.80	-0.77	-0.90	NA
119-MW-2BR-3	Rock	-0.10	-0.27	-0.30	NA
119-MW-4BR-1	Rock	4.19	3.86	3.46	3.29
119-MW-4BR-2	Rock	4.23	3.84	3.51	3.40
119-MW-4BR-3	Rock	4.41	4.03	3.60	3.55
124-MW-02	Shallow	7.30	5.90	5.47	5.82
124-MW-06	Deep	3.77	3.44	3.12	2.80
124-MW-102D	Intermediate	3.31	2.95	2.67	2.54

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	10-Mar-10 GW Elevation ft, msl	29-Jun-10 GW Elevation ft, msl	21-Sep-10 GW Elevation ft, msl	21-Dec-10 GW Elevation ft, msl
124-MW-102T	Deep	4.00	3.75	3.39	2.95
124-MW-103D	Intermediate	3.29	3.08	2.81	2.66
124-MW-103L	Deep	3.60	3.35	2.96	2.70
124-MW-104D	Intermediate	3.48	3.05	2.76	2.60
124-MW-104L	Deep	4.05	3.66	3.30	3.06
124-MW-104T	Deep	4.05	3.73	3.39	3.09
124-MW-105D	Intermediate	3.67	3.35	3.08	2.62
124-MW-105T	Deep	3.62	3.24	2.99	2.66
124-MW-106T	Deep	3.48	3.22	2.87	2.50
124-MW-107T	Deep	3.23	3.05	2.67	2.16
124-MW-11	Shallow	NA	NA	NA	4.53
124-MW-17BR-1	Rock	3.81	3.51	6.17	NA
124-MW-17BR-2	Rock	4.81	3.61	4.82	3.04
124-MW-8BR	Rock	3.64	3.66	3.30	3.17
124-MW-G02D	Intermediate	3.33	3.07	2.82	3.15
124-MW-G02T	Deep	3.30	3.46	2.90	2.65
125-MW-01	Shallow	6.59	5.74	5.40	5.51
125-PZ-001	Shallow	NA	NA	NA	6.71
125-PZ-002	Intermediate	NA	NA	NA	2.42
125-PZ-003	Shallow	NA	NA	NA	5.06
125-PZ-004	Intermediate	NA	NA	NA	2.57
134-MW-Q08	Shallow	6.87	5.46	5.67	5.93
134-MW-V09	Shallow	5.91	5.13	4.99	5.00
134-PZ-001	Shallow	NA	NA	NA	4.32
134-PZ-002	Intermediate	NA	NA	NA	2.13
134-PZ-003	Shallow	NA	NA	NA	6.22
134-PZ-004	Intermediate	NA	NA	NA	2.20
140-MW-04	Shallow	5.77	4.60	4.51	4.67
140-MW-06	Shallow	7.22	6.36	6.11	6.12
140-MW-07	Shallow	5.78	4.90	4.68	4.75
140-MW-08	Shallow	NA	NA	NA	NA
140-MW-10	Shallow	NA	NA	NA	NA
140-MW-1R	Shallow	6.03	4.86	4.64	4.77
140-MW-9BR-1	Rock	1.47	1.29	1.35	1.13
140-MW-9BR-2	Rock	3.03	3.05	2.70	2.59
140-MW-9BR-3	Rock	3.21	3.17	2.91	2.72
140-MW-P05D	Intermediate	2.78	2.79	2.66	3.02
140-PZ-001	Shallow	NA	NA	NA	5.59

Table 2-1 (continued)

Ground Water Level Data from Quarterly Rounds

Well ID	Screen Zone	10-Mar-10 GW Elevation ft, msl	29-Jun-10 GW Elevation ft, msl	21-Sep-10 GW Elevation ft, msl	21-Dec-10 GW Elevation ft, msl
140-PZ-002	Intermediate	NA	NA	NA	3.07
153-MW-A13	Shallow	4.17	3.61	3.30	1.35
153-MW-A13T	Deep	3.84	3.36	3.41	3.88
153-MW-A15	Shallow	3.17	2.49	2.26	2.38
154-MW-A01	Shallow	12.11	11.31	11.03	11.07
154-MW-A06	Shallow	13.62	11.56	11.47	12.29
154-MW-A5A	Shallow	12.15	11.40	11.23	11.14
154-MW-B6A	Shallow	13.37	12.00	11.95	11.97
154-MW-C6A	Shallow	12.87	12.10	11.91	11.90
154-MW-D01	Shallow	13.60	12.45	12.01	11.92
154-MW-E08	Shallow	14.12	12.72	12.62	12.72
163-MW-CC08	Shallow	NA	NA	NA	NA[1]
163-MW-R05	Shallow	5.55	4.82	4.74	4.45
184-MW-001	Shallow	8.31	7.71	6.96	3.68
184-MW-002	Shallow	4.16	3.85	3.50	NA
184-MW-C10	Shallow	11.37	10.02	NA	8.39
184-PZ-116A[1]	Shallow	5.50	5.11	4.61	NA[1]
184-PZ-116B[1]	Intermediate	4.74	4.24	2.81	NA[1]
184-PZ-118[1]	Shallow	5.30	4.72	4.64	NA[1]
184-PZ-120[1]	Shallow	5.11	4.89	4.86	NA[1]
KP-MW-6BR-1	Rock	0.00	-0.37	0.18	-0.24
KP-MW-6BR-2	Rock	0.03	-1.29	-0.13	-0.77
KP-MW-6BR-3	Rock	-5.53	-15.31	-13.69	-46.65
SA6-MW-14BR	Rock	3.56	3.37	3.02	2.92
SA6-MW-15BR	Rock	1.35	1.86	1.46	0.87
SA6-MW-5BR-1	Rock	2.21	-0.96	2.79	1.42
SA6-MW-5BR-2	Rock	2.93	2.54	3.01	2.09
SA6-MW-5BR-3	Rock	3.31	3.13	3.11	2.49
SA6-MW-5BR-4	Rock	3.34	3.08	2.08	2.56
SA6-MW-5BR-5	Rock	3.68	3.35	2.47	2.87
SA6-MW-AA1	Shallow	4.57	3.87	3.39	3.69
SA6-MW-AA1D	Intermediate	0.36	1.40	0.99	0.90
SA6-MW-AA1T	Deep	1.05	1.23	0.85	0.69

Note:

1. Wells were decomissioned prior to last quarter event.

Table 2-2

GWET Pumping Outages in 2010

Well ID	Start Date	End Date	Duration Days and	Hours	Comment
087-PW-1	15-Dec-09	16-Dec-09	1	0.5	Shut down for PW-2 acid line cleaning pump and soak.
087-PW-2	15-Dec-09	16-Dec-09	1	0.5	Shut down for PW-2 acid line cleaning pump and soak.
115-MW-203BR	15-Dec-09	16-Dec-09	--	23	Shut down for PW-2 acid line cleaning pump and soak.
087-PW-1	9-Feb-10	9-Feb-10	--	9	Shut down for PW-2 acid line cleaning pump and soak.
087-PW-2	9-Feb-10	9-Feb-10	--	9	Shut down for PW-2 acid line cleaning pump and soak.
087-PW-2	9-Feb-10	11-Feb-10	1	16.3	Shut down due to power cable failure (replaced).
087-PW-1	15-Feb-10	17-Feb-10	--	--	Multiple shut downs during period of 2 days and 9 hours lasting 1.5 to 6 hours; repeated resets are unsuccessful.
087-PW-1	19-Feb-10	22-Feb-10	2	23.3	Shut down - cable and motor replaced.
087-PW-2	18-Mar-10	19-Mar-10	--	18.6	Shut down due to overcurrent (pump replaced).
087-PW-2	19-Mar-10	22-Mar-10	2	21	Shut down for the weekend - flow too low (throtteled down to 7.5 gpm).[1]
087-PW-1	24-Apr-10	26-Apr-10	2	8	Shut down due to starter overload trip.
087-PW-2	6-May-10	7-May-10	1	5.7	Shut down for well redevelopment.
087-PW-1	10-May-10	11-May-10	1	0.3	Shut down for PW-2 acid line cleaning pump and soak.
087-PW-2	10-May-10	11-May-10	1	0	Shut down for PW-2 acid line cleaning pump and soak.
115-MW-203BR	10-May-10	11-May-10	--	21	Shut down for PW-2 acid line cleaning pump and soak.
087-PW-1	19-Oct-10	20-Oct-10	1	2	Shut down for PW-2 acid line cleaning pump and soak.
087-PW-2	19-Oct-10	20-Oct-10	1	2	Shut down for PW-2 acid line cleaning pump and soak.
115-MW-203BR	19-Oct-10	20-Oct-10	--	23.5	Shut down for PW-2 acid line cleaning pump and soak.
087-PW-2	6-Dec-10	6-Dec-10	--	9.3	Shut down due to overload (pump replaced).

Note: 1. Department approved a new flow rate for the PW-2 forcemain: 7.5 gpm (50% of the design flow rate), starting on March 22, 2010.

Table 3-1

Summary of Ground Water Quality Data from Monitoring Wells
December 2010

	Unfiltered		Filtered	
Well	Total Cr (mg/L)	Hex Cr. (mg/L)	Total Cr. (mg/L)	Hex Cr. (mg/L)
079-MW-13BR-2	ND	ND	ND	ND
087-MW-A26D	ND	ND	ND	ND
087-MW-A26T	ND	ND	ND	ND
087-MW-W25D	ND	ND	ND	ND
087-MW-W25T	0.026	ND	ND	ND
090-MW-18BR	0.030	ND	ND	ND
117-MW-8BR	ND	ND	ND	ND
117-MW-D3	0.014	ND	ND	ND
117-MW-I1	ND	ND	ND	ND
117-MW-I5	0.605	0.54	0.618	0.56
119-MW-01T	0.020	ND	ND	ND
119-MW-02T	0.014	ND	ND	ND
119-MW-16BR-2	ND	ND	ND	ND
119-MW-2BR-2	pending - no access (Droyer's Cove)			
124-MW-102T	0.014	ND	ND	ND
124-MW-104T	0.062	0.029	0.050	0.038
124-MW-106T	0.011	ND	ND	ND
124-MW-107T	0.021	ND	ND	ND
124-MW-8BR	ND	ND	ND	ND
124-MW-G02T	ND	ND	ND	ND
140-MW-9BR-1	ND	ND	ND	ND
KP-MW-6BR-1	ND	ND	ND	ND
SA6-MW-14BR	ND	ND	ND	ND
SA6-MW-15BR-1	ND	ND	ND	ND
SA6-MW-AA1D	0.020	ND	ND	ND
SA6-MW-AA1T	0.013	ND	ND	ND
115-MW-E08TR	11.6	12.1	11.3	11.6

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

Parameter	18-Jan-10			19-Feb-10			16-Mar-10		
	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	5.2	13.1	ND	4.7	12.1	ND	5.6	13,2	ND
Carbon Tetrachloride	14.7	5.4	1.5	11.3	5.4	1.7	13.0	5.7	2.0
Chloroform	22.5	290	ND	21.5	290	ND	24.1	282	0.19
1,1-Dichloroethene	1.5	ND	ND	1.0	ND	ND	1.3	ND	ND
cis-1,2-Dichloroethene	191	30.2	ND	226	26.4	ND	225	31.0	ND
trans-1,2-Dichloroethene	12.6	0.51	ND	12.1	0.28	ND	12.9	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	207	166	ND	208	165	ND	209	176	ND
1,1-Dichloroethane	0.76	ND	ND	0.63	ND	ND	0.77	ND	ND
Methylene chloride	ND	13.0	ND	ND	10.4	ND	ND	10.8	ND
Vinyl chloride	23.9	5.7	ND	20.4	5.1	ND	25.9	6.5	ND
1,2-Dichlorobenzene	1.3	ND	ND	1.0	ND	ND	1.1	ND	ND
Chlorobenzene	0.74	ND	ND	0.72	ND	ND	0.71	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	0.3	ND
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium	58,900	26,200	13,900	57,300	26,500	16,200	59,200	26,400	14,700
Total Chromium	67,500	29,100	15,600	59,000	27,100	15,900	60,100	26,400	14,800

NA = Not Available for Testing due to COPR excavation activities.

ND = Not detected above reporting limit.

J = estimated value.

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

Parameter	14-Apr-10			14-May-10			18-Jun-10		
	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	12.8	ND	5.4	12.4	ND	6.0	12.9	ND
Carbon Tetrachloride	16.6	7.6	2.5	10.4	5.2	1.9	12.0	5.1	1.7
Chloroform	23.8	266	ND	22.9	251	ND	29.8	217	0.2
1,1-Dichloroethene	1.5	ND	ND	1.6	ND	ND	2.2	ND	ND
cis-1,2-Dichloroethene	223	26.6	ND	234	30.1	ND	238	33.2	ND
trans-1,2-Dichloroethene	12.5	ND	ND	11.9	0.5	ND	14.0	0.73	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	223	188	ND	194	164	ND	171	169	ND
1,1-Dichloroethane	0.58	ND	ND	0.73	ND	ND	0.98	ND	ND
Methylene chloride	ND	7.8	ND	ND	11.2	ND	ND	11.3	ND
Vinyl chloride	17.7	4.4	ND	16.8	4.9	ND	22.4	6.4	ND
1,2-Dichlorobenzene	1.3	ND	ND	1.2	ND	ND	1.2	ND	ND
Chlorobenzene	0.83	ND	ND	0.73	ND	ND	0.77	ND	ND
Ethylbenzene	ND	ND	ND	ND	0.19	ND	ND	ND	ND
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium	55,000	24,700	15,800	58,100	27,200	16,800	54,300	21,500	15,300
Total Chromium	60,100	30,800	15,400	54,200	24,400	16,100	53,200	21,300	14,400

NA = Not Available for Testing due to COPR excavation activities.

ND = Not detected above reporting limit.

J = estimated value.

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

Parameter	14-Jul-10			16-Aug-10			20-Sep-10		
	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	12.4	ND	5.0	10.7	ND	4.3	10.2	ND
Carbon Tetrachloride	10.7	5.5	2.1	8.3	4.4	2.4	8.5	4.2	1.8
Chloroform	28.8	232	ND	27.4	208	ND	24.0	176	ND
1,1-Dichloroethene	2.0	ND	ND	ND	ND	ND	1.4	ND	ND
cis-1,2-Dichloroethene	280	31.4	ND	262	29.3	ND	211	26.9	ND
trans-1,2-Dichloroethene	13.4	0.77J	ND	11.4	ND	ND	10	0.86	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	193	163	ND	173	143	ND	162	132	ND
1,1-Dichloroethane	0.81J	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	10.2	ND	ND	8.6	ND	ND	6.9	ND
Vinyl chloride	17.2	6.1	ND	10.7	3.9	ND	9.6	3.4	ND
1,2-Dichlorobenzene	0.98J	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	0.77J	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium	55,100	21,500	15,900	55,500	20,700	15,500	49,600	21,000	15,700
Total Chromium	60,400	22,400	16,200	50,000	37,800	12,800	58,800	23,900	16,000

NA = Not Available for Testing due to COPR excavation activities.

ND = Not detected above reporting limit.

J = estimated value.

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

Parameter	14-Oct-10			15-Nov-10			15-Dec-10		
	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	5.2	7.9	ND	4.6	8.9	ND	5.2	3.6	ND
Carbon Tetrachloride	12.7	3.7	2.0	9.7	4.0	2.0	10.7	1.8J	1.9
Chloroform	31.0	138	ND	30.3	160	ND	32.9	60.1	ND
1,1-Dichloroethene	1.4	ND	ND	1.2	ND	ND	1.3	ND	ND
cis-1,2-Dichloroethene	216	21.3	ND	220	21.9	ND	207	9.1	ND
trans-1,2-Dichloroethene	10.3	0.85J	ND	9.7	0.93J	ND	9.6	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	179	108	ND	174	112	ND	198	46.8	ND
1,1-Dichloroethane	0.88J	ND	ND	0.73J	ND	ND	0.81J	ND	ND
Methylene chloride	0.78J	4.8	ND	1.8J	7.0	ND	0.98J	2.0	ND
Vinyl chloride	12.8	2.7	ND	11.5	3.7	ND	12.8	1.6J	ND
1,2-Dichlorobenzene	1.0	ND	ND	0.94J	ND	ND	1.1	ND	ND
Chlorobenzene	0.64J	ND	ND	0.54J	ND	ND	0.69J	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexavalent Chromium	50,800	20,100	17,300	47,600[1]	16,100	15,000	50,200	19,200	16,300
Total Chromium	53,100	21,000	15,500	51,600	26,200	14,300	44,800	20,500	15,900

NA = Not Available for Testing due to COPR excavation activities.

ND = Not detected above reporting limit.

J = estimated value.

Note: 1. Result from sample out of holding time due to the lab error.

APPENDIX B

FIGURES

ELEVATION IN FEET ABOVE MEAN SEA LEVEL

-100
-100
-100
-100
-100
-100

087-MW-35
087 MW-W25S, D,T
087-OBS-1D, L, T
087-OBS-3L
087-MW-13
087-MW-08
087-PW-2
087-OBS-5D
087-OBS-5T
087-OBS-2D
087-MW-34
087-PW-1
SA6-MW-5BR
SA6-MW-AA1, D, T

FISK STREET
OUTFALL

25S
35 (1.35)
1D (1.80)
13 (-1.94)
5D (1.04)
AA1 (3.75)
AA1D (0.90)
25D (0.36)
1L (0.77)
3L (-0.60)
5T (-0.34)
AA1T (0.69)
25T (0.81)
1T (1.03)
08 (0.62)
5BR (1.42)

1
0
-1
-2
-3
(-10.14)
(-8.06)
(-21.65)
(-1.05)

0 100 200
SCALE IN FEET

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

25T — SCREENED INTERVAL

CORNERSTONE Environmental Group, LLC

HONEYWELL
STUDY AREA 7

GROUNDWATER ELEVATIONS
DECEMBER 21, 2010

FIGURE NO.
2-1
PROJECT NO.
090354

N

SA6-MW-AA1 (3.69)
087-MW-U28 (N/A)
087-MW-W25 (4.67)
087-MW-029 (3.53)
087-MW-119 (4.43)
087-MW-120 (4.18)
087-MW-I30 (3.41)
087-MW-Y20 (2.83)
087-PZ-001 (3.65)
087-MW-023 (5.62)
087-PZ-005 (6.66)
087-MW-S19 (N/A)
115-W1-SO (6.75)
087-MW-019 (6.75)
087-MW-102 (2.12)
087-MW-101 (2.15)
087-MW-121 (2.00)
087-MW-A26 (2.46)
087-PZ-003 (5.01)
087-MW-001 (6.28)
073-MW-BB11 (3.31)
073-PZ-001 (3.69)
073-MW-Y10 (3.97)
163-MW-CC08 (N/A)
086-PZ-003 (4.26)
088-MW-103 (1.79)
088-MW-001 (3.60)
088-MW-102 (2.33)
088-MW-101 (2.23)
088-PZ-001 (4.45)
088-MW-002 (5.66)
079-MW-A2 (2.88)
184-MW-002 (N/A)
079-MW-C6 (N/A)
184-PZ-116A (N/A)
184-PZ-120 (N/A)
184-MW-001 (3.68)
184-MW-C10 (8.39)
134-MW-W09 (5.00)
134-PZ-001 (4.32)
134-PZ-003 (6.22)
134-MW-008 (5.93)
140-PZ-001 (5.58)
115-W5-SO (7.00)
140-MW-06 (6.12)
125-PZ-001 (6.71)
140-MW-07 (4.75)
140-MW-08 (N/A)
140-MW-1R (4.77)
125-MW-01 (5.51)
115-E1-SO (5.55)
125-PZ-005 (5.06)
115-E3-SO (5.95)
117-MW-A93 (6.07)
115-E2-SO (5.55)
117-MW-A82 (6.26)
124-MW-02 (5.82)
117-MW-A85 (5.40)
140-MW-10 (N/A)
117-MW-A89 (4.18)
124-MW-11 (4.53)
153-MW-A13 (1.39)
117-MW-A14 (5.07)
153-MW-A15 (2.38)
117-MW-A05 (6.93)
090-MW-F14 (10.48)
154-MW-D01 (11.92)
154-MW-A01 (11.07)
154-MW-E08 (12.72)
154-MW-A5A (11.14)
154-MW-C6A (11.90)
154-MW-B6A (11.97)
154-MW-A06 (12.29)

BARRIER WALL

STUDY AREA 5
BUILDING 5 DEWATERING
OPERATIONS

RIVER

HACKENSACK

LEGEND:

154-MW-E08	SHALLOW MONITORING WELL
(12.72)	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 21 2010

FIGURE NO. **2-2**

PROJECT NO. 090354

File: X:\PROJECTS\HONEYWELL\090354 - SA7_PROJECT DRAWINGS\2010- 4Q - Annual Figures\MIHONSF-01.dwg Layout: FIGURE 2-2 SHALLOW ZONE User: magda.mendola Feb 04, 2011 - 3:55pm

N

HACKENSACK RIVER

087-OBS-1D (1.80)
087-PW-2 (10.14)
087-OBS-5D (1.04)
087-OBS-2D (-2.06)
087-MW-13 (-1.94)
SA6-MW-AA1D (0.90)
087-MW-W25D (0.36)
087-MW-35 (1.35)
087-MW-029D (1.17)
087-PZ-002 (2.00)
087-PZ-006 (1.89)
115-W1-DO (1.13)
087-MW-A26D (2.24)
087-PZ-004 (1.82)
087-OBS-6D (1.76)
088-MW-15 (N/A)
073-PZ-002 (2.34)
115-E5-DO (1.90)
088-PZ-004 (1.79)
BARRIER WALL
115-W4-DO (2.40)
(2.13)
134-PZ-002
134-PZ-004 (2.20)
115-E4-DO (2.59)
088-PZ-002 (2.85)
115-E6-DO (2.11)
115-E6-DI (1.94)
115-MW-E14D (1.56)
(3.07)
140-PZ-002
(2.42)
125-PZ-002
140-MW-P05D (3.02)
(4.52)
115-E3-DO
(N/A)
117-MW-I3 (4.67)
117-MW-I4 (3.61)
STUDY AREA 5 BUILDING 5 DEWATERING OPERATIONS
115-E1-DI (1.98)
115-E1-DO (2.63)
(2.66)
125-PZ-004 (2.57)
124-MW-103D
115-E2-DO (4.18)
117-MW-I5 (5.69)
117-MW-I2 (6.28)
124-MW-105D (2.62)
124-MW-102D (2.54)
124-MW-G02D (3.15)
124-MW-104D (2.60)
117-MW-I1 (3.34)

1.0 0.0 -1.0 2.0 3.0 4.0 5.0 6.0 7.0

LEGEND:

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

0 400 800
SCALE IN FEET

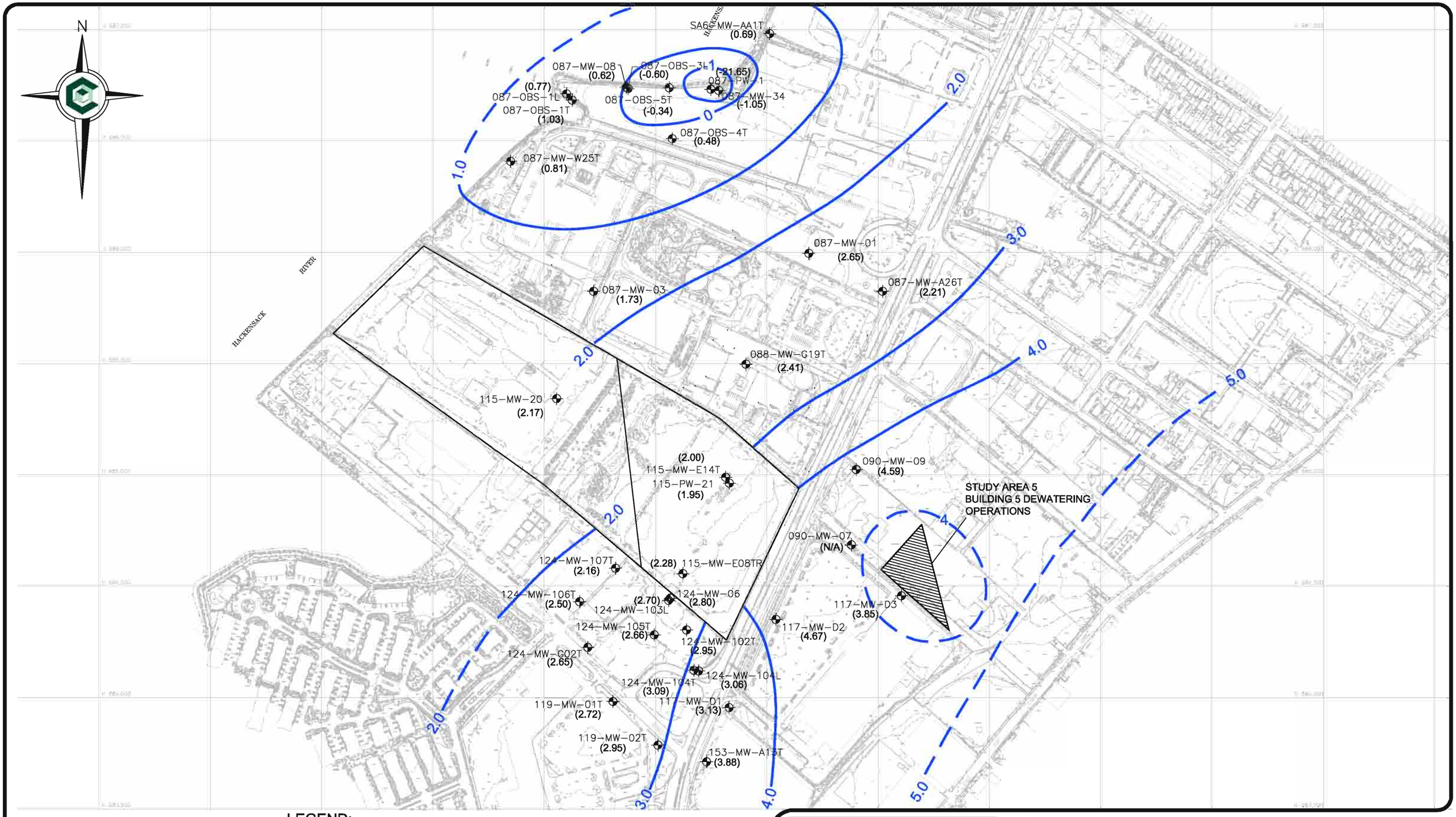
CORNERSTONE Environmental Group, LLC

HONEYWELL
STUDY AREA 7

GROUNDWATER ELEVATION CONTOURS INTERMEDIATE ZONE - DECEMBER 21, 2010

FIGURE NO. **2-3**

PROJECT NO. 090354



LEGEND:

087-MW-01 (2.65) — DEEP ZONE MONITORING WELL

WATER LEVEL ELEVATION (FT, MSL)

1.0 — GROUNDWATER CONTOUR (FT, MSL)

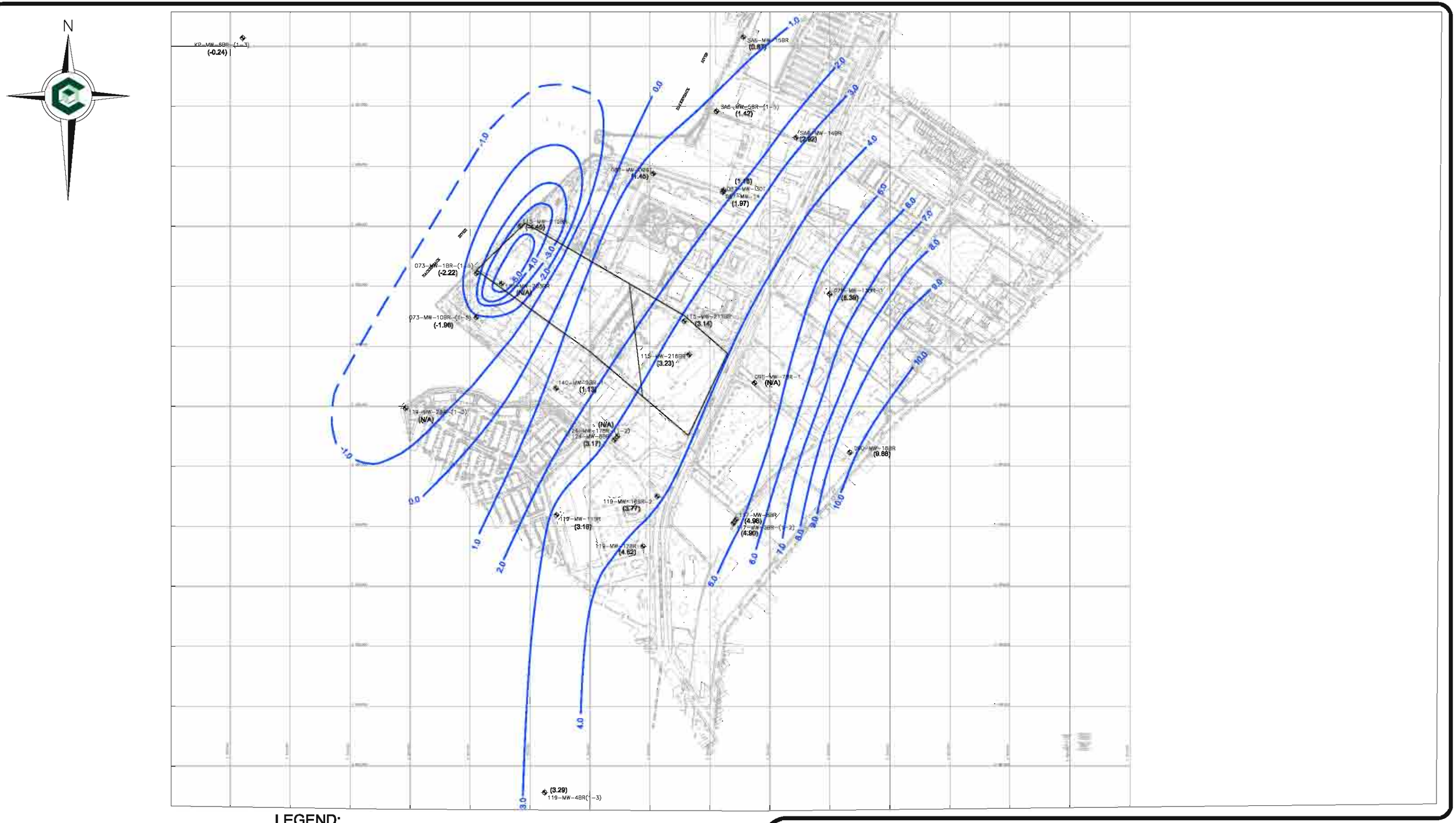
CORNERSTONE Environmental Group, LLC

HONEYWELL
STUDY AREA 7

GROUNDWATER ELEVATION CONTOURS DEEP ZONE - DECEMBER 21, 2010

FIGURE NO. **2-4**

PROJECT NO. 090354



LEGEND:

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

0 750 1500

SCALE IN FEET

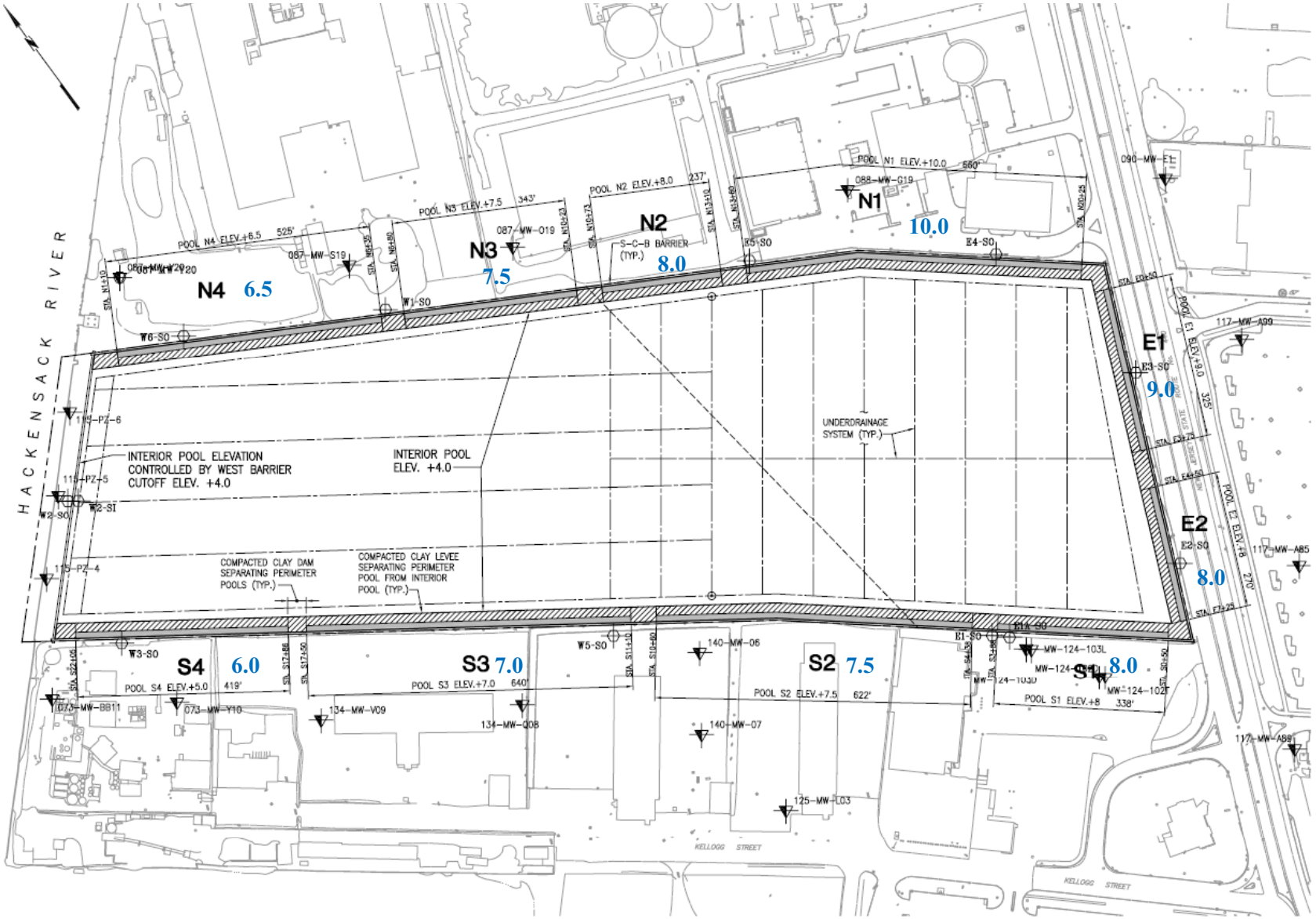
CORNERSTONE Environmental Group, LLC

HONEYWELL
STUDY AREA 7

GROUNDWATER ELEVATION CONTOURS BEDROCK ZONE - DECEMBER 21, 2010

FIGURE NO.
2-5
PROJECT NO.
090354

File: X:\PROJECTS\HONEYWELL\090354 - SA7_PROJECT DRAWINGS\2010- 4Q - Annual Figures\MIHONSF-04.dwg Layout: FIGURE 2-5 BEDROCK ZONE User: magda.mendola Feb 04, 2011 - 6:15pm



LEGEND:

N2 – Perimeter Pool

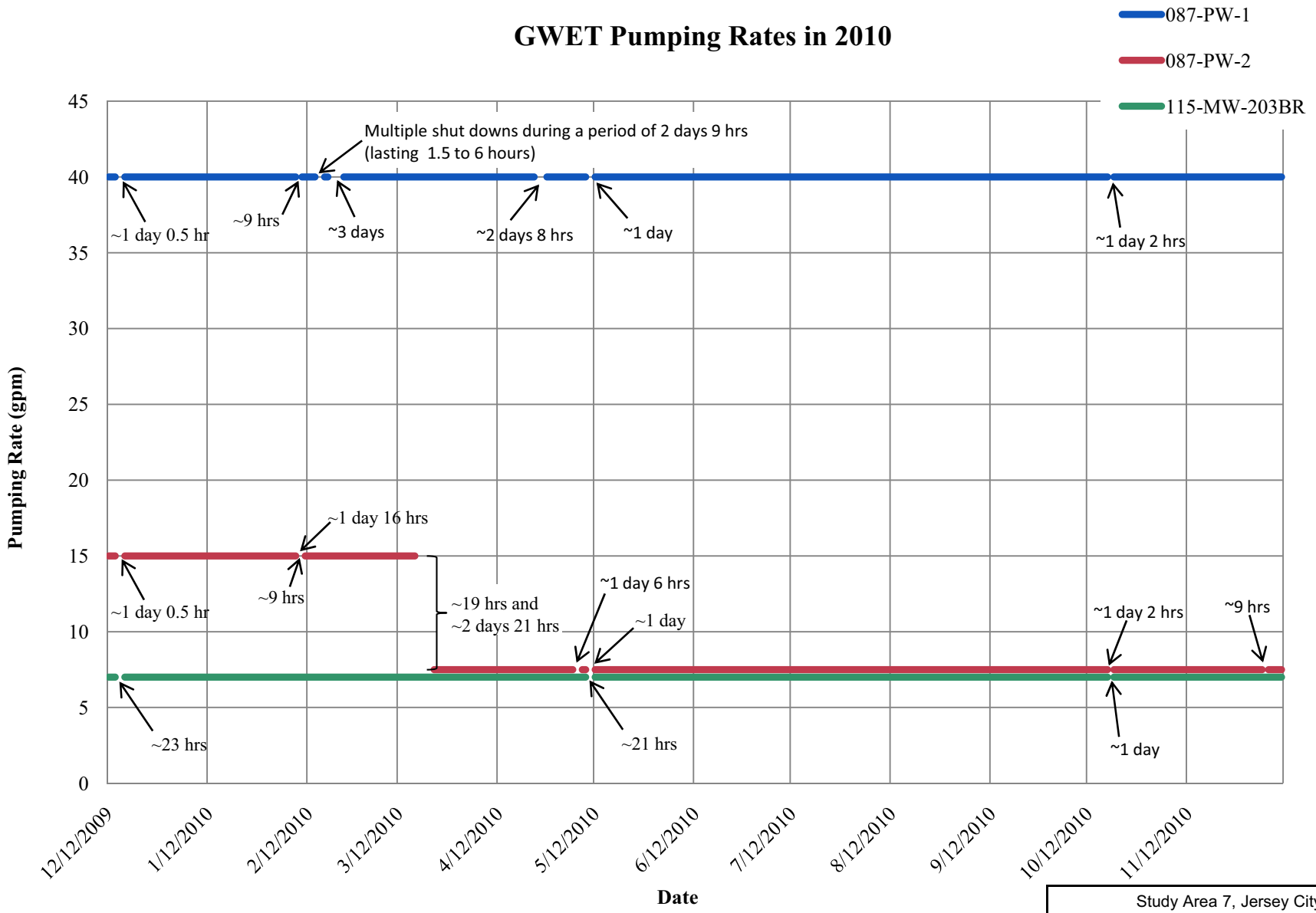
8.0 – Design Elevation of Perimeter Pool Water Level (ft, msl)

Study Area 7, Jersey City, NJ
Annual Progress Report

Figure 2-6

Location of SA-7 Perimeter Pools

CORNERSTONE Environmental Group, LLC



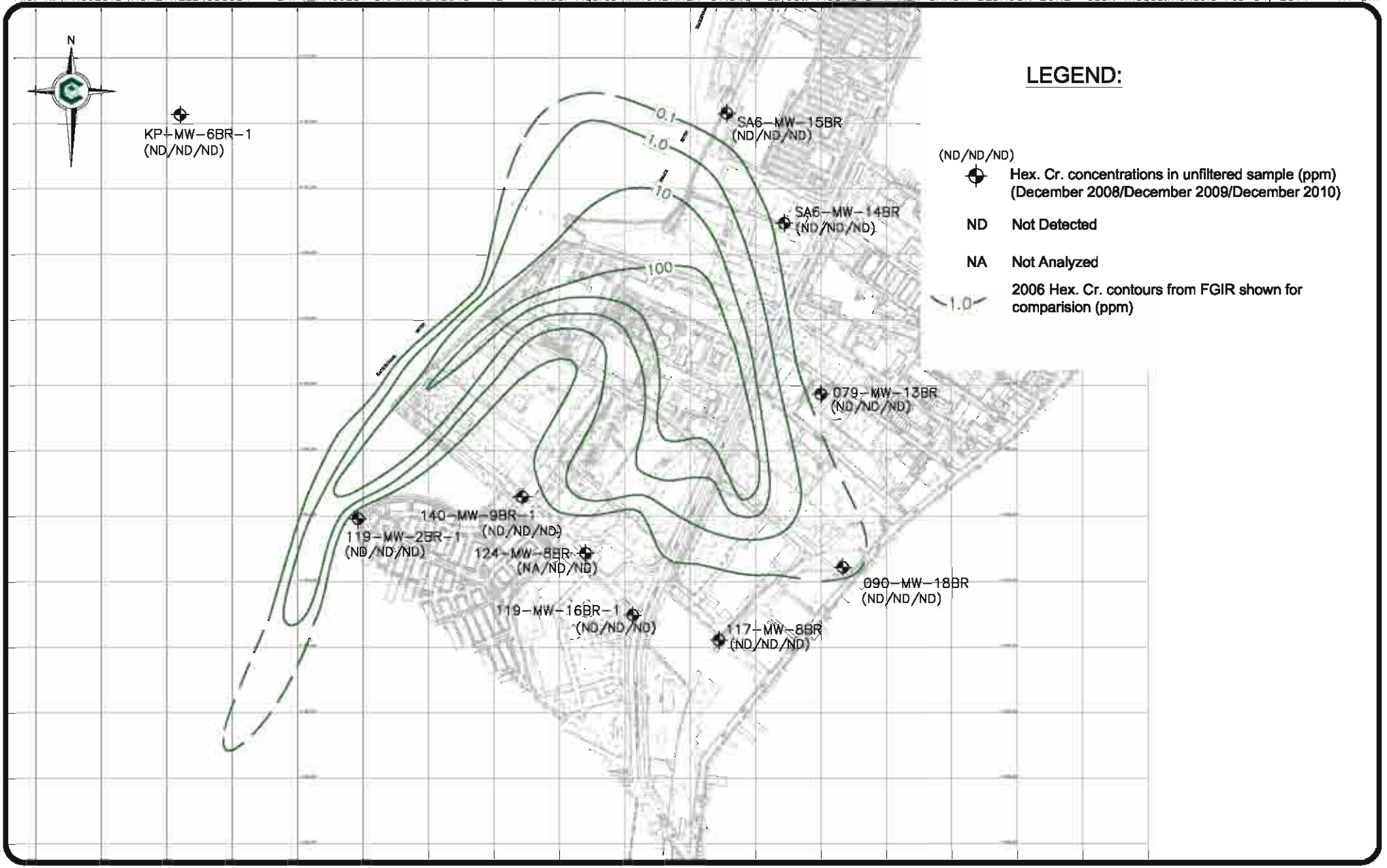
Notes:
1. Outages exceeding 8 hour duration shown on graph.
2. For outages details see Table 2-2.
3. Department approved a new flow rate for the PW-2 forcemain: 7.5 gpm, starting on March 22, 2010.

Study Area 7, Jersey City, NJ
Annual Progress Report

Figure 2-7

GWET Pumping Rates in 2010

CORNERSTONE Environmental Group, LLC



0 1000 2000

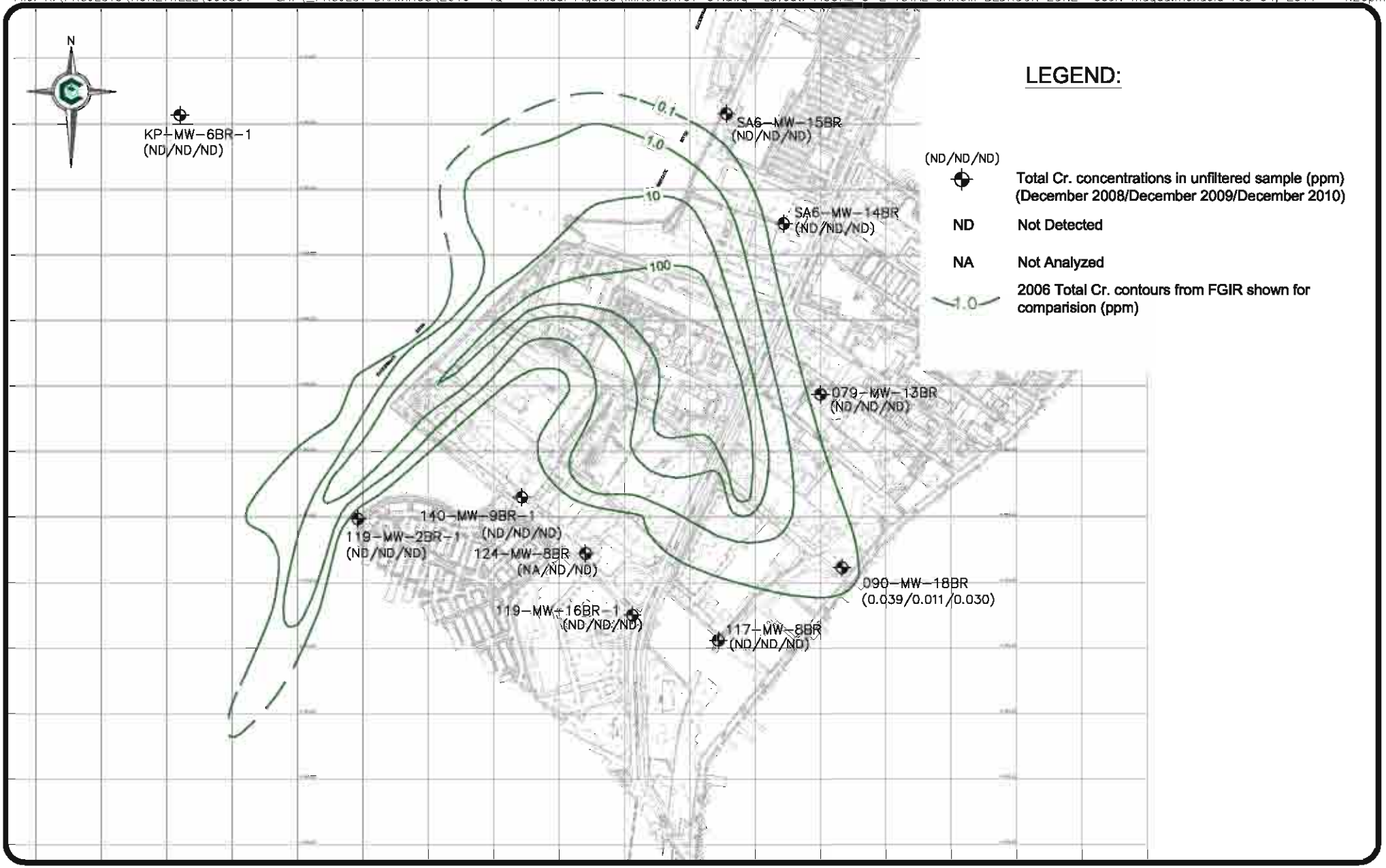
SCALE IN FEET

CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Hexavalent Chromium Concentrations in Bedrock Groundwater

FIGURE NO.
3-1
PROJECT NO.
090354



0 1000 2000

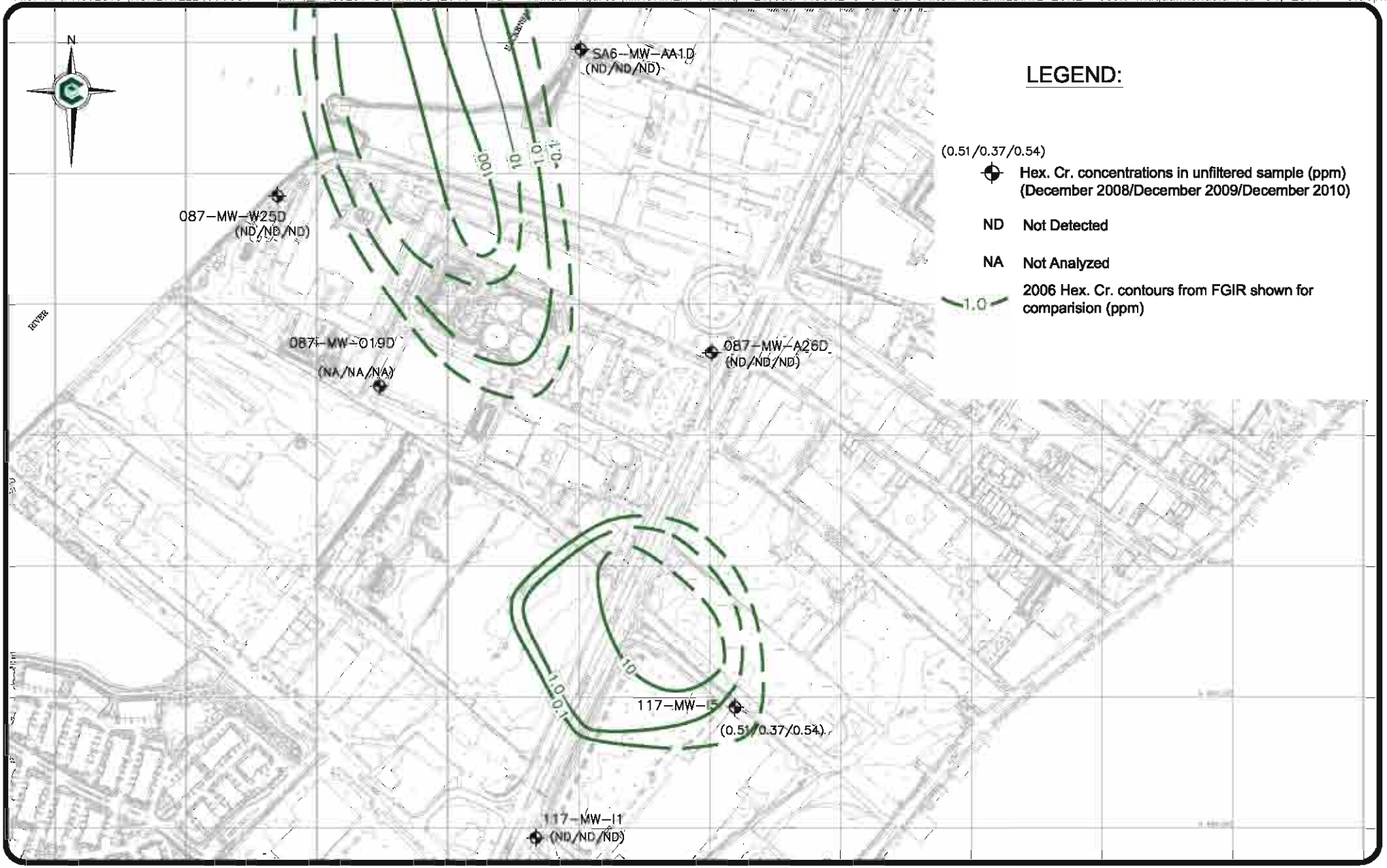
SCALE IN FEET

CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Total Chromium Concentrations in Bedrock Groundwater

FIGURE NO.
3-2
PROJECT NO.
090354



LEGEND:

(0.51/0.37/0.54) Hex. Cr. concentrations in unfiltered sample (ppm) (December 2008/December 2009/December 2010)

ND Not Detected

NA Not Analyzed

1.0 2006 Hex. Cr. contours from FGIR shown for comparision (ppm)

0 500 1000

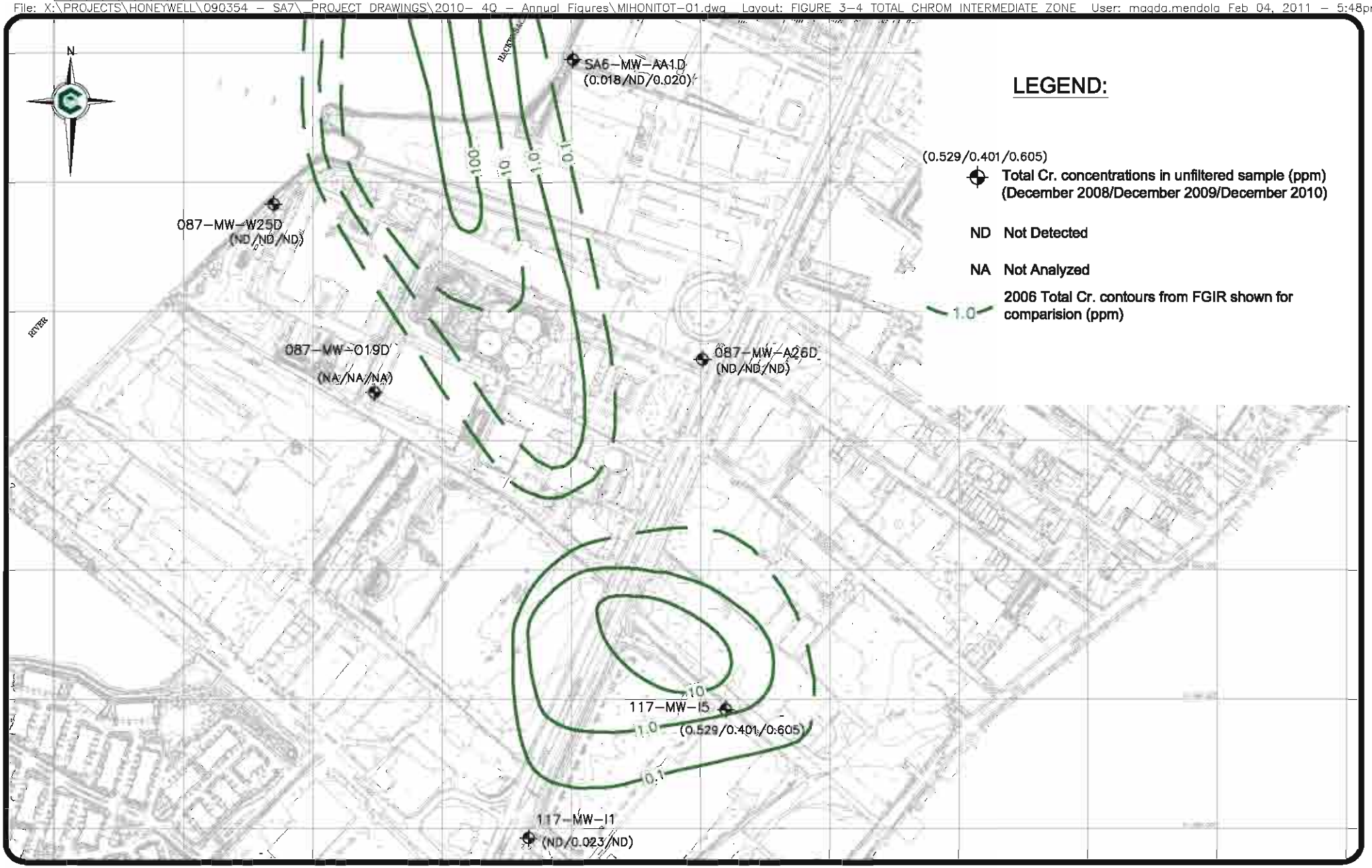
SCALE IN FEET

CORNERSTONE Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Hexavalent Chromium Concentrations in Intermediate Zone Groundwater

FIGURE NO.
3-3
PROJECT NO.
090354



0 500 1000
SCALE IN FEET

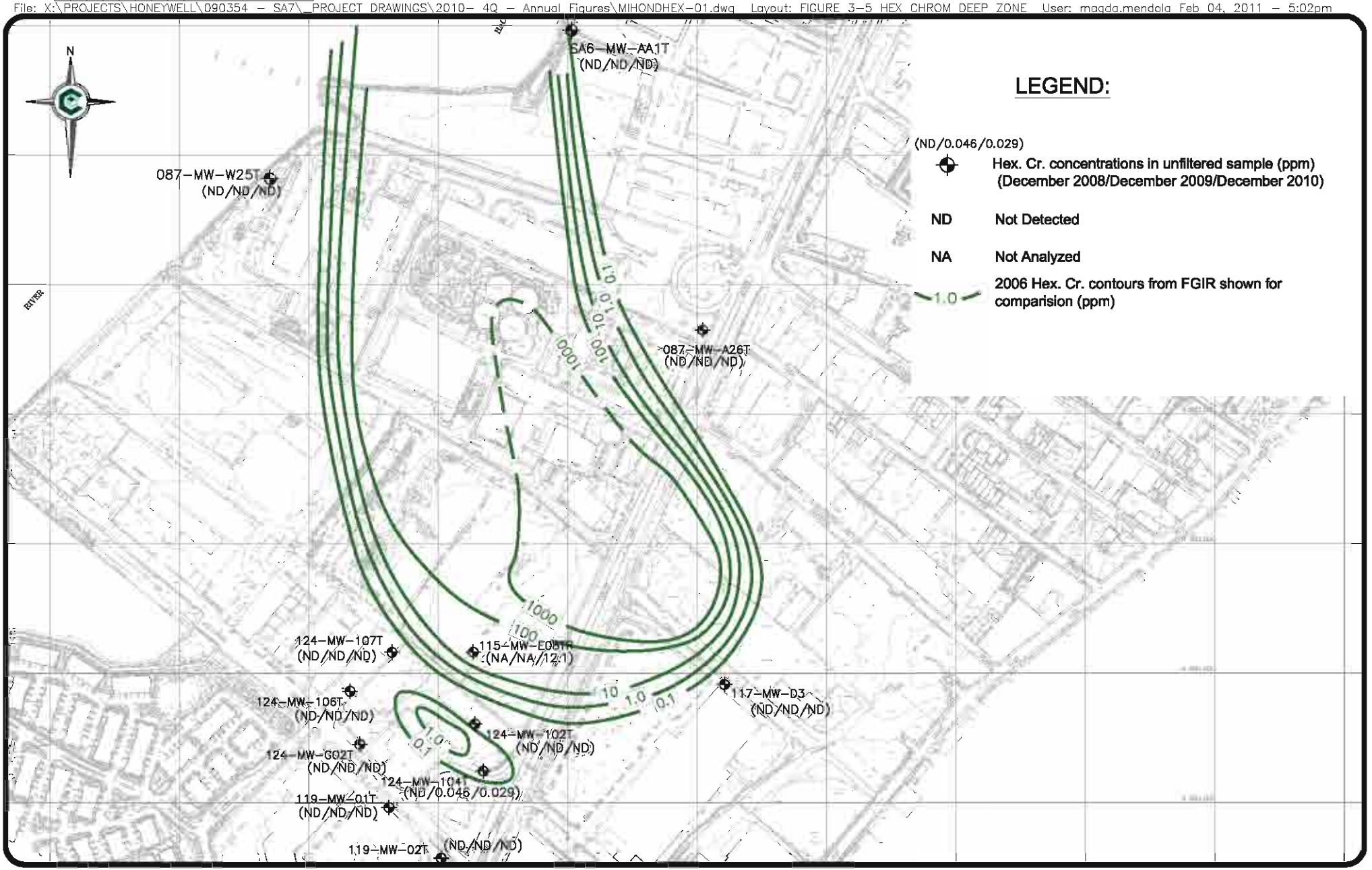
CORNERSTONE
Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Total Chromium Concentrations in Intermediate Zone Groundwater

FIGURE NO.
3-4
PROJECT NO.
090354

File: X:\PROJECTS\HONEYWELL\090354 - SA7_PROJECT DRAWINGS\2010- 4Q - Annual Figures\MIHONDHEX-01.dwg Layout: FIGURE 3-5 HEX CHROM DEEP ZONE User: magda.mendala Feb 04, 2011 - 5:02pm



LEGEND:

(ND/0.046/0.029) Hex. Cr. concentrations in unfiltered sample (ppm) (December 2008/December 2009/December 2010)

ND Not Detected

NA Not Analyzed

1.0 2006 Hex. Cr. contours from FGIR shown for comparision (ppm)

0 500 1000

SCALE IN FEET

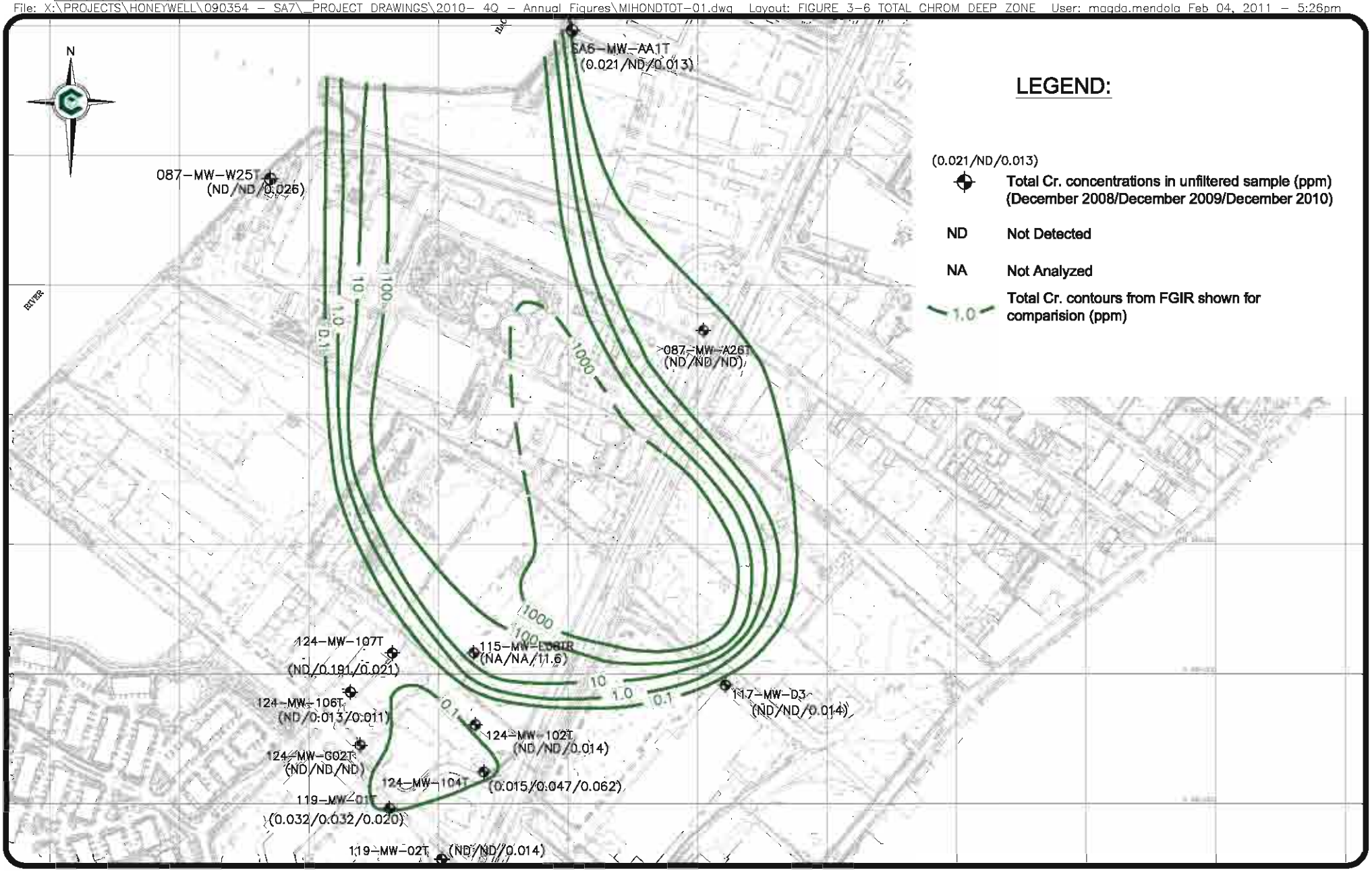
CORNERSTONE Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Hexavalent Chromium Concentrations in Deep Groundwater

FIGURE NO.
3-5
PROJECT NO.
090354

File: X:\PROJECTS\HONEYWELL\090354 - SA7_PROJECT DRAWINGS\2010- 4Q - Annual Figures\MIHONDTOT-01.dwg Layout: FIGURE 3-6 TOTAL CHROM DEEP ZONE User: magda.mendola Feb 04, 2011 - 5:26pm



LEGEND:

(0.021/ND/0.013)	Total Cr. concentrations in unfiltered sample (ppm) (December 2008/December 2009/December 2010)
ND	Not Detected
NA	Not Analyzed
1.0	Total Cr. contours from FGIR shown for comparision (ppm)

0 500 1000

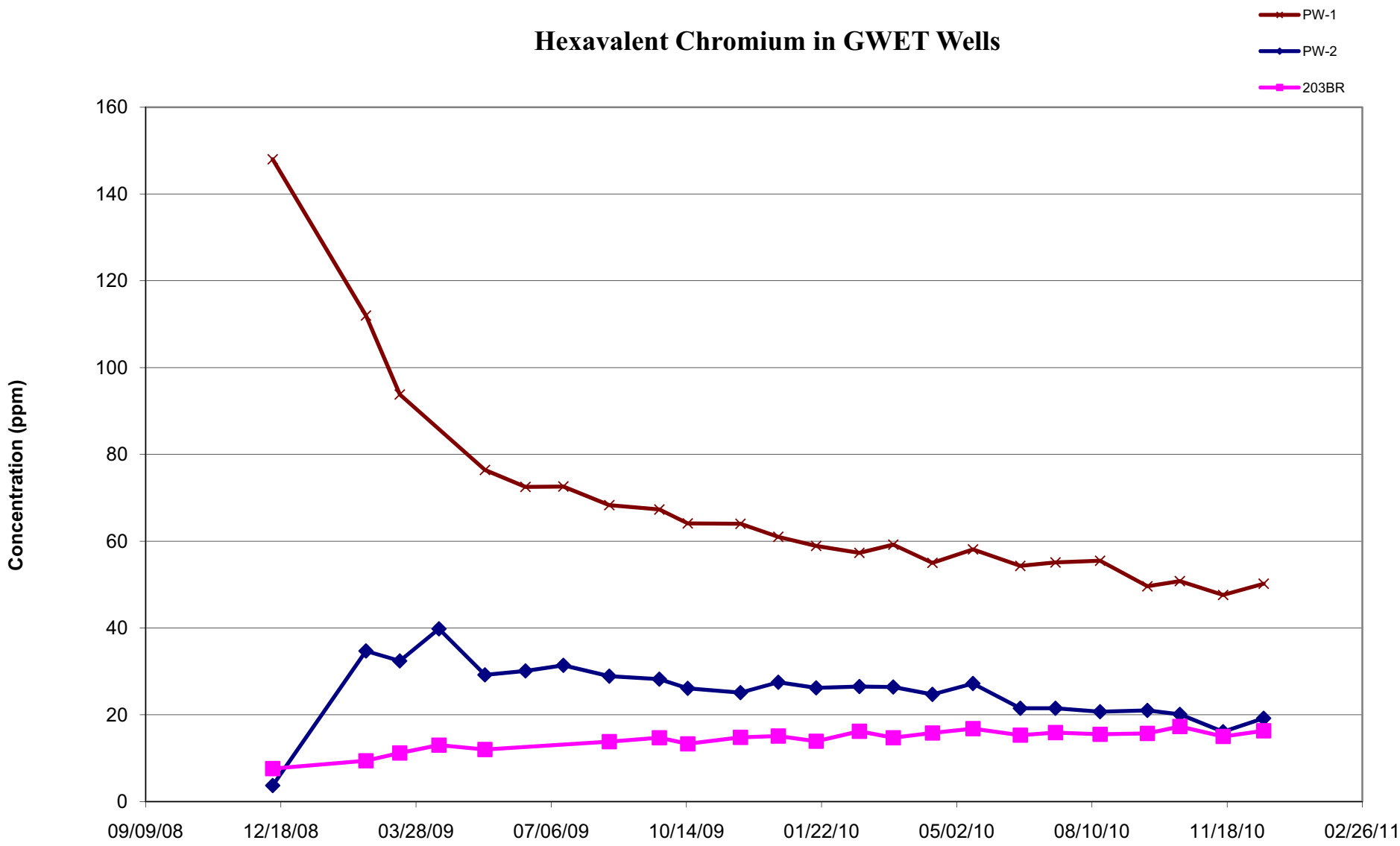
SCALE IN FEET

CORNERSTONE Environmental Group, LLC

HONEYWELL
STUDY AREA 7

Total Chromium Concentrations in Deep Groundwater

FIGURE NO.
3-6
PROJECT NO.
090354

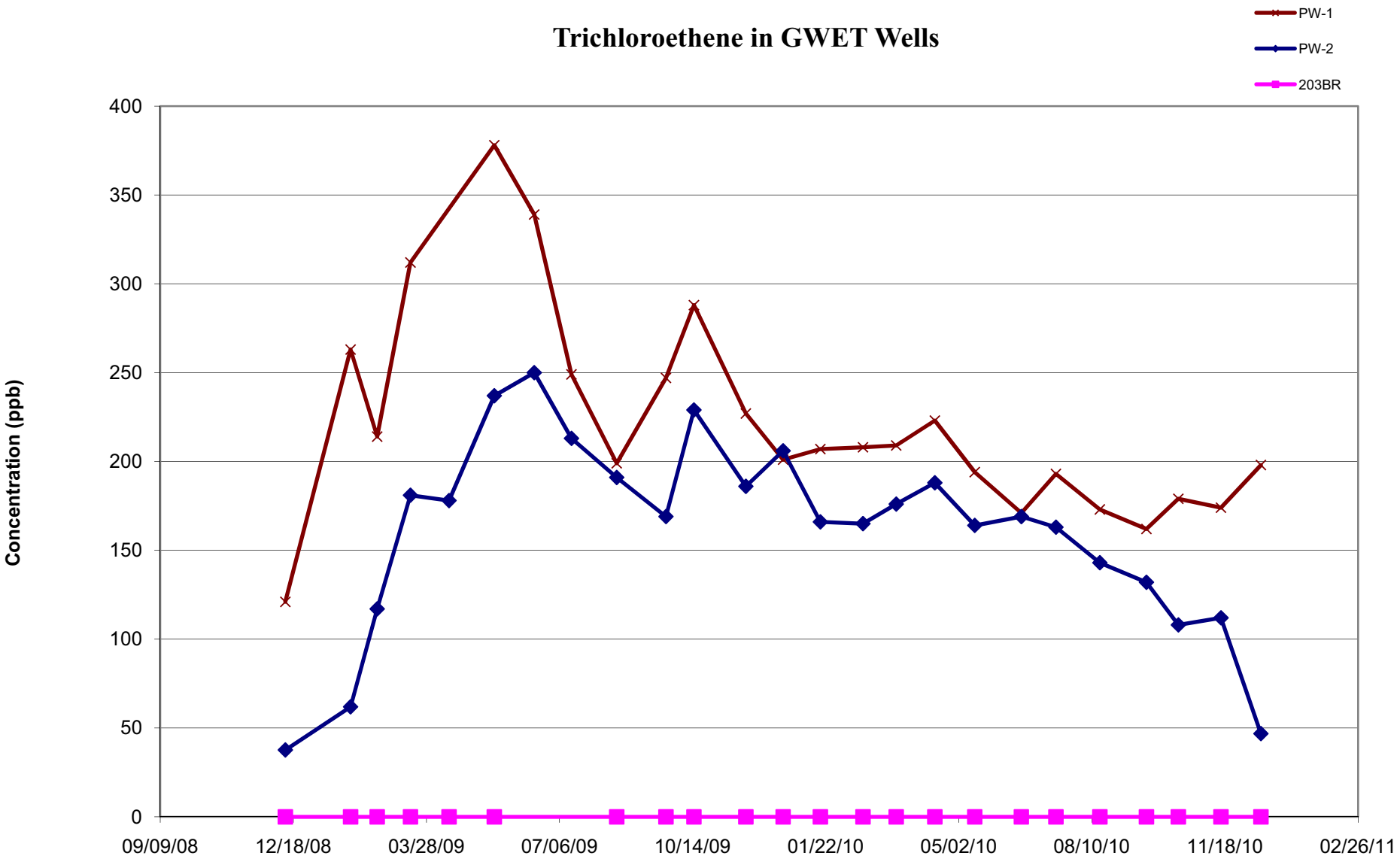


Study Area 7, Jersey City, NJ
Annual Progress Report

Figure 3-7

Hexavalent Chromium Concentrations
in GWET Pumping Wells

CORNERSTONE
Environmental Group, LLC



Study Area 7, Jersey City, NJ
Annual Progress Report

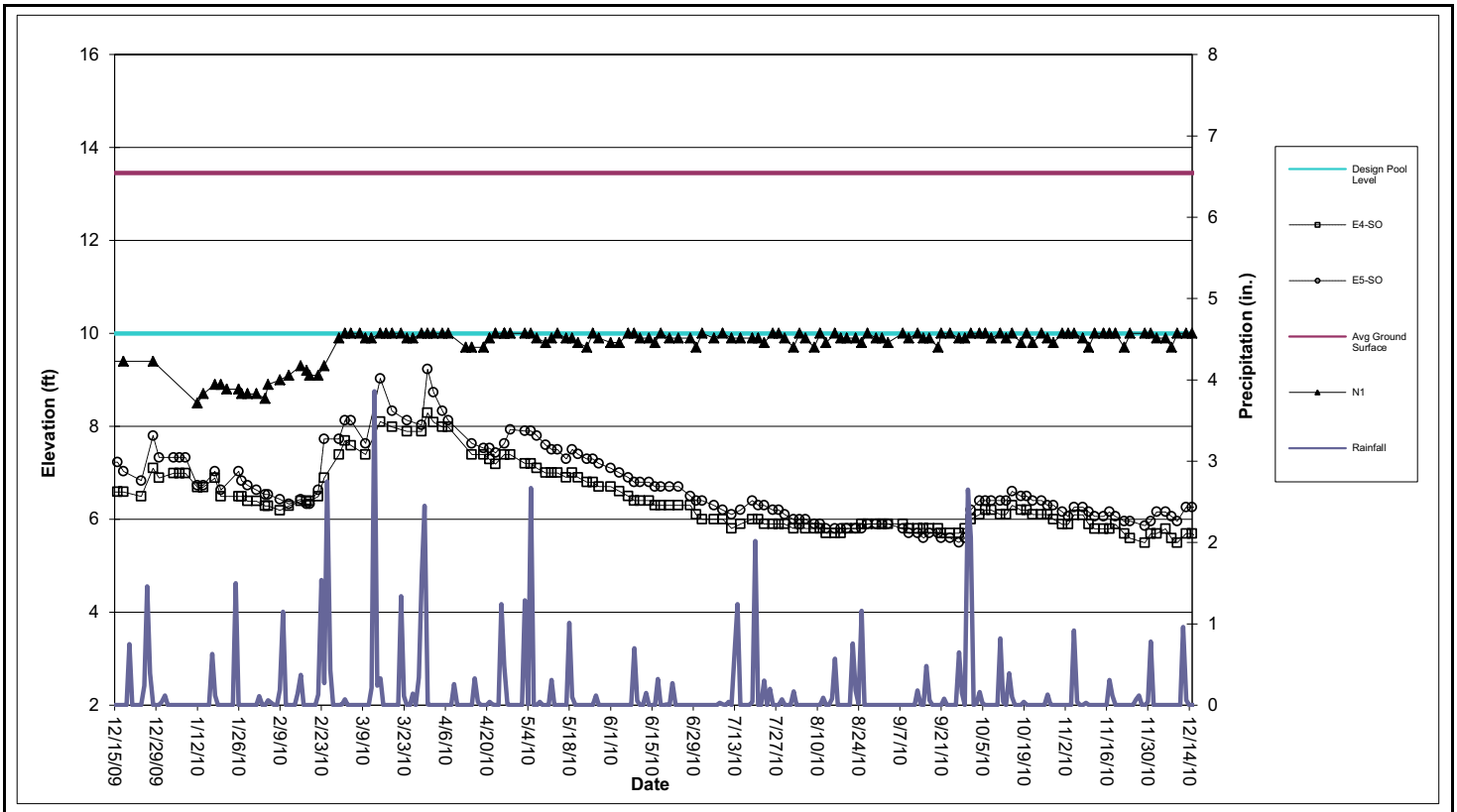
Figure 3-8

Trichloroethylene Concentrations
in GWET Pumping Wells

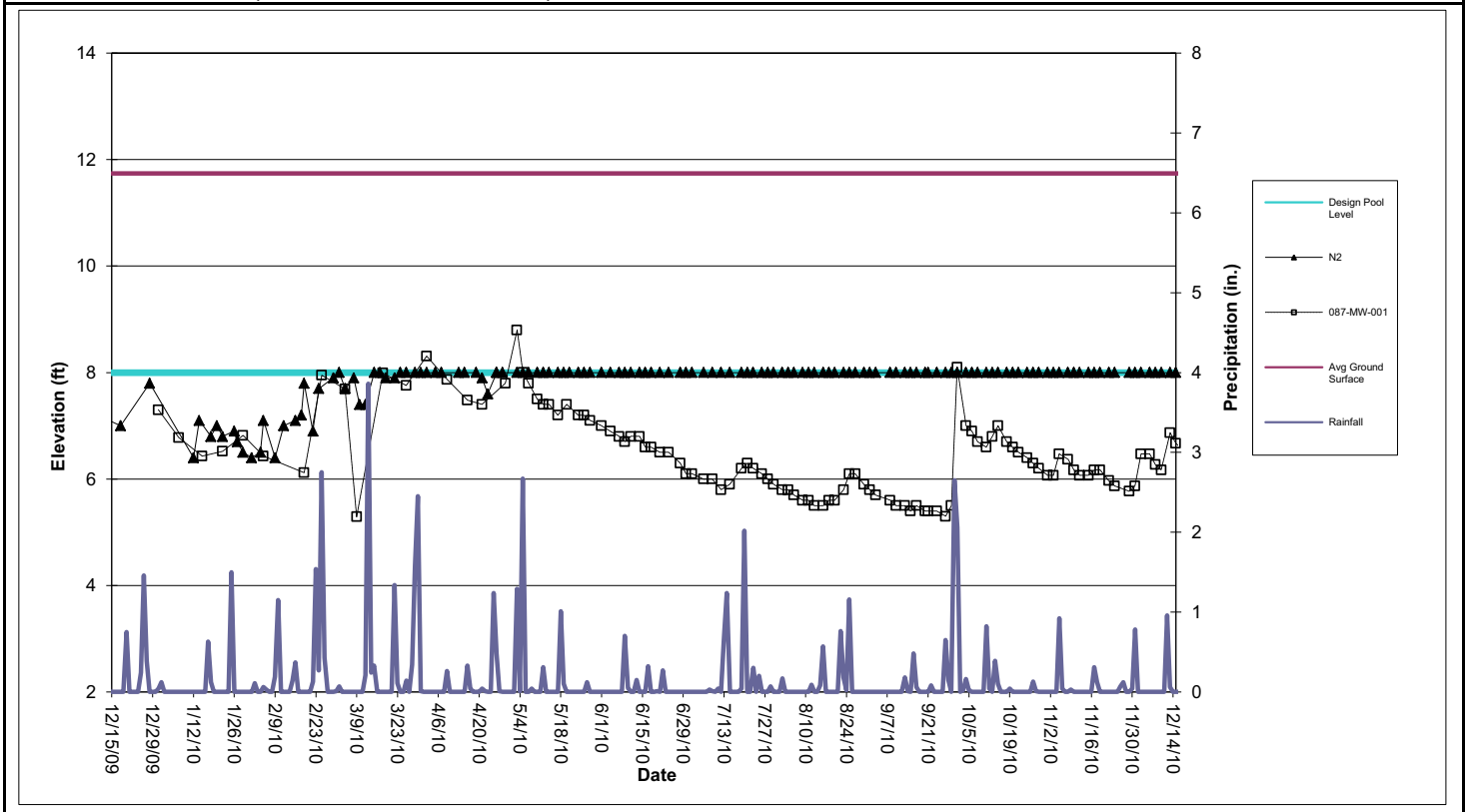
CORNERSTONE
Environmental Group, LLC

APPENDIX C

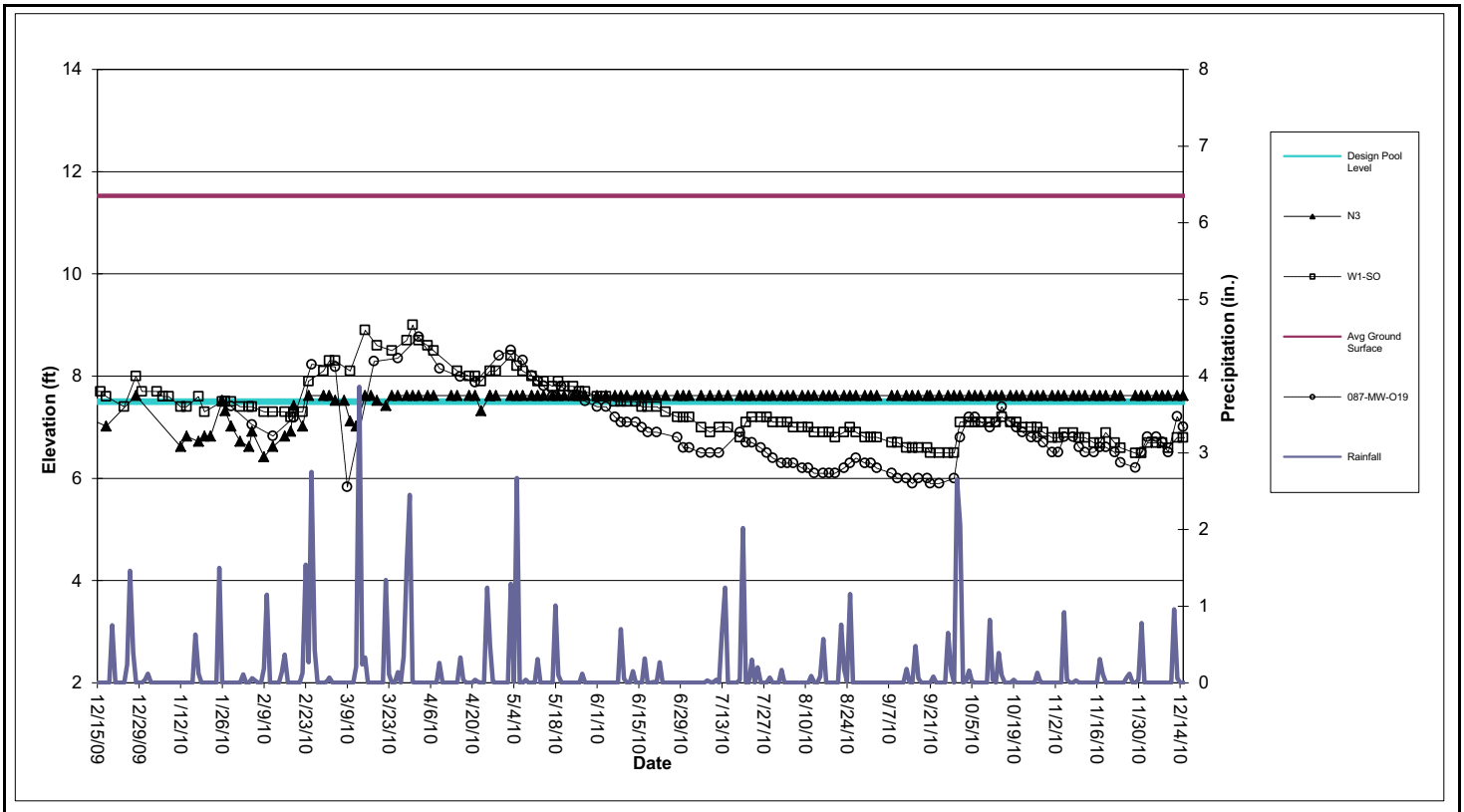
SA-7 PERIMETER POOL HYDROGRAPHS



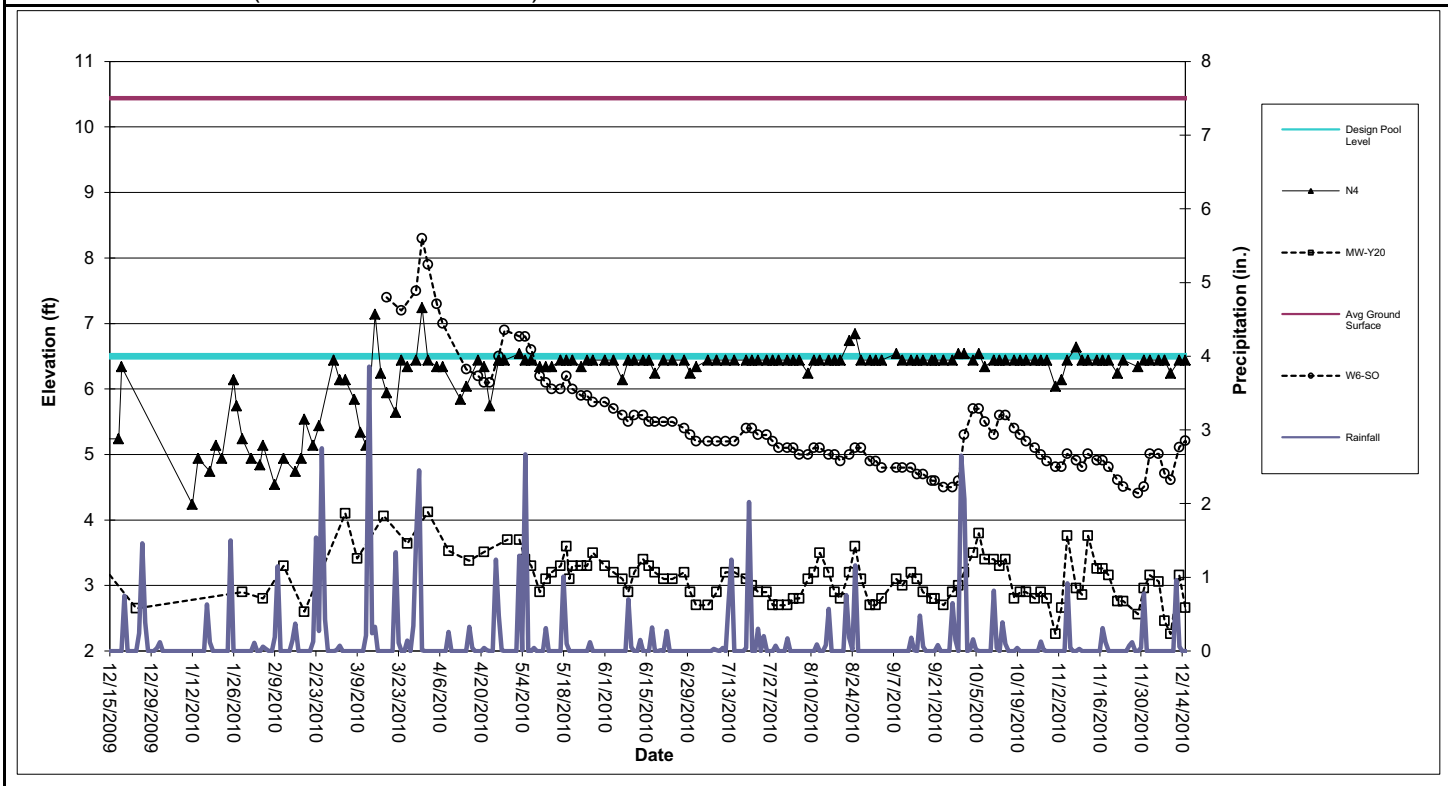
Perimeter Pool N1 (Sta. N13+60 to N20+25)



Perimeter Pool N2 (Sta. N10+73 to N13+10)

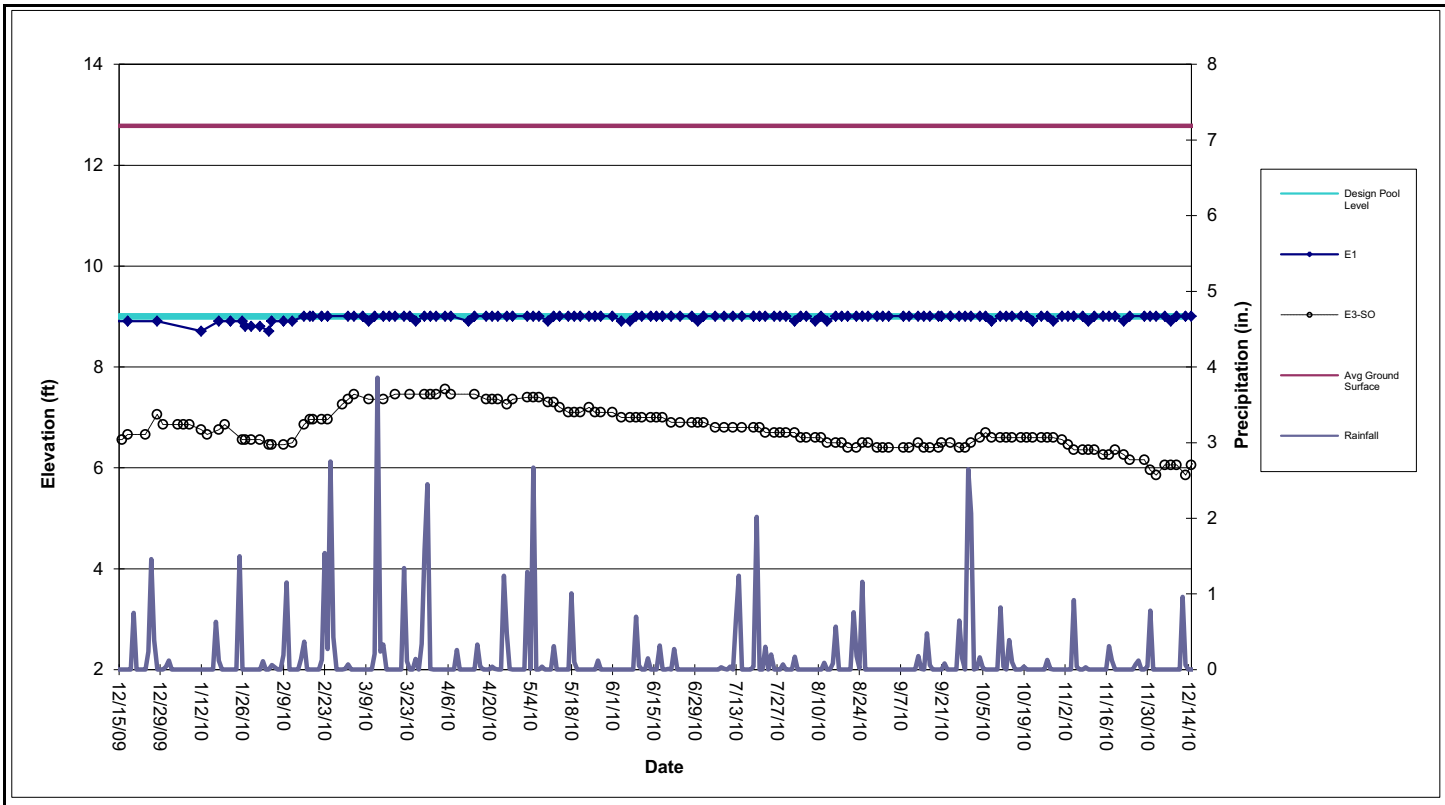


Perimeter Pool N3 (Sta. N6+80 to N10+23)

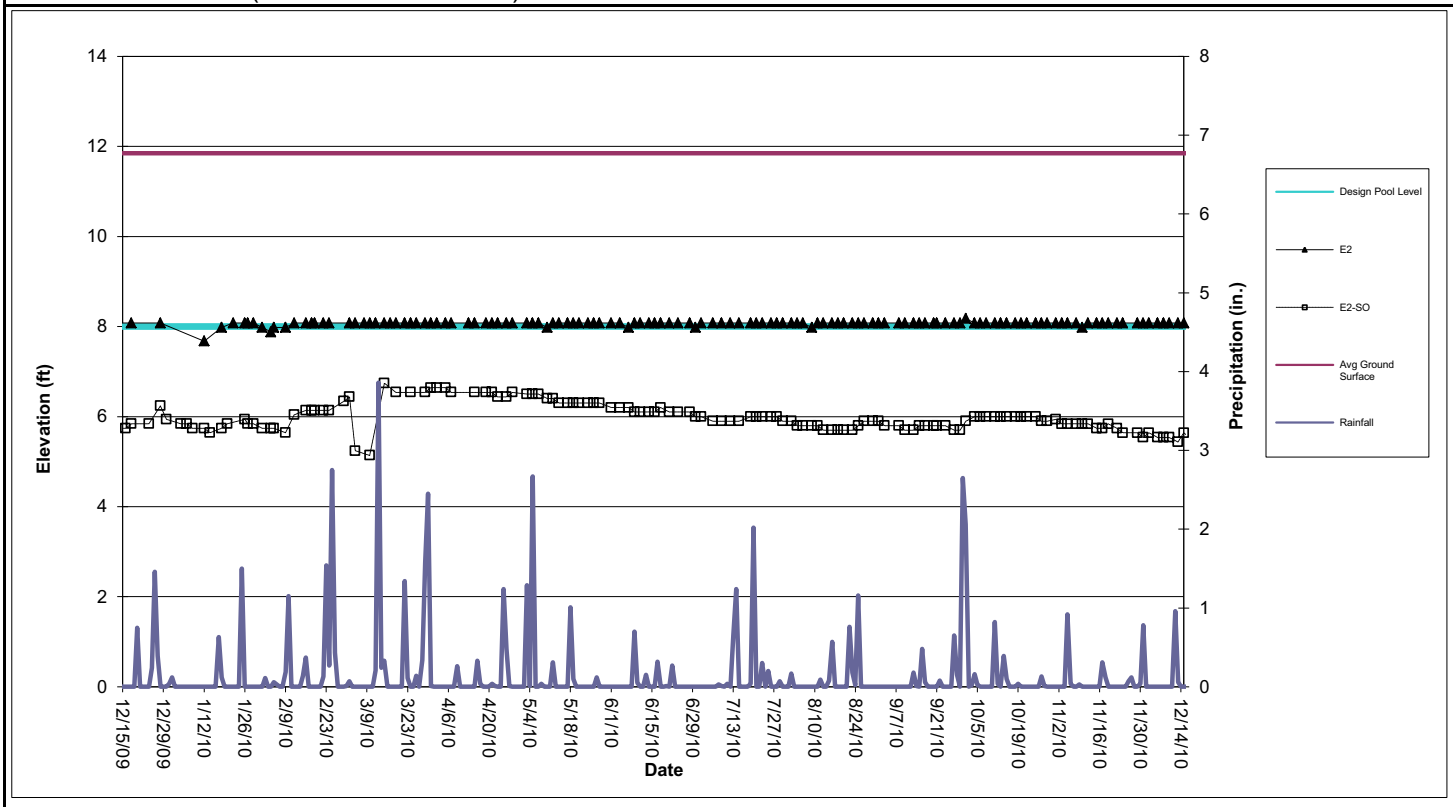


Perimeter Pool N4 (Sta. N6+80 to N10+23)

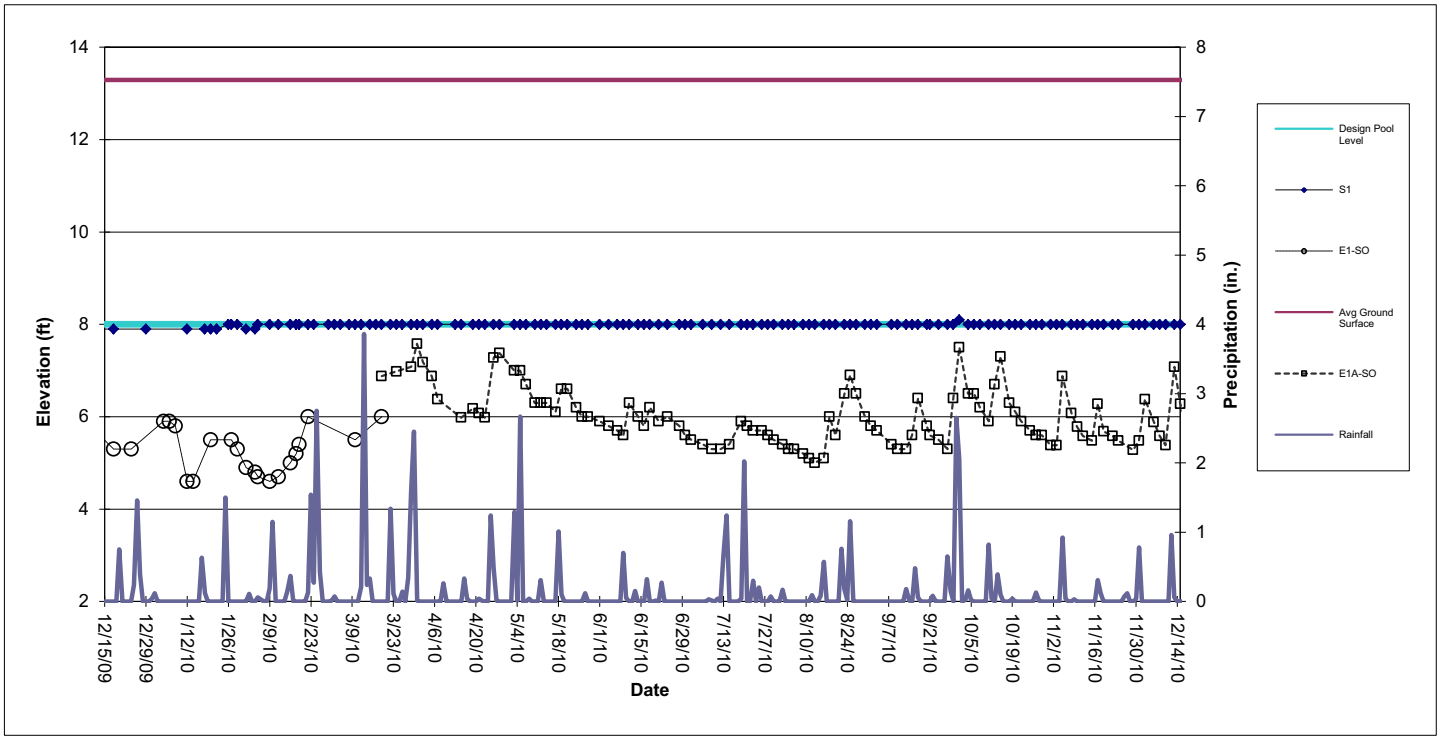
W6-SO is a new well surveyed on 3/19/10. This well was added for closer proximity to Pool N4.



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

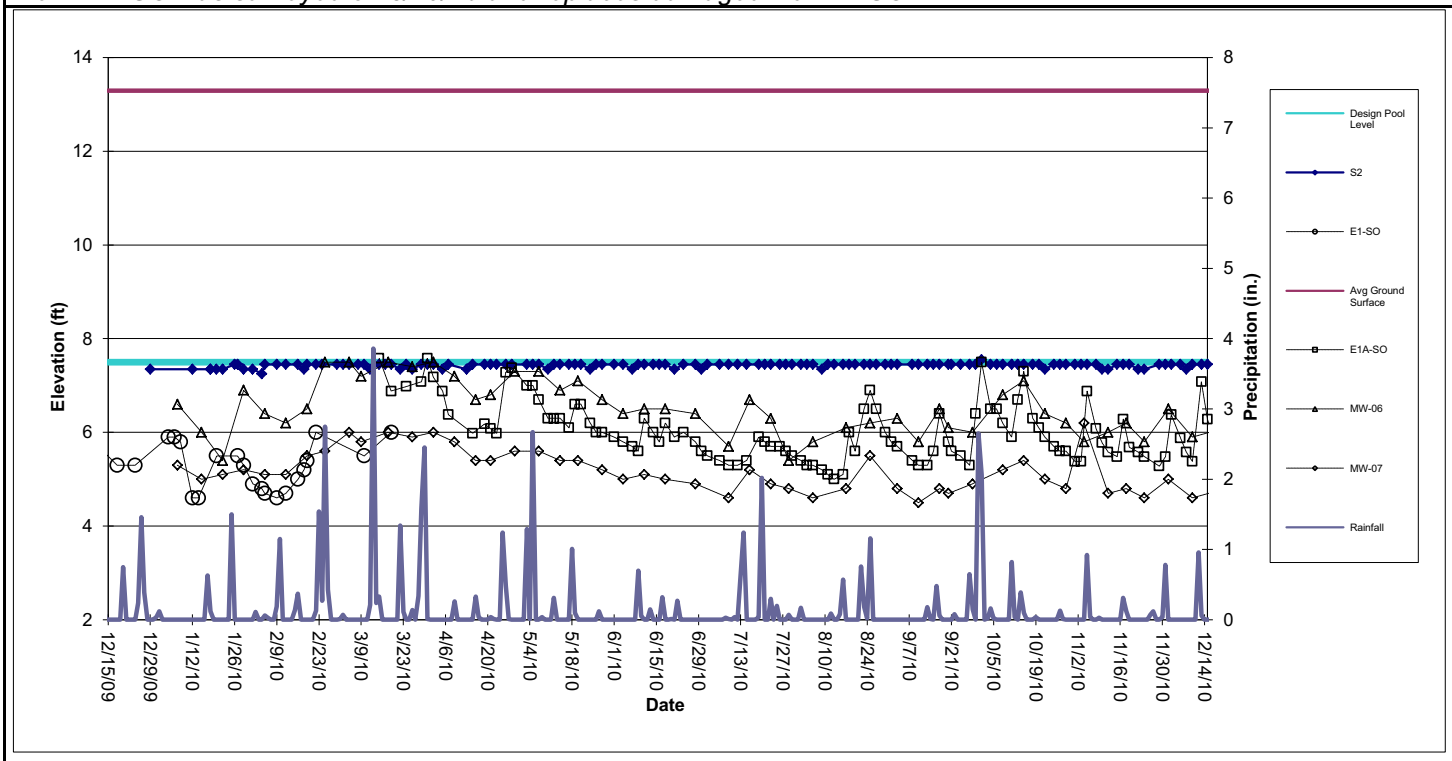


Perimeter Pool E2 (Sta. E4+50 to E7+25)



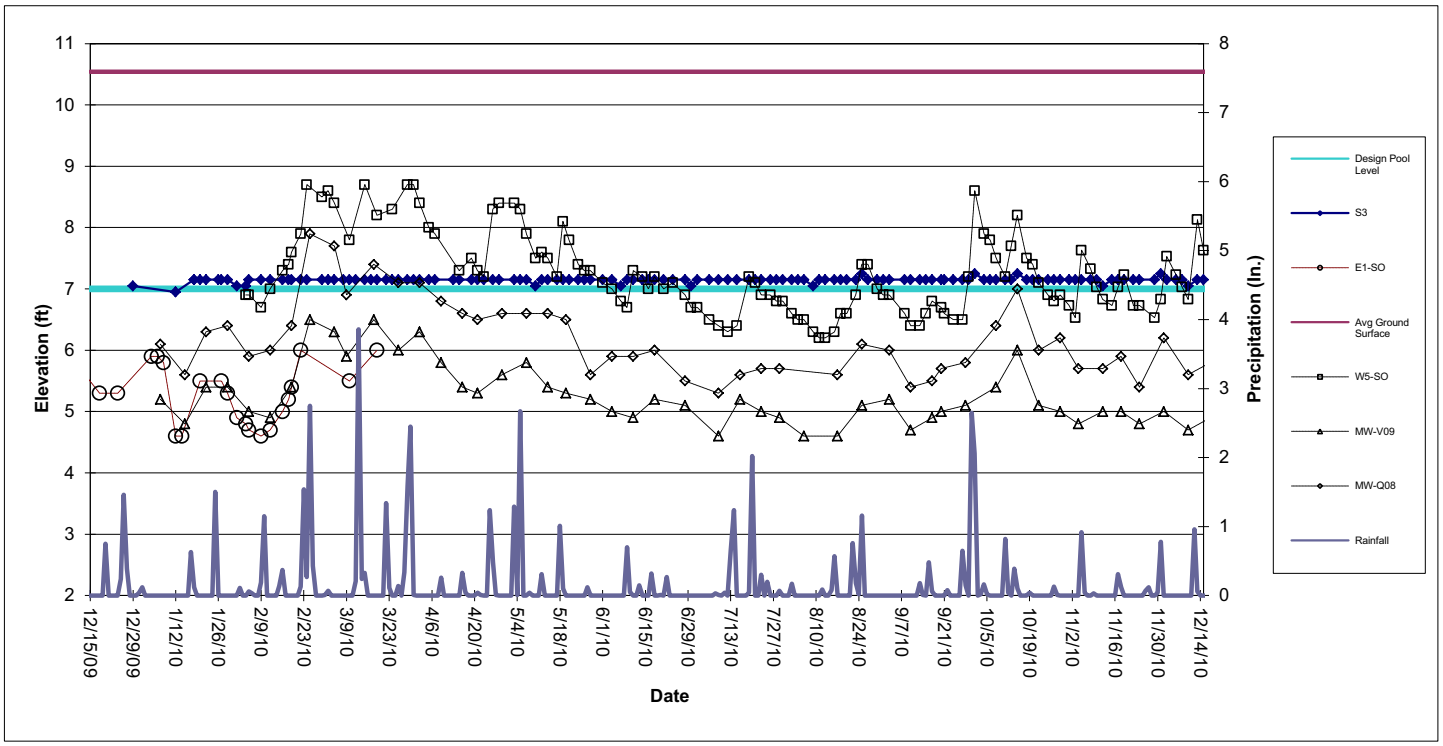
Perimeter Pool S1 (Sta. S0+50 to S3+88)

Well E1A-SO was surveyed on 3/19/10 and replaces damaged well E1-SO.



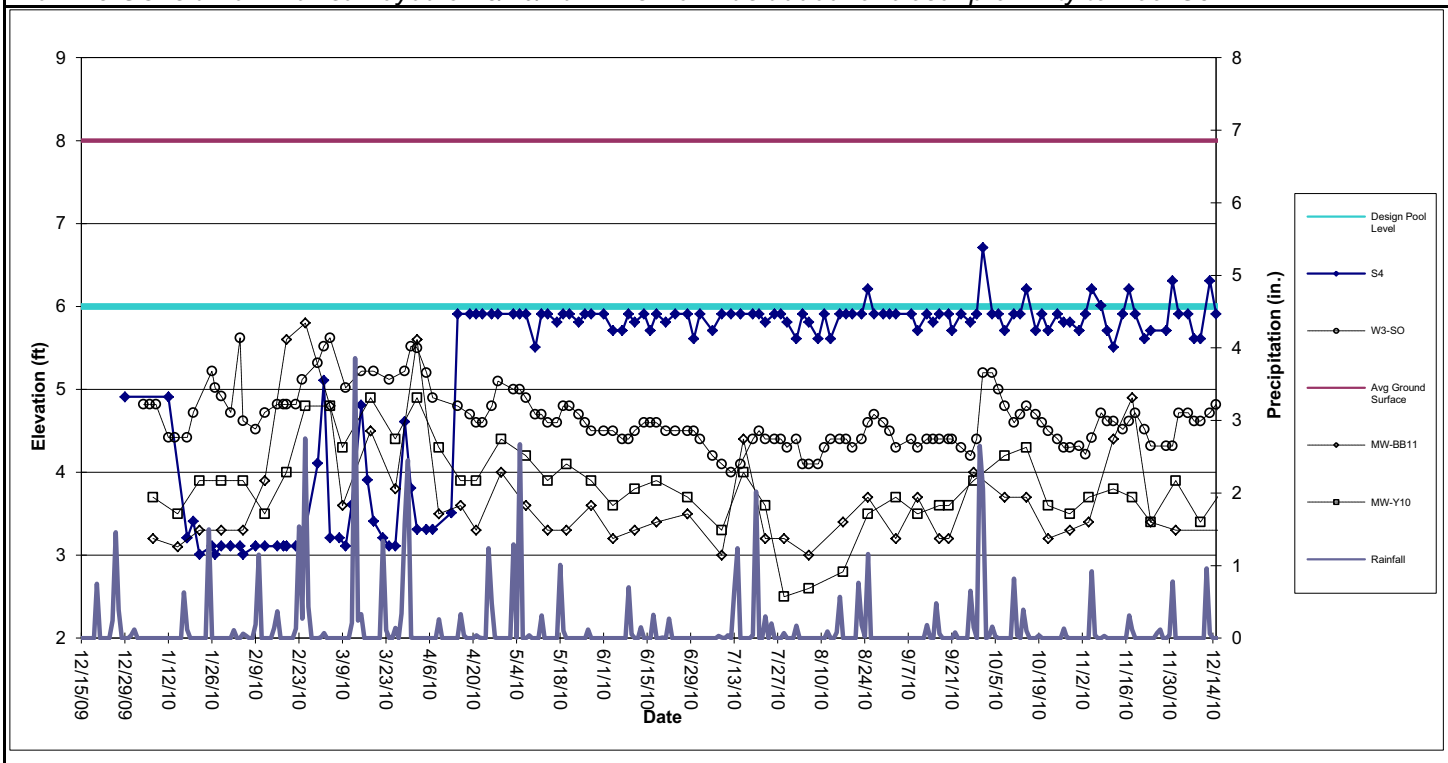
Perimeter Pool S2 (Sta. S4+38 to S10+60)

Well E1A-SO was surveyed on 3/19/10 and replaces damaged well E1-SO.



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

Well W5-SO is a new well surveyed on 3/19/10. This well was added for closer proximity to Pool S3.



Perimeter Pool S4 (Sta. S17+86 to S22+05)

Gooseneck construction completed on 4/14/10.