MONTGOMERY & ASSOCIATES
Water Resource Consultants

www.elmontgomery.com

1550 East Prince Road
Tucson, AZ 85719

TEL 520-881-4912
FAX 520-881-1609

TUCSON PHOENIX SANTIAGO DE CHILE

TECHNICAL MEMORANDUM

DATE: January 26, 2012 **Project 605.411**

TO: Greg Ghidotti
RESOLUTION COPPER MINING LLC

FROM: Ed Peacock, Kate Duke, and Todd Keay
MONTGOMERY & ASSOCIATES

SUBJECT: RESULTS AND ANALYSIS OF 23-DAY AQUIFER TEST AT WELL HRES-09, RESOLUTION COPPER MINING, PINAL COUNTY, ARIZONA

In accordance with a request from Mr. Greg Ghidotti, Resolution Copper Mining LLC (RCM), Montgomery & Associates (M&A) has prepared this Technical Memorandum to document results and analysis of a 23-day aquifer test conducted at hydrologic test well HRES-09. M&A conducted the long-term test to provide aquifer parameters for the Apache Leap Tuff (ALT) aquifer in the area of the well.

SUMMARY

A summary of the long-term pumping test operations and results is provided as follows:

1. The long-term pumping test was conducted at well HRES-09 for 23 days beginning June 11, 2011 and ending July 4, 2011. Recovery was monitored for 23 days after cessation of pumping.
2. Pumping rate at HRES-09 averaged 4.9 liters per second (L/s).
3. Groundwater level and/or pressure response in the ALT aquifer was monitored at: pumped well HRES-09, four fully penetrating open PHRES-series boreholes, eight observation wells, and five annular grouted piezometers. Observation well and piezometer distances range from 32 to 2,508 meters from HRES-09.
4. Discernible groundwater level or pressure response to pumping was observed and analyzed in the ALT aquifer at: four PHRES-series open boreholes, two observation wells, and three annular grouted piezometers at distances ranging from 32 to 1,122 meters from pumped well HRES-09. No discernible response to pumping was observed at more distant observation wells or piezometers.
5. Drawdown response was asymmetric with greatest drawdown observed to the NNE in the direction of wells DHRES-01 and HRES-04.
6. Analysis of water level response indicates a transmissivity of about 31 meters squared per day (m^2/day) and a hydraulic conductivity of about 1 x 10^{-4} centimeters per second (cm/s) for the ALT aquifer at HRES-09 and observation points. Storativity is estimated to be about 1 x 10^{-4} (dimensionless), and specific yield is estimated to be about 1 x 10^{-3} (dimensionless).
7. Results of analysis for wells and open boreholes close to the pumped well suggest that the ratio of vertical hydraulic conductivity to radial hydraulic conductivity (Kz/Kr) is in the range 0.5 to 4.
8. Hydrophysical logging was conducted by COLOG in the PHRES-series open boreholes during HRES-09 pumping operations.
9. Water quality parameters (temperature, pH, and specific conductance) were monitored throughout the test. At the end of the pumping period water temperature was 26.8 degrees Celsius (°C), pH was 7.09 standard units (s.u.), and specific conductance was 339 microsiemens per centimeter (µS/cm).
10. Four hydrochemistry samples were collected during the pumping period. Common ion chemistry was consistent throughout the test.

BACKGROUND

Well HRES-09 was drilled and constructed during the period March 26 through April 7, 2010 in the Apache Leap Tuff south of the South Boundary Fault and north of the South Boundary Splay. The well penetrates the entire thickness of the Apache Leap Tuff and terminates in the uppermost part of the Whitetail Conglomerate. The locations for pumped well HRES-09, and surrounding ALT aquifer wells and piezometers used as observation wells during the test, are shown on **Figure 1**. The ALT aquifer wells and piezometers used as observation wells include four fully penetrating open boreholes (PHRES-series boreholes), eight observation wells, and five annular grouted piezometers, at distances ranging from 32 to 2,508 meters from HRES-09. Hydrophysical logging (HpL) of open boreholes PHRES-01 through PHRES-04 was

conducted by COLOG, Inc., prior to initiation of pumping, and during the pumping period. Results of HpL will be presented in a separate report.

A schematic diagram summarizing well construction details for well HRES-09 is shown on **Figure 2**. Well HRES-09 fully penetrates the ALT aquifer. Well construction details for well HRES-09 and all observation locations are summarized in **Table 1**.

PUMP INSTALLATION AND INSTRUMENTATION

A dedicated pump assembly was installed in hydrologic test well HRES-09 by Layne Christensen Company, Water Supply / Environmental Division (Layne), of Chandler, Arizona on December 19 and 20, 2010. Well HRES-09 is equipped with a stainless steel Grundfos Model 85S200-15 pump with a 20-horsepower, 460-volt, three-phase Grundfos Model MS6EST30 electric motor (Product No. 78355246). The pump is installed on 3-inch galvanized steel column pipe with galvanized steel couplings at a depth of 231 meters bls. The motor failed and was removed by Layne on June 7, 2011. The pump was re-installed with a new motor of the same model on June 8, 2011. The well is equipped with two 1-inch Schedule 80 PVC sounder/transducer access tubes which extend from the wellhead to the top of the pump. The access tubes are capped on the bottom and factory slotted in the lowermost 3 meters. The pump, motor, and column pipe are suspended from a steel and rubber sanitary well seal installed at the wellhead. An In-Situ Level TROLL 500 pressure transducer (S/N 163011; 300 psi, non-vented) is installed at HRES-09.

STEP-RATE AND 24-HOUR CONSTANT RATE PUMPING TESTS

Following installation of dedicated pumping equipment a 10-hour step-rate pumping test was conducted on December 21, 2010, and a 24-hour constant-rate pumping test was conducted on December 28 and 29, 2010. Equipment details and test analysis are given in a previous report (M&A, 2011).

23-DAY CONSTANT RATE AQUIFER TEST

The 23-day constant rate aquifer test began at 13:00 on June 11, 2011. Discharge assembly included a McCrometer UltraMag digital flowmeter, a pressure gage, gate valves to adjust flow rate, and a hose bib for obtaining water samples. Water pumped from HRES-09 was treated for odor on site using two 2,000 lb. activated carbon filter units (Siemens Aqua-Scrub Model No. 2000). Filtered water was conveyed approximately 150 meters to Rancho Rio Creek via flexible hose. Discharge to Rancho Rio Creek was directed onto plastic sheeting to prevent scouring and mobilization of sediment. Flow and water quality parameters were monitored daily in accordance with discharge authorization number AZDGP-59966 under the Arizona Pollutant

Discharge Elimination System (AZPDES) General Permit for De Minimus Discharges to Waters of the U.S.

During testing, groundwater levels at HRES-09 were measured and recorded using the dedicated Level TROLL transducer. Water levels were also measured periodically using an electric sounder. During testing, pumping rate and line pressure were measured as well as water quality parameters. Sand content of the water was measured using a 1-liter calibrated Imhoff cone. After the constant-rate test pumping period was complete, water level recovery was measured for a period equal to the pumping period.

Average pumping rate during the 23-day pumping period was 4.9 L/s; pumping rates are provided in **Appendix B**. Operational parameters for the HRES-09 pumping test are as follows:

PUMPED WELL IDENTIFIER	DATE / TIME PUMPING STARTED	DURATION OF PUMPING PERIOD (days)	AVERAGE PUMPING RATE (L/s)[a]	PRE-PUMPING WATER LEVEL (meters, bls)[b]	MAXIMUM WATER LEVEL DRAWDOWN (meters)	SPECIFIC CAPACITY (L/s/m)[c]
HRES-09	June 11, 2011 13:00	23	4.9	77.24	56.2	0.09

[a] L/s = liters per second
[b] bls = below land surface
[c] L/s/m = Liters per second per meter of drawdown

Maximum water level drawdown at HRES-09 was approximately 56.2 meters; drawdown at the end of the test was approximately 56.1 meters. Maximum drawdown occurred 4.5 days prior to the end of the test due to a rising water level trend in the last 4.5 days of the test. During the last 10 days of the test, wellhead pressure increased and discharge rate decreased causing drawdown to level off or decrease; two adjustments were made to attempt to prevent continued decrease in the discharge rate (**Figure 5**). Increasing wellhead pressure may have been caused by clogging of carbon filters causing increased back pressure.

Locations of pumped well HRES-09, observation wells, and grouted piezometers are shown on **Figure 1.** Location and well construction data, and magnitude of drawdown in response to pumping are summarized in **Table 1**. Groundwater level hydrographs for all observation wells and piezometers for the period April 1 through July 31, 2011 are given in **Appendix A**. Barometric pressure was continuously monitored at well DHRES-07, which is located about 32 meters from the pumped well. Hydrographs shown in **Appendix A** are not corrected for barometric pressure effects. Where possible, water level perturbations within the ALT aquifer that could be associated with drilling and testing activities are noted on the hydrographs. The hydrographs were used to assess possible antecedent water level trends which could mask or distort drawdown response in observation wells. Despite transient perturbations due to drilling activities, only one hydrograph (grouted piezometer DHRES-01_973) exhibited a well-defined antecedent water level trend. For grouted piezometer DHRES-01_973 a linear

water level trend of 0.0133 meters per day was used to approximate observed pre-test water level decline. This trend was removed to correct data during the HRES-09 pumping and recovery periods. Barometric response at DHRES-07 barometer is shown on **Figure A-17.** Maximum barometric change during the pumping and recovery period was about +/- 0.06 meters of water, and is small compared to water level change at analyzed observation wells. Therefore, no barometric corrections were applied to any wells or piezometers. Observation well drawdown at end of pumping ranged from 0.92 meters at HRES-04 to 5.42 meters at PHRES-02. Grouted piezometer drawdown at end of pumping ranged from 0.49 meters at DHRES-01_973 to 4.94 meters at DHRES-07_920 (**Table 1**).

Discharge from well HRES-09 was sampled four times throughout the pumping period. Samples were collected for common and trace constituents, radiological constituents, stable isotopes of hydrogen, oxygen, carbon, and sulfur, and radioisotopes of hydrogen, carbon and strontium. A Piper trilinear diagram showing common ion data from these sampling events is shown on **Figure 3**. The common ion composition of groundwater sampled during the HRES-09 test was very stable indicating essentially no change in groundwater source. In addition, groundwater composition was consistent with a sample collected from HRES-09 on December 29, 2010 (also plotted on **Figure 3**). All chemical and isotopic data will be presented and discussed in a future report. Water quality parameters (temperature, pH, and specific conductance) were measured and recorded during the test using a Myron-L parameter meter that was calibrated daily; these data are presented on **Figure 4**. At the end of pumping, routine parameters for the pumped water at well HRES-09 were as follows:

PUMPED WELL	TEMPERATURE (ºC)[a]	SPECIFIC ELECTRICAL CONDUCTANCE (µS/cm)[b]	pH (s.u.)
HRES-09	26.8	339	7.09

[a] ºC = Temperature in degrees Celsius
[b] µS/cm = Specific electrical conductance in microsiemens per centimeter at 25ºC
[c] pH in standard units

CONCEPTUAL MODEL AND SELECTED ANALYTICAL METHOD

A semi-log drawdown and recovery graph for pumped well HRES-09 is shown on **Figure 5**, together with transmissivity estimates using the Cooper-Jacob drawdown method (Cooper and Jacob, 1946) and Theis recovery method (Theis, 1935). Shape of drawdown graph suggests delayed yield or dual-porosity type aquifer (Kruseman and de Ridder, 1990).

Using the analytical modeling program AQTESOLV (HydroSOLVE, 2008), a variety of diagnostic flow plots were examined to help determine a conceptual model of the flow regime at HRES-09. Diagnostic techniques and observations are tabulated below:

GRAPICAL REPRESENTATION	DIAGNOSTIC OBSERVATION	INDICATED FLOW CHARACTERISTIC	INTERPRETED RESULT AT HRES-09
Log s vs. log t	Early time unit slope in drawdown plot	Wellbore storage	Observed
Log s vs. log t	Valley in derivative plot during mid-time	Delayed drainage or dual-porosity	Observed
Log s vs. log $t^{1/2}$	Early time unit slope	Infinite conductive fracture	Not observed
Log s vs. log $t^{1/2}$	late time unit slope	Channel or strip aquifer	Not observed
Log s vs. log $t^{1/4}$	Early time unit slope	Bilinear flow (finite conductive fracture in infinite slab reservoir)	Not observed
s vs. log t	Constant slope at late time	Infinite acting radial flow (Cooper-Jacob)	Not observed

Figure 6 shows a plot of the drawdown (s) and the logarithmic derivative of drawdown ($\delta s/\delta \log t$) as a function of time elapsed since the beginning of the test (t) on a log-log scale. The well response is dominated by wellbore storage for the first several minutes of the pumping period (**Figure 6**). Mid- and late-time derivative is impacted by changes in pumping rate; however, it is possible to observe that between approximately 10 and 1000 minutes the drawdown trend flattens and there is a valley in the derivative plot. This behavior is consistent with delayed gravity response of an unconfined aquifer or with dual-porosity response of a fractured rock aquifer containing fracture and matrix permeability (Renard and others, 2008). Appropriate analytical techniques include Neuman (1974) and Moench (1997) delayed response methods, and Moench, (1984) dual-porosity method. All three of these techniques were compared during preliminary analysis. Moench (1997) gave the best fit to pumped well and observation well response, and was selected as the most appropriate analytical method.

Parameters and units used in the Moench (1997) solution include the following:

- Transmissivity (T) in m^2/day
- Storativity (S) (dimensionless)
- Specific yield (Sy) (dimensionless)
- Kz/Kr (dimensionless ratio of vertical to radial hydraulic conductivity)
- Well radius (r(w)) in meters
- Casing radius (r(c)) in meters
- Fitting parameter for non-instantaneous drainage (α) in $minutes^{-1}$
- Wellbore skin factor (Sw) (dimensionless)

For analysis of HRES-09 aquifer test data, all parameters were held constant for all analyses except for T, S, Sy, and Kz/Kr. Constant parameters were set as follows:

- For pumped well and all observation wells, well radius r(w) was set identical to drilled borehole radius.
- For pumped well HRES-09, casing radius r(c) used for all analyses was 0.154 meters, slightly larger than installed casing radius of 0.102 meters (8-inch diameter casing). This was done to allow better match of early time drawdown and drawdown derivative data, which are strongly influenced by casing storage. The improved match using a larger casing radius for the pumped well is commonly observed in fractured rock aquifers and may indicate the presence of open fractures of limited volume that are in good hydraulic communication with the pumped well. For all observation wells, casing radius r(c) was set identical to installed casing radius, corrected for diameter of any installed equipment.
- For pumped well and all observation wells, the fitting parameter for non-instantaneous drainage (α) was set at a large value of 10^{30} minutes^{-1} (near-instantaneous drainage).
- For pumped well HRES-09, wellbore skin factor Sw was set at 15. Wellbore skin factor typically ranges from -5 (improved skin) to +20 (damaged skin); zero is neutral (Horne, 1995). Increased positive wellbore skin results in increased drawdown in the pumped well. For HRES-09 and nearby observation wells use of Sw = 15 results in a good match for both drawdown and recovery data at the selected pumping rate of 4.9 L/s. (Skin factor at HRES-09 may be influenced by a combination of turbulent flow in fractures, poorly transmissive rock near the well, formation damage during drilling, and other unidentified factors. Relative magnitude of these effects is expected to vary with pumping rate, and use of Sw = 15 would likely be inappropriate for other pumping rates).

Log-log drawdown and recovery graphs for the pumped well and each analyzed observation well and piezometer are shown on **Figures 7 through 15.** Hydraulic parameters derived from the 23-day aquifer test at HRES-09 are summarized in **Table 2**.

RESULTS AND DISCUSSION

Analysis of water level response at HRES-09 and observation points indicates a transmissivity of about 31 meters squared per day (m^2/day). Hydraulic conductivity based on transmissivity of 31 m^2/day and saturated thickness of 245.9 meters (perforated interval) is 1 x 10^{-4} cm/s. Storativity is estimated to be about 1 x 10^{-4} (dimensionless), and specific yield is estimated to be about 1 x 10^{-3} (dimensionless). Test design and well construction were not optimum for estimating vertical hydraulic conductivity. However, results of analysis for wells and open boreholes close to the pumped well suggest that Kz/Kr is in the range 0.5 to 4.

Pore pressure response at grouted piezometers appears to be anomalous. Magnitude of grouted piezometer response at DHRES-01_973 and DHRES-01_772 was less than the magnitude of response in nearby observation well HRES-04 at end of the pumping period (**Table 1**). Drawdown and recovery response at these piezometers is also delayed compared to response at HRES-04 (**Figures 11, 13, and 14**). Response of grouted piezometer DHRES-07_ 920, located 32 meters from the pumped well, was rapid but not instantaneous. Inspection of the drawdown graph for piezometer DHRES-07_ 920 (**Figure 15**) indicates about 0.02 m of drawdown 15 minutes after pumping started. Forward modeling of this piezometer using a reasonable range of aquifer parameters suggests that expected drawdown would be almost 1 m after 15 minutes of pumping. This disparity between modeled and observed drawdown indicates that response at grouted piezometer DHRES-07_920 was delayed. Moench (1997) interpretation of DHRES-07_920 data gives large storativity, specific yield, and Kz/Kr ratio compared to other observation wells and piezometers (**Table 2**).

Observed anomalies in grouted piezometer responses may be related to: (1) subtraction of linear trend at DHRES-01_973; (2) differences in head response at different discrete depths within the aquifer; (3) comparison of discrete (DHRES-01) to composite (HRES-04) heads; and/or, (4) possibly an intrinsic effect due to pressure response through the grout. Delayed grouted piezometer response has little effect on the slope of the drawdown curve, and therefore has little effect on estimates of transmissivity. However, delayed response results in increased estimated storativity, specific yield, and Kz/Kr ratio. Therefore, if delayed response of grouted piezometers is caused by the grouting process (for example by deep grout invasion into open fractures) estimated values determined by type-curve matching for storage coefficient, specific yield, and Kz/Kr ratio may be too large and not representative of aquifer properties. In addition, for grouted piezometer DHRES-01_973, the antecedent trend was assumed to be linear, but may actually be non-linear (**Figure A13**). Because grouted piezometer responses may be not be representative of aquifer response, mean values for transmissivity, storativity, and specific yield are computed both with and without the grouted piezometer observations (**Table 2**). For storativity and specific yield, the mean values computed by excluding the grouted piezometer data are judged to be more representative.

Contours of maximum drawdown in meters are shown on **Figure 16.** Drawdown response is asymmetric. Strong response was observed at grouted piezometers DHRES-01_973 and DHRES-01_772 and well HRES-04 located approximately 1,120 meters NNE of pumped well HRES-09. These results demonstrate good hydraulic connection in the direction of HRES-04. No discernible response was observed at well HRES-07 located 1,310 meters ESE of well HRES-09. Lack of observed response at HRES-07 suggests a possible hydraulic boundary or change in aquifer parameters in the direction of HRES-07 which is consistent with results of previous HRES-07 testing. Results of previous testing indicate that transmissivity and specific yield are substantially greater in the ALT aquifer in the vicinity of HRES-07 than in the vicinity of HRES-09 (M&A, 2010).

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TABLE 1 CONSTRUCTION DATA AND RESPONSE TO PUMPING FOR WELLS, OPEN BOREHOLES, AND GROUTED PEIZOMETERS MONITORED DURING 23-DAY AQUIFER TEST AT HRES-09

								……..BOREHOLE……..		……..CASING……..						
WELL OR PIEZOMETER IDENTIFIER	EASTING (UTM, m)[a]	NORTHING (UTM, m)	LAND SURFACE ELEVATION (m, amsl)[b]	DISTANCE FROM HRES-09 (m)	AZIMUTH FROM HRES-09 (degrees)[c]	PRE-PUMPING DEPTH TO WATER (m, bls)[d]	PRE-PUMPING WATER LEVEL ELEVATION (m, amsl)	BOREHOLE DIAMETER (inches)	BOREHOLE DEPTH (m, bls)	DIAMETER (inches)	DEPTH (m, bls)	PERFORATED or OPEN INTERVAL DEPTH (m, bls)	PERFORATED or OPEN INTERVAL ELEVATION (m, amsl)	DRAWDOWN AT 23 DAYS[e] (m)	RESIDUAL DRAWDOWN AT 46 DAYS[e] (m)	MAXIMUM OBSERVED DRAWDOWN (m)
PUMPED WELL																
HRES-09	495687.806	3682555.149	1195.12	----PUMPED WELL----		77.24	1117.88	20-1/2 14-3/4	0 - 6.9 6.9 - 342.9	16 8-5/8	0 - 6.9 0 - 341.8	--- 82.6 - 328.5	1112.5 - 866.6	56.05	0.83	56.34 at 20.233 days
OPEN BOREHOLES																
PHRES-01	495928.807	3682627.034	1192.04	252	74	74.13	---	12 6-1/4	0 - 12.2 12.2 - 353.6	8	0 - 12.2	Open borehole 12.2 - 353.6	---	2.29	0.81	2.29 at 23.125 days
PHRES-02	495776.282	3682551.965	1193.44	89	95	75.00	---	12 6-1/4	0 - 18.3 18.3 - 335.3	8	0 - 18.3	Open borehole 18.3 - 335.3	---	5.42	0.69	5.42 at 22.990 days
PHRES-03	495718.864	3682465.128	1201.51	95	161	82.84	---	12 6-1/4	0 - 12.2 12.2 - 330.7	8	0 - 12.2	Open borehole 12.2 - 330.7	---	5.24[f]	1.03	5.24 at 19.688 days (data gap)
PHRES-04	495613.917	3682377.334	1224.05	193	202	105.61	---	12 6-1/4	0 - 15.2 15.2- 349.0	8	0 - 15.2	Open borehole 15.2 - 349.0	---	5.15	0.84	5.15 at 23.000 days
CASED MONITOR WELLS																
HRES-02	494479.323	3683886.304	1214.34	1798	318	88.77	1125.57	17-1/2 9	0 - 5.8 5.8 - 483.8	12 4	0 - 5.8 0 - 399.3	--- 199.9 - 206.6 312.7 - 319.4 383.8 - 399.3	--- 1014.4 - 1007.7 901.6 - 894.9 830.5 - 815.0	no discernible response		
HRES-04	495322.295	3683616.17	1243.49	1122	341	121.92	1121.57	17-1/2 9	0 - 5.8 5.8 - 532.5	12 4	0 - 5.8 0 - 438.9	--- 178.1 - 190.3 220.8 - 233.0 391.4 - 397.5 432.6 - 438.9	--- 1065.4 - 1053.2 1022.7 - 1010.5 852.1 - 846.0 810.9 - 804.6	0.92	0.67	0.92 at 23.000 days
HRES-05	495523.291	3682274.632	1218.30	325	210	97.43	1120.86	17-1/2 9	0 - 5.8 5.8 - 349.6	12 4	0 - 5.8 0 - 321.6	--- 117.3 - 129.5 178.3 - 184.4 309.4 - 315.5	--- 1101.0 - 1088.8 1040.0 - 1033.9 908.9 - 902.8	3.91	0.77	3.91 at 23.000 days
HRES-07	496851.374	3681952.939	1223.46	1310	117	116.35	1107.11	14-3/4 8-3/4	0 - 6.0 6.0 - 325.5	10 4	0 - 6.0 0 - 317.3	--- 102.1 - 228.3 247.5 - 310.6	--- 1121.4 - 995.2 976.0 - 912.9	no discernible response		
HRES-08	495620.051	3680752.768	1232.77	1804	182	57.00	1175.77	14-3/4 8-3/4	0 - 6.0 6.0 - 443.5	10 4	0 - 6.0 0 - 311.5	--- 59.1 - 90.5 241.6 - 304.8	--- 1173.7 - 1142.3 991.2 - 928.0	no discernible response		
HRES-13	494613.369	3681730.334	1279.21	1355	232	143.42	1135.79	17-1/4 10	0 - 9.1 9.1 - 278.9	12 4-1/2	0 - 9.1 0 - 274.3	--- 129.0 - 262.2	--- 1150.2 - 1017.0	no discernible response		
A-06	497365.707	3683231.668	1269.61	1809	68	158.84	1110.77	NA 8	NA 353.6	8 no casing	0 - 3.0 3.0 - 353.6	--- 3.0 - 353.6	--- 1266.6 - 916.0	no discernible response		
MJ-11	498075.785	3681789.236	1192.63	2508	108	92.15	1100.48	NA 6	NA 239.3	6 no casing	0 - 3.1 3.1 - 239.2	--- 3.1 - 239.3	--- 1189.5- 953.3	no discernible response		
GROUTED PIEZOMETERS																
DHRES-01_ 973	495318.697	3683612.593	1241.68	1120	341	126.65[g]	1115.03[g]	Deep Aquifer Characterization Wells (Construction data not shown)				269[h]	973[h]	0.49[i]	0.12[i]	0.50 at 24.083 days
DHRES-01_ 772	495318.697	3683612.593	1241.68	1120	341	132.80[g]	1108.88[g]	---				470[h]	772[h]	0.71	0.60	0.75 at 27.792 days
DHRES-02_ 297	494513.561	3684037.246	1211.40	1891	322	89.03[g]	1122.37[g]	---				297[h]	915[h]	no discernible response		
DHRES-07_ 920	495719.193	3682551.213	1194.96	32	97	81.03[g]	1113.93[g]	---				275[h]	920[h]	4.94	0.77	4.94 at 23.000 days
DHRES-08_ 980	494555.253	3682963.792	1255.28	1204	290	141.13[g]	1114.15[g]	---				275[h]	980[h]	no discernible response		

[a] UTM = Universal Transverse Mercator projection, NAD27, in meters. All locations surveyed except PHRES holes (survey pending)
[b] m, amsl = meters above mean sea level
[c] Degrees measured clockwise from North
[d] m, bls = meters below land surface
[e] Days after pumping started
[f] Drawdown at 19.69 days (t = 28,350 minutes)
[g] Depth to water computed from pressure on grouted vibrating-wire transducer
[h] Installed depth or elevation of vibrating-wire pressure transducer pressure-grouted in annular space between 7-5/8-inch blank casing and 12-1/4-inch borehole
[i] Computed by removal of linear trend of 9.25 x 10^{-6} meters per minute
--- = Not applicable

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TABLE 2. AQUIFER HYDRAULIC PARAMETERS FOR 23-DAY HRES-09 AQUIFER TEST

				SEMI-LOG GRAPHICAL METHOD		MOENCH (1997) ANALYTICAL METHOD			
WELL IDENTIFIER	DISTANCE FROM PUMPED WELL (meters)	DRAWDOWN AT 23 DAYS (meters)	RESIDUAL DRAWDOWN AT t/t'=2[a] (meters)	COOPER-JACOB DRAWDOWN METHOD T[b] (m^2/day)[c]	THEIS RECOVERY METHOD T (m^2/day)	T (m^2/day)	S[d] (dimensionless)	Sy[e] (dimensionless)	Kz/Kr[f] (dimensionless)
Pumped Well (Fully Penetrating)									
HRES-09	0.0	**56.05**	**0.83**	12	32	---	---	---	---
Open Boreholes (Fully Penetrating)									
PHRES-01		2.29	0.81			29.5	6.2E-04	3.5E-03	4
PHRES-02	88.5	5.42	0.69			30.8	1.3E-04	1.8E-03	3
PHRES-03	95.2	5.24[g]	1.03			31.7	2.5E-05	1.3E-03	3
PHRES-04	192.6	5.15	0.84			31.7	1.6E-05	4.4E-04	1
Monitor Wells (Short screened, multi-level completions)									
HRES-04	1122.2	0.92	0.67			31.7	4.4E-05	8.8E-05	0.3
HRES-05	325.2	3.91	0.77			30.6	8.3E-05	4.2E-04	0.5
Grouted Piezometers									
DHRES-01_973	1120.0	0.49[h]	0.12[h]			30.2	1.1E-06	1.4E-03	1
DHRES-01_772	1120.0	0.71	0.60			33.0	1.0E-06	1.0E-03	1
DHRES-07_920	31.6	4.94	0.77			28.1	3.0E-03	1.8E-02	100
	MEAN (all wells and piezometers) =					**30.8**	**4.4E-04**	**3.1E-03**	
	MEAN (excluding grouted piezometers) =					**31.0**	**1.5E-04**	**1.3E-03**	

No Discernible Response

HRES-02	1797.9	Monitor well (Short-screened multi-level completion)
HRES-07	1310.2	Monitor well (fully penetrating)
HRES-13	1354.5	Monitor well (fully penetrating)
A-06	1809.2	Monitor well (fully penetrating)
MJ-11	2507.8	Open borehole (partially penetrating)
DHRES-02_915	1890.9	Grouted piezometer
DHRES-08_980	1204.0	Grouted piezometer

[a] t/t' = (time after pumping started/time after pumping stopped)
[b] T= transmissivity (rate of groundwater flow through a fully saturated vertical strip of aquifer of unit width under unit hydraulic gradient)
[c] m^2/day = meters squared per day
[d] S= storativity (volume of water an aquifer releases or take into storage per unit surface area of aquifer per unit change in head)
[e] Sy = specific yield (volume of water a unit volume of aquifer releases under gravity drainage)
[f] Kz/Kr = ratio of vertical hydraulic conductivity to radial hydraulic conductivity
[g] Drawdown at 23 days not available due to pressure transducer failure; drawdown given for 19.69 days (28,350 minutes)
[h] Computed by removal of linear trend of 9.25×10^{-6} meters per minute
--- = Not calculated

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R. 13 E.

494,000 495,000 496,000 497,000 498,000

T. 1 S.

3,684,000

3,683,000

T. 2 S.

3,682,000

3,681,000

32 33 34

06 05 04

07 08 09

DHRES-02

HRES-02

DHRES-01

HRES-04

DHRES-08

DHRES-07

PHRES-01

PHRES-02

PHRES-03

PHRES-04

HRES-09

HRES-05

A-06

HRES-07

HRES-13

MJ-11

Devils Canyon

Canyon

Hackberry

1300 1200 1100 1400

R. 12 E. R. 13 E.

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EXPLANATION

Watershed Boundary

Perennial Reach

Groundwater Monitoring Sites

Apache Leap Tuff Aquifer Monitor Well

Fully Penetrating Open Borehole

Deep Groundwater System Monitor Well with Apache Leap Tuff Annular Grouted Piezometer

N

0 0.25 0.5

Miles

Resolution Copper Mining

LOCATION MAP HRES-09 AQUIFER TESTING

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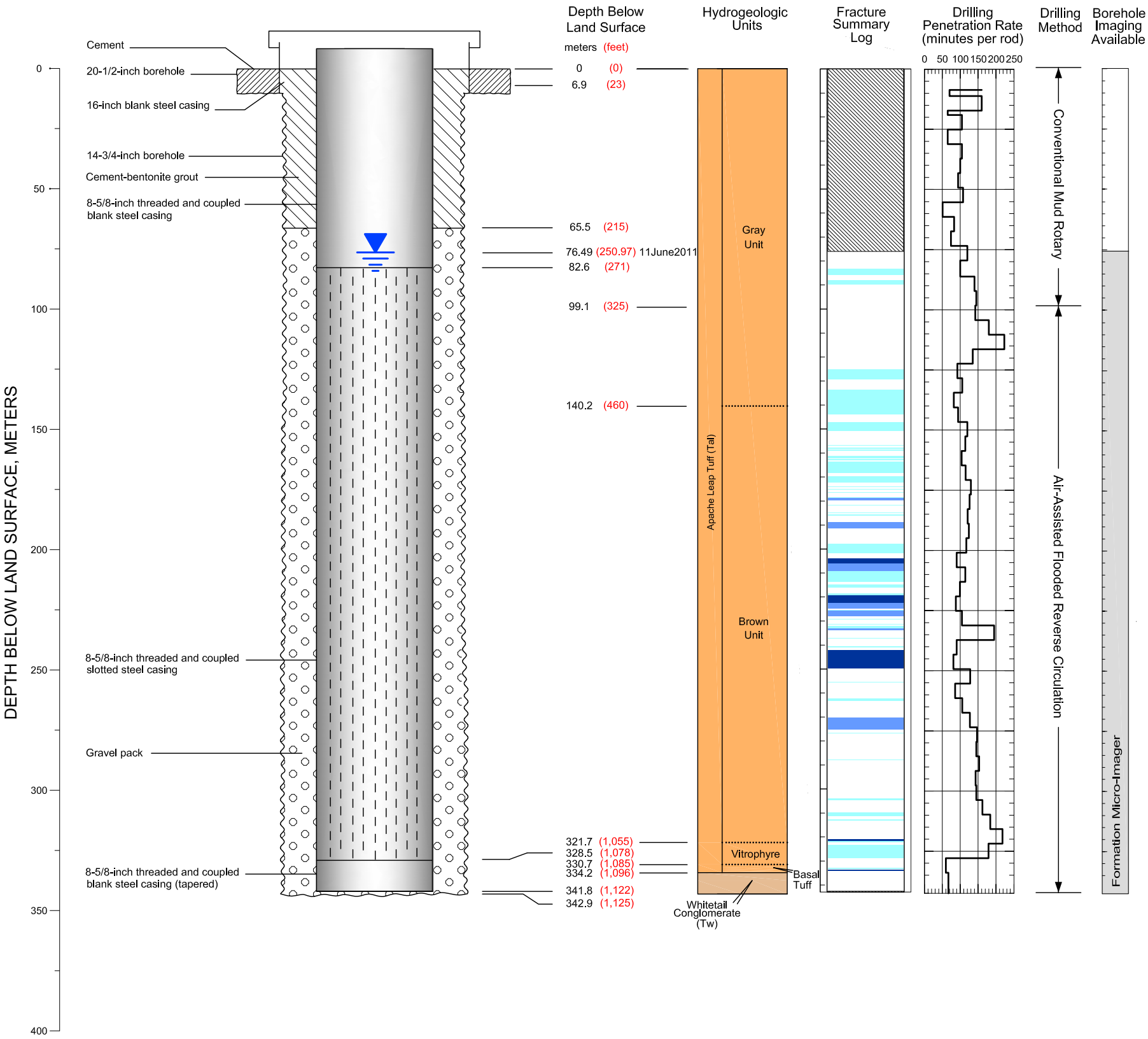
Water Resource Consultants

2012

FIGURE 1



Non-pumping water level

CADASTRAL: (D-2-12)05cbd	ADWR NO: 55-911875
NORTHING: 3682555.149	EASTING: 495687.806
LAND SURFACE ELEVATION: 1195.12	
DATUM: UTM12N, NAD 27, meters VERTICAL: NGVD 29 METERS	

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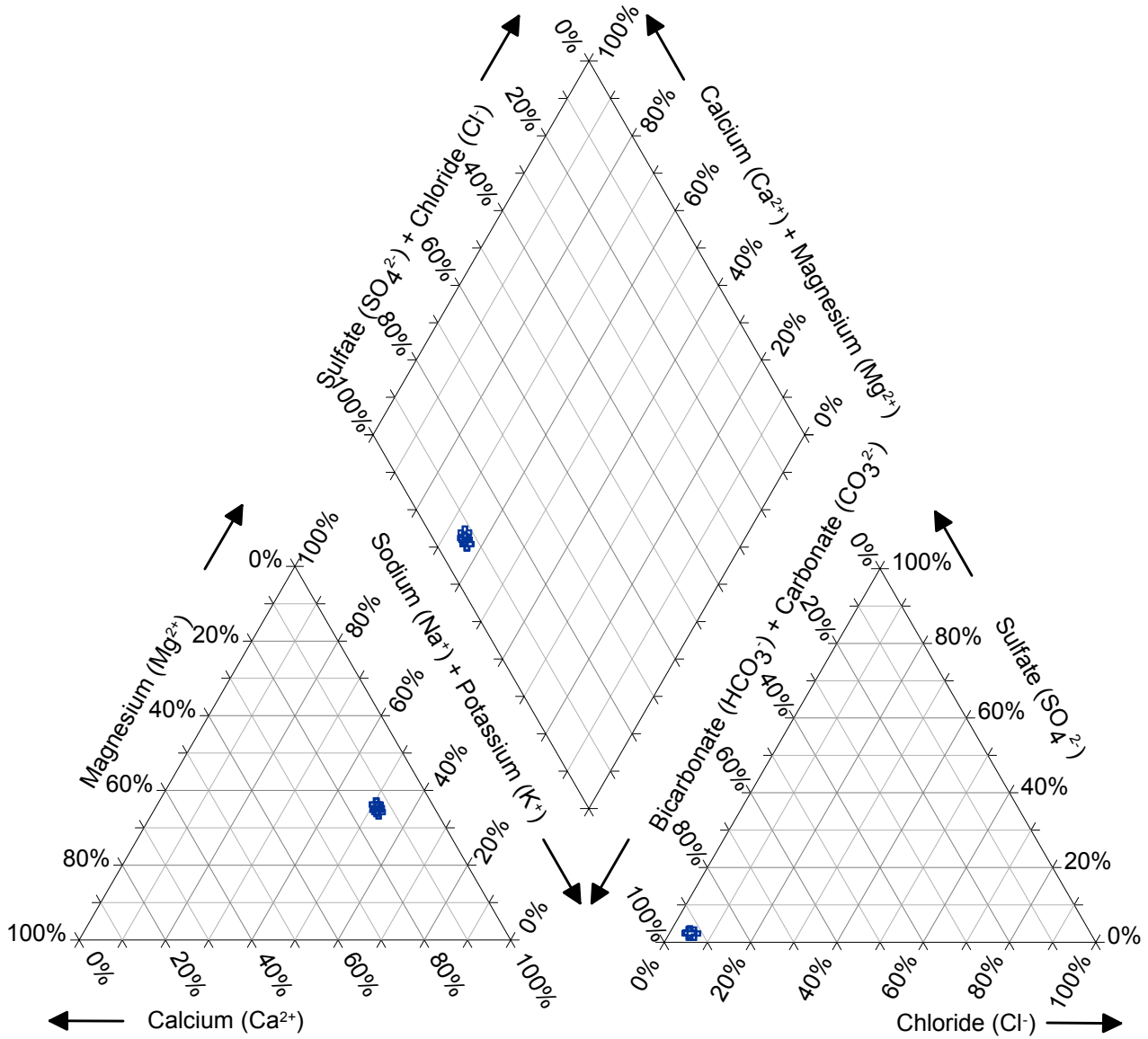
HRES-09
SCHEMATIC DIAGRAM OF WELL CONSTRUCTION

Version: November 30, 2011

FIGURE 2

605\wellschematics2010\HRES9_ws\30Nov2011



EXPLANATION

Apache Leap Tuff Aquifer

HRES-09

FIGURE 3. TRILINEAR DIAGRAM SHOWING COMMON ION COMPOSITIONS FOR GROUNDWATER FROM WELL HRES-09 DURING THE HRES-09 LONG-TERM PUMPING TEST JUNE/JULY 2011, RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

S:605\CHEMISTRY\GrapherPipers\HRES-09_LT_Test\Piper_HRES-09_LT_Test. grf 3Nov2011

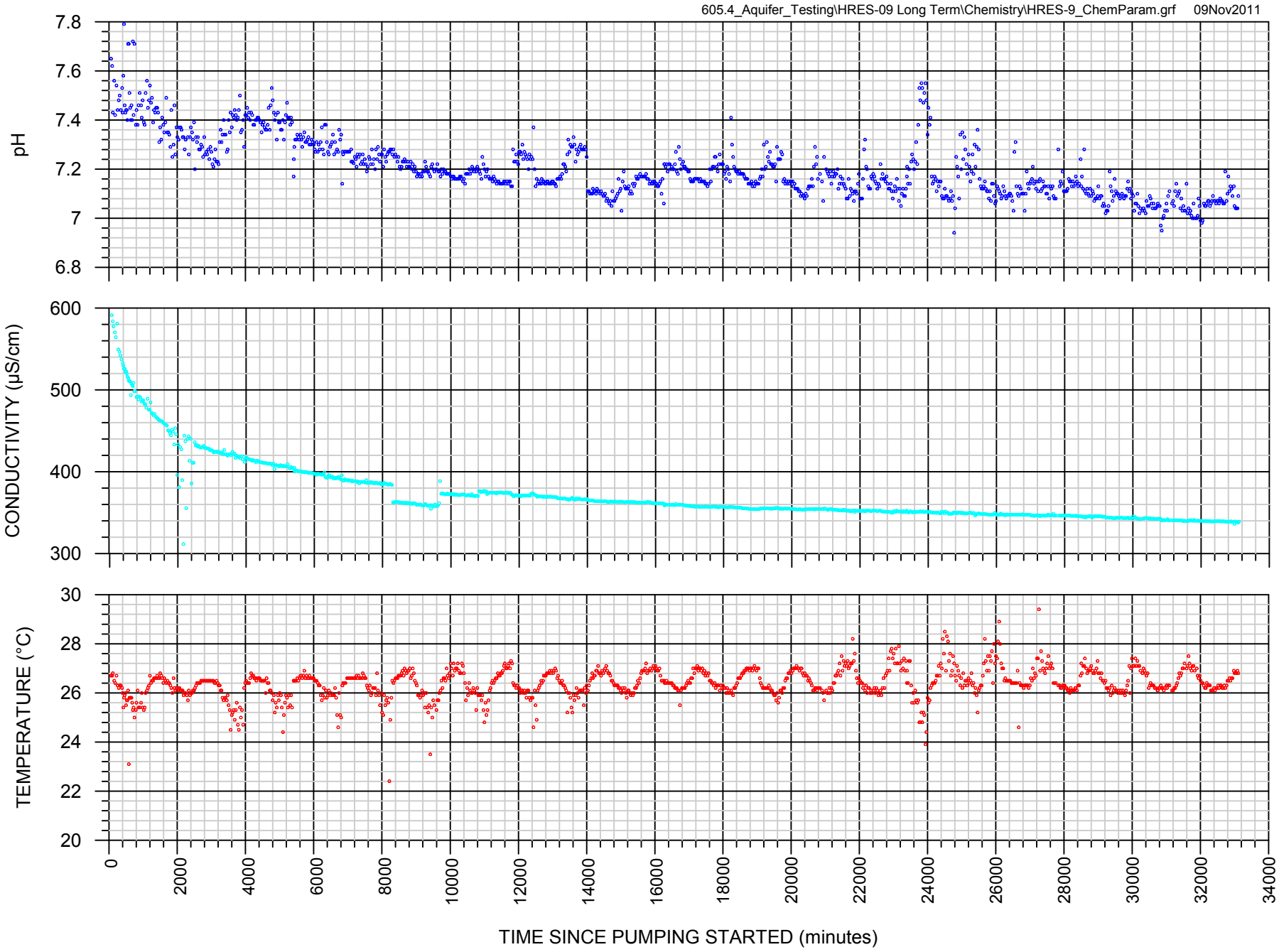


FIGURE 4. MEASUREMENTS OF pH, CONDUCTIVITY, AND TEMPERATURE AT PUMPED WELL HRES-09 DURING LONG-TERM PUMPING TEST, RESOLUTION PROJECT

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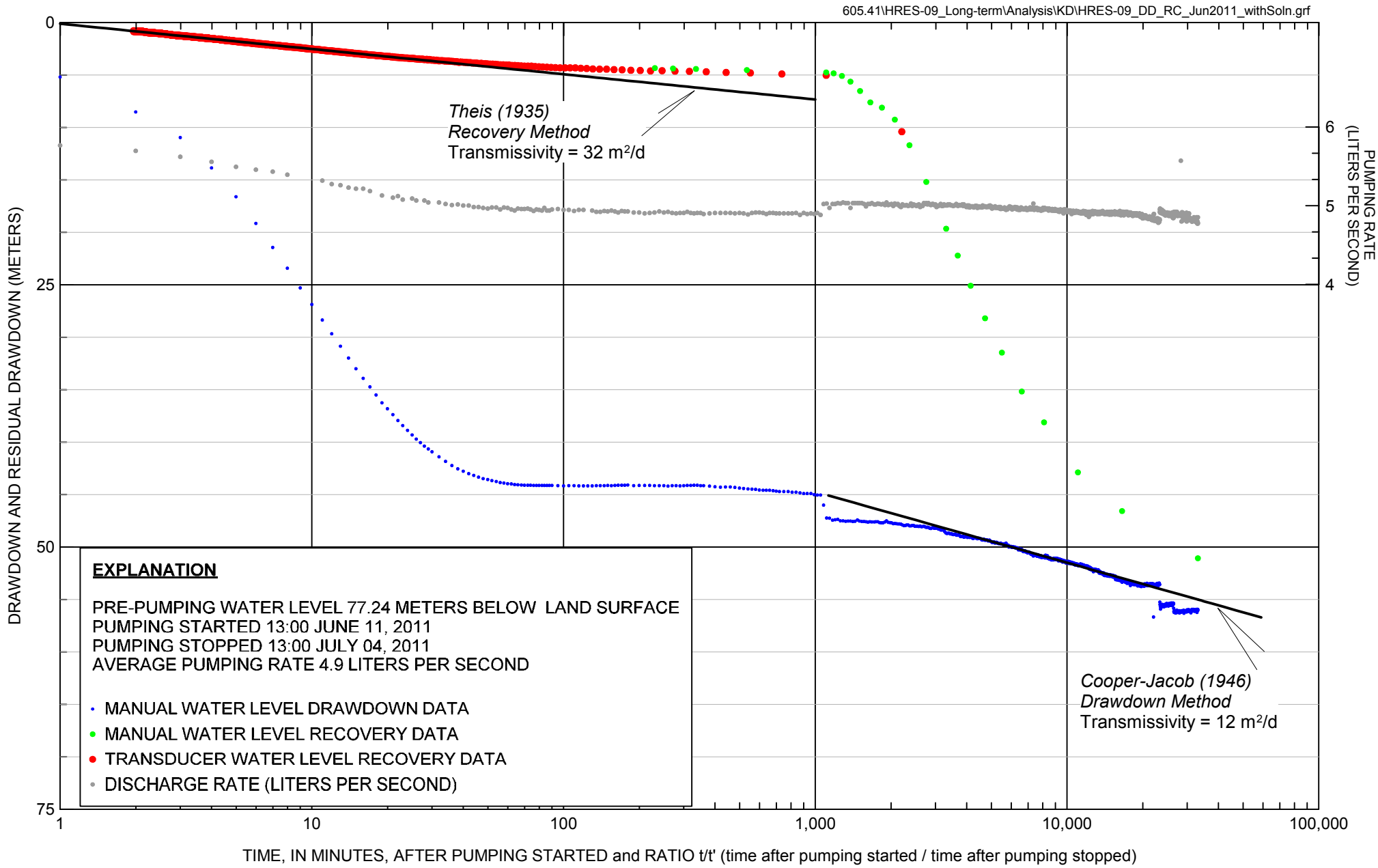

FIGURE 5. DRAWDOWN AND RECOVERY GRAPH FOR PUMPED WELL HRES-09 DURING 23-DAY CONSTANT-DISCHARGE PUMPING TEST, RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

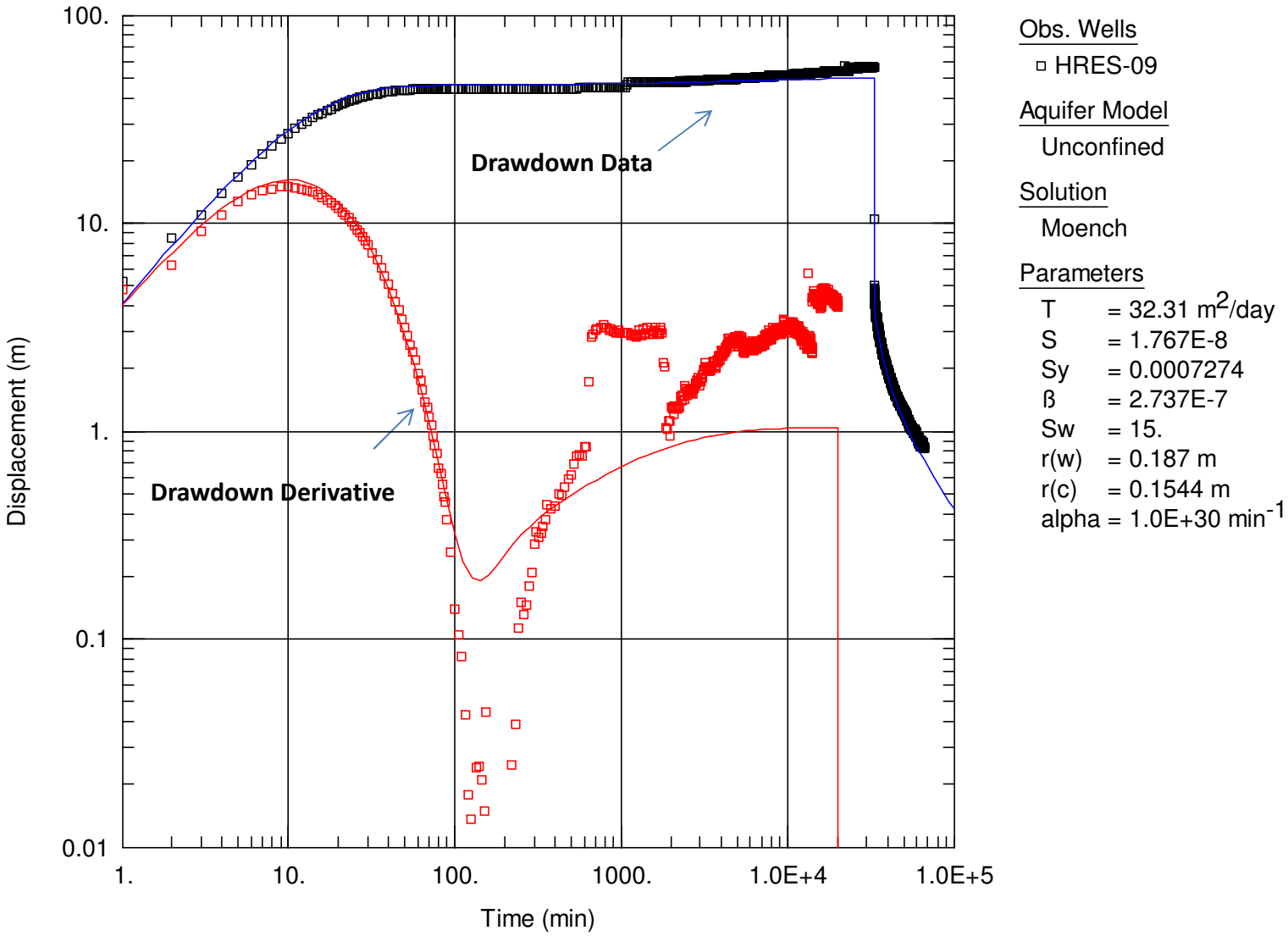

FIGURE 6. DERIVATIVE PLOT FOR PUMPING WELL HRES-09 DURING 23-DAY CONSTANT-RATE PUMPING TEST, RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

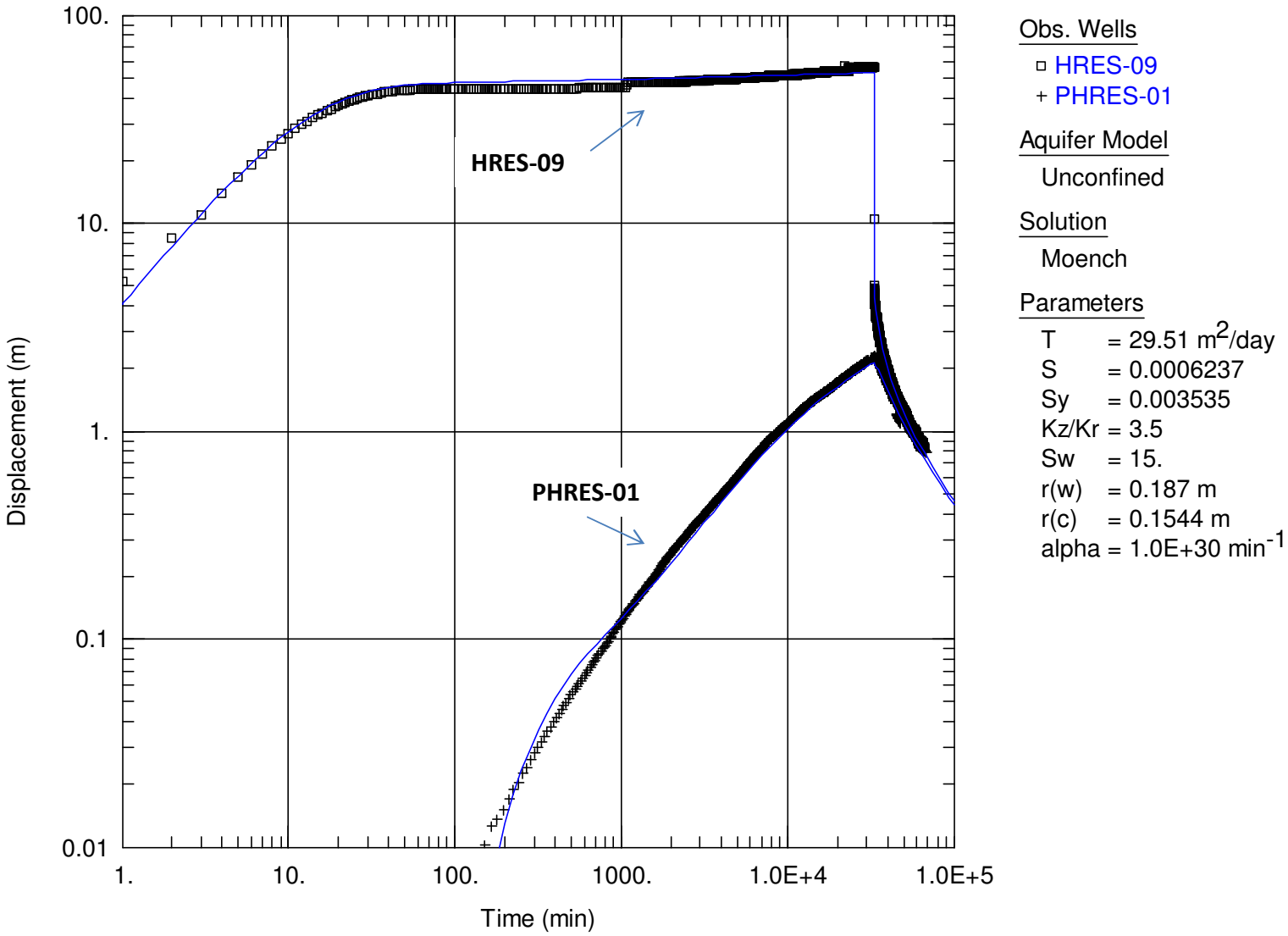

FIGURE 7. DRAWDOWN AND RECOVERY GRAPH FOR PUMPING WELL HRES-09 AND OBSERVATION WELL PHRES-01 DURING 23-DAY CONSTANT-RATE PUMPING TEST RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

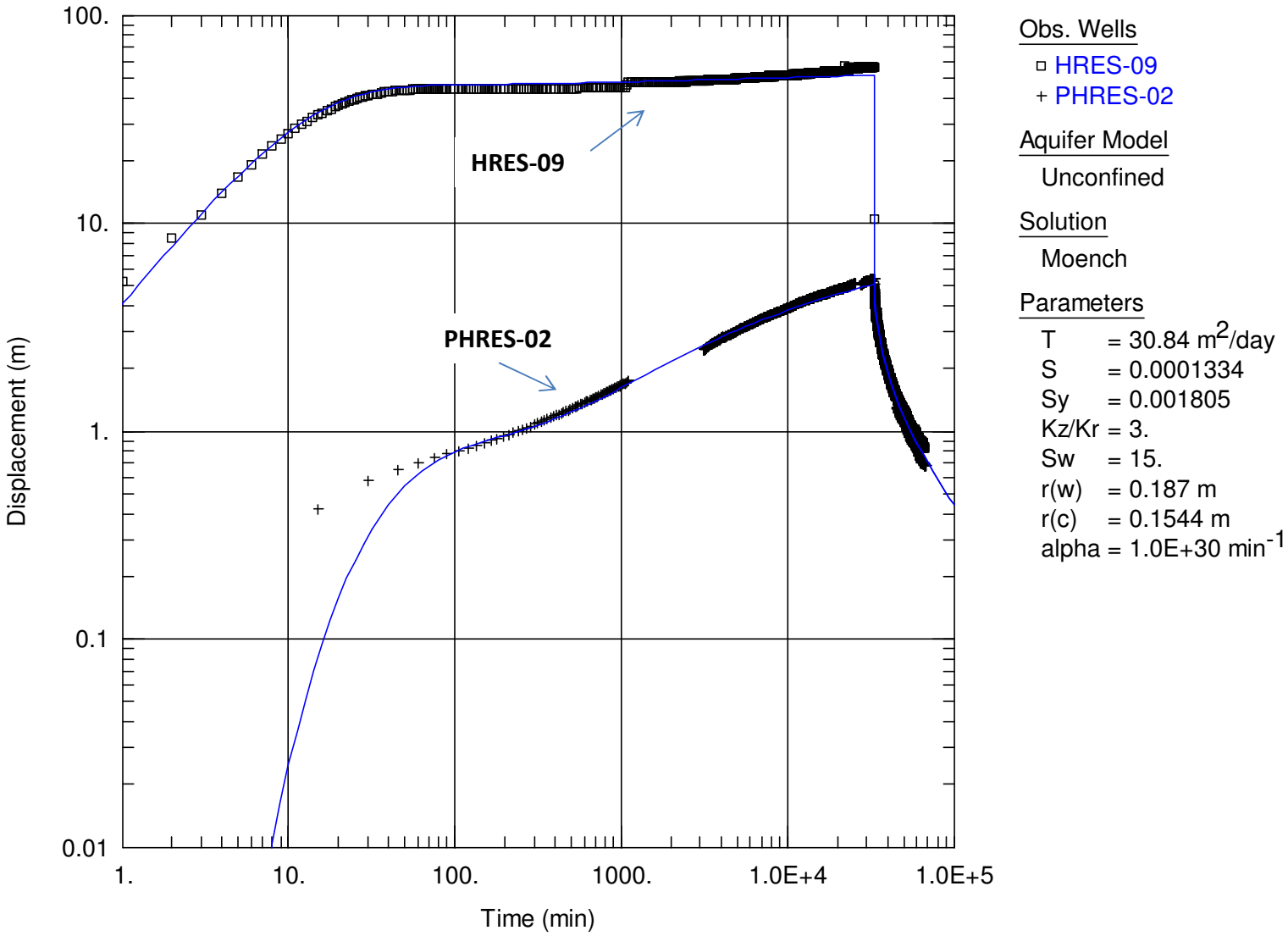

FIGURE 8. DRAWDOWN AND RECOVERY GRAPH FOR PUMPING WELL HRES-09 AND OBSERVATION WELL PHRES-02 DURING 23-DAY CONSTANT-RATE PUMPING TEST RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

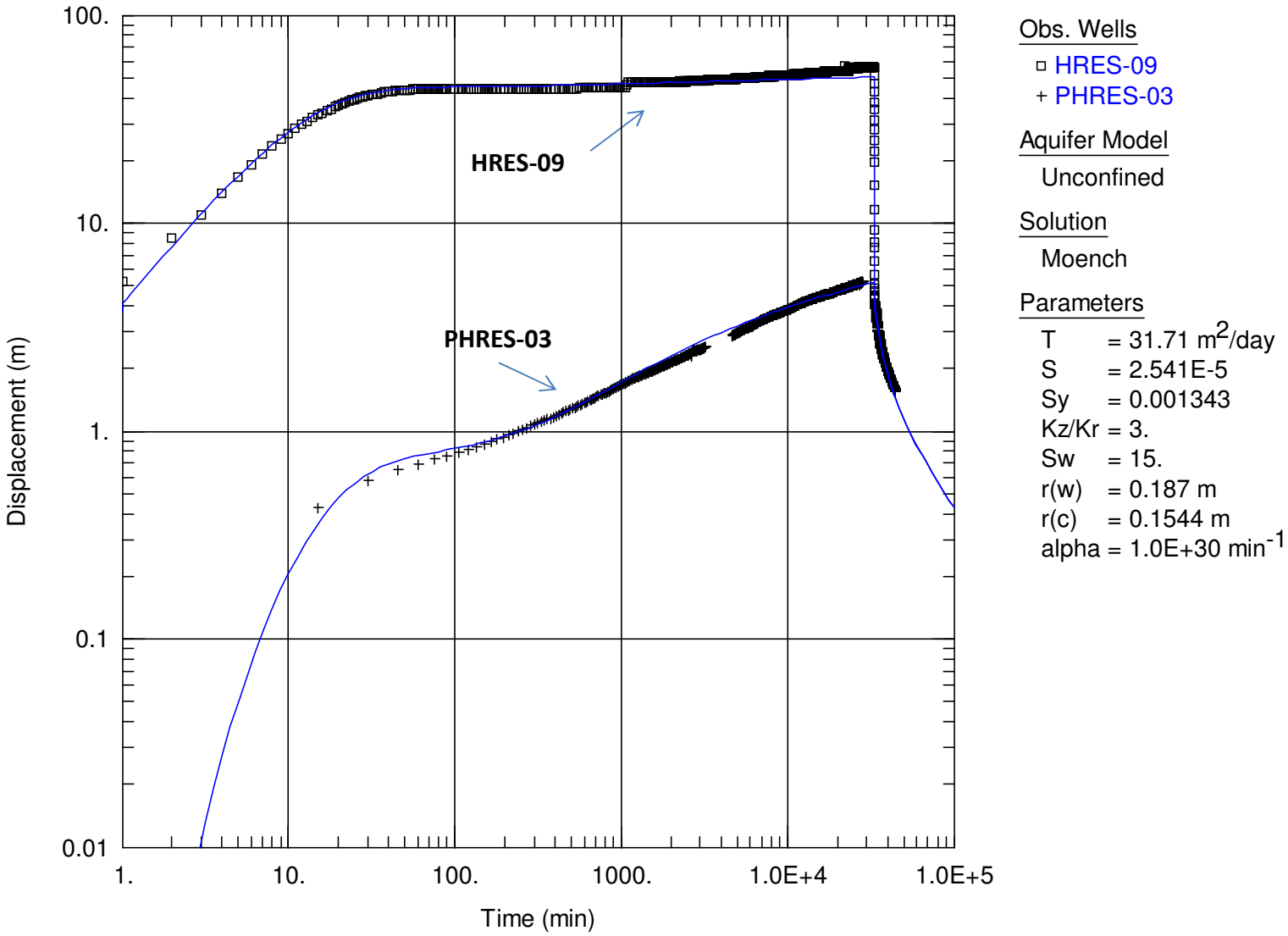

FIGURE 9. DRAWDOWN AND RECOVERY GRAPH FOR PUMPING WELL HRES-09 AND OBSERVATION WELL PHRES-03 DURING 23-DAY CONSTANT-RATE PUMPING TEST RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

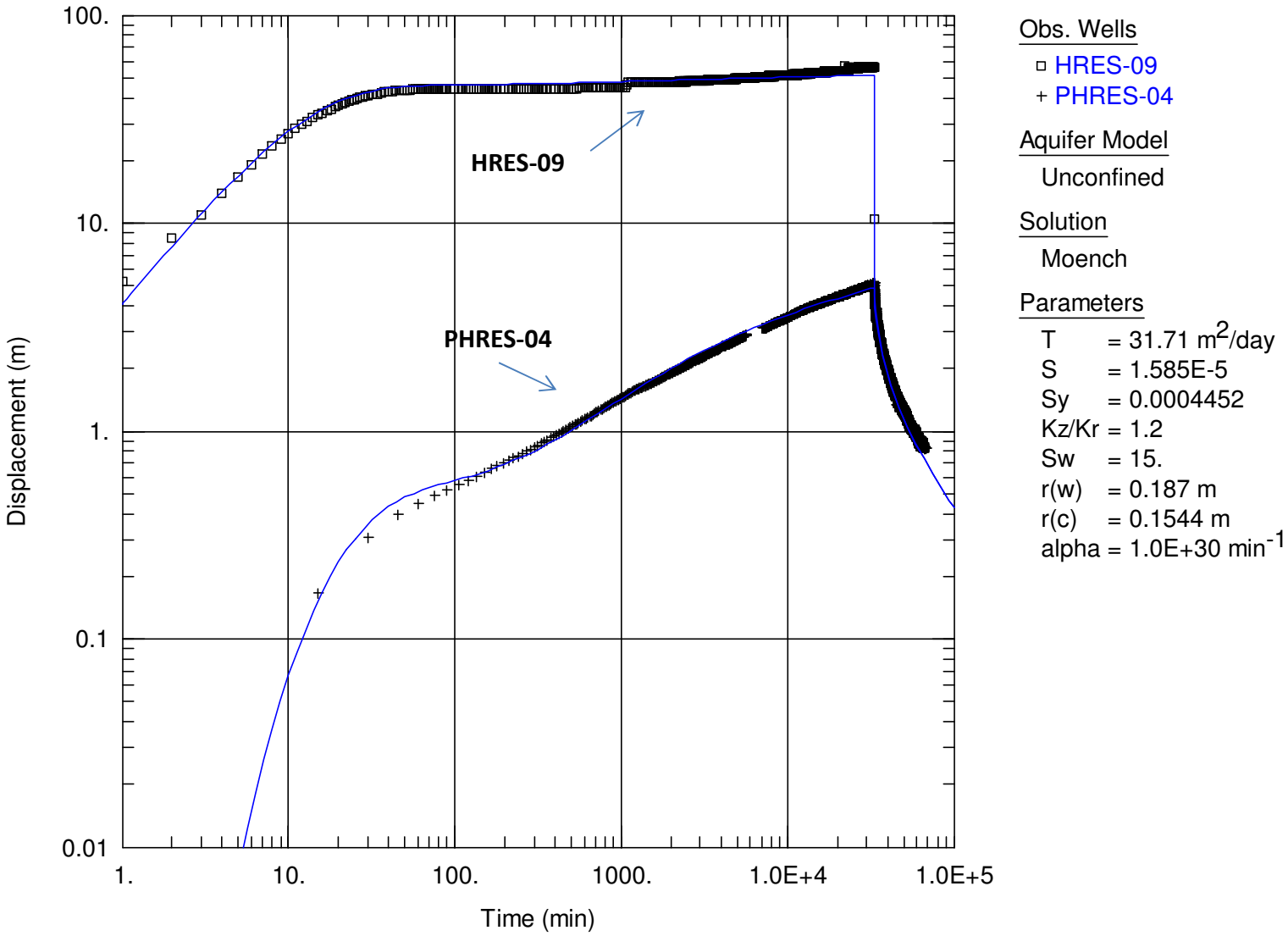

FIGURE 10. DRAWDOWN AND RECOVERY GRAPH FOR PUMPING WELL HRES-09 AND OBSERVATION WELL PHRES-04 DURING 23-DAY CONSTANT-RATE PUMPING TEST RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

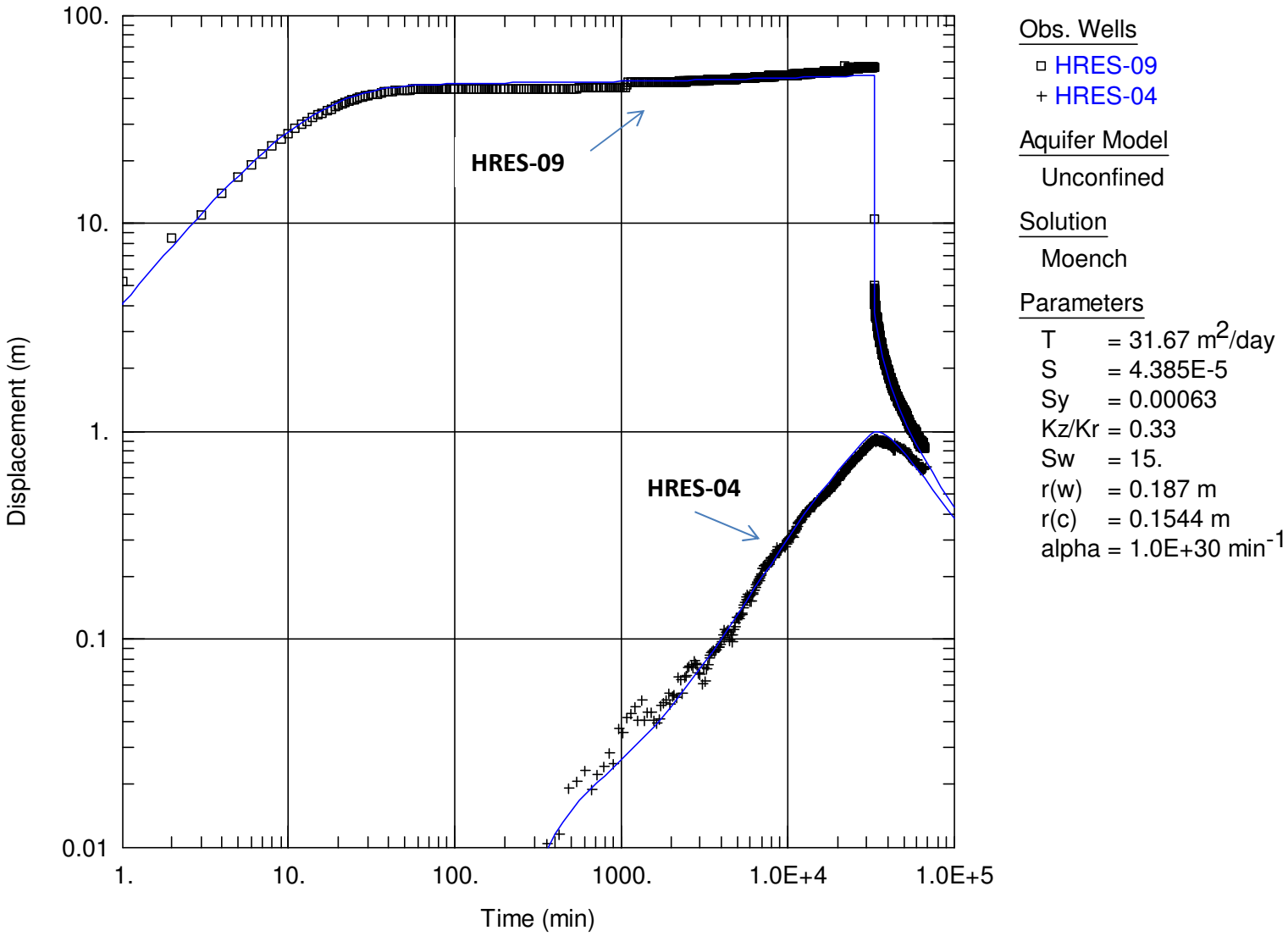

FIGURE 11. DRAWDOWN AND RECOVERY GRAPH FOR PUMPING WELL HRES-09 AND OBSERVATION WELL HRES-04 DURING 23-DAY CONSTANT-RATE PUMPING TEST RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

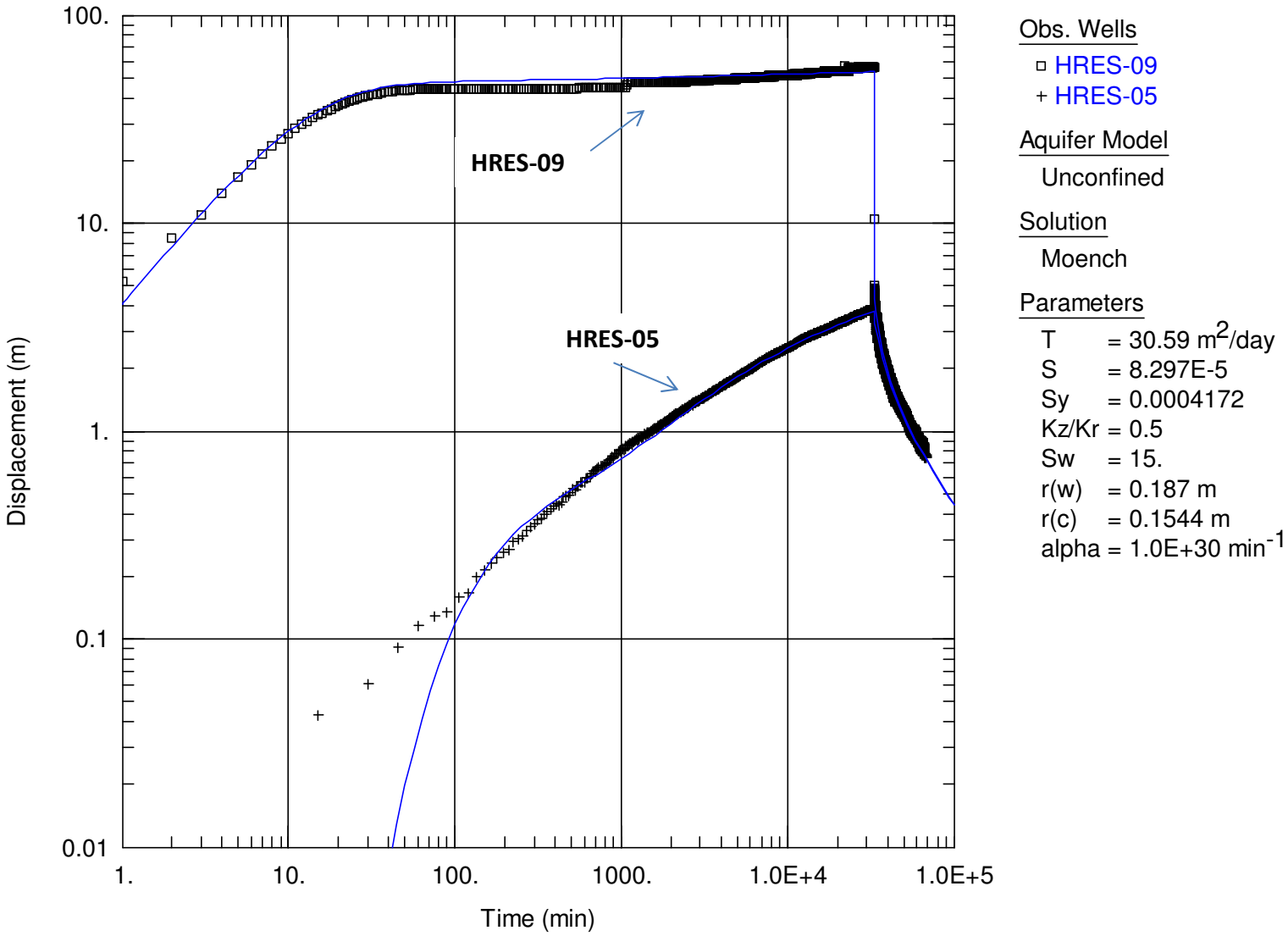

FIGURE 12. DRAWDOWN AND RECOVERY GRAPH FOR PUMPING WELL HRES-09 AND OBSERVATION WELL HRES-05 DURING 23-DAY CONSTANT-RATE PUMPING TEST RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

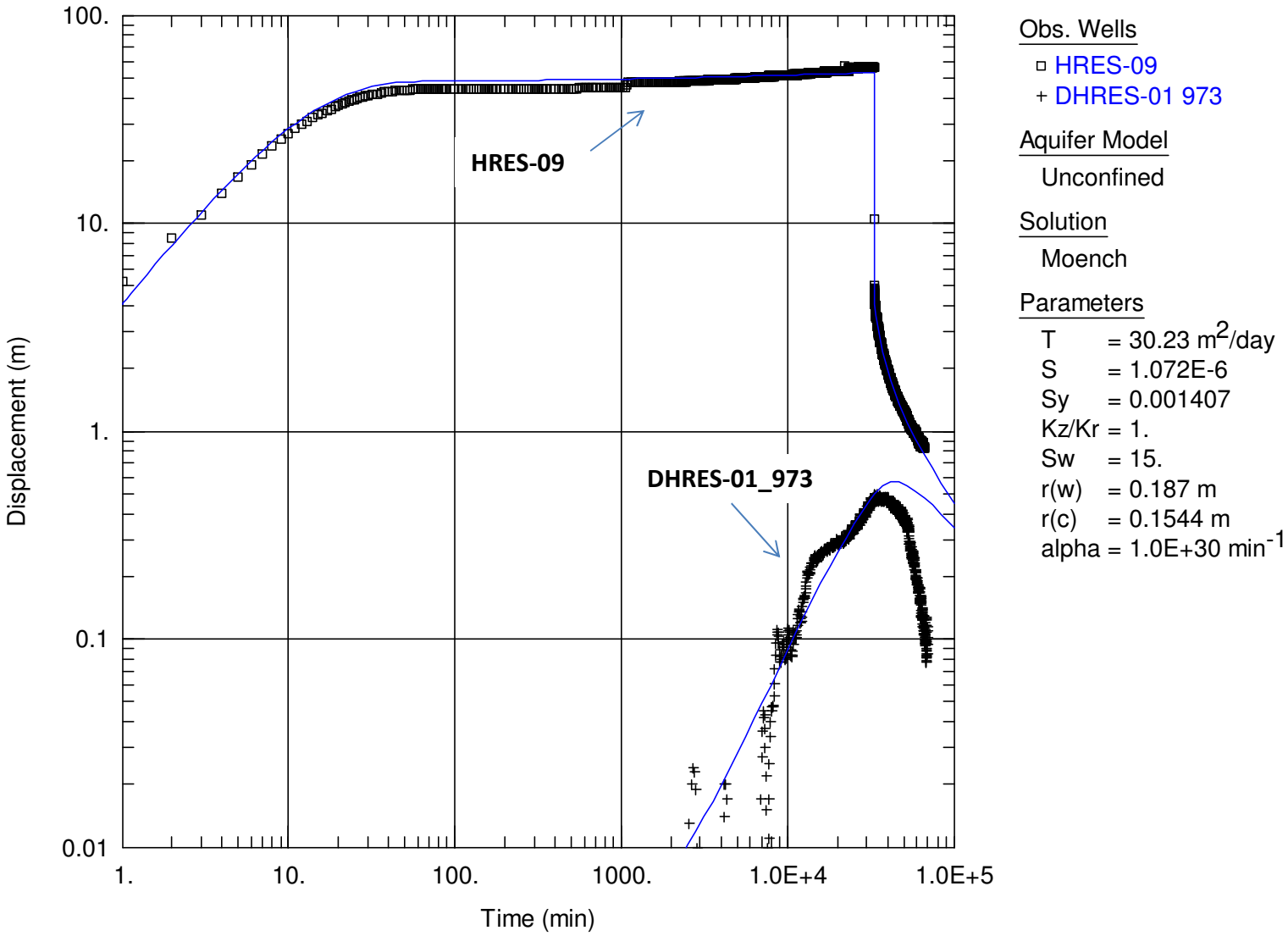

FIGURE 13. DRAWDOWN AND RECOVERY GRAPH FOR PUMPING WELL HRES-09 AND OBSERVATION PIEZOMETER DHRES-01_973 DURING 23-DAY CONSTANT-RATE PUMPING TEST, RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

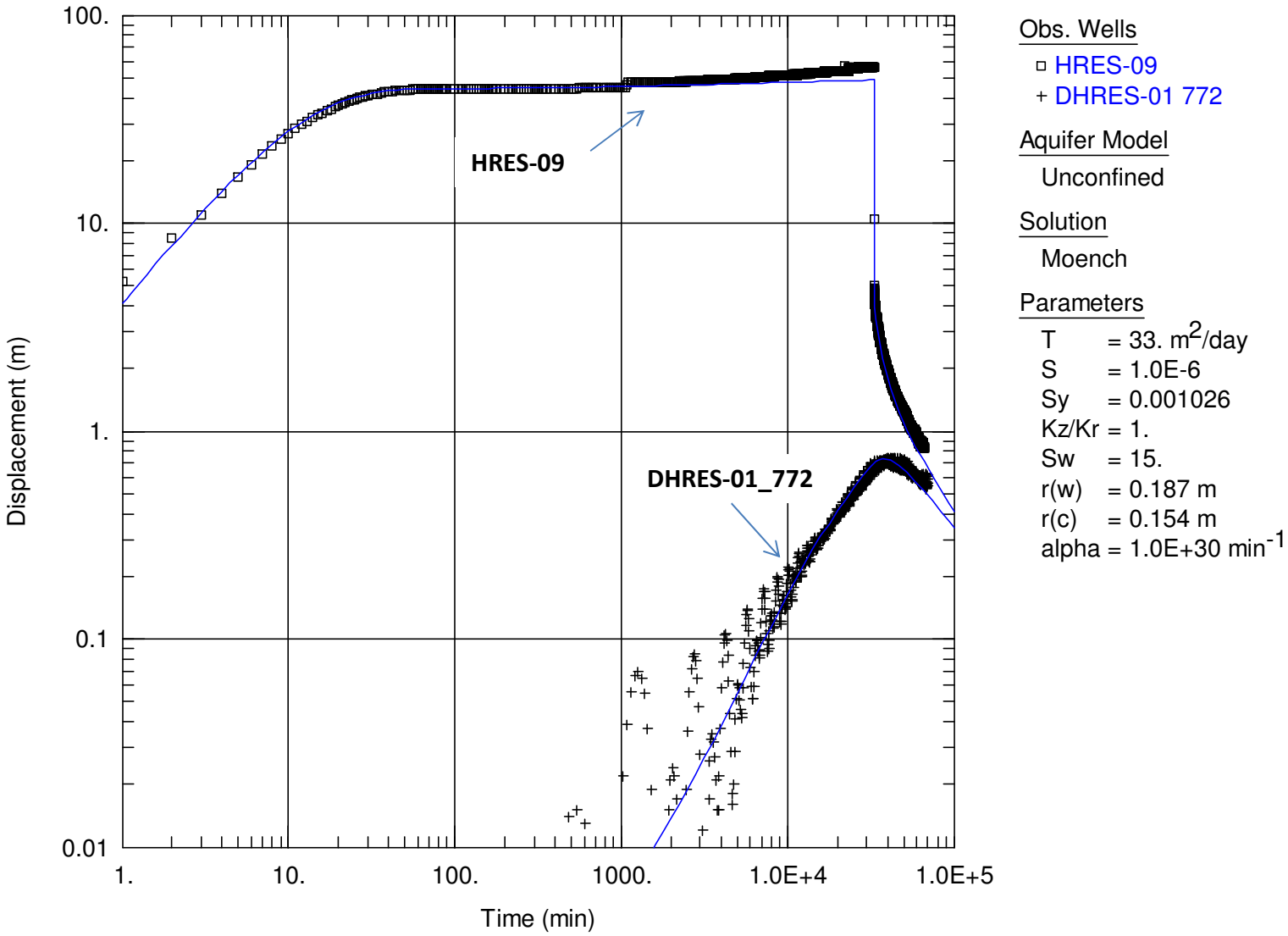

FIGURE 14. DRAWDOWN AND RECOVERY GRAPH FOR PUMPING WELL HRES-09 AND OBSERVATION PIEZOMETER DHRES-01_772 DURING 23-DAY CONSTANT-RATE PUMPING TEST, RESOLUTION PROJECT

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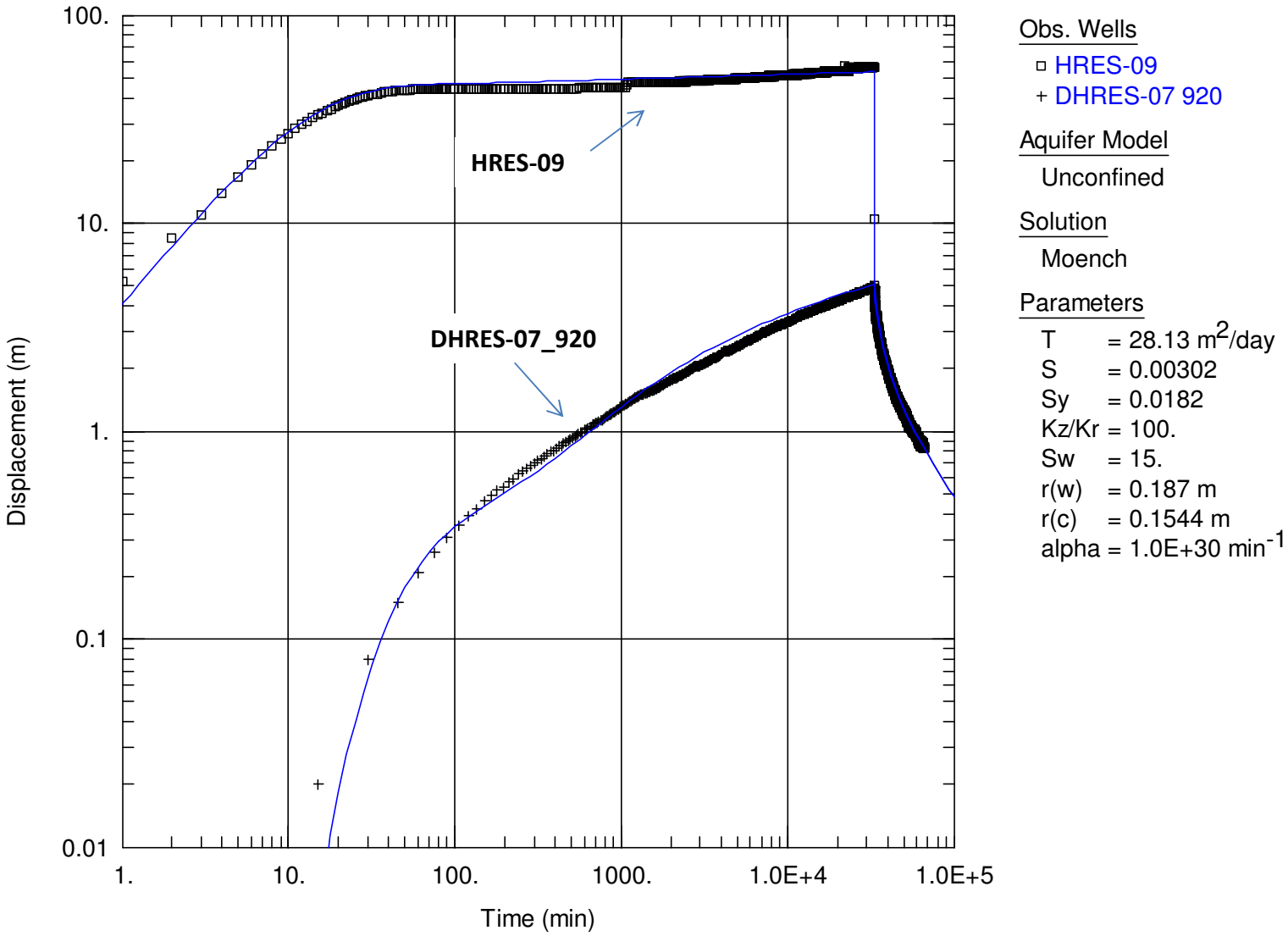

FIGURE 15. DRAWDOWN AND RECOVERY GRAPH FOR PUMPING WELL HRES-09 AND OBSERVATION PIEZOMETER DHRES-07_920 DURING 23-DAY CONSTANT-RATE PUMPING TEST, RESOLUTION PROJECT

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R. 13 E.

T. 1 S.

T. 2 S.

R. 12 E.

R. 13 E.

DHRES-02
HRES-02
HRES-04
DHRES-01
DHRES-08
HRES-09
DHRES-07
PHRES-01
PHRES-02
PHRES-03
PHRES-04
HRES-05
DHRES-06
HRES-08
HRES-13
HRES-07
A-06
HRES-16
MJ-11

1
2
3
4
5
6
7
8
9
10
11

1300
1400
1200

04
05
06
07
08
09

EXPLANATION

- Watershed Boundary
- Perennial Reach
- Fault
- Contours of Maximum Drawdown (in meters) (dashed where gradient is not controlled)

Groundwater Monitoring Sites

- Apache Leap Tuff Aquifer Monitor Well
- Deep Groundwater System Monitor Well
- Open Borehole

Geologic Units

- Quaternary Alluvial Deposits
- Tertiary Apache Leap Tuff

N

0 500 1,000

Meters

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HRES-09 PUMPING TEST MAXIMUM DRAWDOWN CONTOURS

2012

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FIGURE 16

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APPENDIX A

GROUNDWATER LEVEL HYDROGRAPHS
(APRIL 1 – JULY 31, 2011)

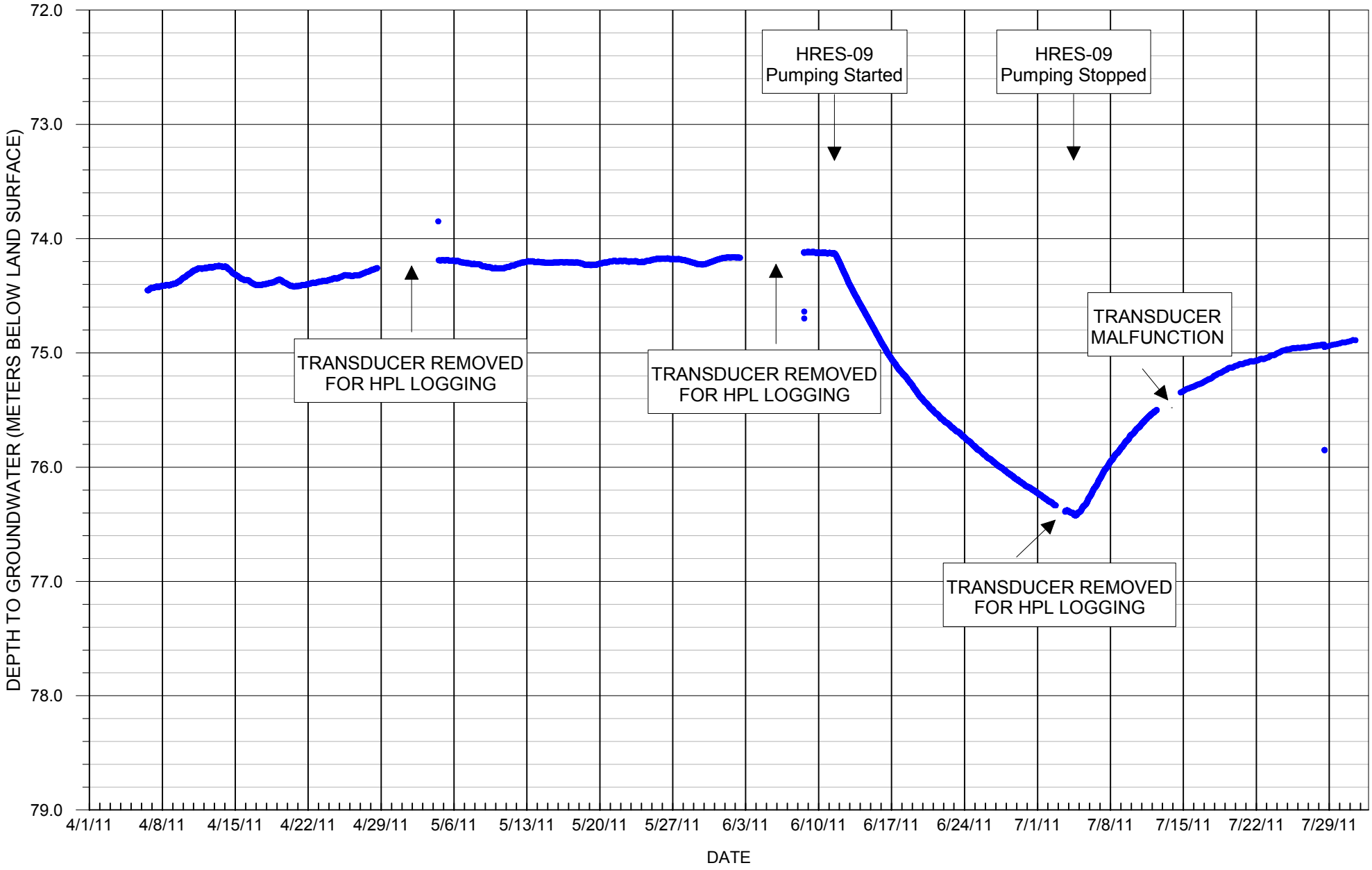

FIGURE A1. WATER LEVEL HYDROGRAPH FOR <u>OBSERVATION WELL PHRES-01,</u> APRIL THROUGH JULY 2011 RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\Linear\PHRES-01_WL.grf

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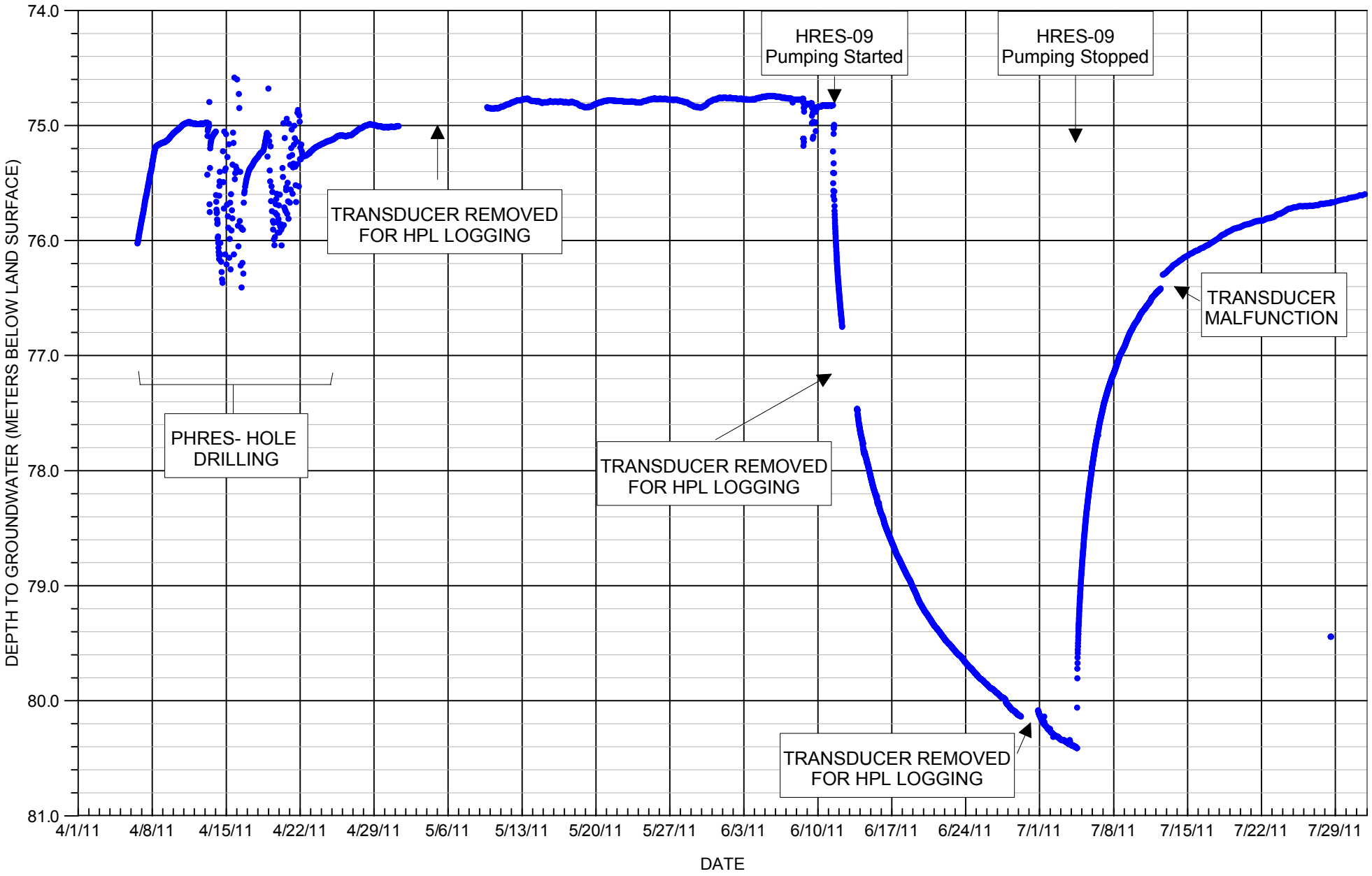

FIGURE A2. WATER LEVEL HYDROGRAPH FOR OBSERVATION WELL PHRES-02, APRIL THROUGH JULY 2011 RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\Linear\PHRES-04_WL.grf

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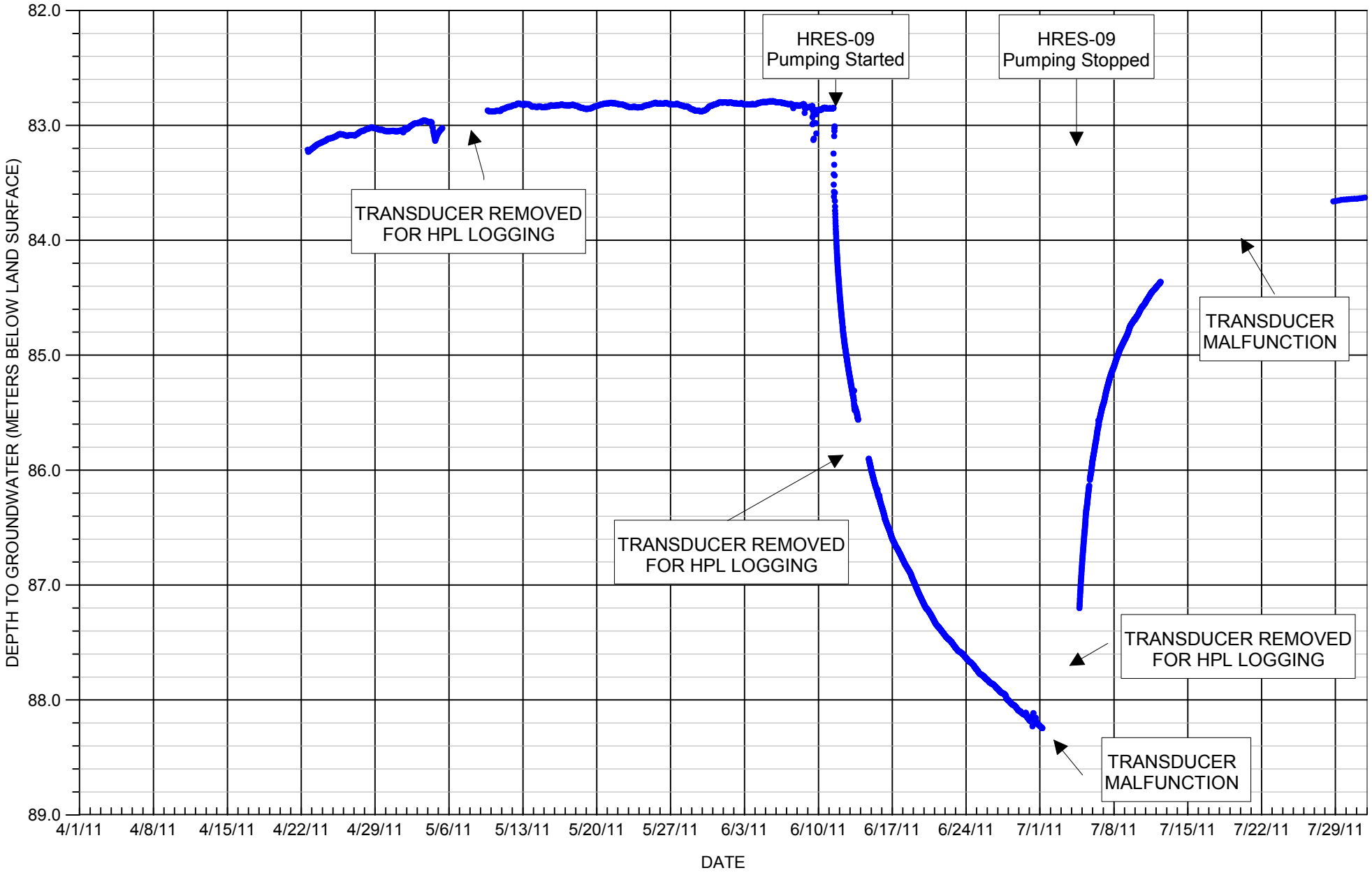

FIGURE A3. WATER LEVEL HYDROGRAPH FOR <u>OBSERVATION WELL PHRES-03,</u> APRIL THROUGH JULY 2011 RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\Linear\PHRES-03_WL.grf

MONTGOMERY & ASSOCIATES

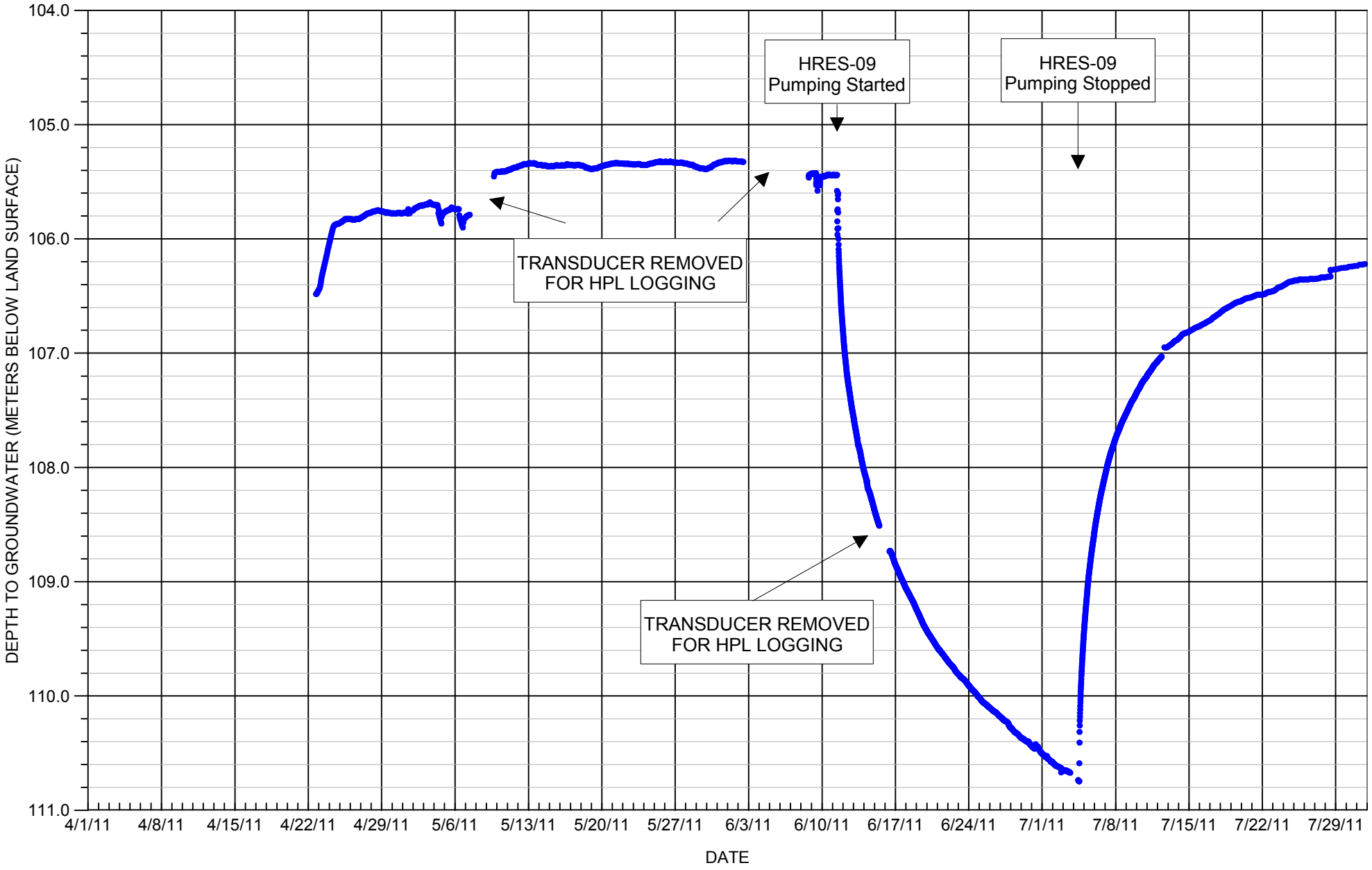

FIGURE A4. WATER LEVEL HYDROGRAPH FOR OBSERVATION WELL PHRES-04, APRIL THROUGH JULY 2011 RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\Linear\PHRES-04_WL.grf

MONTGOMERY & ASSOCIATES

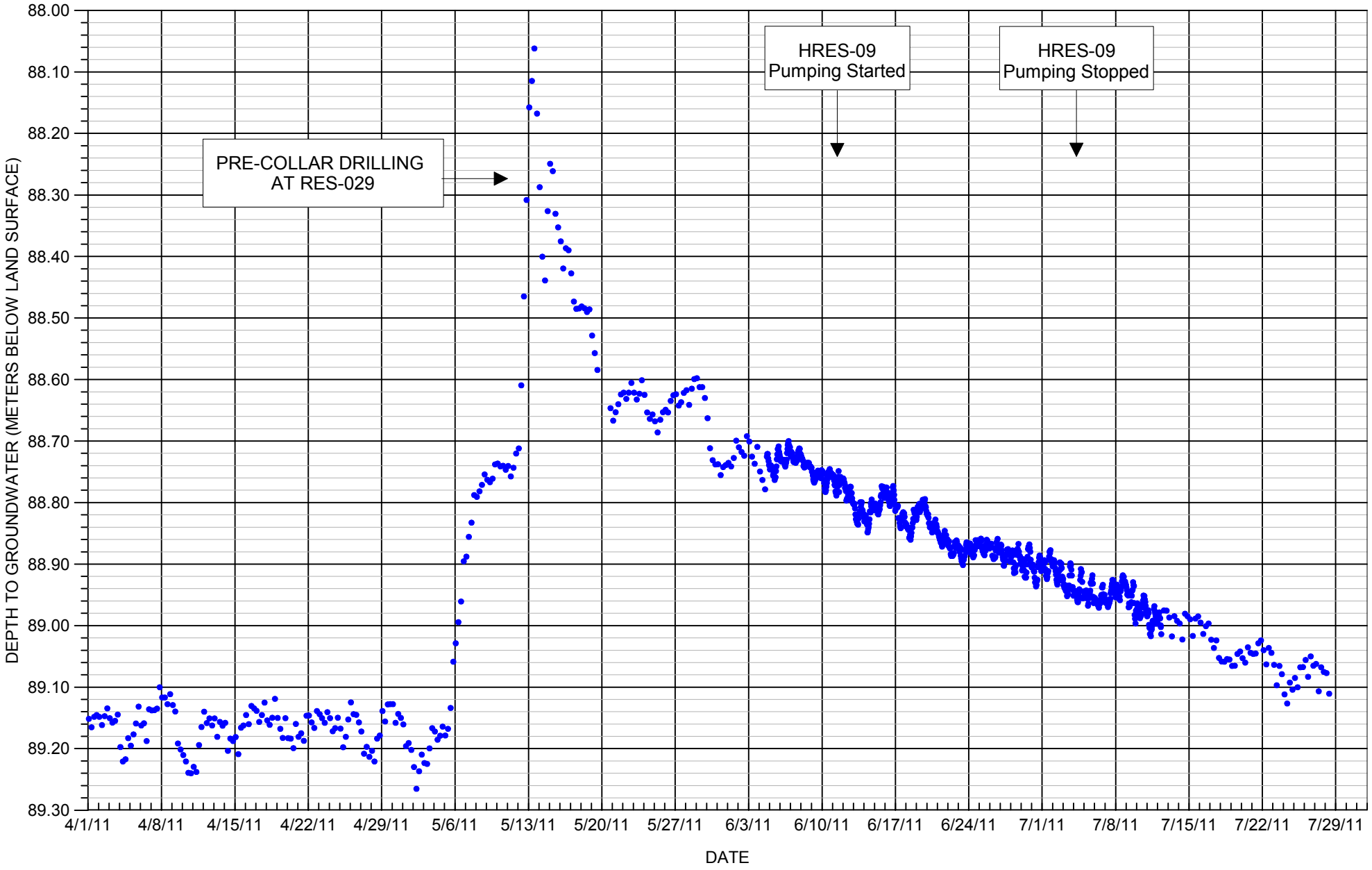

FIGURE A5. WATER LEVEL HYDROGRAPH FOR OBSERVATION WELL HRES-02, APRIL THROUGH JULY 2011 RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\Linear\HRES-02_WL.grf

MONTGOMERY & ASSOCIATES

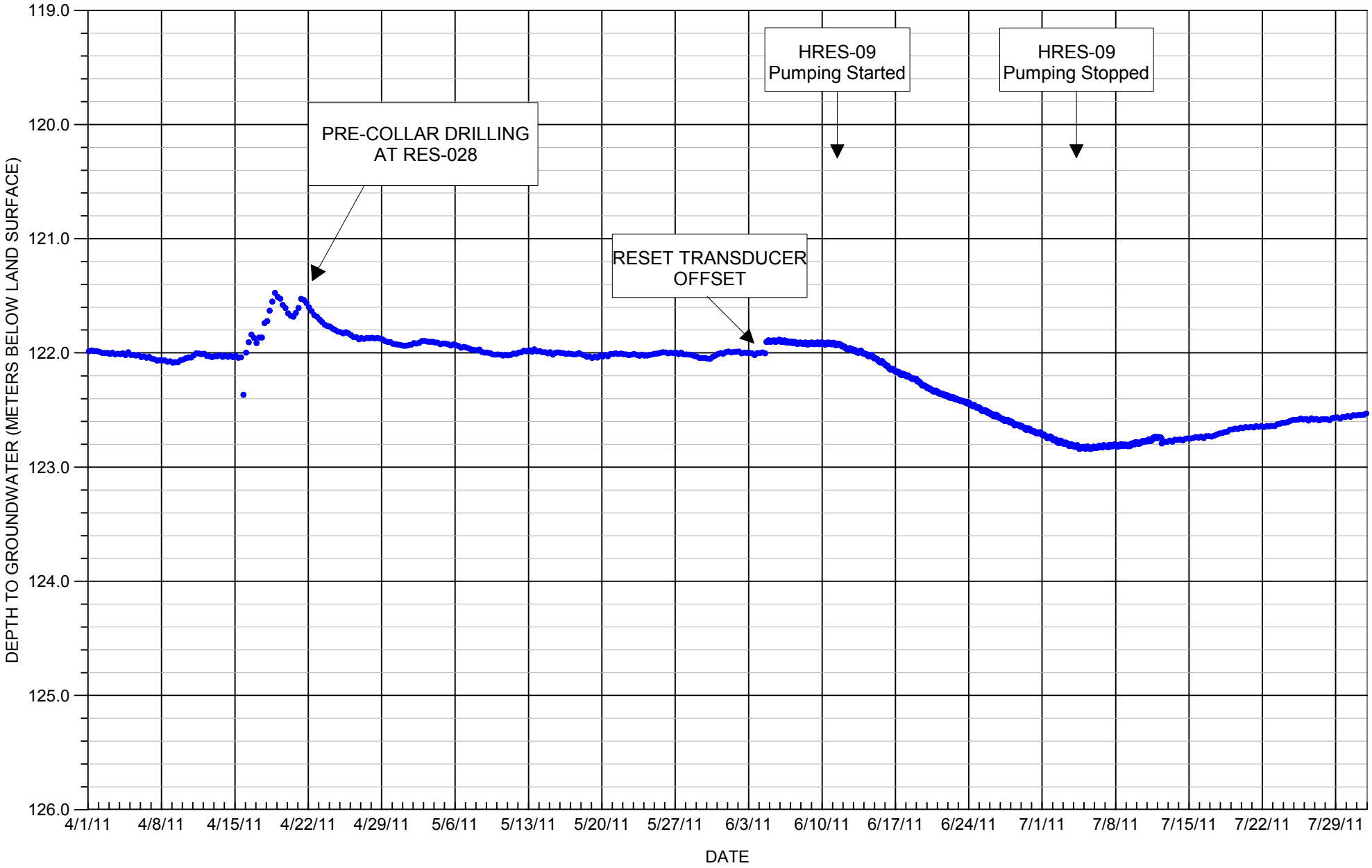

FIGURE A6. WATER LEVEL HYDROGRAPH FOR OBSERVATION WELL HRES-04, APRIL THROUGH JULY 2011 RESOLUTION PROJECT

605.4\HRES-09_Long-term\HRES-04_WL.grf

MONTGOMERY & ASSOCIATES

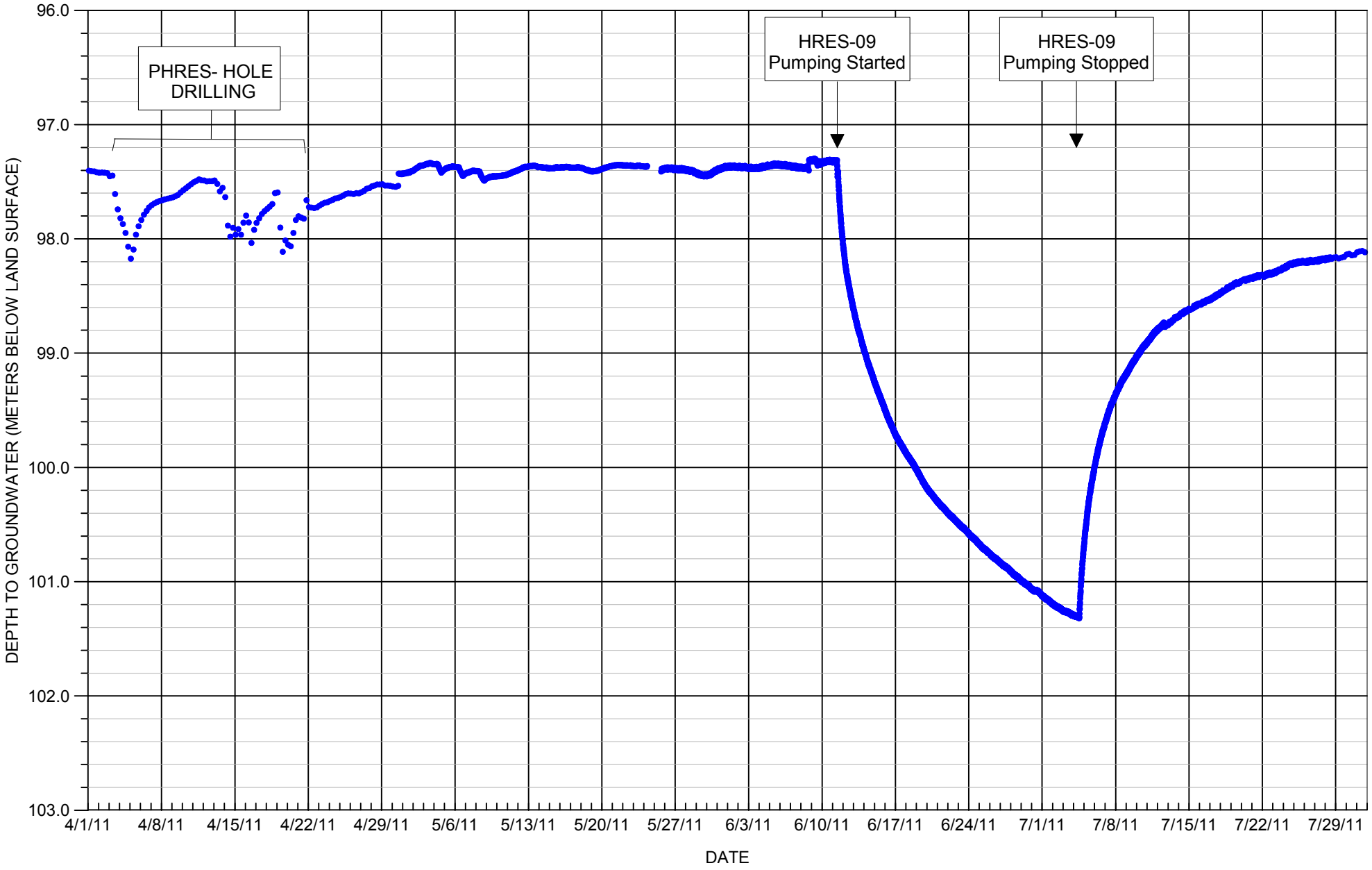

FIGURE A7. WATER LEVEL HYDROGRAPH FOR <u>OBSERVATION WELL HRES-05,</u> APRIL THROUGH JULY 2011 RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\Linear\HRES-05_WL.grf

MONTGOMERY & ASSOCIATES

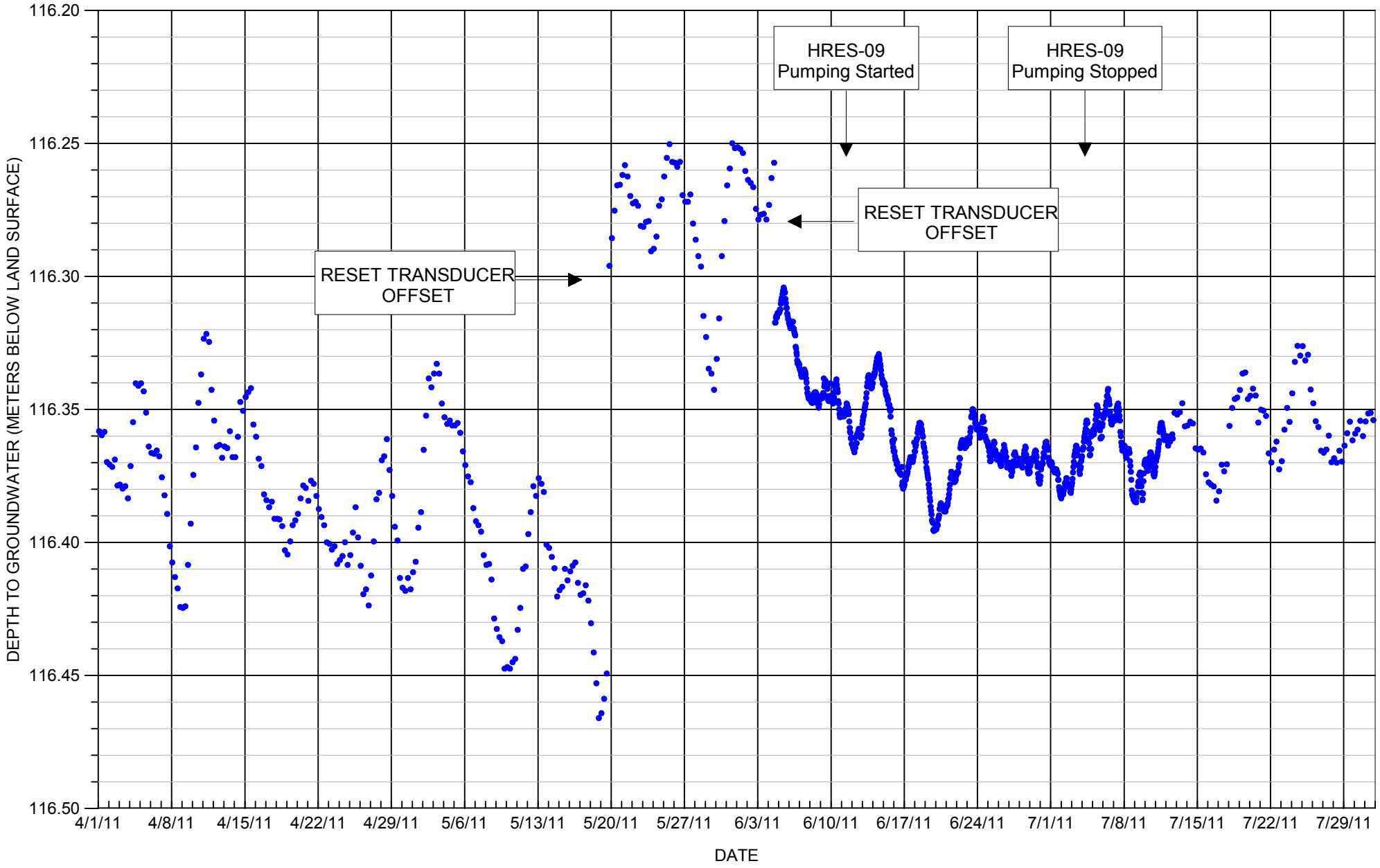

FIGURE A8. WATER LEVEL HYDROGRAPH FOR OBSERVATION WELL HRES-07, APRIL THROUGH JULY 2011 RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\Linear\HRES-07_WL.grf

MONTGOMERY & ASSOCIATES

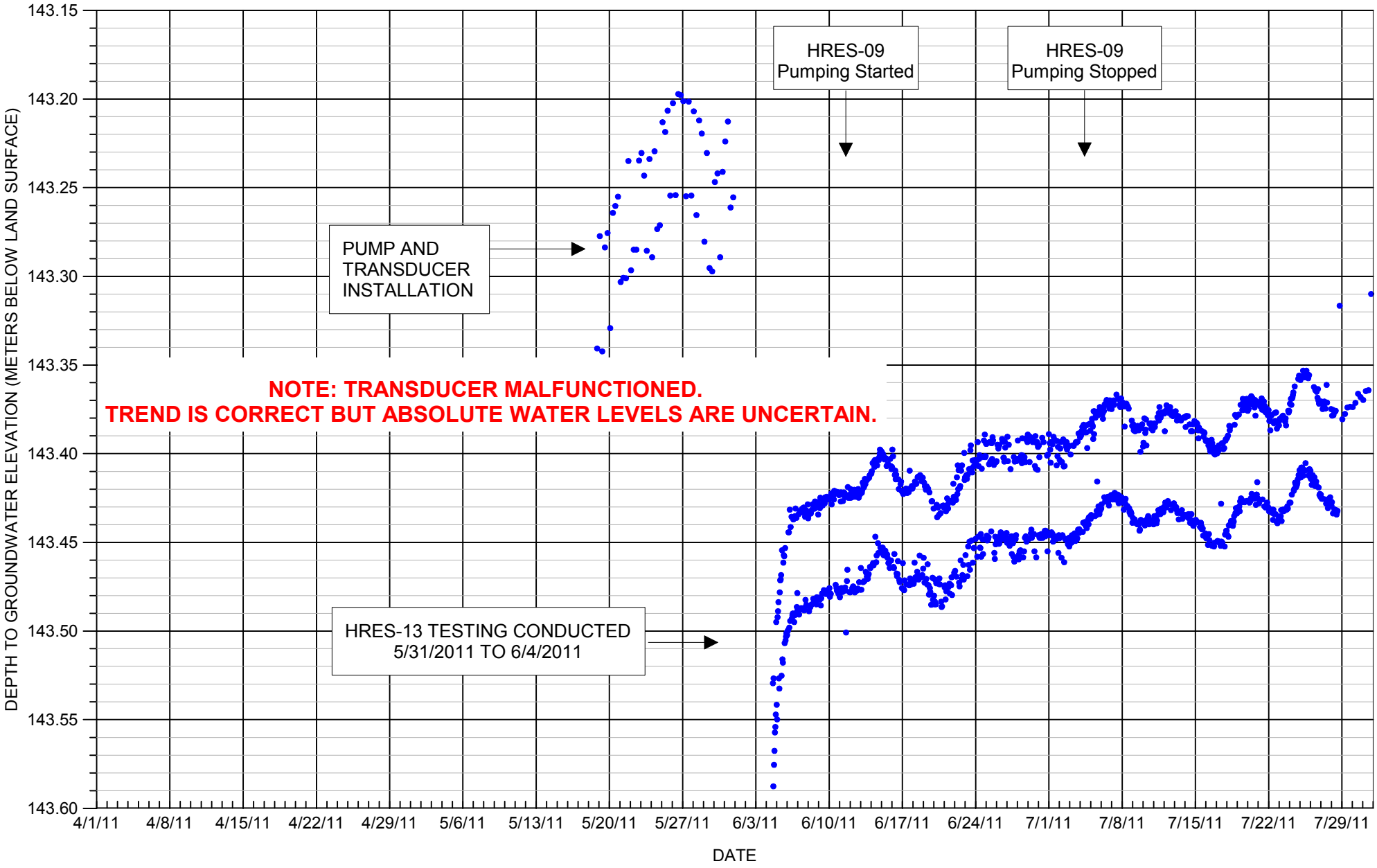

FIGURE A9. WATER LEVEL HYDROGRAPH FOR OBSERVATION WELL HRES-13, APRIL THROUGH JULY 2011 RESOLUTION PROJECT

605.4\HRES-09_Long-term\HRES-13_WL.grf

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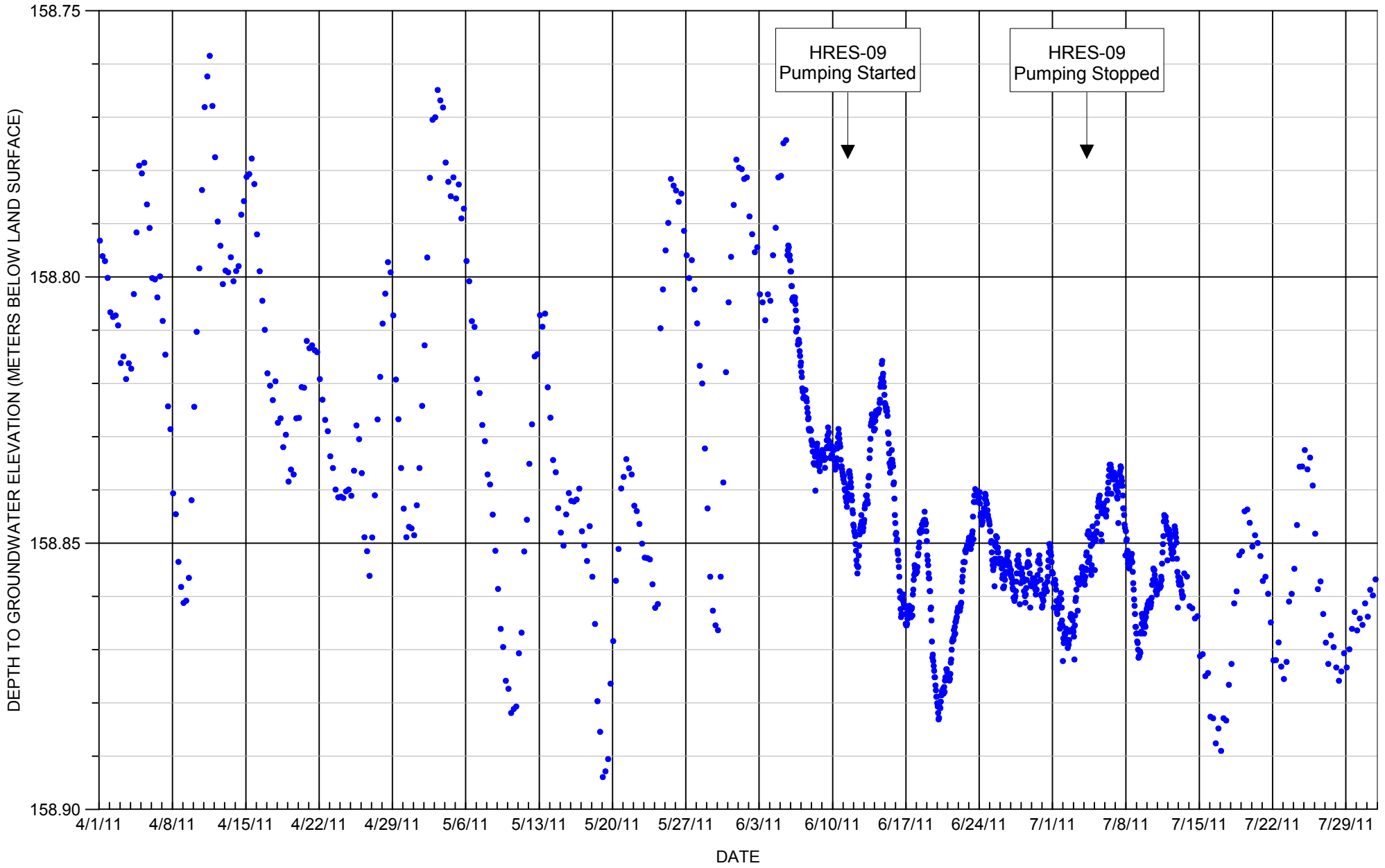

FIGURE A10. WATER LEVEL HYDROGRAPH FOR <u>OBSERVATION WELL A-06,</u> APRIL THROUGH JULY 2011 RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\Linear\A-06_WL.grf

MONTGOMERY & ASSOCIATES

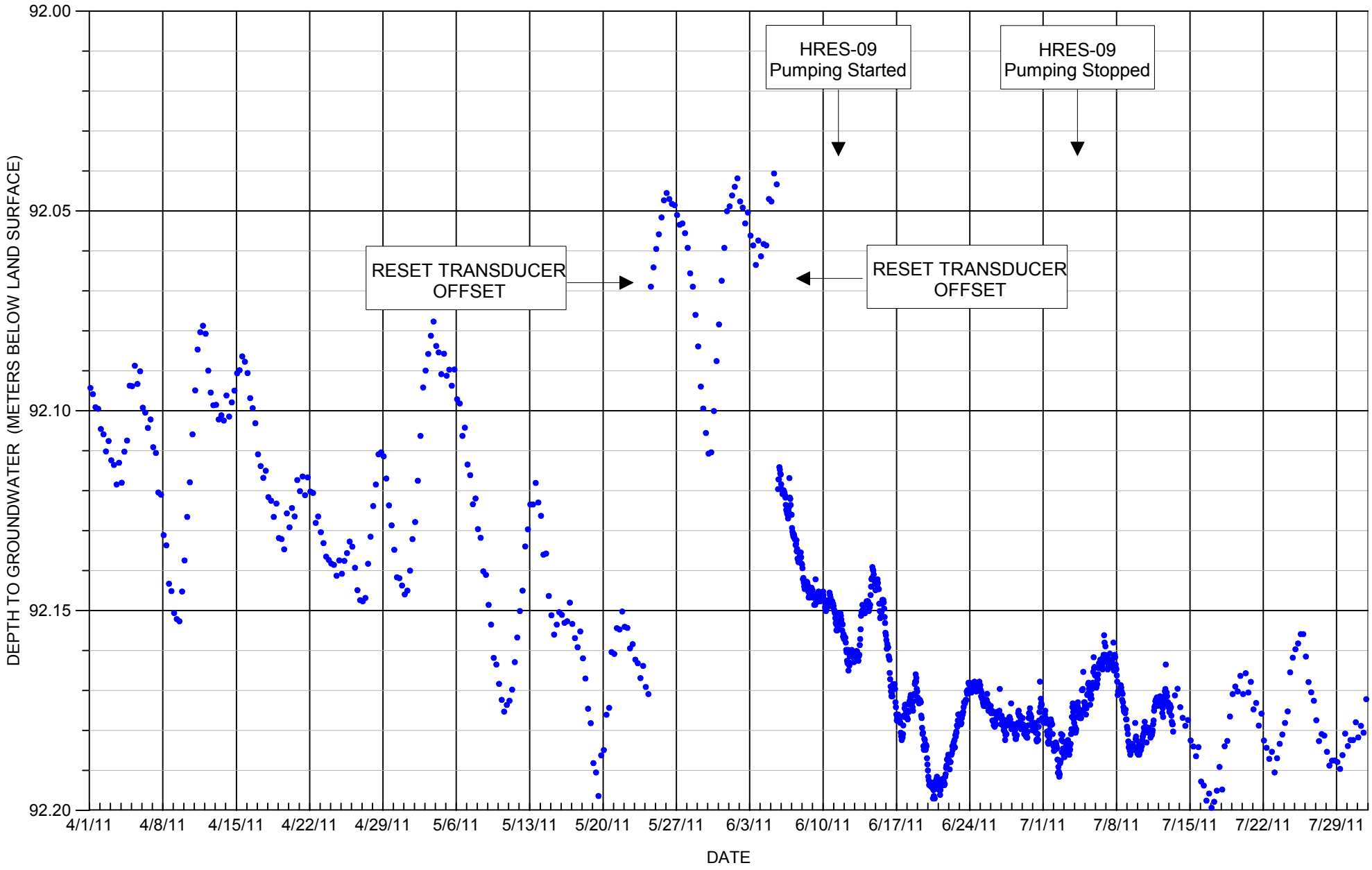

FIGURE A11. WATER LEVEL HYDROGRAPH FOR OBSERVATION WELL MJ-11, APRIL THROUGH JULY 2011 RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\Linear\MJ-11_WL.grf

MONTGOMERY & ASSOCIATES

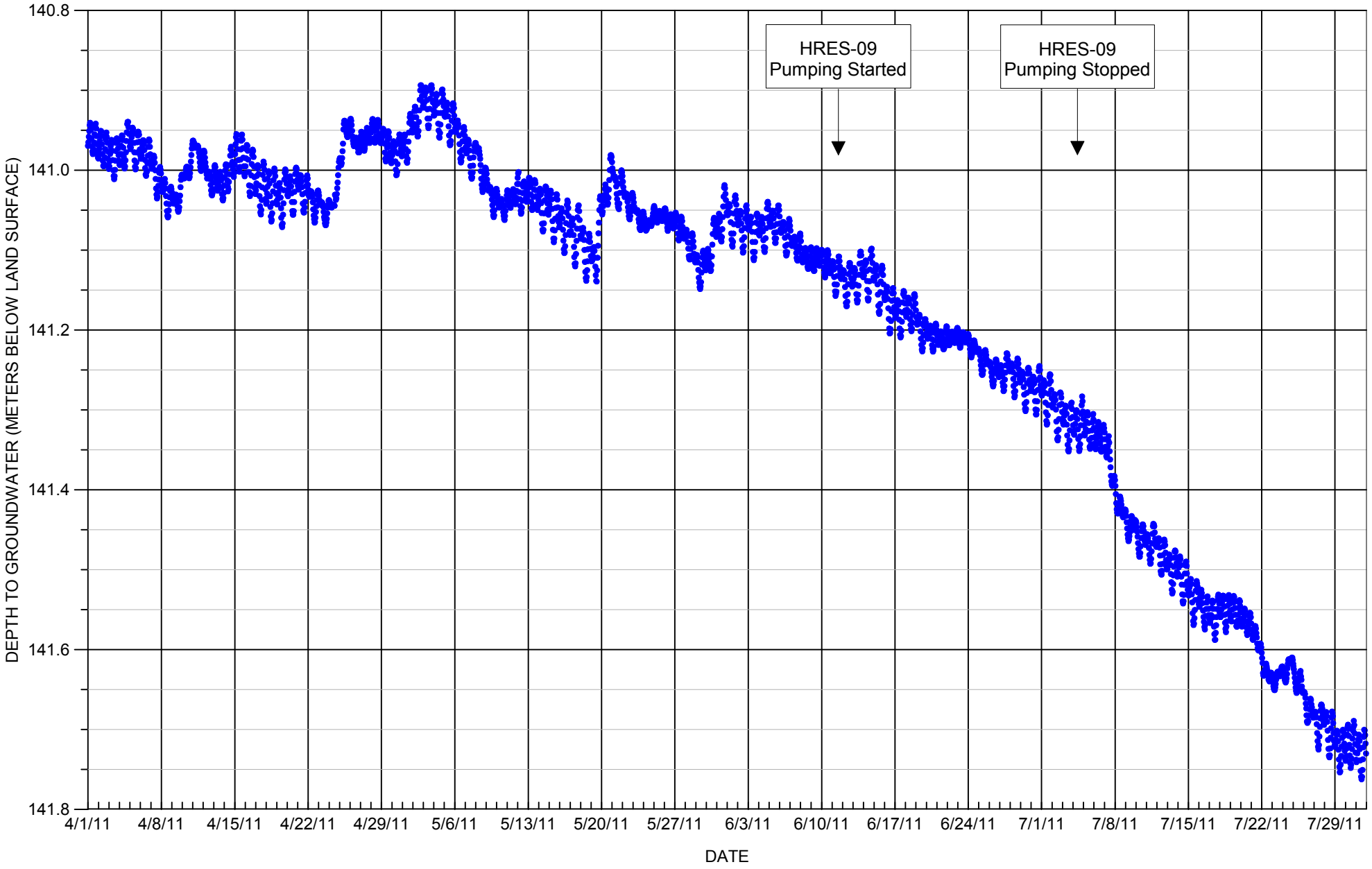

FIGURE A12. WATER LEVEL HYDROGRAPH FOR GROUTED PIEZOMETER DHRES-08_980 APRIL THROUGH JULY 2011, RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\Linear\DHRES-08_980_WL.grf

MONTGOMERY & ASSOCIATES

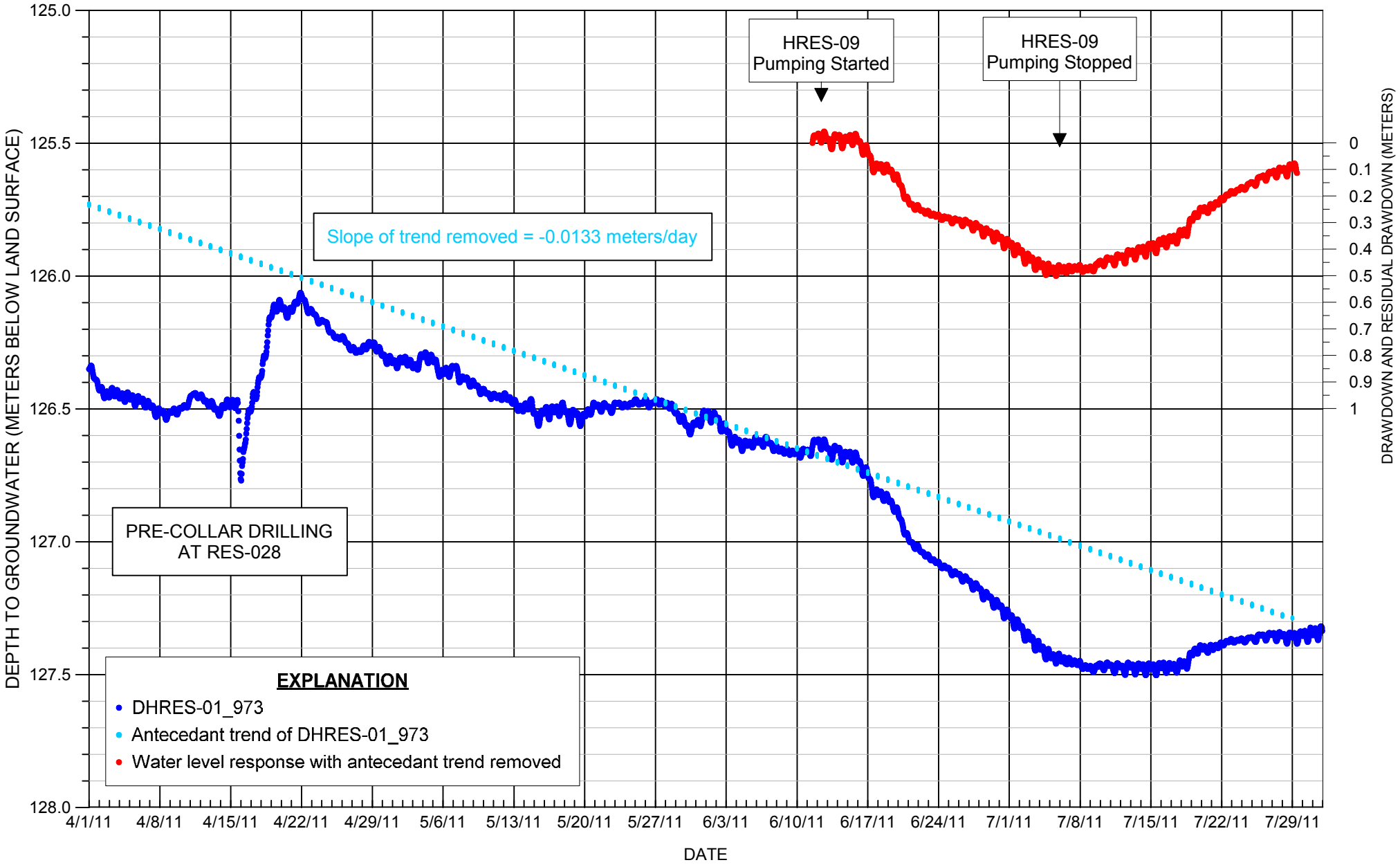

FIGURE A13. WATER LEVEL HYDROGRAPH FOR GROUTED PIEZOMETER DHRES-01_973 APRIL THROUGH JULY 2011, RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\Linear\DHRES-01_973_WL.grf

MONTGOMERY & ASSOCIATES

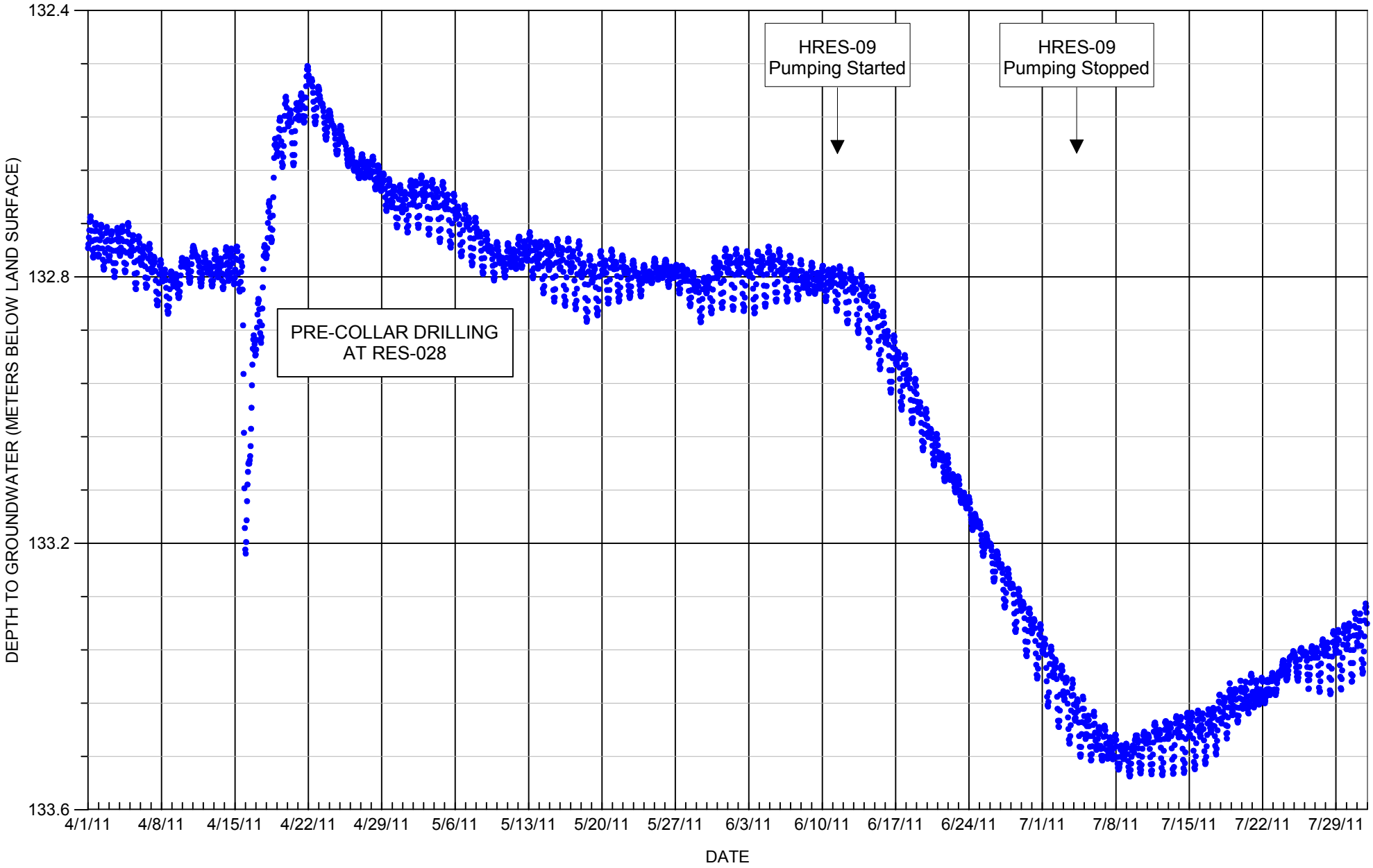

FIGURE A14. WATER LEVEL HYDROGRAPH FOR GROUTED PIEZOMETER DHRES-01_772 APRIL THROUGH JULY 2011, RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\Linear\DHRES-01_772_WL.grf

MONTGOMERY & ASSOCIATES

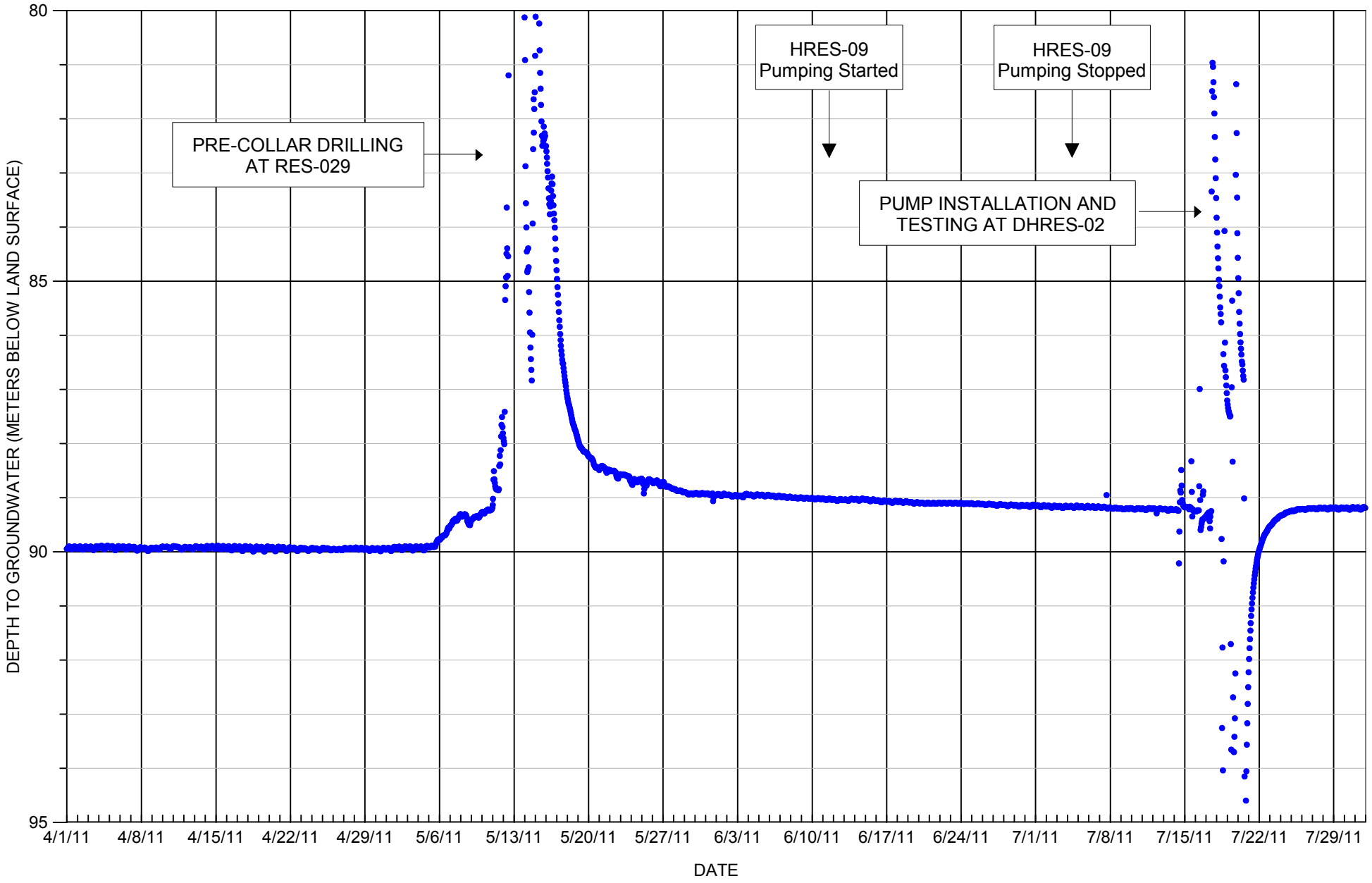

FIGURE A15. WATER LEVEL HYDROGRAPH FOR GROUTED PIEZOMETER DHRES-02_915 APRIL THROUGH JULY 2011, RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\Linear\DHRES-02_915_WL.grf

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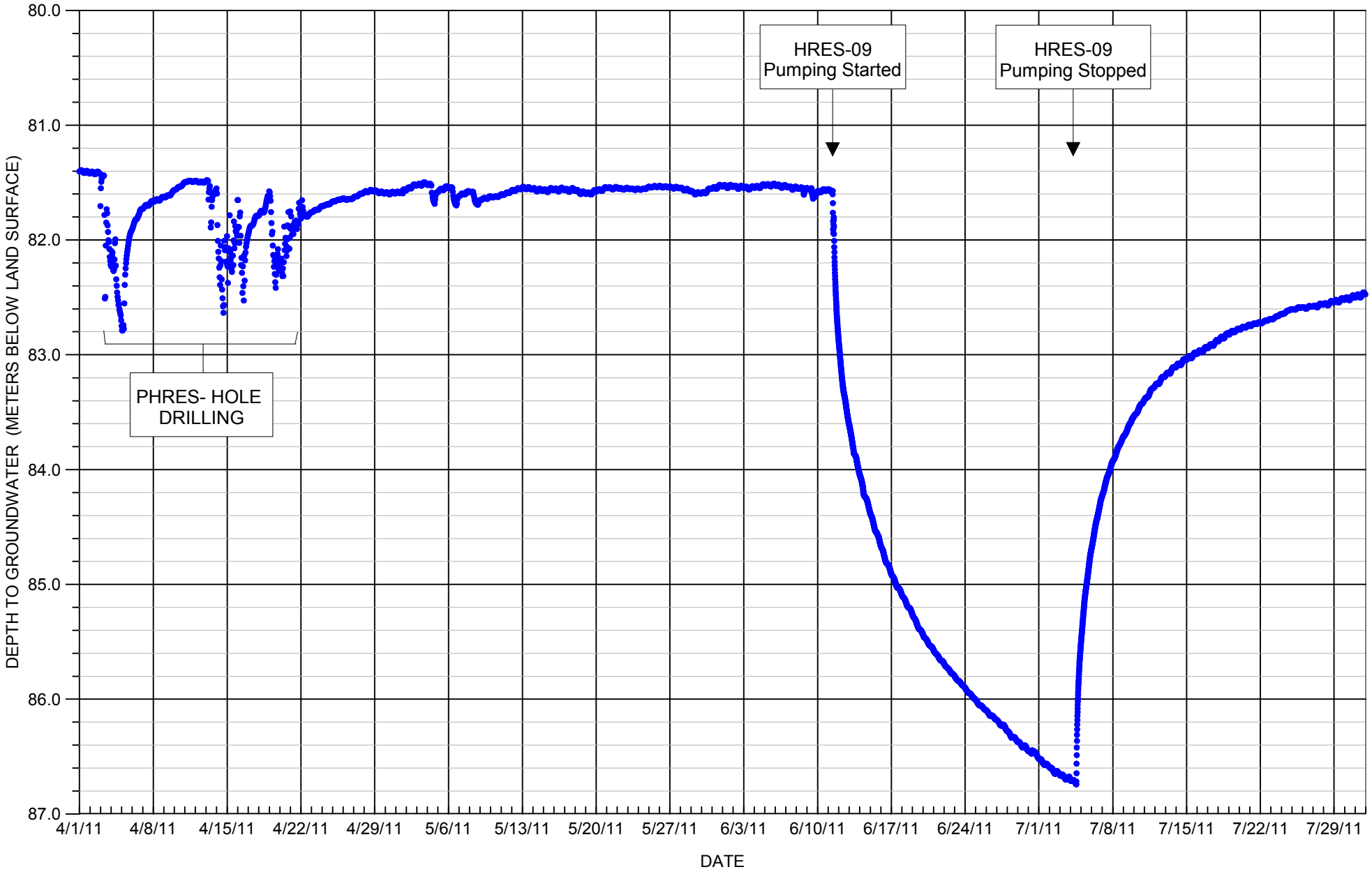

FIGURE A16. WATER LEVEL HYDROGRAPH FOR GROUTED PIEZOMETER DHRES-07_920 APRIL THROUGH JULY 2011, RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\Linear\DHRES-07_920_WL.grf

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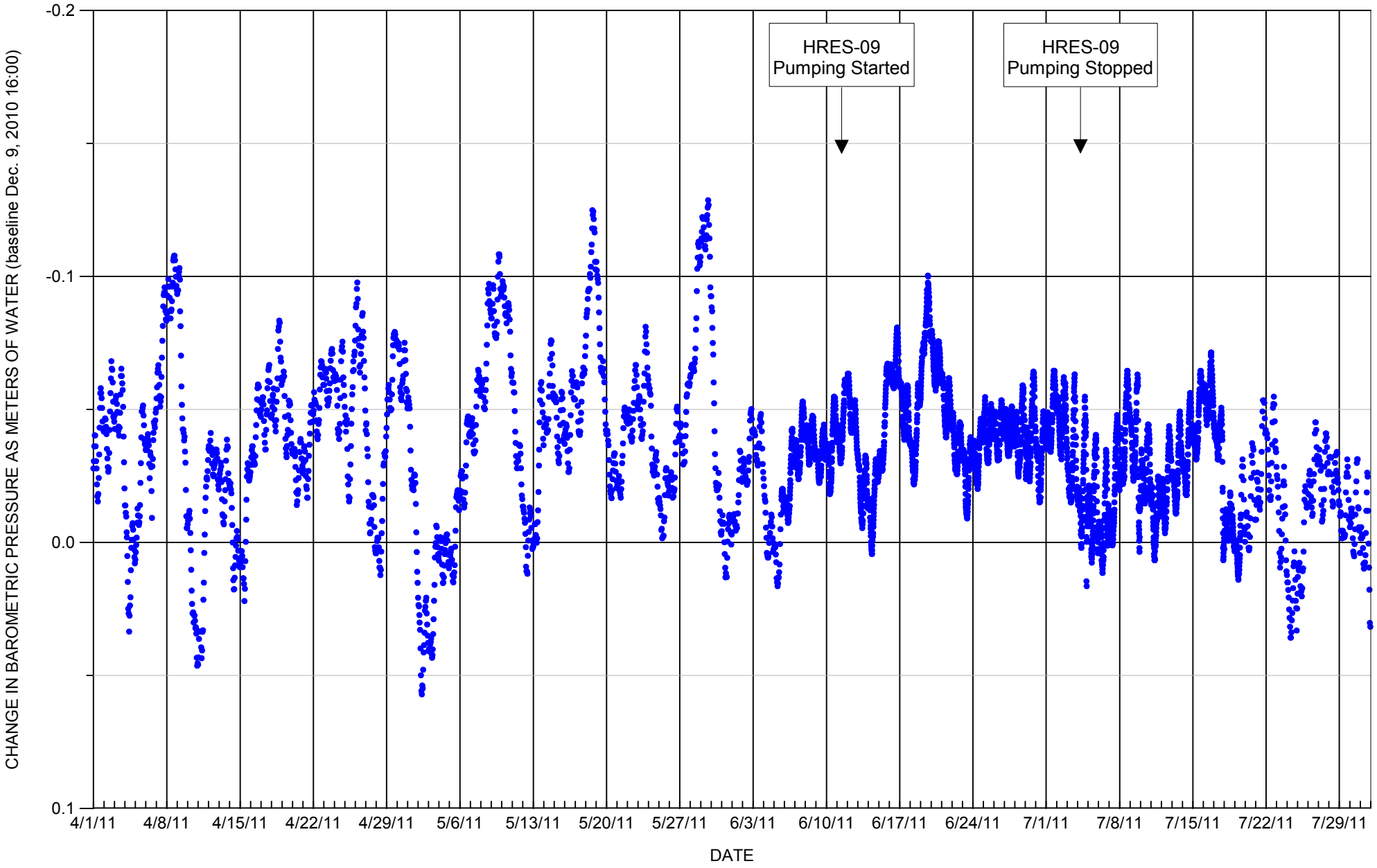

FIGURE A17. CHANGE IN WATER LEVEL DUE TO BAROMETRIC PRESSURE CHANGE AT DHRES-07 APRIL THROUGH JULY 2011, RESOLUTION PROJECT

605.4_Aquifer_Testing\HRES-09 Long Term\DHRES-07 Baro\DHRES-07_Baro.grf

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APPENDIX B

PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/11/2011 13:01	1.0	91.4		5.8	
6/11/2011 13:02	2.0	90.3		5.7	
6/11/2011 13:03	3.0	89.1		5.6	
6/11/2011 13:04	4.0	88.1		5.6	
6/11/2011 13:05	5.0	87.1		5.5	
6/11/2011 13:06	6.0	86.5		5.5	
6/11/2011 13:07	7.0	86.1		5.4	
6/11/2011 13:08	8.0	85.5		5.4	
6/11/2011 13:11	11.0	84.3		5.3	
6/11/2011 13:12	12.0	83.6		5.3	
6/11/2011 13:13	13.0	83.4		5.3	
6/11/2011 13:14	14.0	82.9		5.2	
6/11/2011 13:15	15.0	82.7		5.2	
6/11/2011 13:16	16.0	82.7		5.2	
6/11/2011 13:17	17.0	82.2		5.2	
6/11/2011 13:19	19.0	81.3		5.1	
6/11/2011 13:20	20.0		85.2		5.4
6/11/2011 13:21	21.0	80.9		5.1	
6/11/2011 13:22	22.0	81.2		5.1	
6/11/2011 13:23	23.0	80.5		5.1	
6/11/2011 13:25	25.0	80.7		5.1	
6/11/2011 13:26	26.0	80.3		5.1	
6/11/2011 13:28	28.0	80.3		5.1	
6/11/2011 13:29	29.0	79.9		5.0	
6/11/2011 13:31	31.0		83.5		5.3
6/11/2011 13:32	32.0	79.9		5.0	
6/11/2011 13:34	34.0	79.6		5.0	
6/11/2011 13:36	36.0	79.4		5.0	
6/11/2011 13:38	38.0	79.5		5.0	
6/11/2011 13:40	40.0	79.3		5.0	
6/11/2011 13:42	42.0	79.3	83.0	5.0	5.2
6/11/2011 13:44	44.0	79.0		5.0	
6/11/2011 13:46	46.0	79.0	82.9	5.0	5.2
6/11/2011 13:48	48.0	78.8		5.0	
6/11/2011 13:50	50.0	78.7		5.0	
6/11/2011 13:52	52.0	78.9		5.0	
6/11/2011 13:54	54.0	78.9	81.6	5.0	5.1
6/11/2011 13:56	56.0	78.5		5.0	
6/11/2011 13:58	58.0	78.9		5.0	
6/11/2011 14:00	60.0	78.8		5.0	
6/11/2011 14:02	62.0	78.5		5.0	
6/11/2011 14:04	64.0	78.3		4.9	
6/11/2011 14:06	66.0	78.7		5.0	

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/11/2011 14:08	68.0	78.6		5.0	
6/11/2011 14:10	70.0	78.6		5.0	
6/11/2011 14:12	72.0	78.7		5.0	
6/11/2011 14:14	74.0	78.5	80.9	5.0	5.1
6/11/2011 14:16	76.0	78.2	80.8	4.9	5.1
6/11/2011 14:18	78.0	78.5	80.7	5.0	5.1
6/11/2011 14:20	80.0	78.4	80.7	4.9	5.1
6/11/2011 14:22	82.0	78.3	80.7	4.9	5.1
6/11/2011 14:24	84.0	78.8	80.7	5.0	5.1
6/11/2011 14:26	86.0	78.3	80.6	4.9	5.1
6/11/2011 14:28	88.0	78.3	80.6	4.9	5.1
6/11/2011 14:30	90.0	78.5	80.5	5.0	5.1
6/11/2011 14:35	95.0	78.6	80.4	5.0	5.1
6/11/2011 14:40	100.0	78.4	80.3	4.9	5.1
6/11/2011 14:45	105.0	78.4	80.2	4.9	5.1
6/11/2011 14:50	110.0	78.2	80.1	4.9	5.1
6/11/2011 14:55	115.0	78.4	80.1	4.9	5.1
6/11/2011 15:00	120.0	78.4	80.0	4.9	5.0
6/11/2011 15:10	130.0	78.3	79.9	4.9	5.0
6/11/2011 15:15	135.0	78.0	79.8	4.9	5.0
6/11/2011 15:20	140.0	78.0	79.7	4.9	5.0
6/11/2011 15:25	145.0	78.2	79.7	4.9	5.0
6/11/2011 15:30	150.0	78.1	79.6	4.9	5.0
6/11/2011 15:35	155.0	78.3	79.6	4.9	5.0
6/11/2011 15:40	160.0	78.1	79.5	4.9	5.0
6/11/2011 15:45	165.0	77.9	79.5	4.9	5.0
6/11/2011 15:50	170.0	78.2	79.5	4.9	5.0
6/11/2011 15:55	175.0	78.1	79.4	4.9	5.0
6/11/2011 16:00	180.0	78.1	79.4	4.9	5.0
6/11/2011 16:10	190.0	77.9	79.3	4.9	5.0
6/11/2011 16:20	200.0	77.9	79.2	4.9	5.0
6/11/2011 16:30	210.0	77.7	79.2	4.9	5.0
6/11/2011 16:40	220.0	77.8	79.1	4.9	5.0
6/11/2011 16:50	230.0	77.9	79.1	4.9	5.0
6/11/2011 17:00	240.0	78.1	79.0	4.9	5.0
6/11/2011 17:10	250.0	77.9	79.0	4.9	5.0
6/11/2011 17:20	260.0	78.0	79.0	4.9	5.0
6/11/2011 17:30	270.0	77.8	78.9	4.9	5.0
6/11/2011 17:40	280.0	77.7	78.9	4.9	5.0
6/11/2011 17:50	290.0	77.8	78.8	4.9	5.0
6/11/2011 18:00	300.0	77.8	78.8	4.9	5.0
6/11/2011 18:10	310.0	78.0	78.8	4.9	5.0
6/11/2011 18:20	320.0	77.8	78.8	4.9	5.0

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/11/2011 18:30	330.0	77.7	78.7	4.9	5.0
6/11/2011 18:40	340.0	77.8	78.7	4.9	5.0
6/11/2011 18:50	350.0	77.8	78.7	4.9	5.0
6/11/2011 19:00	360.0	77.6	78.6	4.9	5.0
6/11/2011 19:20	380.0	77.7	78.6	4.9	5.0
6/11/2011 19:40	400.0	77.8	78.4	4.9	4.9
6/11/2011 20:00	420.0	77.8	78.7	4.9	5.0
6/11/2011 20:20	440.0	77.8	78.7	4.9	5.0
6/11/2011 20:40	460.0	77.8	78.5	4.9	5.0
6/11/2011 21:00	480.0	77.7	78.4	4.9	4.9
6/11/2011 21:20	500.0	77.8	78.6	4.9	5.0
6/11/2011 21:40	520.0	77.7	78.4	4.9	4.9
6/11/2011 22:00	540.0	77.5	78.5	4.9	5.0
6/11/2011 22:20	560.0	77.8	78.3	4.9	4.9
6/11/2011 22:40	580.0	77.9	78.3	4.9	4.9
6/11/2011 23:00	600.0	77.9	80.0	4.9	5.0
6/11/2011 23:20	620.0	77.8	78.3	4.9	4.9
6/11/2011 23:40	640.0	77.6	78.3	4.9	4.9
6/12/2011 0:00	660.0	77.8	78.3	4.9	4.9
6/12/2011 0:20	680.0	77.8	78.3	4.9	4.9
6/12/2011 0:40	700.0	77.7	78.2	4.9	4.9
6/12/2011 1:00	720.0	77.7	78.3	4.9	4.9
6/12/2011 1:30	750.0	77.7	78.2	4.9	4.9
6/12/2011 2:00	780.0	77.7	78.6	4.9	5.0
6/12/2011 2:30	810.0	77.7	78.2	4.9	4.9
6/12/2011 3:00	840.0	77.8	78.1	4.9	4.9
6/12/2011 3:30	870.0	77.4	78.1	4.9	4.9
6/12/2011 4:00	900.0	77.8	78.1	4.9	4.9
6/12/2011 4:30	930.0	77.6	78.8	4.9	5.0
6/12/2011 5:00	960.0	77.7	78.2	4.9	4.9
6/12/2011 5:30	990.0	77.6	78.1	4.9	4.9
6/12/2011 6:00	1020.0	77.8	78.1	4.9	4.9
6/12/2011 6:30	1050.0	77.4	78.0	4.9	4.9
6/12/2011 7:00	1080.0	79.6	78.1	5.0	4.9
6/12/2011 7:30	1110.0	79.7	78.1	5.0	4.9
6/12/2011 8:00	1140.0	78.8	78.2	5.0	4.9
6/12/2011 8:30	1170.0	79.6	78.2	5.0	4.9
6/12/2011 9:00	1200.0	79.6	78.2	5.0	4.9
6/12/2011 9:30	1230.0	79.8	78.3	5.0	4.9
6/12/2011 10:00	1260.0	79.7	78.3	5.0	4.9
6/12/2011 10:30	1290.0	79.9	78.3	5.0	4.9
6/12/2011 11:00	1320.0	79.8	78.4	5.0	4.9
6/12/2011 11:30	1350.0	79.8	78.3	5.0	4.9

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/12/2011 12:00	1380.0	78.8	78.6	5.0	5.0
6/12/2011 12:30	1410.0	79.8	78.5	5.0	5.0
6/12/2011 13:00	1440.0	79.8	78.5	5.0	5.0
6/12/2011 13:30	1470.0	79.8	78.5	5.0	5.0
6/12/2011 14:00	1500.0	79.8	78.5	5.0	5.0
6/12/2011 14:30	1530.0	79.8	78.6	5.0	5.0
6/12/2011 15:00	1560.0	79.6	78.6	5.0	5.0
6/12/2011 15:30	1590.0	79.1	78.6	5.0	5.0
6/12/2011 16:00	1620.0	79.6	78.6	5.0	5.0
6/12/2011 16:30	1650.0	79.6	78.6	5.0	5.0
6/12/2011 17:00	1680.0	79.8	78.7	5.0	5.0
6/12/2011 17:36	1716.0	79.5	78.7	5.0	5.0
6/12/2011 18:00	1740.0	79.5	78.7	5.0	5.0
6/12/2011 18:30	1770.0	79.7	78.7	5.0	5.0
6/12/2011 19:00	1800.0	79.6	78.8	5.0	5.0
6/12/2011 19:30	1830.0	79.5	78.8	5.0	5.0
6/12/2011 20:00	1860.0	79.6	78.8	5.0	5.0
6/12/2011 20:30	1890.0	79.4	78.8	5.0	5.0
6/12/2011 21:00	1920.0	79.9	78.8	5.0	5.0
6/12/2011 21:30	1950.0	79.4	78.8	5.0	5.0
6/12/2011 22:00	1980.0	79.5	78.8	5.0	5.0
6/12/2011 22:30	2010.0	79.6	78.8	5.0	5.0
6/12/2011 23:00	2040.0	79.2	78.8	5.0	5.0
6/12/2011 23:30	2070.0	79.7	78.8	5.0	5.0
6/13/2011 0:00	2100.0	79.5	78.8	5.0	5.0
6/13/2011 0:30	2130.0	79.6	78.8	5.0	5.0
6/13/2011 1:00	2160.0	79.2	78.9	5.0	5.0
6/13/2011 1:30	2190.0	79.0	78.9	5.0	5.0
6/13/2011 2:00	2220.0	79.5	78.8	5.0	5.0
6/13/2011 2:30	2250.0	79.3	78.9	5.0	5.0
6/13/2011 3:00	2280.0	79.3	78.9	5.0	5.0
6/13/2011 3:30	2310.0	79.4	78.9	5.0	5.0
6/13/2011 4:00	2340.0	79.2	78.9	5.0	5.0
6/13/2011 4:30	2370.0	79.3	78.9	5.0	5.0
6/13/2011 5:00	2400.0	79.7	78.9	5.0	5.0
6/13/2011 5:30	2430.0	79.2	79.0	5.0	5.0
6/13/2011 6:00	2460.0	79.5	78.9	5.0	5.0
6/13/2011 6:30	2490.0	79.4	78.9	5.0	5.0
6/13/2011 7:00	2520.0	79.2	78.9	5.0	5.0
6/13/2011 7:30	2550.0	79.4	78.9	5.0	5.0
6/13/2011 8:00	2580.0	79.5	79.0	5.0	5.0
6/13/2011 8:30	2610.0	79.0	79.0	5.0	5.0
6/13/2011 9:00	2640.0	79.3	79.0	5.0	5.0

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/13/2011 9:30	2670.0	79.2	79.0	5.0	5.0
6/13/2011 10:00	2700.0	79.8	80.7	5.0	5.1
6/13/2011 10:30	2730.0	79.6	80.7	5.0	5.1
6/13/2011 11:00	2760.0	79.8	80.7	5.0	5.1
6/13/2011 11:30	2790.0	79.5	80.7	5.0	5.1
6/13/2011 12:00	2820.0	79.8	79.0	5.0	5.0
6/13/2011 12:30	2850.0	79.5	79.0	5.0	5.0
6/13/2011 13:00	2880.0	79.4	79.0	5.0	5.0
6/13/2011 13:30	2910.0	79.6	79.0	5.0	5.0
6/13/2011 14:01	2941.0	79.6	79.0	5.0	5.0
6/13/2011 14:30	2970.0	79.4	79.0	5.0	5.0
6/13/2011 15:01	3001.0	79.5	79.0	5.0	5.0
6/13/2011 15:32	3032.0	79.0	79.0	5.0	5.0
6/13/2011 16:00	3060.0	79.2	79.0	5.0	5.0
6/13/2011 16:30	3090.0	79.2	79.0	5.0	5.0
6/13/2011 17:00	3120.0	79.4	79.0	5.0	5.0
6/13/2011 17:30	3150.0	79.6	79.1	5.0	5.0
6/13/2011 18:03	3183.0	79.2	79.0	5.0	5.0
6/13/2011 18:30	3210.0	79.2	79.0	5.0	5.0
6/13/2011 19:08	3248.0	79.5	79.0	5.0	5.0
6/13/2011 19:30	3270.0	79.3	79.0	5.0	5.0
6/13/2011 20:00	3300.0	79.4	79.1	5.0	5.0
6/13/2011 20:30	3330.0	79.3	79.1	5.0	5.0
6/13/2011 21:00	3360.0	79.5	79.1	5.0	5.0
6/13/2011 21:30	3390.0	79.4	79.0	5.0	5.0
6/13/2011 22:00	3420.0	79.5	79.1	5.0	5.0
6/13/2011 22:30	3450.0	79.4	79.1	5.0	5.0
6/13/2011 23:00	3480.0	79.3	79.1	5.0	5.0
6/13/2011 23:30	3510.0	79.3	79.1	5.0	5.0
6/14/2011 0:01	3541.0	79.2	79.0	5.0	5.0
6/14/2011 0:30	3570.0	79.3	79.1	5.0	5.0
6/14/2011 1:00	3600.0	79.4	79.1	5.0	5.0
6/14/2011 1:30	3630.0	79.6	79.1	5.0	5.0
6/14/2011 2:00	3660.0	79.4	79.1	5.0	5.0
6/14/2011 2:30	3690.0	79.2	79.1	5.0	5.0
6/14/2011 3:00	3720.0	79.4	79.1	5.0	5.0
6/14/2011 3:30	3750.0	79.4	79.1	5.0	5.0
6/14/2011 4:01	3781.0	79.3	79.1	5.0	5.0
6/14/2011 4:30	3810.0	79.4	79.1	5.0	5.0
6/14/2011 5:00	3840.0	79.5	79.1	5.0	5.0
6/14/2011 5:30	3870.0	79.2	79.1	5.0	5.0
6/14/2011 6:00	3900.0	79.5	79.1	5.0	5.0
6/14/2011 6:30	3930.0	79.3	0.1	5.0	0.0

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/14/2011 7:00	3960.0	79.2	79.1	5.0	5.0
6/14/2011 7:30	3990.0	79.0	79.1	5.0	5.0
6/14/2011 8:00	4020.0	79.3	79.1	5.0	5.0
6/14/2011 8:30	4050.0	79.0	79.1	5.0	5.0
6/14/2011 9:00	4080.0	79.3	79.1	5.0	5.0
6/14/2011 9:30	4110.0	78.9	79.1	5.0	5.0
6/14/2011 10:00	4140.0	79.1	79.1	5.0	5.0
6/14/2011 10:30	4170.0	79.1	79.1	5.0	5.0
6/14/2011 11:00	4200.0	79.1	79.1	5.0	5.0
6/14/2011 11:30	4230.0	79.1	79.1	5.0	5.0
6/14/2011 12:00	4260.0	78.9	79.1	5.0	5.0
6/14/2011 12:30	4290.0	79.0	79.1	5.0	5.0
6/14/2011 13:02	4322.0	79.2	79.1	5.0	5.0
6/14/2011 13:32	4352.0	79.1	79.1	5.0	5.0
6/14/2011 14:00	4380.0	79.2	79.1	5.0	5.0
6/14/2011 14:30	4410.0	78.8	79.1	5.0	5.0
6/14/2011 15:00	4440.0	78.9	79.1	5.0	5.0
6/14/2011 15:30	4470.0	79.1	79.1	5.0	5.0
6/14/2011 16:00	4500.0	79.0	79.1	5.0	5.0
6/14/2011 16:30	4530.0	79.0	79.1	5.0	5.0
6/14/2011 17:00	4560.0	79.0	79.1	5.0	5.0
6/14/2011 17:30	4590.0	78.9	79.1	5.0	5.0
6/14/2011 18:00	4620.0	79.3	79.1	5.0	5.0
6/14/2011 18:30	4650.0	79.0	79.1	5.0	5.0
6/14/2011 19:00	4680.0	79.1	79.1	5.0	5.0
6/14/2011 19:30	4710.0	79.1	79.1	5.0	5.0
6/14/2011 20:00	4740.0	79.1	79.1	5.0	5.0
6/14/2011 20:30	4770.0	79.0	79.1	5.0	5.0
6/14/2011 21:00	4800.0	79.0	79.1	5.0	5.0
6/14/2011 21:30	4830.0	79.0	79.1	5.0	5.0
6/14/2011 22:00	4860.0	79.1	79.1	5.0	5.0
6/14/2011 22:30	4890.0	79.2	79.1	5.0	5.0
6/14/2011 23:00	4920.0	79.0	79.1	5.0	5.0
6/14/2011 23:30	4950.0	79.3	79.1	5.0	5.0
6/15/2011 0:14	4994.4	79.1	78.9	5.0	5.0
6/15/2011 0:30	5010.0	79.1	79.1	5.0	5.0
6/15/2011 1:00	5040.0	78.7	79.1	5.0	5.0
6/15/2011 1:30	5070.0	78.8	79.1	5.0	5.0
6/15/2011 2:00	5100.0	78.8	79.1	5.0	5.0
6/15/2011 2:30	5130.0	79.0	79.1	5.0	5.0
6/15/2011 3:00	5160.0	79.0	79.1	5.0	5.0
6/15/2011 3:30	5190.0	79.1	79.1	5.0	5.0
6/15/2011 4:00	5220.0	78.8	79.1	5.0	5.0

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/15/2011 4:30	5250.0	78.9	79.1	5.0	5.0
6/15/2011 5:00	5280.0	78.9	79.1	5.0	5.0
6/15/2011 5:30	5310.0	78.8	79.1	5.0	5.0
6/15/2011 6:00	5340.0	78.8	79.1	5.0	5.0
6/15/2011 6:30	5370.0	79.0	79.1	5.0	5.0
6/15/2011 7:00	5400.0	78.7	79.1	5.0	5.0
6/15/2011 7:30	5430.0	79.0	79.1	5.0	5.0
6/15/2011 8:00	5460.0	78.6	79.1	5.0	5.0
6/15/2011 8:30	5490.0	78.7	79.1	5.0	5.0
6/15/2011 9:00	5520.0	78.7	79.1	5.0	5.0
6/15/2011 9:30	5550.0	78.7	79.1	5.0	5.0
6/15/2011 10:00	5580.0	78.7	79.1	5.0	5.0
6/15/2011 10:30	5610.0	78.7	79.1	5.0	5.0
6/15/2011 11:00	5640.0	78.9	79.1	5.0	5.0
6/15/2011 11:30	5670.0	78.7	79.1	5.0	5.0
6/15/2011 12:00	5700.0	78.5	79.1	5.0	5.0
6/15/2011 12:30	5730.0	78.4	79.1	4.9	5.0
6/15/2011 13:00	5760.0	78.7	79.1	5.0	5.0
6/15/2011 13:30	5790.0	78.5	79.1	5.0	5.0
6/15/2011 14:00	5820.0	78.6	79.1	5.0	5.0
6/15/2011 14:30	5850.0	78.9	72.2	5.0	4.6
6/15/2011 15:00	5880.0	78.9	79.1	5.0	5.0
6/15/2011 15:34	5914.0	79.1	79.1	5.0	5.0
6/15/2011 16:00	5940.0	78.8	79.1	5.0	5.0
6/15/2011 16:30	5970.0	78.8	79.1	5.0	5.0
6/15/2011 17:00	6000.0	79.0	79.1	5.0	5.0
6/15/2011 17:30	6030.0	78.7	79.1	5.0	5.0
6/15/2011 18:00	6060.0	78.5	79.1	5.0	5.0
6/15/2011 18:30	6090.0	78.7	79.0	5.0	5.0
6/15/2011 19:00	6120.0	78.8	79.0	5.0	5.0
6/15/2011 19:30	6150.0	78.9	79.1	5.0	5.0
6/15/2011 20:00	6180.0	78.7	79.0	5.0	5.0
6/15/2011 20:30	6210.0	79.0	79.0	5.0	5.0
6/15/2011 21:00	6240.0	78.9	79.1	5.0	5.0
6/15/2011 21:30	6270.0	78.9	79.0	5.0	5.0
6/15/2011 22:00	6300.0	78.9	79.0	5.0	5.0
6/15/2011 22:30	6330.0	78.5	79.0	5.0	5.0
6/15/2011 23:00	6360.0	78.9	79.0	5.0	5.0
6/15/2011 23:30	6390.0	78.6	79.0	5.0	5.0
6/16/2011 0:00	6420.0	78.4	79.0	4.9	5.0
6/16/2011 0:30	6450.0	78.6	79.0	5.0	5.0
6/16/2011 1:00	6480.0	78.7	79.0	5.0	5.0
6/16/2011 1:30	6510.0	78.4	79.0	4.9	5.0

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/16/2011 2:00	6540.0	78.6	79.0	5.0	5.0
6/16/2011 2:30	6570.0	78.9	79.0	5.0	5.0
6/16/2011 3:00	6600.0	78.8	79.0	5.0	5.0
6/16/2011 3:30	6630.0	78.6	79.0	5.0	5.0
6/16/2011 4:00	6660.0	78.7	79.0	5.0	5.0
6/16/2011 4:30	6690.0	78.6	79.0	5.0	5.0
6/16/2011 5:00	6720.0	78.6	79.0	5.0	5.0
6/16/2011 5:30	6750.0	78.5	79.0	5.0	5.0
6/16/2011 6:00	6780.0	78.7	79.0	5.0	5.0
6/16/2011 6:30	6810.0	78.7	79.0	5.0	5.0
6/16/2011 7:00	6840.0	78.7	79.0	5.0	5.0
6/16/2011 7:30	6870.0	78.8	79.0	5.0	5.0
6/16/2011 8:00	6900.0	78.4	79.0	4.9	5.0
6/16/2011 8:30	6930.0	78.7	79.0	5.0	5.0
6/16/2011 9:00	6960.0	78.5	79.3	5.0	5.0
6/16/2011 9:30	6990.0	78.4	79.0	4.9	5.0
6/16/2011 10:00	7020.0	78.7	79.0	5.0	5.0
6/16/2011 10:30	7050.0	78.6	79.0	5.0	5.0
6/16/2011 11:00	7080.0	78.6	79.2	5.0	5.0
6/16/2011 11:30	7110.0	78.6	79.0	5.0	5.0
6/16/2011 12:00	7140.0	78.9	79.0	5.0	5.0
6/16/2011 12:30	7170.0	78.5	79.0	5.0	5.0
6/16/2011 13:00	7200.0	78.7	79.1	5.0	5.0
6/16/2011 13:30	7230.0	78.6	79.0	5.0	5.0
6/16/2011 14:00	7260.0	78.5	79.0	5.0	5.0
6/16/2011 14:30	7290.0	78.8	79.0	5.0	5.0
6/16/2011 15:00	7320.0	78.8	79.0	5.0	5.0
6/16/2011 15:30	7350.0	79.7	79.0	5.0	5.0
6/16/2011 16:00	7380.0	78.7	79.0	5.0	5.0
6/16/2011 16:38	7418.0	78.4	79.0	4.9	5.0
6/16/2011 17:00	7440.0	78.6	79.0	5.0	5.0
6/16/2011 17:30	7470.0	78.8	79.0	5.0	5.0
6/16/2011 18:00	7500.0	78.7	79.0	5.0	5.0
6/16/2011 18:30	7530.0	78.7	79.0	5.0	5.0
6/16/2011 19:00	7560.0	78.5	79.0	5.0	5.0
6/16/2011 19:30	7590.0	78.8	79.0	5.0	5.0
6/16/2011 20:00	7620.0	78.5	79.0	5.0	5.0
6/16/2011 20:30	7650.0	78.4	79.0	4.9	5.0
6/16/2011 21:00	7680.0	78.4	79.0	4.9	5.0
6/16/2011 21:30	7710.0	78.7	79.0	5.0	5.0
6/16/2011 22:00	7740.0	78.6	79.0	5.0	5.0
6/16/2011 22:30	7770.0	78.4	79.0	4.9	5.0
6/16/2011 23:00	7800.0	78.5	79.0	5.0	5.0

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/16/2011 23:30	7830.0	78.6	79.0	5.0	5.0
6/17/2011 0:00	7860.0	78.3	79.0	4.9	5.0
6/17/2011 0:30	7890.0	78.4	79.0	4.9	5.0
6/17/2011 1:00	7920.0	78.3	79.0	4.9	5.0
6/17/2011 1:30	7950.0	78.6	79.0	5.0	5.0
6/17/2011 2:00	7980.0	78.4	79.0	4.9	5.0
6/17/2011 2:30	8010.0	78.4	79.0	4.9	5.0
6/17/2011 3:00	8040.0	78.8	79.0	5.0	5.0
6/17/2011 3:30	8070.0	78.4	79.0	4.9	5.0
6/17/2011 4:00	8100.0	78.6	79.0	5.0	5.0
6/17/2011 4:30	8130.0	78.7	79.0	5.0	5.0
6/17/2011 5:00	8160.0	78.8	79.0	5.0	5.0
6/17/2011 5:30	8190.0	78.5	79.0	5.0	5.0
6/17/2011 6:00	8220.0	78.6	79.0	5.0	5.0
6/17/2011 6:30	8250.0	78.6	79.0	5.0	5.0
6/17/2011 7:00	8280.0	78.6	79.0	5.0	5.0
6/17/2011 7:30	8310.0	78.5	79.0	5.0	5.0
6/17/2011 8:00	8340.0	78.7	79.0	5.0	5.0
6/17/2011 8:30	8370.0	78.6	79.0	5.0	5.0
6/17/2011 9:00	8400.0	78.5	79.0	5.0	5.0
6/17/2011 9:30	8430.0	78.6	79.0	5.0	5.0
6/17/2011 10:00	8460.0	78.3	79.0	4.9	5.0
6/17/2011 10:30	8490.0	78.7	79.0	5.0	5.0
6/17/2011 11:00	8520.0	78.6	79.0	5.0	5.0
6/17/2011 11:30	8550.0	78.6	78.9	5.0	5.0
6/17/2011 12:00	8580.0	78.4	78.9	4.9	5.0
6/17/2011 12:30	8610.0	78.5	78.9	5.0	5.0
6/17/2011 13:00	8640.0	78.4	78.9	4.9	5.0
6/17/2011 13:30	8670.0	78.3	78.9	4.9	5.0
6/17/2011 14:00	8700.0	78.5	78.9	5.0	5.0
6/17/2011 14:30	8730.0	78.6	78.9	5.0	5.0
6/17/2011 15:00	8760.0	78.3	78.9	4.9	5.0
6/17/2011 15:30	8790.0	78.4	78.9	4.9	5.0
6/17/2011 16:00	8820.0	78.4	78.9	4.9	5.0
6/17/2011 16:30	8850.0	78.3	78.9	4.9	5.0
6/17/2011 17:00	8880.0	78.4	78.9	4.9	5.0
6/17/2011 17:30	8910.0	78.3	78.9	4.9	5.0
6/17/2011 18:00	8940.0	78.3	78.9	4.9	5.0
6/17/2011 18:30	8970.0	78.6	78.9	5.0	5.0
6/17/2011 19:00	9000.0	78.3	78.9	4.9	5.0
6/17/2011 19:30	9030.0	78.3	78.9	4.9	5.0
6/17/2011 20:00	9060.0	78.3	78.9	4.9	5.0
6/17/2011 20:30	9090.0	78.4	78.9	4.9	5.0

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/17/2011 21:00	9120.0	78.4	78.9	4.9	5.0
6/17/2011 21:30	9150.0	78.2	78.9	4.9	5.0
6/17/2011 22:00	9180.0	78.3	78.9	4.9	5.0
6/17/2011 22:30	9210.0	78.2	78.9	4.9	5.0
6/17/2011 23:00	9240.0	78.4	78.9	4.9	5.0
6/17/2011 23:30	9270.0	78.1	78.9	4.9	5.0
6/18/2011 0:00	9300.0	78.3	78.9	4.9	5.0
6/18/2011 0:30	9330.0	78.0	78.9	4.9	5.0
6/18/2011 1:00	9360.0	78.3	78.9	4.9	5.0
6/18/2011 1:30	9390.0	78.3	78.9	4.9	5.0
6/18/2011 2:00	9420.0	78.5	78.9	5.0	5.0
6/18/2011 2:30	9450.0	78.3	78.9	4.9	5.0
6/18/2011 3:00	9480.0	78.2	78.9	4.9	5.0
6/18/2011 3:30	9510.0	78.1	78.9	4.9	5.0
6/18/2011 4:00	9540.0	78.1	78.9	4.9	5.0
6/18/2011 5:00	9600.0	78.4	78.9	4.9	5.0
6/18/2011 5:31	9631.0	78.1	78.9	4.9	5.0
6/18/2011 6:00	9660.0	78.4	78.9	4.9	5.0
6/18/2011 6:30	9690.0	77.7	78.9	4.9	5.0
6/18/2011 7:00	9720.0	78.4	78.9	4.9	5.0
6/18/2011 7:30	9750.0	78.5	78.9	5.0	5.0
6/18/2011 8:00	9780.0	78.2	78.9	4.9	5.0
6/18/2011 8:30	9810.0	78.2	78.9	4.9	5.0
6/18/2011 9:00	9840.0	78.0	78.9	4.9	5.0
6/18/2011 9:30	9870.0	78.5	78.9	5.0	5.0
6/18/2011 10:00	9900.0	78.3	78.9	4.9	5.0
6/18/2011 10:30	9930.0	78.0	78.9	4.9	5.0
6/18/2011 11:00	9960.0	78.1	78.9	4.9	5.0
6/18/2011 11:30	9990.0	78.4	78.9	4.9	5.0
6/18/2011 12:00	10020.0	78.3	78.9	4.9	5.0
6/18/2011 12:30	10050.0	78.0	78.9	4.9	5.0
6/18/2011 13:00	10080.0	78.0	78.8	4.9	5.0
6/18/2011 13:30	10110.0	78.0	78.8	4.9	5.0
6/18/2011 14:00	10140.0	78.2	78.8	4.9	5.0
6/18/2011 14:30	10170.0	78.1	78.8	4.9	5.0
6/18/2011 15:00	10200.0	78.2	78.8	4.9	5.0
6/18/2011 15:30	10230.0	78.0	78.8	4.9	5.0
6/18/2011 16:00	10260.0	78.3	78.8	4.9	5.0
6/18/2011 16:30	10290.0	78.3	78.8	4.9	5.0
6/18/2011 17:01	10321.0	78.2	78.8	4.9	5.0
6/18/2011 17:30	10350.0	78.2	78.8	4.9	5.0
6/18/2011 18:00	10380.0	78.0	78.8	4.9	5.0
6/18/2011 18:30	10410.0	78.0	78.8	4.9	5.0

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/18/2011 19:00	10440.0	77.6	78.8	4.9	5.0
6/18/2011 19:30	10470.0	78.0	78.8	4.9	5.0
6/18/2011 20:00	10500.0	78.2	78.8	4.9	5.0
6/18/2011 20:30	10530.0	78.1	78.8	4.9	5.0
6/18/2011 21:00	10560.0	77.9	78.8	4.9	5.0
6/18/2011 21:30	10590.0	78.2	78.8	4.9	5.0
6/18/2011 22:00	10620.0	78.2	78.8	4.9	5.0
6/18/2011 22:30	10650.0	78.1	78.8	4.9	5.0
6/18/2011 23:00	10680.0	77.8	78.8	4.9	5.0
6/18/2011 23:30	10710.0	78.0	78.8	4.9	5.0
6/19/2011 0:00	10740.0	78.1	78.8	4.9	5.0
6/19/2011 0:30	10770.0	78.0	78.8	4.9	5.0
6/19/2011 1:00	10800.0	78.1	78.8	4.9	5.0
6/19/2011 1:30	10830.0	77.9	78.8	4.9	5.0
6/19/2011 2:00	10860.0	78.2	78.8	4.9	5.0
6/19/2011 2:30	10890.0	77.9	78.8	4.9	5.0
6/19/2011 3:00	10920.0	78.2	78.8	4.9	5.0
6/19/2011 3:30	10950.0	78.1	78.8	4.9	5.0
6/19/2011 4:00	10980.0	78.0	78.8	4.9	5.0
6/19/2011 4:30	11010.0	78.0	78.8	4.9	5.0
6/19/2011 5:00	11040.0	77.9	78.8	4.9	5.0
6/19/2011 5:30	11070.0	78.1	78.8	4.9	5.0
6/19/2011 6:00	11100.0	78.0	78.8	4.9	5.0
6/19/2011 6:30	11130.0	77.9	78.8	4.9	5.0
6/19/2011 7:00	11160.0	77.8	78.8	4.9	5.0
6/19/2011 7:30	11190.0	78.0	78.8	4.9	5.0
6/19/2011 8:00	11220.0	77.9	78.8	4.9	5.0
6/19/2011 8:30	11250.0	77.8	78.8	4.9	5.0
6/19/2011 9:00	11280.0	77.9	78.8	4.9	5.0
6/19/2011 9:30	11310.0	78.0	78.8	4.9	5.0
6/19/2011 10:00	11340.0	77.7	78.8	4.9	5.0
6/19/2011 10:30	11370.0	77.9	78.8	4.9	5.0
6/19/2011 11:00	11400.0	77.8	78.8	4.9	5.0
6/19/2011 11:30	11430.0	78.0	78.8	4.9	5.0
6/19/2011 12:00	11460.0	77.7	78.8	4.9	5.0
6/19/2011 12:30	11490.0	77.9	78.8	4.9	5.0
6/19/2011 13:00	11520.0	77.9	78.7	4.9	5.0
6/19/2011 13:30	11550.0	78.0	78.7	4.9	5.0
6/19/2011 14:00	11580.0	78.1	78.7	4.9	5.0
6/19/2011 14:30	11610.0	78.2	78.8	4.9	5.0
6/19/2011 15:00	11640.0	77.7	78.8	4.9	5.0
6/19/2011 15:30	11670.0	77.9	78.7	4.9	5.0
6/19/2011 16:00	11700.0	77.8	78.7	4.9	5.0

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/19/2011 16:30	11730.0	78.0	78.7	4.9	5.0
6/19/2011 17:00	11760.0	77.9	78.7	4.9	5.0
6/19/2011 17:30	11790.0	78.1	78.7	4.9	5.0
6/19/2011 18:00	11820.0	78.1	78.7	4.9	5.0
6/19/2011 18:30	11850.0	78.0	78.7	4.9	5.0
6/19/2011 19:00	11880.0	77.9	78.7	4.9	5.0
6/19/2011 19:30	11910.0	77.9	78.7	4.9	5.0
6/19/2011 20:00	11940.0	77.4	78.7	4.9	5.0
6/19/2011 20:30	11970.0	78.0	78.7	4.9	5.0
6/19/2011 21:00	12000.0	78.0	78.7	4.9	5.0
6/19/2011 21:30	12030.0	77.8	78.7	4.9	5.0
6/19/2011 22:00	12060.0	77.9	78.7	4.9	5.0
6/19/2011 22:30	12090.0	77.7	78.7	4.9	5.0
6/19/2011 23:00	12120.0	77.6	78.7	4.9	5.0
6/19/2011 23:30	12150.0	77.9	78.7	4.9	5.0
6/20/2011 0:00	12180.0	78.0	78.7	4.9	5.0
6/20/2011 0:30	12210.0	77.0	78.7	4.9	5.0
6/20/2011 1:00	12240.0	77.7	78.7	4.9	5.0
6/20/2011 1:30	12270.0	77.8	78.7	4.9	5.0
6/20/2011 2:00	12300.0	77.6	78.7	4.9	5.0
6/20/2011 2:30	12330.0	78.0	78.7	4.9	5.0
6/20/2011 3:00	12360.0	77.6	78.7	4.9	5.0
6/20/2011 3:30	12390.0	78.0	78.7	4.9	5.0
6/20/2011 4:00	12420.0	77.5	78.7	4.9	5.0
6/20/2011 4:30	12450.0	77.8	78.7	4.9	5.0
6/20/2011 5:00	12480.0	77.5	78.7	4.9	5.0
6/20/2011 5:30	12510.0	77.8	78.7	4.9	5.0
6/20/2011 6:00	12540.0	77.8	78.7	4.9	5.0
6/20/2011 6:30	12570.0	77.8	78.7	4.9	5.0
6/20/2011 7:00	12600.0	77.7	78.7	4.9	5.0
6/20/2011 7:30	12630.0	78.2	78.7	4.9	5.0
6/20/2011 8:15	12675.0	77.6	78.7	4.9	5.0
6/20/2011 8:30	12690.0	77.9	78.7	4.9	5.0
6/20/2011 9:05	12725.0	77.6	78.7	4.9	5.0
6/20/2011 9:30	12750.0	77.9	78.7	4.9	5.0
6/20/2011 10:00	12780.0	78.0	78.7	4.9	5.0
6/20/2011 10:30	12810.0	77.8	78.7	4.9	5.0
6/20/2011 11:00	12840.0	77.9	78.7	4.9	5.0
6/20/2011 11:30	12870.0	77.8	78.7	4.9	5.0
6/20/2011 12:00	12900.0	78.0	78.7	4.9	5.0
6/20/2011 12:30	12930.0	78.1	78.7	4.9	5.0
6/20/2011 13:00	12960.0	77.8	78.6	4.9	5.0
6/20/2011 13:30	12990.0	77.9	78.6	4.9	5.0

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/20/2011 14:00	13020.0	77.8	78.6	4.9	5.0
6/20/2011 14:30	13050.0	78.0	78.4	4.9	4.9
6/20/2011 15:00	13080.0	78.0	78.6	4.9	5.0
6/20/2011 15:30	13110.0	77.7	78.6	4.9	5.0
6/20/2011 16:00	13140.0	77.8	78.6	4.9	5.0
6/20/2011 16:30	13170.0	77.6	78.6	4.9	5.0
6/20/2011 17:00	13200.0	77.8	78.6	4.9	5.0
6/20/2011 17:30	13230.0	78.0	78.6	4.9	5.0
6/20/2011 18:00	13260.0	77.9	78.6	4.9	5.0
6/20/2011 18:30	13290.0	77.6	78.6	4.9	5.0
6/20/2011 19:00	13320.0	77.7	78.6	4.9	5.0
6/20/2011 19:30	13350.0	77.7	78.6	4.9	5.0
6/20/2011 20:00	13380.0	77.9	78.6	4.9	5.0
6/20/2011 20:30	13410.0	78.0	78.6	4.9	5.0
6/20/2011 21:00	13440.0	77.7	78.6	4.9	5.0
6/20/2011 21:30	13470.0	77.7	78.6	4.9	5.0
6/20/2011 22:00	13500.0	77.6	78.6	4.9	5.0
6/20/2011 22:30	13530.0	78.0	78.6	4.9	5.0
6/20/2011 23:00	13560.0	77.8	78.6	4.9	5.0
6/20/2011 23:30	13590.0	77.8	78.6	4.9	5.0
6/21/2011 0:00	13620.0	78.0	78.6	4.9	5.0
6/21/2011 0:30	13650.0	77.8	78.6	4.9	5.0
6/21/2011 1:00	13680.0	77.7	78.6	4.9	5.0
6/21/2011 1:30	13710.0	77.8	78.6	4.9	5.0
6/21/2011 2:00	13740.0	77.7	78.6	4.9	5.0
6/21/2011 2:30	13770.0	77.8	78.6	4.9	5.0
6/21/2011 3:00	13800.0	77.9	78.6	4.9	5.0
6/21/2011 3:30	13830.0	78.0	78.6	4.9	5.0
6/21/2011 4:00	13860.0	78.2	78.6	4.9	5.0
6/21/2011 4:30	13890.0	77.7	78.6	4.9	5.0
6/21/2011 5:00	13920.0	77.9	78.6	4.9	5.0
6/21/2011 5:30	13950.0	77.7	78.6	4.9	5.0
6/21/2011 6:00	13980.0	77.9	78.6	4.9	5.0
6/21/2011 6:30	14010.0	77.8	78.6	4.9	5.0
6/21/2011 7:00	14040.0	77.8	78.6	4.9	5.0
6/21/2011 7:31	14071.0	77.6	78.6	4.9	5.0
6/21/2011 8:00	14100.0	77.6	78.6	4.9	5.0
6/21/2011 8:42	14142.0	77.6	78.6	4.9	5.0
6/21/2011 9:05	14165.0	77.8	78.6	4.9	5.0
6/21/2011 9:30	14190.0	77.9	78.6	4.9	5.0
6/21/2011 10:00	14220.0	77.9	78.6	4.9	5.0
6/21/2011 10:30	14250.0	77.8	78.6	4.9	5.0
6/21/2011 11:00	14280.0	77.7	78.5	4.9	5.0

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/21/2011 11:30	14310.0	77.9	78.6	4.9	5.0
6/21/2011 12:00	14340.0	77.8	78.6	4.9	5.0
6/21/2011 12:30	14370.0	77.9	78.6	4.9	5.0
6/21/2011 13:00	14400.0	77.6	78.6	4.9	5.0
6/21/2011 13:30	14430.0	78.0	78.6	4.9	5.0
6/21/2011 14:00	14460.0	77.7	78.6	4.9	5.0
6/21/2011 14:37	14497.0	77.9	78.6	4.9	5.0
6/21/2011 15:00	14520.0	77.7	78.6	4.9	5.0
6/21/2011 15:30	14550.0	77.8	78.6	4.9	5.0
6/21/2011 16:00	14580.0	77.6	78.6	4.9	5.0
6/21/2011 16:30	14610.0	77.8	78.6	4.9	5.0
6/21/2011 17:00	14640.0	77.8	78.6	4.9	5.0
6/21/2011 17:30	14670.0	77.5	78.6	4.9	5.0
6/21/2011 18:00	14700.0	78.0	78.5	4.9	5.0
6/21/2011 18:30	14730.0	77.9	78.6	4.9	5.0
6/21/2011 19:00	14760.0	77.5	78.5	4.9	5.0
6/21/2011 19:30	14790.0	77.5	78.5	4.9	5.0
6/21/2011 20:00	14820.0	77.7	78.5	4.9	5.0
6/21/2011 20:30	14850.0	77.8	78.5	4.9	5.0
6/21/2011 21:04	14884.0	77.8	78.5	4.9	5.0
6/21/2011 21:33	14913.0	77.7	78.5	4.9	5.0
6/21/2011 22:00	14940.0	77.6	78.5	4.9	5.0
6/21/2011 22:31	14971.0	78.0	78.5	4.9	5.0
6/21/2011 23:00	15000.0	77.9	78.5	4.9	5.0
6/21/2011 23:30	15030.0	77.5	78.5	4.9	5.0
6/22/2011 0:00	15060.0	77.5	78.5	4.9	5.0
6/22/2011 0:30	15090.0	78.0	78.5	4.9	5.0
6/22/2011 1:00	15120.0	77.7	78.5	4.9	5.0
6/22/2011 1:30	15150.0	77.6	78.5	4.9	5.0
6/22/2011 2:00	15180.0	77.7	78.5	4.9	5.0
6/22/2011 2:30	15210.0	77.8	78.5	4.9	5.0
6/22/2011 3:00	15240.0	77.9	78.5	4.9	5.0
6/22/2011 3:30	15270.0	77.8	78.5	4.9	5.0
6/22/2011 4:00	15300.0	77.7	78.5	4.9	5.0
6/22/2011 4:30	15330.0	77.7	78.5	4.9	5.0
6/22/2011 5:00	15360.0	77.7	78.5	4.9	5.0
6/22/2011 5:30	15390.0	77.7	78.5	4.9	5.0
6/22/2011 6:00	15420.0	77.6	78.5	4.9	5.0
6/22/2011 6:30	15450.0	78.1	78.5	4.9	5.0
6/22/2011 7:00	15480.0	77.9	78.5	4.9	5.0
6/22/2011 7:30	15510.0	77.5	78.5	4.9	5.0
6/22/2011 8:00	15540.0	77.7	78.5	4.9	5.0
6/22/2011 8:35	15575.0	77.6	78.5	4.9	5.0

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/22/2011 9:00	15600.0	78.0	78.5	4.9	5.0
6/22/2011 9:30	15630.0	77.9	78.5	4.9	5.0
6/22/2011 10:08	15668.0	77.8	78.5	4.9	5.0
6/22/2011 10:31	15691.0	77.9	78.5	4.9	5.0
6/22/2011 11:00	15720.0	77.8	78.5	4.9	5.0
6/22/2011 11:30	15750.0	77.9	78.5	4.9	5.0
6/22/2011 12:00	15780.0	77.8	78.5	4.9	5.0
6/22/2011 12:30	15810.0	77.6	78.5	4.9	5.0
6/22/2011 13:08	15848.0	77.9	78.5	4.9	5.0
6/22/2011 13:30	15870.0	77.7	78.5	4.9	5.0
6/22/2011 14:04	15904.0	77.8	78.5	4.9	5.0
6/22/2011 14:32	15932.0	77.6	78.5	4.9	5.0
6/22/2011 15:00	15960.0	77.5	78.5	4.9	5.0
6/22/2011 15:31	15991.0	77.7	78.5	4.9	5.0
6/22/2011 16:08	16028.0	77.5	78.5	4.9	5.0
6/22/2011 16:30	16050.0	78.0	78.5	4.9	5.0
6/22/2011 17:00	16080.0	77.9	78.5	4.9	5.0
6/22/2011 17:30	16110.0	77.6	78.5	4.9	5.0
6/22/2011 18:00	16140.0	77.8	78.5	4.9	5.0
6/22/2011 18:30	16170.0	78.0	78.5	4.9	5.0
6/22/2011 19:00	16200.0	77.7	78.5	4.9	5.0
6/22/2011 19:30	16230.0	78.2	78.5	4.9	5.0
6/22/2011 20:00	16260.0	77.9	78.5	4.9	5.0
6/22/2011 20:37	16297.0	77.7	78.5	4.9	5.0
6/22/2011 21:00	16320.0	77.7	78.5	4.9	5.0
6/22/2011 21:30	16350.0	77.9	78.5	4.9	5.0
6/22/2011 22:00	16380.0	77.3	78.5	4.9	5.0
6/22/2011 22:30	16410.0	78.0	78.5	4.9	5.0
6/22/2011 23:00	16440.0	77.8	78.5	4.9	5.0
6/22/2011 23:30	16470.0	77.8	78.5	4.9	5.0
6/23/2011 0:00	16500.0	77.7	78.5	4.9	5.0
6/23/2011 0:30	16530.0	77.6	78.5	4.9	5.0
6/23/2011 1:00	16560.0	78.0	78.5	4.9	5.0
6/23/2011 1:30	16590.0	77.7	78.5	4.9	5.0
6/23/2011 2:00	16620.0	77.4	72.4	4.9	4.6
6/23/2011 2:30	16650.0	78.0	78.5	4.9	4.9
6/23/2011 3:00	16680.0	77.8	78.5	4.9	4.9
6/23/2011 3:30	16710.0	77.6	78.5	4.9	4.9
6/23/2011 4:00	16740.0	77.4	78.5	4.9	4.9
6/23/2011 4:30	16770.0	78.0	78.5	4.9	4.9
6/23/2011 5:00	16800.0	77.8	78.5	4.9	4.9
6/23/2011 5:30	16830.0	77.3	78.5	4.9	4.9
6/23/2011 6:00	16860.0	77.5	78.5	4.9	4.9

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/23/2011 6:30	16890.0	77.8	78.4	4.9	4.9
6/23/2011 7:00	16920.0	77.8	78.4	4.9	4.9
6/23/2011 7:30	16950.0	77.5	78.4	4.9	4.9
6/23/2011 8:00	16980.0	77.6	78.4	4.9	4.9
6/23/2011 8:30	17010.0	78.0	78.4	4.9	4.9
6/23/2011 9:00	17040.0	77.7	78.4	4.9	4.9
6/23/2011 9:30	17070.0	77.6	78.4	4.9	4.9
6/23/2011 10:00	17100.0	77.6	78.4	4.9	4.9
6/23/2011 10:30	17130.0	77.8	78.4	4.9	4.9
6/23/2011 11:00	17160.0	77.9	78.4	4.9	4.9
6/23/2011 11:30	17190.0	77.9	78.4	4.9	4.9
6/23/2011 12:00	17220.0	77.8	78.4	4.9	4.9
6/23/2011 12:30	17250.0	78.0	78.4	4.9	4.9
6/23/2011 13:00	17280.0	77.6	78.4	4.9	4.9
6/23/2011 13:30	17310.0	77.9	78.4	4.9	4.9
6/23/2011 14:00	17340.0	78.0	78.4	4.9	4.9
6/23/2011 14:30	17370.0	77.8	78.4	4.9	4.9
6/23/2011 15:00	17400.0	77.7	78.4	4.9	4.9
6/23/2011 15:30	17430.0	77.9	78.4	4.9	4.9
6/23/2011 16:00	17460.0	77.7	78.4	4.9	4.9
6/23/2011 16:30	17490.0	77.7	78.4	4.9	4.9
6/23/2011 17:00	17520.0	77.6	78.4	4.9	4.9
6/23/2011 17:30	17550.0	77.3	78.4	4.9	4.9
6/23/2011 18:00	17580.0	77.7	78.4	4.9	4.9
6/23/2011 18:31	17611.0	77.5	78.4	4.9	4.9
6/23/2011 19:07	17647.0	77.6	78.4	4.9	4.9
6/23/2011 19:32	17672.0	77.5	78.4	4.9	4.9
6/23/2011 20:01	17701.0	77.8	78.4	4.9	4.9
6/23/2011 20:31	17731.0	77.9	78.4	4.9	4.9
6/23/2011 21:01	17761.0	77.7	78.4	4.9	4.9
6/23/2011 21:30	17790.0	77.5	78.4	4.9	4.9
6/23/2011 22:00	17820.0	77.7	78.4	4.9	4.9
6/23/2011 22:30	17850.0	77.9	78.4	4.9	4.9
6/23/2011 23:01	17881.0	77.6	78.4	4.9	4.9
6/23/2011 23:30	17910.0	77.4	78.4	4.9	4.9
6/24/2011 0:00	17940.0	77.8	78.4	4.9	4.9
6/24/2011 0:30	17970.0	77.8	78.4	4.9	4.9
6/24/2011 1:00	18000.0	77.6	78.4	4.9	4.9
6/24/2011 1:31	18031.0	77.6	78.4	4.9	4.9
6/24/2011 2:00	18060.0	77.6	78.4	4.9	4.9
6/24/2011 2:30	18090.0	77.5	78.4	4.9	4.9
6/24/2011 3:00	18120.0	77.5	78.4	4.9	4.9
6/24/2011 3:31	18151.0	77.5	78.4	4.9	4.9

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/24/2011 4:00	18180.0	77.4	78.4	4.9	4.9
6/24/2011 4:30	18210.0	77.4	78.4	4.9	4.9
6/24/2011 5:01	18241.0	77.4	78.4	4.9	4.9
6/24/2011 5:30	18270.0	77.2	78.4	4.9	4.9
6/24/2011 6:00	18300.0	77.6	78.4	4.9	4.9
6/24/2011 6:30	18330.0	77.6	78.4	4.9	4.9
6/24/2011 7:00	18360.0	77.5	78.4	4.9	4.9
6/24/2011 7:30	18390.0	77.6	78.4	4.9	4.9
6/24/2011 8:00	18420.0	77.7	78.4	4.9	4.9
6/24/2011 8:30	18450.0	77.5	78.4	4.9	4.9
6/24/2011 9:00	18480.0	77.7	78.4	4.9	4.9
6/24/2011 9:30	18510.0	77.6	78.4	4.9	4.9
6/24/2011 10:00	18540.0	77.6	78.4	4.9	4.9
6/24/2011 10:30	18570.0	77.4	78.4	4.9	4.9
6/24/2011 11:00	18600.0	77.3	78.4	4.9	4.9
6/24/2011 11:30	18630.0	77.6	78.4	4.9	4.9
6/24/2011 12:00	18660.0	77.6	78.4	4.9	4.9
6/24/2011 12:30	18690.0	77.5	78.4	4.9	4.9
6/24/2011 13:00	18720.0	77.4	78.4	4.9	4.9
6/24/2011 13:30	18750.0	77.7	78.4	4.9	4.9
6/24/2011 14:00	18780.0	77.5	78.4	4.9	4.9
6/24/2011 14:30	18810.0	77.6	78.4	4.9	4.9
6/24/2011 15:00	18840.0	77.4	78.4	4.9	4.9
6/24/2011 15:30	18870.0	77.4	78.4	4.9	4.9
6/24/2011 16:00	18900.0	77.6	78.4	4.9	4.9
6/24/2011 16:30	18930.0	77.5	78.4	4.9	4.9
6/24/2011 17:00	18960.0	77.3	78.4	4.9	4.9
6/24/2011 17:30	18990.0	77.7	78.4	4.9	4.9
6/24/2011 18:00	19020.0	77.3	78.4	4.9	4.9
6/24/2011 18:30	19050.0	77.3	78.4	4.9	4.9
6/24/2011 19:00	19080.0	77.4	78.3	4.9	4.9
6/24/2011 19:30	19110.0	77.5	78.3	4.9	4.9
6/24/2011 20:00	19140.0	77.4	78.3	4.9	4.9
6/24/2011 20:30	19170.0	77.3	78.3	4.9	4.9
6/24/2011 21:00	19200.0	77.4	78.3	4.9	4.9
6/24/2011 21:30	19230.0	77.6	78.3	4.9	4.9
6/24/2011 22:00	19260.0	77.5	78.3	4.9	4.9
6/24/2011 22:30	19290.0	77.3	78.3	4.9	4.9
6/24/2011 23:00	19320.0	77.3	78.3	4.9	4.9
6/24/2011 23:30	19350.0	77.4	78.3	4.9	4.9
6/25/2011 0:00	19380.0	77.2	78.3	4.9	4.9
6/25/2011 0:30	19410.0	77.2	78.3	4.9	4.9
6/25/2011 1:00	19440.0	77.7	78.3	4.9	4.9

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/25/2011 1:30	19470.0	77.2	78.3	4.9	4.9
6/25/2011 2:00	19500.0	77.3	78.3	4.9	4.9
6/25/2011 2:30	19530.0	77.6	78.3	4.9	4.9
6/25/2011 3:00	19560.0	77.5	78.3	4.9	4.9
6/25/2011 3:30	19590.0	77.0	78.3	4.9	4.9
6/25/2011 4:00	19620.0	77.3	78.3	4.9	4.9
6/25/2011 4:30	19650.0	77.3	78.3	4.9	4.9
6/25/2011 5:00	19680.0	77.1	78.3	4.9	4.9
6/25/2011 5:30	19710.0	77.4	78.3	4.9	4.9
6/25/2011 6:00	19740.0	77.4	78.3	4.9	4.9
6/25/2011 6:30	19770.0	77.2	78.3	4.9	4.9
6/25/2011 7:00	19800.0	77.2	78.3	4.9	4.9
6/25/2011 7:30	19830.0	77.1	78.3	4.9	4.9
6/25/2011 8:00	19860.0	76.9	78.3	4.9	4.9
6/25/2011 8:30	19890.0	77.6	78.3	4.9	4.9
6/25/2011 9:00	19920.0	77.3	78.3	4.9	4.9
6/25/2011 9:30	19950.0	77.1	78.3	4.9	4.9
6/25/2011 10:00	19980.0	76.7	78.3	4.8	4.9
6/25/2011 10:30	20010.0	76.9	78.3	4.9	4.9
6/25/2011 11:04	20044.0	77.2	78.3	4.9	4.9
6/25/2011 11:30	20070.0	77.3	78.3	4.9	4.9
6/25/2011 12:00	20100.0	77.1	78.3	4.9	4.9
6/25/2011 12:30	20130.0	77.3	78.3	4.9	4.9
6/25/2011 13:00	20160.0	77.1	78.3	4.9	4.9
6/25/2011 13:30	20190.0	76.8	78.3	4.8	4.9
6/25/2011 14:00	20220.0	77.3	78.3	4.9	4.9
6/25/2011 14:30	20250.0	77.0	78.3	4.9	4.9
6/25/2011 15:00	20280.0	77.1	78.3	4.9	4.9
6/25/2011 15:30	20310.0	77.0	78.3	4.9	4.9
6/25/2011 16:00	20340.0	76.8	78.3	4.8	4.9
6/25/2011 16:30	20370.0	77.1	78.3	4.9	4.9
6/25/2011 17:00	20400.0	77.1	78.3	4.9	4.9
6/25/2011 17:30	20430.0	77.2	78.3	4.9	4.9
6/25/2011 18:00	20460.0	77.0	78.3	4.9	4.9
6/25/2011 18:30	20490.0	77.1	78.3	4.9	4.9
6/25/2011 19:00	20520.0	76.9	78.3	4.9	4.9
6/25/2011 19:30	20550.0	77.3	78.3	4.9	4.9
6/25/2011 20:00	20580.0	77.0	78.3	4.9	4.9
6/25/2011 20:30	20610.0	77.1	78.3	4.9	4.9
6/25/2011 21:00	20640.0	77.0	78.3	4.9	4.9
6/25/2011 21:30	20670.0	77.0	78.3	4.9	4.9
6/25/2011 22:00	20700.0	76.9	78.3	4.9	4.9
6/25/2011 22:30	20730.0	77.0	78.3	4.9	4.9

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/25/2011 23:00	20760.0	76.9	78.3	4.9	4.9
6/25/2011 23:30	20790.0	76.7	78.3	4.8	4.9
6/26/2011 0:00	20820.0	77.0	78.3	4.9	4.9
6/26/2011 0:30	20850.0	77.0	78.3	4.9	4.9
6/26/2011 1:00	20880.0	76.8	78.2	4.8	4.9
6/26/2011 2:00	20940.0	77.0	78.2	4.9	4.9
6/26/2011 2:30	20970.0	76.9	78.2	4.9	4.9
6/26/2011 3:30	21030.0	76.6	78.2	4.8	4.9
6/26/2011 4:00	21060.0	76.9	78.2	4.9	4.9
6/26/2011 4:30	21090.0	76.6	78.2	4.8	4.9
6/26/2011 5:00	21120.0	76.9	78.2	4.9	4.9
6/26/2011 5:30	21150.0	77.0	78.2	4.9	4.9
6/26/2011 6:00	21180.0	77.0	78.2	4.9	4.9
6/26/2011 6:30	21210.0	76.8	78.2	4.8	4.9
6/26/2011 7:00	21240.0	76.6	78.2	4.8	4.9
6/26/2011 7:30	21270.0	76.9	78.2	4.9	4.9
6/26/2011 8:00	21300.0	77.1	78.2	4.9	4.9
6/26/2011 8:30	21330.0	76.7	78.2	4.8	4.9
6/26/2011 9:00	21360.0	76.8	78.2	4.8	4.9
6/26/2011 9:30	21390.0	76.8	78.2	4.8	4.9
6/26/2011 10:00	21420.0	77.0	78.2	4.9	4.9
6/26/2011 10:30	21450.0	76.8	78.2	4.8	4.9
6/26/2011 11:00	21480.0	76.9	78.2	4.9	4.9
6/26/2011 11:30	21510.0	76.8	78.2	4.8	4.9
6/26/2011 12:00	21540.0	76.5	78.2	4.8	4.9
6/26/2011 12:30	21570.0	76.8	78.2	4.8	4.9
6/26/2011 13:00	21600.0	77.0	78.2	4.9	4.9
6/26/2011 13:30	21630.0	76.7	78.2	4.8	4.9
6/26/2011 14:00	21660.0	76.5	78.2	4.8	4.9
6/26/2011 14:30	21690.0	76.4	78.2	4.8	4.9
6/26/2011 15:00	21720.0	76.6	78.2	4.8	4.9
6/26/2011 15:30	21750.0	76.4	78.2	4.8	4.9
6/26/2011 16:00	21780.0	76.9	78.2	4.9	4.9
6/26/2011 16:30	21810.0	76.6	78.2	4.8	4.9
6/26/2011 17:00	21840.0	76.4	78.2	4.8	4.9
6/26/2011 17:30	21870.0	76.7	78.2	4.8	4.9
6/26/2011 18:00	21900.0	76.4	78.2	4.8	4.9
6/26/2011 18:30	21930.0	76.7	78.2	4.8	4.9
6/26/2011 19:00	21960.0	76.7	78.2	4.8	4.9
6/26/2011 19:31	21991.0	76.4	78.2	4.8	4.9
6/26/2011 20:00	22020.0	76.5	78.2	4.8	4.9
6/26/2011 20:30	22050.0	76.6	78.2	4.8	4.9
6/26/2011 21:00	22080.0	76.6	78.2	4.8	4.9

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/26/2011 21:30	22110.0	77.6	78.2	4.9	4.9
6/26/2011 22:00	22140.0	76.4	78.2	4.8	4.9
6/26/2011 22:30	22170.0	77.6	78.2	4.9	4.9
6/26/2011 23:00	22200.0	76.8	78.2	4.8	4.9
6/26/2011 23:30	22230.0	76.2	78.2	4.8	4.9
6/27/2011 0:00	22260.0	76.6	78.2	4.8	4.9
6/27/2011 0:30	22290.0	76.5	78.2	4.8	4.9
6/27/2011 1:00	22320.0	76.6	78.2	4.8	4.9
6/27/2011 1:30	22350.0	76.4	78.1	4.8	4.9
6/27/2011 2:00	22380.0	76.5	78.1	4.8	4.9
6/27/2011 2:30	22410.0	76.3	78.1	4.8	4.9
6/27/2011 3:00	22440.0	76.3	78.1	4.8	4.9
6/27/2011 3:30	22470.0	76.2	78.1	4.8	4.9
6/27/2011 4:00	22500.0	76.5	78.1	4.8	4.9
6/27/2011 4:30	22530.0	76.3	78.1	4.8	4.9
6/27/2011 5:00	22560.0	76.6	78.1	4.8	4.9
6/27/2011 5:30	22590.0	76.6	78.1	4.8	4.9
6/27/2011 6:00	22620.0	76.6	78.1	4.8	4.9
6/27/2011 6:30	22650.0	76.3	78.1	4.8	4.9
6/27/2011 7:00	22680.0	76.5	78.1	4.8	4.9
6/27/2011 7:30	22710.0	76.4	78.1	4.8	4.9
6/27/2011 8:00	22740.0	76.7	78.1	4.8	4.9
6/27/2011 8:30	22770.0	76.1	78.1	4.8	4.9
6/27/2011 9:00	22800.0	76.3	78.1	4.8	4.9
6/27/2011 9:30	22830.0	76.4	78.1	4.8	4.9
6/27/2011 10:00	22860.0	76.5	78.1	4.8	4.9
6/27/2011 10:30	22890.0	76.4	78.1	4.8	4.9
6/27/2011 11:00	22920.0	76.3	78.1	4.8	4.9
6/27/2011 11:30	22950.0	76.2	56.3	4.8	3.6
6/27/2011 12:00	22980.0	76.3	78.1	4.8	4.9
6/27/2011 12:30	23010.0	76.7	78.1	4.8	4.9
6/27/2011 13:00	23040.0	76.3	78.1	4.8	4.9
6/27/2011 13:30	23070.0	75.8	78.1	4.8	4.9
6/27/2011 14:00	23100.0	76.3	78.1	4.8	4.9
6/27/2011 14:30	23130.0	76.4	78.1	4.8	4.9
6/27/2011 15:00	23160.0	76.4	78.1	4.8	4.9
6/27/2011 15:30	23190.0	76.3	78.1	4.8	4.9
6/27/2011 16:00	23220.0	76.0	78.1	4.8	4.9
6/27/2011 16:30	23250.0	76.0	78.1	4.8	4.9
6/27/2011 17:00	23280.0	76.1	78.1	4.8	4.9
6/27/2011 17:30	23310.0	76.4	78.1	4.8	4.9
6/27/2011 18:00	23340.0	76.3	78.1	4.8	4.9
6/27/2011 18:30	23370.0	76.5	78.1	4.8	4.9

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/27/2011 18:55	23395.0	78.5	78.1	5.0	4.9
6/27/2011 19:00	23400.0	78.0	78.1	4.9	4.9
6/27/2011 19:30	23430.0	78.7	78.1	5.0	4.9
6/27/2011 20:00	23460.0	77.9	78.0	4.9	4.9
6/27/2011 20:30	23490.0	78.2	78.1	4.9	4.9
6/27/2011 21:00	23520.0	78.1	78.1	4.9	4.9
6/27/2011 21:30	23550.0	78.1	78.1	4.9	4.9
6/27/2011 22:00	23580.0	77.8	78.0	4.9	4.9
6/27/2011 22:30	23610.0	78.0	78.0	4.9	4.9
6/27/2011 23:00	23640.0	78.1	78.0	4.9	4.9
6/27/2011 23:30	23670.0	77.9	78.1	4.9	4.9
6/28/2011 0:00	23700.0	78.2	78.1	4.9	4.9
6/28/2011 0:30	23730.0	77.8	78.1	4.9	4.9
6/28/2011 1:00	23760.0	78.1	78.1	4.9	4.9
6/28/2011 1:30	23790.0	77.9	78.1	4.9	4.9
6/28/2011 2:00	23820.0	77.7	78.1	4.9	4.9
6/28/2011 2:30	23850.0	78.4	78.1	4.9	4.9
6/28/2011 3:00	23880.0	77.8	78.1	4.9	4.9
6/28/2011 3:30	23910.0	78.2	78.0	4.9	4.9
6/28/2011 4:00	23940.0	77.9	78.1	4.9	4.9
6/28/2011 4:30	23970.0	77.8	78.0	4.9	4.9
6/28/2011 5:00	24000.0	77.7	78.1	4.9	4.9
6/28/2011 5:30	24030.0	77.9	78.1	4.9	4.9
6/28/2011 6:00	24060.0	77.8	78.1	4.9	4.9
6/28/2011 6:30	24090.0	77.7	78.1	4.9	4.9
6/28/2011 7:00	24120.0	77.9	78.1	4.9	4.9
6/28/2011 7:30	24150.0	78.1	78.1	4.9	4.9
6/28/2011 8:00	24180.0	77.6	78.1	4.9	4.9
6/28/2011 8:30	24210.0	77.6	78.1	4.9	4.9
6/28/2011 9:00	24240.0	77.8	78.1	4.9	4.9
6/28/2011 9:30	24270.0	78.1	78.1	4.9	4.9
6/28/2011 10:00	24300.0	77.9	78.1	4.9	4.9
6/28/2011 10:30	24330.0	77.8	78.1	4.9	4.9
6/28/2011 11:00	24360.0	77.7	78.1	4.9	4.9
6/28/2011 11:30	24390.0	77.6	78.1	4.9	4.9
6/28/2011 12:00	24420.0	77.8	78.1	4.9	4.9
6/28/2011 12:30	24450.0	77.7	78.1	4.9	4.9
6/28/2011 13:00	24480.0	77.8	78.1	4.9	4.9
6/28/2011 13:30	24510.0	77.8	78.1	4.9	4.9
6/28/2011 14:00	24540.0	77.3	78.1	4.9	4.9
6/28/2011 14:30	24570.0	77.4	78.1	4.9	4.9
6/28/2011 15:00	24600.0	77.6	78.1	4.9	4.9
6/28/2011 15:30	24630.0	77.6	78.1	4.9	4.9

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/28/2011 16:00	24660.0	77.6	78.1	4.9	4.9
6/28/2011 16:30	24690.0	77.3	78.1	4.9	4.9
6/28/2011 17:00	24720.0	77.8	78.1	4.9	4.9
6/28/2011 17:30	24750.0	77.8	78.1	4.9	4.9
6/28/2011 18:00	24780.0	77.7	78.1	4.9	4.9
6/28/2011 18:30	24810.0	77.6	78.1	4.9	4.9
6/28/2011 19:00	24840.0	77.5	78.0	4.9	4.9
6/28/2011 19:30	24870.0	77.7	78.0	4.9	4.9
6/28/2011 20:00	24900.0	77.5	78.0	4.9	4.9
6/28/2011 20:30	24930.0	77.8	78.0	4.9	4.9
6/28/2011 21:00	24960.0	77.7	78.0	4.9	4.9
6/28/2011 21:30	24990.0	77.9	78.1	4.9	4.9
6/28/2011 22:00	25020.0	77.6	78.0	4.9	4.9
6/28/2011 22:30	25050.0	77.8	78.0	4.9	4.9
6/28/2011 23:00	25080.0	77.4	78.0	4.9	4.9
6/28/2011 23:30	25110.0	77.7	78.0	4.9	4.9
6/29/2011 0:00	25140.0	77.4	78.0	4.9	4.9
6/29/2011 0:30	25170.0	77.8	78.0	4.9	4.9
6/29/2011 1:00	25200.0	77.3	78.1	4.9	4.9
6/29/2011 1:30	25230.0	77.6	78.0	4.9	4.9
6/29/2011 2:00	25260.0	77.4	78.0	4.9	4.9
6/29/2011 2:30	25290.0	77.7	78.0	4.9	4.9
6/29/2011 3:00	25320.0	77.3	78.0	4.9	4.9
6/29/2011 3:30	25350.0	77.5	78.1	4.9	4.9
6/29/2011 4:00	25380.0	77.3	78.0	4.9	4.9
6/29/2011 4:30	25410.0	77.6	78.0	4.9	4.9
6/29/2011 5:00	25440.0	77.2	78.0	4.9	4.9
6/29/2011 5:30	25470.0	77.3	78.0	4.9	4.9
6/29/2011 6:00	25500.0	77.7	78.0	4.9	4.9
6/29/2011 6:30	25530.0	77.5	78.0	4.9	4.9
6/29/2011 7:00	25560.0	77.8	78.0	4.9	4.9
6/29/2011 7:30	25590.0	77.4	78.0	4.9	4.9
6/29/2011 8:00	25620.0	77.4	78.0	4.9	4.9
6/29/2011 8:30	25650.0	77.5	78.0	4.9	4.9
6/29/2011 9:00	25680.0	77.5	78.0	4.9	4.9
6/29/2011 9:30	25710.0	77.3	78.0	4.9	4.9
6/29/2011 10:00	25740.0	77.6	78.0	4.9	4.9
6/29/2011 10:30	25770.0	77.5	78.0	4.9	4.9
6/29/2011 11:00	25800.0	77.3	78.0	4.9	4.9
6/29/2011 11:30	25830.0	77.4	78.0	4.9	4.9
6/29/2011 12:00	25860.0	77.3	78.0	4.9	4.9
6/29/2011 12:30	25890.0	77.2	78.0	4.9	4.9
6/29/2011 13:00	25920.0	77.4	78.0	4.9	4.9

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/29/2011 13:30	25950.0	77.3	78.0	4.9	4.9
6/29/2011 14:00	25980.0	77.3	78.0	4.9	4.9
6/29/2011 14:30	26010.0	77.3	78.0	4.9	4.9
6/29/2011 15:00	26040.0	77.2	78.0	4.9	4.9
6/29/2011 15:30	26070.0	77.2	78.0	4.9	4.9
6/29/2011 16:00	26100.0	77.2	78.0	4.9	4.9
6/29/2011 16:30	26130.0	77.5	78.0	4.9	4.9
6/29/2011 17:00	26160.0	77.2	78.0	4.9	4.9
6/29/2011 17:30	26190.0	77.0	78.0	4.9	4.9
6/29/2011 18:00	26220.0	77.9	78.0	4.9	4.9
6/29/2011 18:30	26250.0	77.4	78.0	4.9	4.9
6/29/2011 19:00	26280.0	77.1	78.0	4.9	4.9
6/29/2011 19:30	26310.0	77.4	78.0	4.9	4.9
6/29/2011 20:00	26340.0	76.8	78.0	4.8	4.9
6/29/2011 20:30	26370.0	77.3	78.0	4.9	4.9
6/29/2011 21:00	26400.0	76.9	78.0	4.9	4.9
6/29/2011 21:30	26430.0	76.8	78.0	4.8	4.9
6/29/2011 22:00	26460.0	76.8	78.0	4.8	4.9
6/29/2011 22:30	26490.0	77.3	78.0	4.9	4.9
6/29/2011 23:00	26520.0	77.0	78.0	4.9	4.9
6/29/2011 23:30	26550.0	77.1	78.0	4.9	4.9
6/30/2011 0:00	26580.0	77.9	78.0	4.9	4.9
6/30/2011 0:30	26610.0	77.7	78.0	4.9	4.9
6/30/2011 1:00	26640.0	78.0	78.0	4.9	4.9
6/30/2011 1:30	26670.0	77.5	78.0	4.9	4.9
6/30/2011 2:00	26700.0	77.6	78.0	4.9	4.9
6/30/2011 2:30	26730.0	77.4	78.0	4.9	4.9
6/30/2011 3:00	26760.0	77.8	78.0	4.9	4.9
6/30/2011 3:33	26793.0	77.3	78.0	4.9	4.9
6/30/2011 4:00	26820.0	77.6	78.0	4.9	4.9
6/30/2011 4:30	26850.0	77.9	78.0	4.9	4.9
6/30/2011 5:00	26880.0	77.6	78.0	4.9	4.9
6/30/2011 5:30	26910.0	77.5	78.0	4.9	4.9
6/30/2011 6:00	26940.0	77.6	78.0	4.9	4.9
6/30/2011 6:30	26970.0	77.8	78.0	4.9	4.9
6/30/2011 7:00	27000.0	78.0	78.0	4.9	4.9
6/30/2011 7:30	27030.0	77.9	78.0	4.9	4.9
6/30/2011 8:00	27060.0	77.6	78.0	4.9	4.9
6/30/2011 8:30	27090.0	77.7	78.0	4.9	4.9
6/30/2011 9:00	27120.0	77.6	78.0	4.9	4.9
6/30/2011 9:30	27150.0	77.4	78.0	4.9	4.9
6/30/2011 10:00	27180.0	77.4	78.0	4.9	4.9
6/30/2011 10:32	27212.0	77.6	78.0	4.9	4.9

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
6/30/2011 11:00	27240.0	77.5	78.0	4.9	4.9
6/30/2011 11:30	27270.0	77.8	78.0	4.9	4.9
6/30/2011 12:00	27300.0	77.3	78.0	4.9	4.9
6/30/2011 12:30	27330.0	78.0	78.0	4.9	4.9
6/30/2011 13:00	27360.0	77.7	78.0	4.9	4.9
6/30/2011 13:30	27390.0	77.5	78.0	4.9	4.9
6/30/2011 14:00	27420.0	77.6	78.0	4.9	4.9
6/30/2011 14:30	27450.0	77.2	78.0	4.9	4.9
6/30/2011 15:00	27480.0	77.4	78.0	4.9	4.9
6/30/2011 15:30	27510.0	77.8	78.0	4.9	4.9
6/30/2011 16:00	27540.0	77.5	78.0	4.9	4.9
6/30/2011 16:30	27570.0	77.4	78.0	4.9	4.9
6/30/2011 17:00	27600.0	77.3	78.0	4.9	4.9
6/30/2011 17:30	27630.0	77.7	78.0	4.9	4.9
6/30/2011 18:10	27670.0	77.6	78.0	4.9	4.9
6/30/2011 18:30	27690.0	77.4	78.0	4.9	4.9
6/30/2011 19:03	27723.0	77.5	78.0	4.9	4.9
6/30/2011 19:38	27758.0	77.4	78.0	4.9	4.9
6/30/2011 20:50	27830.0	77.2	78.0	4.9	4.9
6/30/2011 21:30	27870.0	77.4	78.0	4.9	4.9
6/30/2011 21:59	27899.0	77.4	78.0	4.9	4.9
6/30/2011 22:30	27930.0	77.4	78.0	4.9	4.9
6/30/2011 23:00	27960.0	77.5	78.0	4.9	4.9
6/30/2011 23:30	27990.0	77.4	78.0	4.9	4.9
7/1/2011 0:00	28020.0	77.6	78.0	4.9	4.9
7/1/2011 0:30	28050.0	77.3	78.0	4.9	4.9
7/1/2011 1:00	28080.0	77.3	78.0	4.9	4.9
7/1/2011 1:30	28110.0	77.3	78.0	4.9	4.9
7/1/2011 2:00	28140.0	77.4	78.0	4.9	4.9
7/1/2011 2:30	28170.0	77.4	78.0	4.9	4.9
7/1/2011 3:00	28200.0	77.2	78.0	4.9	4.9
7/1/2011 3:30	28230.0	77.5	78.0	4.9	4.9
7/1/2011 4:00	28260.0	77.3	78.0	4.9	4.9
7/1/2011 4:30	28290.0	77.5	78.0	4.9	4.9
7/1/2011 5:14	28334.0	77.3	78.0	4.9	4.9
7/1/2011 5:30	28350.0	88.3	78.0	5.6	4.9
7/1/2011 6:00	28380.0	77.4	78.0	4.9	4.9
7/1/2011 6:30	28410.0	77.3	78.0	4.9	4.9
7/1/2011 7:02	28442.0	77.2	78.0	4.9	4.9
7/1/2011 7:52	28492.0	77.3	78.0	4.9	4.9
7/1/2011 8:11	28511.0	76.1	78.0	4.8	4.9
7/1/2011 8:31	28531.0	77.2	78.0	4.9	4.9
7/1/2011 9:04	28564.0	77.2	78.0	4.9	4.9

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
7/1/2011 9:35	28595.0	77.3	78.0	4.9	4.9
7/1/2011 10:00	28620.0	77.9	78.0	4.9	4.9
7/1/2011 10:40	28660.0	77.3	78.0	4.9	4.9
7/1/2011 11:03	28683.0	77.3	78.0	4.9	4.9
7/1/2011 11:35	28715.0	77.3	78.0	4.9	4.9
7/1/2011 12:06	28746.0	76.2	78.0	4.8	4.9
7/1/2011 12:35	28775.0	77.1	78.0	4.9	4.9
7/1/2011 13:05	28805.0	77.9	78.0	4.9	4.9
7/1/2011 13:44	28844.0	76.3	78.0	4.8	4.9
7/1/2011 14:01	28861.0	77.4	78.0	4.9	4.9
7/1/2011 13:31	28831.0	77.0	78.1	4.9	4.9
7/1/2011 15:06	28926.0	77.1	78.1	4.9	4.9
7/1/2011 15:43	28963.0	77.2	78.0	4.9	4.9
7/1/2011 16:12	28992.0	77.1	78.0	4.9	4.9
7/1/2011 16:35	29015.0	77.3	78.0	4.9	4.9
7/1/2011 17:04	29044.0	77.3	78.0	4.9	4.9
7/1/2011 17:36	29076.0	76.9	78.0	4.8	4.9
7/1/2011 18:04	29104.0	77.6	78.0	4.9	4.9
7/1/2011 18:35	29135.0	77.3	78.0	4.9	4.9
7/1/2011 19:00	29160.0	77.4	78.0	4.9	4.9
7/1/2011 19:30	29190.0	77.2	78.0	4.9	4.9
7/1/2011 20:00	29220.0	77.2	78.0	4.9	4.9
7/1/2011 20:30	29250.0	76.9	78.0	4.9	4.9
7/1/2011 21:00	29280.0	77.4	78.0	4.9	4.9
7/1/2011 21:30	29310.0	77.0	78.0	4.9	4.9
7/1/2011 22:00	29340.0	77.2	78.0	4.9	4.9
7/1/2011 22:30	29370.0	77.2	78.0	4.9	4.9
7/1/2011 23:00	29400.0	77.0	78.0	4.9	4.9
7/1/2011 23:30	29430.0	77.2	78.0	4.9	4.9
7/2/2011 0:00	29460.0	77.1	78.0	4.9	4.9
7/2/2011 0:30	29490.0	77.1	78.0	4.9	4.9
7/2/2011 1:00	29520.0	76.8	77.9	4.8	4.9
7/2/2011 1:30	29550.0	77.0	77.9	4.9	4.9
7/2/2011 2:00	29580.0	77.0	77.9	4.9	4.9
7/2/2011 2:30	29610.0	76.8	77.9	4.8	4.9
7/2/2011 3:00	29640.0	76.9	77.9	4.8	4.9
7/2/2011 3:30	29670.0	76.8	77.9	4.8	4.9
7/2/2011 4:00	29700.0	76.8	77.9	4.8	4.9
7/2/2011 4:30	29730.0	77.0	77.9	4.9	4.9
7/2/2011 5:00	29760.0	76.8	77.9	4.8	4.9
7/2/2011 5:30	29790.0	77.1	77.9	4.9	4.9
7/2/2011 6:00	29820.0	76.8	77.9	4.8	4.9
7/2/2011 6:31	29851.0	77.8	77.9	4.9	4.9

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
7/2/2011 7:00	29880.0	77.1	77.9	4.9	4.9
7/2/2011 7:30	29910.0	76.1	77.9	4.8	4.9
7/2/2011 8:00	29940.0	76.7	77.9	4.8	4.9
7/2/2011 8:30	29970.0	76.9	77.9	4.8	4.9
7/2/2011 9:00	30000.0	77.1	77.9	4.9	4.9
7/2/2011 9:30	30030.0	76.8	77.9	4.8	4.9
7/2/2011 10:00	30060.0	76.8	77.9	4.8	4.9
7/2/2011 10:30	30090.0	76.8	77.9	4.8	4.9
7/2/2011 11:00	30120.0	76.5	77.9	4.8	4.9
7/2/2011 11:30	30150.0	76.7	77.9	4.8	4.9
7/2/2011 12:00	30180.0	76.9	77.9	4.8	4.9
7/2/2011 12:30	30210.0	76.8	77.9	4.8	4.9
7/2/2011 13:00	30240.0	76.8	77.9	4.8	4.9
7/2/2011 13:30	30270.0	76.8	77.9	4.8	4.9
7/2/2011 14:00	30300.0	76.8	77.9	4.8	4.9
7/2/2011 14:30	30330.0	76.5	77.9	4.8	4.9
7/2/2011 15:00	30360.0	76.9	77.9	4.9	4.9
7/2/2011 15:30	30390.0	76.9	77.9	4.9	4.9
7/2/2011 16:00	30420.0	76.7	77.9	4.8	4.9
7/2/2011 16:30	30450.0	77.0	77.9	4.9	4.9
7/2/2011 17:04	30484.0	77.6	77.9	4.9	4.9
7/2/2011 17:30	30510.0	77.7	77.9	4.9	4.9
7/2/2011 18:00	30540.0	76.9	77.9	4.8	4.9
7/2/2011 18:30	30570.0	76.9	77.9	4.9	4.9
7/2/2011 19:00	30600.0	76.8	77.9	4.8	4.9
7/2/2011 19:30	30630.0	76.4	77.9	4.8	4.9
7/2/2011 20:00	30660.0	76.6	77.9	4.8	4.9
7/2/2011 20:30	30690.0	76.4	77.9	4.8	4.9
7/2/2011 21:19	30739.0	76.5	77.9	4.8	4.9
7/2/2011 21:32	30752.0	76.7	77.9	4.8	4.9
7/2/2011 22:00	30780.0	76.3	77.9	4.8	4.9
7/2/2011 22:30	30810.0	76.7	77.9	4.8	4.9
7/2/2011 23:00	30840.0	76.6	77.9	4.8	4.9
7/2/2011 23:30	30870.0	76.7	77.9	4.8	4.9
7/3/2011 0:00	30900.0	76.6	77.9	4.8	4.9
7/3/2011 0:30	30930.0	76.6	77.9	4.8	4.9
7/3/2011 1:00	30960.0	76.7	77.9	4.8	4.9
7/3/2011 1:43	31003.0	76.5	77.9	4.8	4.9
7/3/2011 2:02	31022.0	76.5	77.9	4.8	4.9
7/3/2011 2:30	31050.0	76.6	77.9	4.8	4.9
7/3/2011 3:17	31097.0	76.7	77.9	4.8	4.9
7/3/2011 4:23	31163.0	76.4	77.9	4.8	4.9
7/3/2011 5:00	31200.0	76.6	77.9	4.8	4.9

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
7/3/2011 5:30	31230.0	76.6	77.9	4.8	4.9
7/3/2011 6:00	31260.0	76.5	77.9	4.8	4.9
7/3/2011 6:30	31290.0	76.2	77.9	4.8	4.9
7/3/2011 7:00	31320.0	76.4	77.9	4.8	4.9
7/3/2011 7:31	31351.0	76.0	77.9	4.8	4.9
7/3/2011 8:00	31380.0	76.1	77.9	4.8	4.9
7/3/2011 8:30	31410.0	76.3	77.9	4.8	4.9
7/3/2011 9:00	31440.0	76.5	77.9	4.8	4.9
7/3/2011 9:30	31470.0	76.6	77.9	4.8	4.9
7/3/2011 10:01	31501.0	76.5	77.9	4.8	4.9
7/3/2011 10:30	31530.0	76.4	77.9	4.8	4.9
7/3/2011 11:00	31560.0	76.3	77.9	4.8	4.9
7/3/2011 11:30	31590.0	76.5	77.9	4.8	4.9
7/3/2011 12:00	31620.0	76.4	77.9	4.8	4.9
7/3/2011 12:30	31650.0	76.3	77.9	4.8	4.9
7/3/2011 13:00	31680.0	76.3	77.9	4.8	4.9
7/3/2011 13:30	31710.0	76.4	77.9	4.8	4.9
7/3/2011 14:00	31740.0	76.3	77.9	4.8	4.9
7/3/2011 14:30	31770.0	76.3	77.9	4.8	4.9
7/3/2011 15:00	31800.0	76.2	77.9	4.8	4.9
7/3/2011 15:31	31831.0	76.2	77.9	4.8	4.9
7/3/2011 16:30	31890.0	76.3	77.9	4.8	4.9
7/3/2011 17:00	31920.0	76.2	77.9	4.8	4.9
7/3/2011 17:30	31950.0	76.9	77.8	4.9	4.9
7/3/2011 18:00	31980.0	76.1	77.8	4.8	4.9
7/3/2011 18:30	32010.0	76.3	77.8	4.8	4.9
7/3/2011 19:00	32040.0	76.3	77.8	4.8	4.9
7/3/2011 19:30	32070.0	76.4	77.8	4.8	4.9
7/3/2011 20:00	32100.0	76.6	77.8	4.8	4.9
7/3/2011 20:33	32133.0	76.5	77.8	4.8	4.9
7/3/2011 21:00	32160.0	76.2	77.8	4.8	4.9
7/3/2011 21:30	32190.0	76.3	77.8	4.8	4.9
7/3/2011 22:00	32220.0	76.4	77.8	4.8	4.9
7/3/2011 22:30	32250.0	76.4	77.8	4.8	4.9
7/3/2011 23:00	32280.0	76.5	77.8	4.8	4.9
7/3/2011 23:30	32310.0	76.2	77.8	4.8	4.9
7/4/2011 0:00	32340.0	76.1	77.8	4.8	4.9
7/4/2011 0:30	32370.0	76.2	77.8	4.8	4.9
7/4/2011 1:00	32400.0	76.1	77.8	4.8	4.9
7/4/2011 1:30	32430.0	76.1	77.8	4.8	4.9
7/4/2011 2:00	32460.0	76.1	77.8	4.8	4.9
7/4/2011 2:30	32490.0	76.1	77.8	4.8	4.9
7/4/2011 3:00	32520.0	76.3	77.8	4.8	4.9

TABLE B-1: PUMPING RATES FOR HRES-09 LONG-TERM PUMPING TEST

Date/Time	Time elapsed (min)	Q (instantantaneous, gpm)	Q (based on totalizer, gpm)	Q (instantantaneous, L/s)	Q (based on totalizer, L/s)
7/4/2011 3:30	32550.0	76.2	77.8	4.8	4.9
7/4/2011 4:00	32580.0	76.0	77.8	4.8	4.9
7/4/2011 4:30	32610.0	76.1	77.8	4.8	4.9
7/4/2011 5:00	32640.0	76.2	77.8	4.8	4.9
7/4/2011 5:30	32670.0	76.0	77.8	4.8	4.9
7/4/2011 6:00	32700.0	76.0	77.8	4.8	4.9
7/4/2011 6:30	32730.0	76.1	77.8	4.8	4.9
7/4/2011 7:04	32764.0	76.9	77.8	4.9	4.9
7/4/2011 7:30	32790.0	76.1	77.8	4.8	4.9
7/4/2011 8:00	32820.0	76.2	77.8	4.8	4.9
7/4/2011 8:32	32852.0	76.0	77.8	4.8	4.9
7/4/2011 9:00	32880.0	76.2	77.8	4.8	4.9
7/4/2011 9:30	32910.0	75.7	77.8	4.8	4.9
7/4/2011 10:00	32940.0	76.1	77.8	4.8	4.9
7/4/2011 10:43	32983.0	75.8	77.8	4.8	4.9
7/4/2011 11:00	33000.0	76.0	77.8	4.8	4.9
7/4/2011 11:36	33036.0	75.9	77.8	4.8	4.9
7/4/2011 12:00	33060.0	75.6	77.8	4.8	4.9
7/4/2011 12:30	33090.0	76.9	77.8	4.9	4.9
7/4/2011 12:58	33118.0	75.7	77.8	4.8	4.9