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NAWC WARMINSTER
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C-51-8-8-49

August 26, 1998

Project Number 6883

Mr. Lonnie Monaco
Naval Facilities Engineering Command (NAVFACENGCOM)
Northern Division
Environmental Contracts Branch, Mail Stop No. 82
10 Industrial Highway
Lester, Pennsylvania 19113

Reference: CLEAN Contract No. N642472-D-1298
Contract Task Order (CTO) No. 252

Subject: Final Report
Area A/Offsite Water Level Study
Naval Air Warfare Center (NAWC) Warminster, Pennsylvania

Dear Mr. Monaco:

Tetra Tech NUS is pleased to submit the attached Final Area A/Offsite Water Level Study report. The report summarizes the field effort and evaluates the data collected during the ten day water level study that was conducted in conjunction with the shut-down of Warminster Municipal Authority Well 26. Copies are being forwading to Technical SubCommittee (TSC) members.

Comments on the draft report were received from Earth Data Incorporated (on behalf of the Warminster Municipal Authority), U.S. Geological Survey, and EPA and their contractor Gannett Fleming (GF). Revisions have been made to the report to incorporate specific comments with the exception of two comments made by GF.

Specific comment number 3 from GF suggested that the water table graphs be revised to reflect the decreasing background water level trend and that the data be re-evaluated in light of this trend. No adjustments to the data/graphs/figures were made. The trend of declining water levels is likely due to a combination of pumping effects and a background water level decline due to the lack of precipitation over the time period of the study. Extrapolating the decline in water levels through the recovery time period and attributing that change solely to the stoppage of pumping would overestimate the amount of recovery due to the shutdown. It is questionable whether several of the wells mentioned as having positive water level recoveries after factoring in the "background" trend actually were influenced as suggested in the comment (HN-22S, HN-53S, HN-56S). In any event, a correction of this type would not change any of the substantive conclusions of the study and may add a level of uncertainty to the measurements. A sentence has been added to the text pointing out the overall trend and the possibility that recoveries could be slightly understated in some cases.

GF comment number 4 suggested that a re-evaluation of the water level recoveries might result in a change in the conclusion regarding the onbase effects of pumping at WMA-26. To allow for

some expanded interpretation, the statement has been revised to say that the onbase effects of the municipal well were confined to the general vicinity of Area A rather than Site 1 as originally written.

Respectfully,

Garth Glenn
Project Manager

GG/ejc

c: Thomas Ames (NAVFACENGCOM)
Dunnie Wingo (NAVFACENGCOM)
Darius Ostrauskas (EPA Region III)
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1.0 INTRODUCTION

In response to Contract Task Order (CTO) No. 252 under Contract No. N62472-90-D-1296, Brown and Root Environmental (B & R Environmental) (Note: The assets of B&R Environmental were purchased on January 1, 1988 by Tetra Tech NUS, Inc.) was tasked by Naval Engineering Command (NAVFAC) Northern Division (NORTHDIV), as part of continuing investigations at the Naval Air Warfare Center (NAWC) Warminster, Pennsylvania, to perform a short-term water level survey for Area A and the downgradient off-base area between the base and Warminster Municipal Authority well No. 26 (WMA 26). This scope of work is outlined in a technical memorandum dated August 19,1997. The primary purpose of the short-term water level survey was to evaluate the impacts that the pumping of WMA 26 has on water levels both on base and in the area between the base and the municipal well.

The following activities were performed as part of this survey:

- Groundwater elevations were collected in 40 wells within the vicinity of the base to determine the influence of WMA 26 on water elevations. The study was performed over the 10 day period from September 19,1997 through September 29, 1997. Seventeen onsite and 23 offsite wells were monitored before, during and after a 48-hour shut down of Warminster municipal well No.26 (WMA 26). Water levels were collected using pressure transducers/data loggers. The transducers were programmed to collect data points at varying time intervals throughout the study.

- Barometric pressure and precipitation data were collected from nearby Willow Grove Naval Air Station, to determine what roles barometric pressure and/or precipitation played in the water level changes observed.

- Operating records were obtained from WMA 26, WMA 13, and base production wells, to correlate the operation of these wells with water level data.

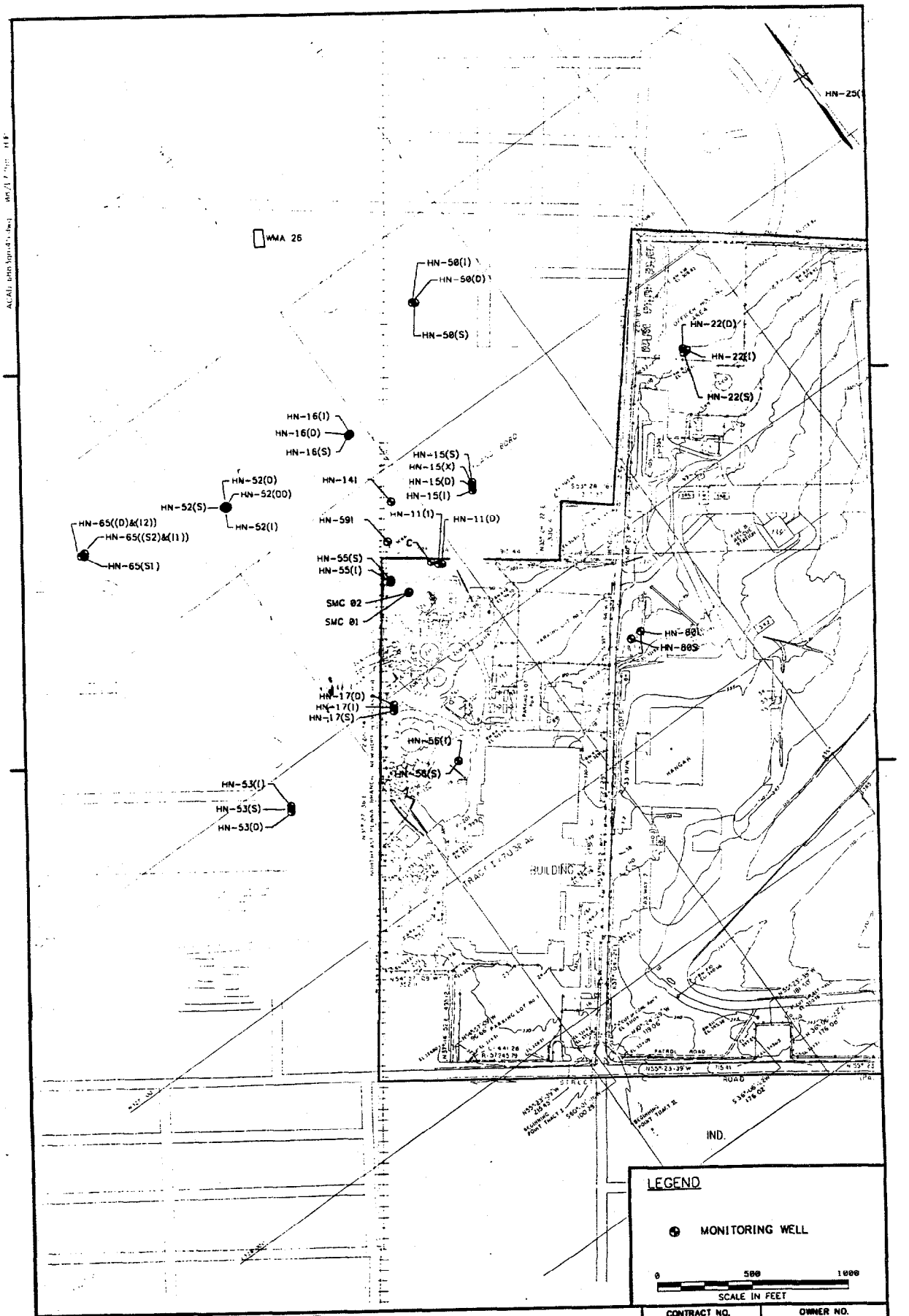
2.0 FIELD INVESTIGATION PROCEDURES

As per the Technical Memorandum of August 19, 1997, Brown & Root Environmental personnel installed pressure transducers/data loggers (transducers) in 40 wells located within the potential area of influence of Warminster well 26 within and downgradient of Area A. The 17 onsite and 23 offsite wells were chosen based on technical reviews by the Navy, EPA, and USGS, and take into account previous water level studies. Offsite well clusters chosen for monitoring include HN-15S/I/D, HN-16S/I/D, HN-50S/I/D, HN-52S/I/D/DD, HN-53S/I/D, and HN-65S/S2/I/I2/D. A transducer was not installed in the Hobensack well as planned because access could not be obtained from the property owner. However, transducers were installed in the open boreholes for wells HN-14I and HN-59I, which had been drilled but not yet completed. Onsite well clusters chosen for monitoring include HN-11S(WellC)/I/D, HN-22S/I/D, HN-55S/I, SMC1/2, HN-56S/I, HN-80S/I, and HN-17S/I/D. Figure 2-1 shows the locations of the monitoring wells within and around Areas A and D at NAWC Warminster that were monitored during this survey. The location of municipal water supply well WMA 26 is also shown. Well construction details for the wells are provided in Table 2-1.

The wells were sounded prior to installing each of the pressure transducers. Based on the depth to water installation depths were selected for each transducer. On average the transducers were placed 10 to 15 feet below the water level in the shallow and intermediate depth wells and between 40 and 60 feet below the water in the deep wells.

Four of the wells required a riser pipe be installed prior to installing the transducers because of flowing artesian conditions. Each of the four wells was located in a different well cluster. Two of the wells (HN-56I and HN-15I) were intermediate wells and two (HN-17D and SMC2) were deep wells.

The water level survey was conducted over a 10 day period. The first part of the survey provided information on background conditions. The test was started on Friday September 19, 1997 with readings collected every 10 minutes until Monday September 22, 1997 at 10:00 AM. During this time period WMA 26 was operated continuously at a pumping rate of approximately 250 gallons per minute (gpm). At 10:00 AM on September 22, WMA 26 was turned off in order to determine the extent and magnitude of water level changes in the study area due to the shutdown of the municipal well. From 10:00 to 10:05 water level readings were collected every 30 seconds. From 10:05 to 10:10 the readings were collected every minute. From 10:10 September 22, to 10:00 AM on Wednesday September 24, readings were collected every 10 minutes. On Wednesday September 24, at 10:00 WMA 26 was turned back on, and water levels obtained to determine the effects of the restart of the municipal well on local groundwater levels. From



DRAWN BY HJP DATE 11/11/97	Brown & Root Environmental	CONTRACT NO. 6883	OWNER NO.
CHECKED BY DATE	MONITORING WELL LOCATIONS AREA A/OFFSITE WATER LEVEL STUDY NAWC WARMINSTER, PA	APPROVED BY	DATE
COST/SCHED-AREA		APPROVED BY	DATE
SCALE AS NOTED		DRAWING NO. FIGURE 2-1	REV. 0

FORM CADD NO. SOUTH_BV.DWG - REV 0 - 04/16/97

TABLE 2-1
WELL CONSTRUCTION DETAILS
AREA A/OFFSITE WATER LEVEL STUDY
NAWC WARMINSTER

WELL	ELEVATION (FT MSL) GROUND/TOC		BOREHOLE DEPTH (FT)	MONITORED INTERVAL (FT)	WELL YIELD (GPM)
HN-11S	NA	309.63	40	35-40	NA
HN-11I	307.90	308.30	88	70-88	2
HN-11D	307.73	309.28	301	151-170	1
HN-14I	299.40	299.90	116	19-116	5
HN-15S	NA	299.48	44	30-44	3
HN-15I	297.29	297.08	152	96-113	<1
HN-15D	298.18	297.66	202	185-202	2
HN-16S	295.11	294.50	65	51-65	<1
HN-16I	295.26	294.73	125	101-120	2
HN-16D	295.23	294.99	220	168-200	2
HN-17S	317.28	318.99	102	84-102	14
HN-17I	316.94	318.32	202	185-202	>15
HN-17D	316.56	317.00	304	252-289	<1
HN-22S	309.30	310.57	152	38-55	3
HN-22I	309.30	311.65	152	138-152	3
HN-22D	309.10	310.39	304	254-271	6
HN-50S	284.74	285.04	83	67-83	5
HN-50I	284.57	285.32	243	105-122	4
HN-50D		286.13		160-174	5
HN-52S	286.14	285.79	92	73-87	20
HN-52I	286.63	285.92	163	115-132	3
HN-52D	285.48	285.90	220	178-194	3
HN-52DD	286.25	286.00	304	266-283	1.5
HN-53S	323.33	323.06	152	40-60	1.5
HN-53I	323.16	322.75	152	69-83	2
HN-53D	323.66	323.40	206	189-206	4
HN-55S	311.08	312.10	103	24-44	<1
HN-55I	311.09	312.10	95	79-94	>15
HN-56S	316.46	316.03	163	33-50	5
HN-56I		316.19		118-134	5
HN-59I	306.00	306.87	103	19-103	3
HN-65S1	281.07	280.84	103	78-103	5
HN-65S2	280.90	280.58	203	37-52	5
HN-65I1		280.62		102-123	2
HN-65I2	281.41	280.87	303	158-171	4
HN-65D		281.36		274-303	2
HN-80S	322.1	323.44	44	27-44	5
HN-80I	322.1	323.11	115	97-115	10
SMC-01	NA	313.91	60	20-60	20
SMC-02	NA	313.01	298	276-298	10
WMA 26	~260	~260	250	75-250	>250

NS - Not surveyed
NA - Not available
FT MSL - Feet above mean sea level
Borehole depth and monitored interval measured in feet below ground surface

10:00 to 10:05 water level readings were collected every 30 seconds. From 10:05 to 10:10 the readings were collected every minute. From 10:10 September 24, to Monday September 29 readings were collected every 10 minutes, at which point the survey was discontinued.

In addition to collecting water level readings from the wells listed above, strip chart recorder sheets for WMA wells 26 and 13 were obtained from Warminster Municipal Authority representatives. These strip charts provided information regarding water levels in the municipal wells over the time period from September 15 through September 29. Attachment A contains the strip chart recorder sheets for the two municipal wells, along with available pumping information for base water supply wells SW-1, SW-2, SW-3, and SW-4. Pertinent information regarding WMA 26 was gathered from the municipal authority and from an existing document (Technical Memorandum – Downhole Testing of Production Well 26, Earth Data, August 15, 1995), to aid in interpreting the data gathered. A summary of the information used for this investigation is as follows:

- WMA 26 well depth - 250 feet
- Well diameter - 10 inches
- Surface casing depth - 75 feet
- Pumping rate - Approximately 250 gpm
- Primary water producing zones:
  - Zone 1 - 76-97 feet, specific capacity 0.24 gpm/ft of drawdown
  - Zone 2 - 107-128 feet, specific capacity 1.4 gpm/ft of drawdown
  - Zone 3 - 206-227 feet, specific capacity 2.55 gpm/ft of drawdown
  - Zone 4 - 222-250 feet, specific capacity 0.53 gpm/ft of drawdown
- Pump depth setting - 205 feet
- Normal period of operation - Constant usage, 24 hours/day
- Operating water level - Approximately 60 feet above the pump (145 feet below the top of the well)
- Shutdown water level - Approximately 160 feet above the pump (45 feet below the top of the well)
- Well elevation - Approximately 260 ft msl (based on USGS topographic map ground surface contours)

Barometric pressure and precipitation data for the survey duration was collected from the nearby Willow Grove Naval Air Station (Attachment B). No significant barometric pressure fluctuations or precipitation events were recorded over the duration of the survey, thus no adjustments were made to the water level data collected.

3.0 DATA EVALUATION

3.1 WATER LEVEL CHANGES

3.1.1 General Observations

Water level data was used to prepare water level graphs for each well, which are included in Attachment C. The graphs show water level changes over time for the duration of the study. Background water level data, collected for 3 days prior to the shutdown of WMA 26, shows a general trend of decreasing water levels as indicated on the water level graphs. Following the shutdown of the municipal well, which had an operating water level approximately 100 feet below static water level, water levels in the monitored wells recovered (rose) by amounts ranging from zero (no recovery noted) to 12 feet. Following the restart of the municipal well, water levels dropped in the same wells that responded to the shutdown of the municipal well, in most (but not all) cases to below the pre-shutdown level. The steady background trend of decreasing water levels continued throughout the entire survey time period, reflecting the lack of precipitation and the municipal well pumping effects.

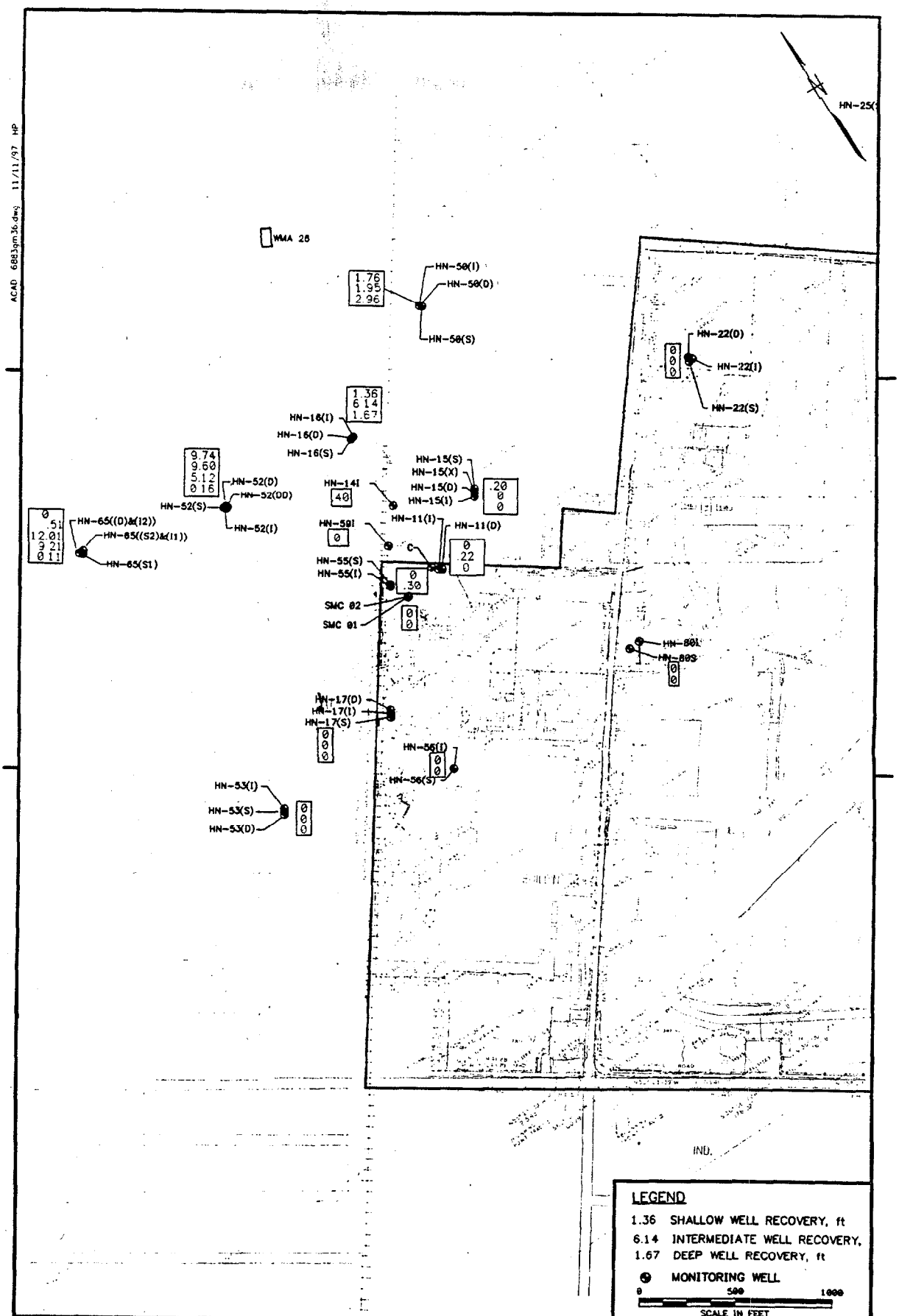
Earth tide effects (cyclical rising and falling of water levels approximately twice per day) of up to 0.2 ft are also evident in some of the wells, particularly the deeper wells. The graphs for wells HN-17S, HN-52DD, and HN-65D show good examples of earth tide effects. On some of the graphs for other wells (i.e., wells HN-16D, HN-50D, and SMC-2) the earth tide effects are muted by scaling effects (the greater range in water level changes decreased the resolution of the graph and made small fluctuations due to earth tides more difficult to see).

In addition to preparation of the graphs, water level changes during the shutdown period were calculated for each well. To avoid any potential inaccuracies regarding the timing of the programming of the transducers and the shutdown/restart of the municipal well, changes in water levels from 9:00 September 22 (one hour prior to WMA 26 shutdown) to 9:00 September 24 (one hour prior to restart) were calculated for each well, as shown in Table 3-1. These water level changes were used to determine the approximate magnitude of water level recovery due to the shutdown of the municipal well. Figure 3-1 shows the magnitude and areal distribution of water level recoveries in shallow, intermediate, and deep wells. No corrections were made to the data to try to factor in background/pumping-related trends. It should be recognized that the total amount of water level recovery may in some cases be slightly understated as a result.

TABLE 3-1
SELECTED WATER LEVELS
AREA A/OFFSITE WATER LEVEL STUDY
NAWC WARMINSTER

	TOC. ELEV.	DEPTH INITIAL	GW ELEV. INITIAL	DEPTH 9/22/9:00	GW ELEV. 9/22/9:00	DEPTH 9/24/9:00	GW ELEV. 9/24/9:00	WL CHANGE 9/2/9:00 9/24/9:00
HN-11S	309.63	18.60	291.03	19.11	290.52	19.11	290.52	0.00
HN-11I	308.30	17.79	290.51	18.14	290.16	17.92	290.38	0.22
HN-11D	309.28	2.91	306.38	2.67	306.61	2.75	306.53	-0.08
HN-14I	299.90	17.76	282.14	18.35	281.55	17.95	281.95	0.40
HN-15S	299.48	10.10	289.38	10.43	289.05	10.23	289.25	0.20
HN-15I*	307.08	3.70	303.38	3.78	303.30	3.86	303.22	-0.08
HN-15D	297.66	4.39	293.27	4.21	293.45	3.91	293.75	0.30
HN-16S	294.50	21.18	273.32	21.44	273.06	20.08	274.42	1.36
HN-16I	294.73	36.56	258.18	37.19	257.54	31.05	263.68	6.14
HN-16D	294.99	15.55	279.44	16.14	278.85	14.48	280.51	1.67
HN-17S	318.99	14.53	304.46	14.68	304.31	14.71	304.28	-0.03
HN-17I	318.32	3.33	315.00	3.30	315.03	3.51	314.81	-0.21
HN-17D*	320.00	1.95	318.05	1.86	318.14	1.85	318.15	0.01
HN-22S	310.57	18.06	292.51	18.42	292.15	18.62	291.96	-0.20
HN-22I	311.65	7.94	303.71	7.22	304.43	7.48	304.17	-0.26
HN-22D	310.39	15.83	294.56	15.57	294.82	15.59	294.81	-0.02
HN-50S	285.04	18.24	266.80	18.75	266.29	16.99	268.05	1.76
HN-50I	285.32	21.77	263.55	22.43	262.89	20.48	264.84	1.95
HN-50D	286.13	10.54	275.59	11.22	274.91	8.26	277.88	2.96
HN-52S	285.79	59.96	225.84	60.78	225.01	51.04	234.75	9.74
HN-52I	285.92	45.02	240.90	45.76	240.16	36.17	249.76	9.60
HN-52D	285.90	28.11	257.79	28.62	257.28	23.50	262.40	5.12
HN-52DD	286.00	6.09	279.91	6.58	279.42	6.43	279.57	0.16
HN-53S	323.06	18.92	304.14	19.33	303.73	19.38	303.68	-0.05
HN-3I	322.75	18.73	304.02	19.15	303.60	19.18	303.57	-0.03
HN-53D	323.40	7.73	315.67	7.78	315.62	7.96	315.44	-0.18
HN-55S	312.10	19.79	292.32	20.60	291.50	20.81	291.30	-0.20
HN-55I	312.10	22.83	289.28	23.35	288.75	23.05	289.05	0.30
HN-56S	316.03	7.37	308.66	7.51	308.52	7.58	308.45	-0.07
HN-56I*	320.54	2.59	317.95	2.64	317.90	3.18	317.36	-0.54
HN-59I	306.87	17.08	289.79	17.64	289.23	17.66	289.21	-0.02
HN-65S	280.84	41.68	239.16	42.90	237.94	42.39	238.45	0.51
HN-65S2	280.58	41.11	239.47	42.02	238.56	42.03	238.55	-0.01
HN-65I	280.62	57.78	222.84	58.60	222.02	46.59	234.03	12.01
HN-65I2	280.87	38.14	242.74	38.80	242.07	29.59	251.28	9.21
HN-65D	281.36	2.43	278.93	2.95	278.41	2.85	278.52	0.11
HN-80IS	323.44	11.33	312.11	11.64	311.80	11.83	311.61	-0.19
HN-80I	323.11	3.95	319.16	4.06	319.05	4.31	318.80	-0.25
SMC1	313.91	18.57	295.34	19.32	294.59	19.80	294.11	-0.48
SMC2*	320.01	3.18	316.83	3.24	316.78	3.37	316.64	-0.13

***Artesian water level - Stickup added to wells as follows:**
HN-151 - 10.00 ft HN-17D - 3.00 ft HN-561 - 4.55 ft SMC - 7.00 FT
Top of casing elevations were adjusted by these added stickups



DRAWN BY HJP DATE 11/11/97	Brown & Root Environmental	CONTRACT NO. 6883	OWNER NO.
CHECKED BY DATE	WATER LEVEL RECOVERY 9:00 SEPTEMBER 22 TO 9:00 SEPTEMBER 24, 1997 AREA A/OFFSITE WATER LEVEL STUDY NAWC WARMINSTER, PA	APPROVED BY	DATE
COST/SCHED-AREA		APPROVED BY	DATE
SCALE AS NOTED		DRAWING NO. FIGURE 3-1	REV. 0

3.1.2 Onbase Observation Wells

Water level responses to the shutdown and restart of the municipal well were minimal or absent in the onbase wells. The only onbase well clusters that had water level changes that could be attributed to the shutdown and restart of the municipal well were HN-11S/I and HN-55S/I. HN-11I recovered approximately 0.2 feet after the shutdown of WMA 26, then dropped after the restart of the well. HN-55I recovered approximately 0.3 feet following the municipal well shutdown, then dropped following the restart. In both cases, the water level declines following the restart are a combination of pumping effects and background trend. The shallow wells at these two locations (HN-11S and HN-55S) exhibited some flattening out of the trend of declining water levels during the shutdown period of the municipal well, indicating that they may be affected slightly by the municipal well. Based on strike and dip projections, wells HN-11S/I and HN-55S/I may monitor the same lithologic interval as (or slightly below) the lowermost strata intersected by WMA 26.

Onbase wells HN-11D, SMC1, SMC2, HN-22S/I/D, HN-80S/I, HN-17S/I/D, and HN-56S/I did not exhibit any responses that could be attributed to the shutdown and restart of the municipal well. In some cases there were, however, water level responses observed that were attributed to other pumping activities. Significant (> 0.5 ft) short duration (several hours) declines in water levels were observed in wells HN-17I (2.1 ft), HN-17D (0.8 ft), HN-56I (7.7 ft), HN-80I (2.3 ft), and SMC2 (3.2 ft) shortly after the restart of the municipal well, however these effects are likely due to pumping activities other than the restart of WMA 26. Lesser effects were noted in wells HN-17S, HN-56S, and HN-80S.

It appears, based on the timing of the water level changes, that the short term water level declines noted in these wells are due to a common pumping event. The drops in water levels in these wells began at approximately 10:30 on September 24 and generally reached a maximum decline at approximately 12:30 - 12:40 on the same day. The timing for reaching maximum water level declines varied significantly for three wells - in HN-56I the maximum water level decline was observed at 12:00, in SMC2 the maximum decline was observed at 13:40, and in HN-17D the maximum water level decline was not reached until 17:40. The pumping event responsible for this short term spike in water levels is likely the operation of onbase water supply wells SW-1 and SW-2. According to the available pumping records (Attachment A), these wells were operating during the time period covered by the spike in water levels on September 24. SW-1 was checked at 10:40 AM and was found to be pumping at a rate of 120 gpm. SW-2 was checked at 10:50 AM and was found to be pumping at a rate of 63 gpm. Another factor indicating that the operation of SW-1 and SW-2 is responsible for this water level spike in selected wells is that the maximum water level decline was noted in well HN-56I, which is the closest monitored well to the production wells and is aligned approximately along strike with them.

A second onbase water level response not related to WMA 26 was observed in wells HN-56I and HN-80I. Minor, short term fluctuations were recorded in these two wells throughout the survey. These fluctuations were in the form of sudden, brief drops followed by more gradual recoveries (best seen on the graph for HN-56I), a pattern that suggests that they are related to cyclical short-term pumping activities. The magnitude of the fluctuations in HN-56I (0.4 - 0.5 ft) was greater than in HN-80I (0.1-0.2 ft). The shallow wells at these cluster locations did not fluctuate in the same manner, suggesting that the well responsible for the cyclical pumping-related fluctuations in the intermediate wells is either drawing from deeper portions of the bedrock aquifer or is located updip from the two well clusters. During the April 1995 Area D pumping test, cyclical fluctuations in water levels were observed in HN-56I that were attributed to the operation of base water supply wells SW-3 and/or SW-4. In addition, recent Area D Supply well testing has shown that the water level in HN-56I is drawn down by the operation of SW-3 and SW-4. It is therefore considered likely that either or both of these wells may have caused the cyclical fluctuations seen in HN-56I and HN-80I.

A third onbase water level response not related to WMA 26 was observed in well HN-22I. Cyclical daily water level declines of approximately 0.25 to 0.9 feet were noted in this well, beginning around 6:00 - 8:00 and extending into the late afternoon. This pattern of water level fluctuations was noted on all days except Sundays, suggesting that a nearby commercial well was responsible for the fluctuations. This same pattern of water level changes was observed in offbase well HN-15D (located approximately 1350 feet west of HN-22I), however the daily water level fluctuations were in the 1-2 foot range. The well responsible for the fluctuations is unknown, however Aztec Corporation is located in the area between these two wells and is known to have a well for commercial use. Well HN-22D also appears to be influenced by some nearby pumping, but the pattern is different than what is observed in wells HN-15D and HN-22I.

3.1.3 Offbase Wells

In general, recovery/drawdown effects were much more pronounced in the offsite well clusters located in the offbase area north of Area A. At least one well in each of well clusters HN-16S/I/D, HN-50 S/I/D, HN-52S/I/D/DD, and HN-65S1/S2/I1/I2/D had a water level recovery of at least 2 feet in response to the shutdown of WMA 26. The magnitude of water level changes in response to the shutdown and restart of the municipal well was observed to be highly variable and dependent on at least 2 factors; alignment relative to WMA 26 and well depth.

At well cluster HN-50S/I/D, located approximately 880 feet directly updip from WMA 26 (the Stockton Formation in the vicinity of Area A has a strike of north 64 degrees east and a dip of 7 degrees to the northwest, based on Area A/offsite well log data), the maximum water level recovery due to the shutdown

of the municipal well was 2.96 feet, in HN-50D. The intermediate well in this cluster (HN-50I) had a recovery of 1.95 feet and the shallow well (HN-50S) a recovery of 1.76 feet. Based on geophysical logs and strike and dip projections, HN-50D appears to intersect the same lithologic interval as Zone 4 of WMA 26.

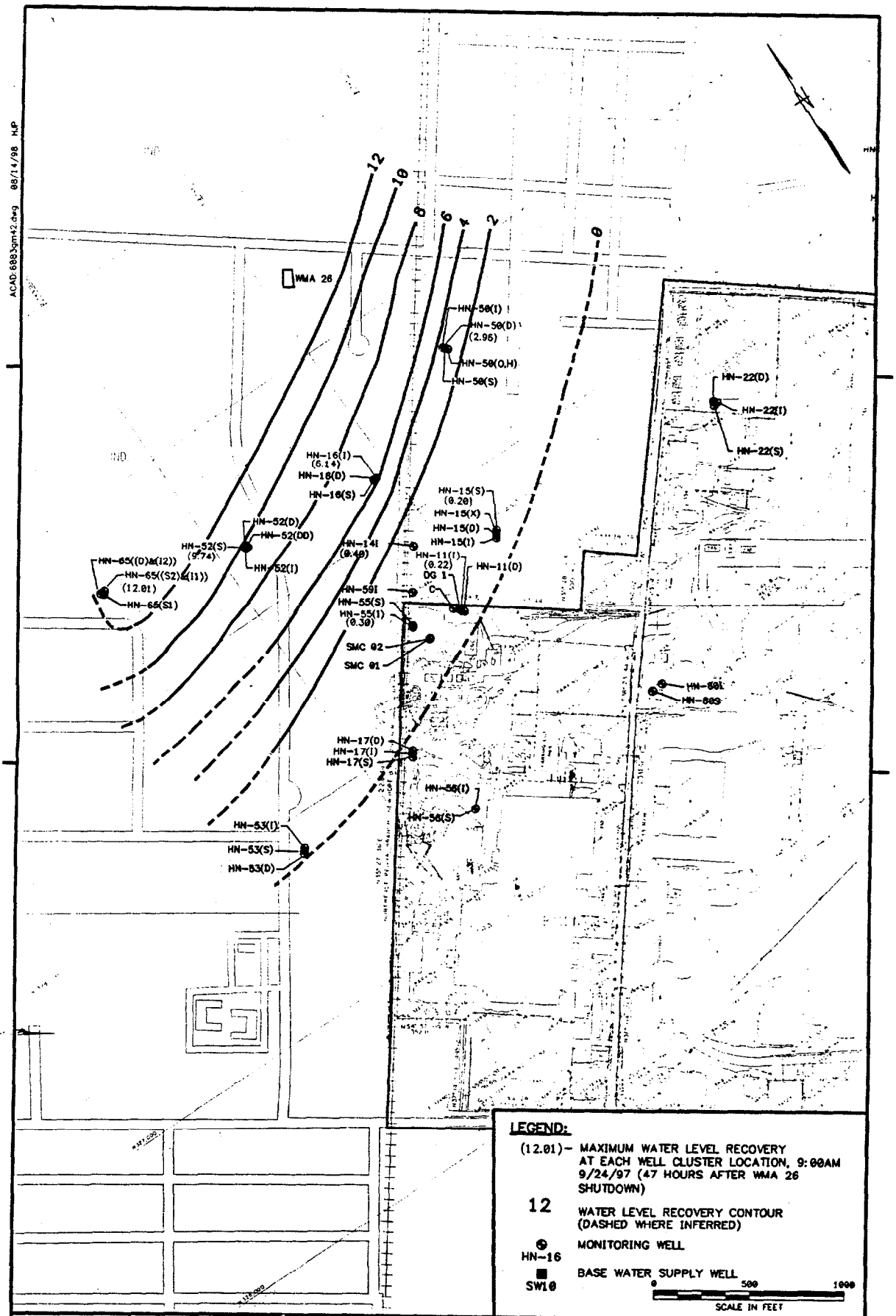
The maximum water level recovery at well cluster HN-16S/I/D, located approximately 1150 feet south-southwest of WMA 26 (approximately 40 degrees from the updip direction), was 6.14 feet, in HN-16I. The deep well in this cluster (HN-16D) had a water level recovery of 1.67 ft, while the shallow well (HN-16S) had a water level recovery of 1.36 ft. Based on geophysical logs and strike and dip projections, HN-16I appears to intersect the same lithologic interval as Zone 3 of WMA 26.

At well cluster HN-52S/I/D/DD, located approximately 1450 feet southwest of WMA 26 (approximately 70 degrees from the updip direction), the maximum water level recovery was 9.74 feet, in HN-52S. The intermediate well in this cluster (HN-52I) had a water level recovery of 9.6 ft. The deep wells in this cluster (HN-52D and HN-52DD) had water level recoveries of 5.12 and 0.16 feet, respectively. Based on geophysical logs and strike and dip projections, HN-52S appears to intersect the same lithologic interval as Zone 2 of WMA 26, and HN-52I intersects the same lithologic interval as Zone 3 of the municipal well.

The maximum water level recovery at well cluster HN-65S1/S2/I1/I2/D, located approximately 1950 feet west-southwest of WMA 26 (approximately along strike), was 12.01 feet, in HN-65I1 The other intermediate well in this cluster (HN-65I2) had a recovery of 9.21 feet. The deep well (HN-65D) had a water level recovery of 0.11 ft, while the shallow wells (HN-65S1 and HN-65S2) had water level recoveries of 0.51 feet and no effect, respectively. Based on geophysical logs and strike and dip projections, HN-65I1 appears to intersect the same lithologic interval as Zone 2 of WMA 26.

The water level recovery responses in the four clusters described above clearly indicate that water level responses are more pronounced along strike than along the dip direction from WMA 26, as shown on Figure 3-2. The alignment of the wells with respect to WMA 26, along with the strata intersected by the observation wells, appear to be the primary controls governing the amount of water level change observed. Distance from WMA 26 is a secondary controlling factor in the amount of water level response observed.

A much less pronounced response to the shutdown and restart of WMA 26 was noted at well cluster HN-15S/I/D. HN-15S had a water level recovery of 0.2 feet during the shutdown period, similar in magnitude to that observed in onbase well HN-11I. A rise in water level of 0.3 feet was observed in HN-15D, however this is attributed to factors unrelated to the municipal well shutdown, including the obvious



DRAWN BY DLT DATE 11/12/97	Brown & Root Environmental	CONTRACT NO. 6883	OWNER NO. 0252
CHECKED BY DATE	MAXIMUM WATER LEVEL RECOVERY CONTOURS AREA A/OFFSITE WATER LEVEL STUDY NAWC WARMINSTER, PA	APPROVED BY	DATE
COST/SCHED-AREA		APPROVED BY	DATE
SCALE AS NOTED		DRAWING NO. FIGURE 3-2	REV. 0

pumping effect of a different well on HN-15I (as previously discussed in Section 3.1.2) and the timing of the water level comparisons in combination with this outside pumping. No response to the shutdown/restart of WMA 26 was observed in HN-15I.

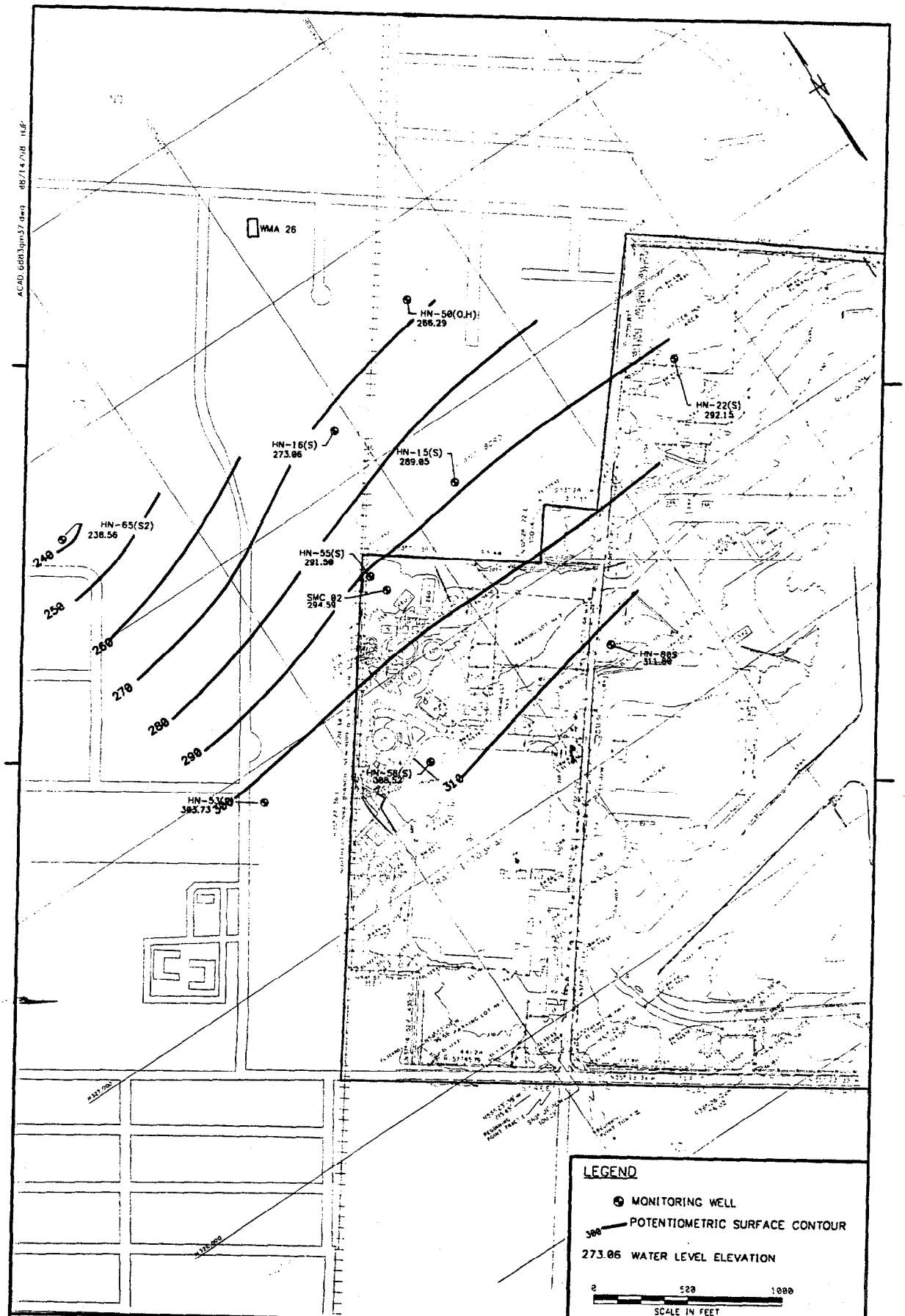
Minor water level changes were observed in open borehole wells HN-14I2 and HN-59I2 in response to the shutdown/restart of WMA 26. In HN-14I2, a 0.4 ft rise in water level was observed which is clearly in response to the shutdown of the municipal well. In HN-59I2, the change in water level is much less pronounced and consists of a flattening out of the background trend of decreasing water levels over the period of time that the municipal well was shut down.

The remaining offsite wells monitored during the water level survey, HN-53S/I/D, did not exhibit any changes in water levels that could be attributed to the shutdown/restart of WMA 26. Some irregular fluctuations in water levels of approximately 0.2 to 0.3 ft were observed in HN-53S, however they could not be correlated to any other observed water level changes. No significant water level fluctuations were noted in HN-53I. In HN-53D, however, the same short term drop seen in several onbase wells shortly after the restart of the municipal well was observed. This short term drop of approximately 2.4 ft in water level started at about 10:30 and reached a maximum low at about 12:40 on September 24, consistent with what was seen onbase in several wells. As discussed in Section 3.1.2, the temporary decline in water level may be related to the use of SW-1 and/or SW-2, but cannot be conclusively determined with the information available.

3.2 GROUNDWATER FLOW DIRECTIONS

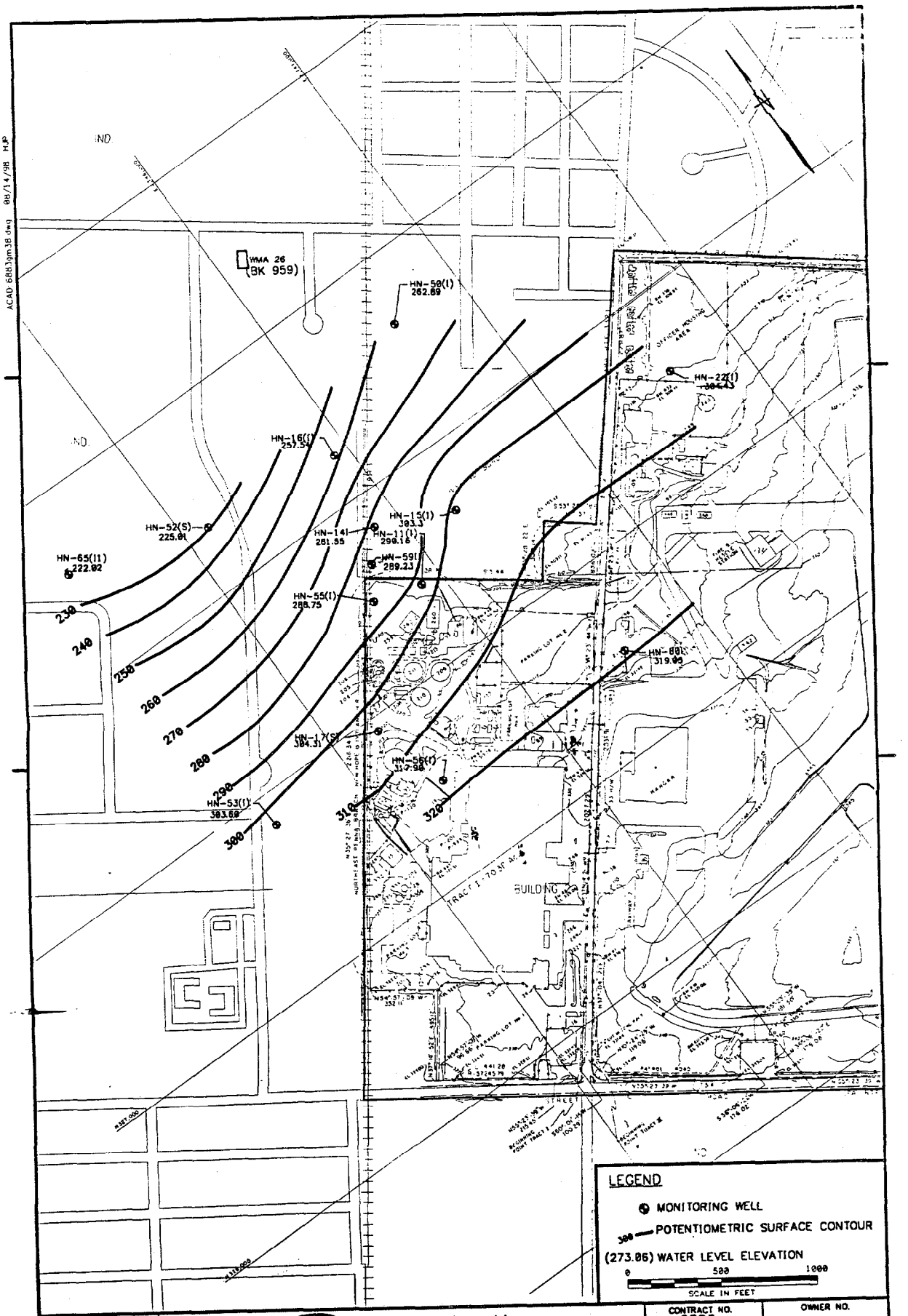
Two sets of potentiometric surface maps were prepared, showing groundwater gradients in shallow (<75 feet), intermediate (75-150 ft) and deep (150-275 feet) portions of the bedrock aquifer. Water level data from immediately prior to the shutdown of WMA 26 well (to evaluate potential flow patterns under long term usage conditions) and immediately prior to the restart of WMA 26 (to evaluate potential flow patterns after a short term shutdown of the well) were used to develop the two sets of maps.

Figures 3-3, 3-4, and 3-5 show groundwater elevation contours at 9:00 on September 22, immediately prior to the shutdown of the municipal well. These figures show potentiometric contours that are indicative of the flow pattern in the area while WMA 26 was in operation. The overall direction of the groundwater gradient is to the north-northwest on all three maps, indicating a consistent flow pattern with depth. The gradients vary with depth, with the intermediate zone having the highest gradient and the shallow zone the lowest (possibly due to the municipal well being cased to 75 feet, thus not directly drawing water from the shallow flow zone). Lowest water levels were typically (but not always) observed in the intermediate wells.



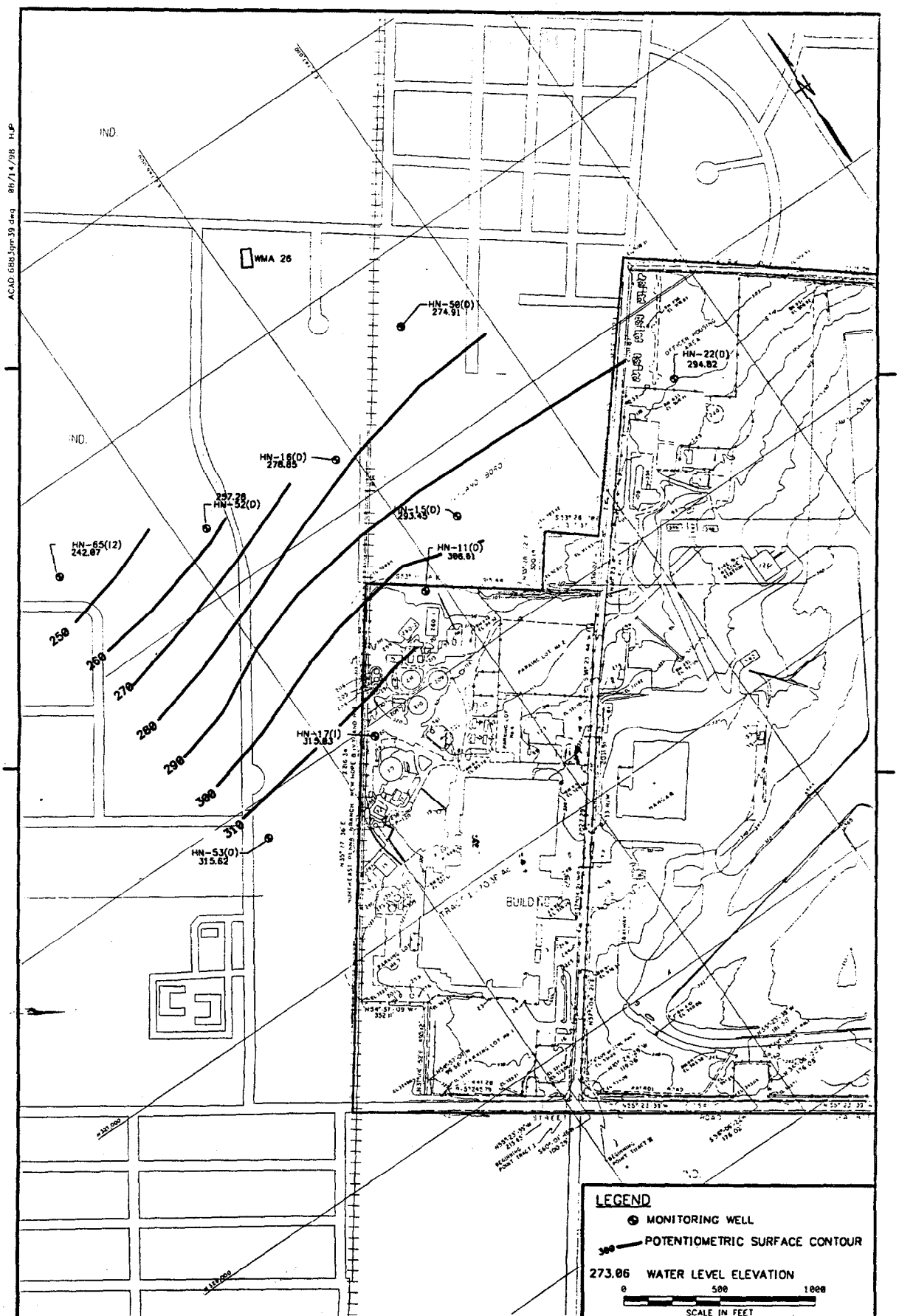
DRAWN BY HJP DATE 11/11/97	Brown & Root Environmental	CONTRACT NO. 6883	OWNER NO.
CHECKED BY DATE	POTENTIOMETRIC SURFACE MAP SHALLOW WELLS (<75 ft) SEPTEMBER 22, 9:00 AREA A/OFFSITE WATER LEVEL STUDY NAWC WARMINSTER, PA	APPROVED BY	DATE
COST/SCHED-AREA		APPROVED BY	DATE
SCALE AS NOTED		DRAWING NO. FIGURE 3-3	REV. 0

FORM CABB NO. SOUTH_BV.DWG - REV 8 - 04/16/97



DRAWN BY HJP DATE 11/11/97	Brown & Root Environmental	CONTRACT NO. 6883	OWNER NO.
CHECKED BY DATE	POTENTIOMETRIC SURFACE MAP INTERMEDIATE WELLS (75–150 ft) SEPT 22, 9:00 AREA A/OFFSITE WATER LEVEL STUDY NAWC WARMINSTER, PA	APPROVED BY	DATE
COST/SCHED–AREA		APPROVED BY	DATE
SCALE AS NOTED		DRAWING NO. FIGURE 3–4	REV. 0

FORM CADD NO. SOUTH_BV.DWG - REV 0 - 04/16/97



DRAWN BY HJP DATE 11/11/97	Brown & Root Environmental	CONTRACT NO. 6883	OWNER NO.
CHECKED BY DATE	POTENTIOMETRIC SURFACE MAP DEEP WELLS (150-275 ft) SEPTEMBER 22, 9:00 AREA A/OFFSITE WATER LEVEL STUDY NAWC WARMINSTER, PA	APPROVED BY	DATE
COST/SCHED-AREA		APPROVED BY	DATE
SCALE AS NOTED		DRAWING NO. FIGURE 3-5	REV. 0

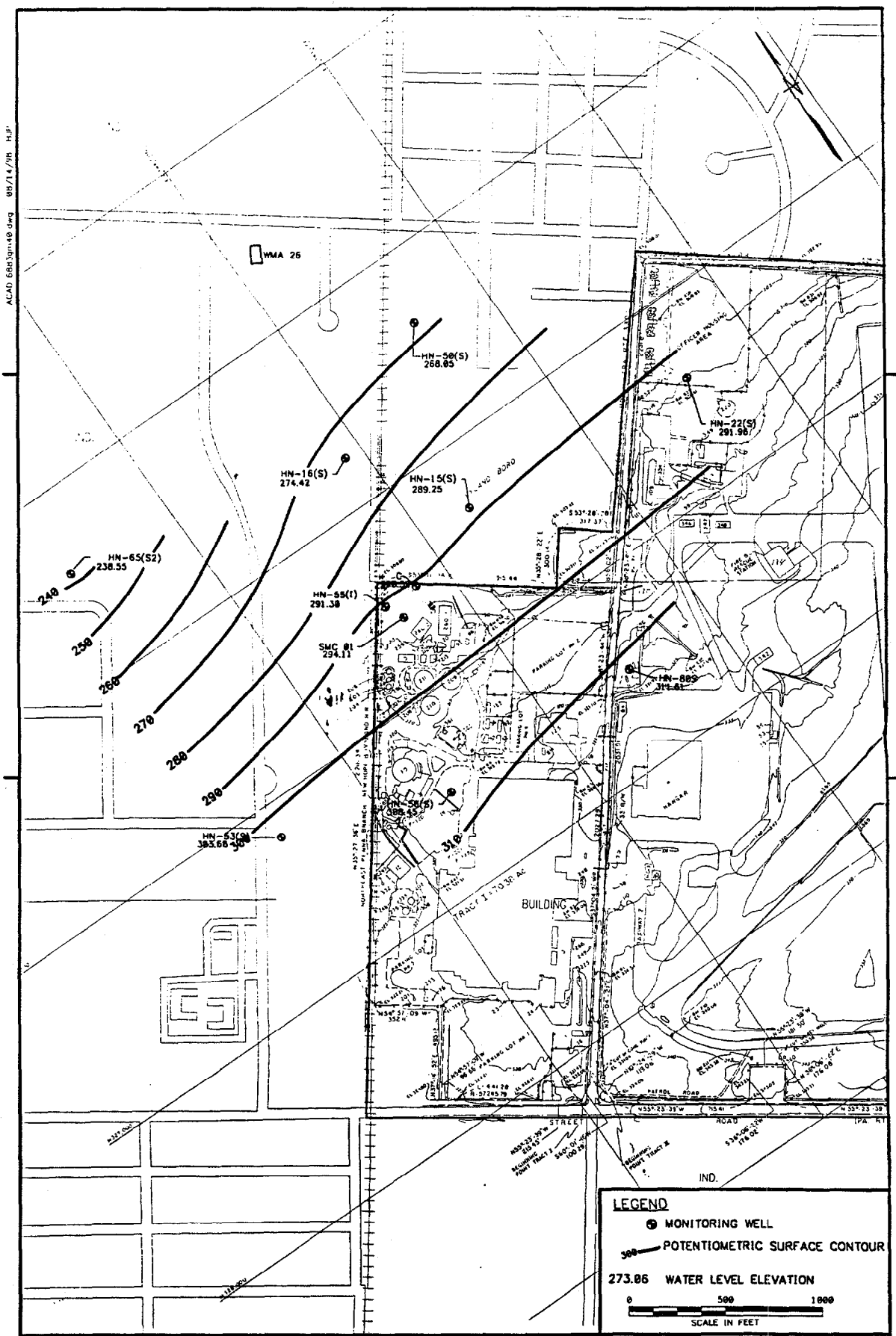
FORM CADD NO. SOUTH_BV.DWG - REV 0 - 04/16/97

Water levels in the deep wells located west of Jacksonville Road were generally 10 feet or more higher than in the companion intermediate wells at cluster locations, and also higher than the shallow well water levels, but to a lesser degree.

Figures 3-6, 3-7, and 3-8 show groundwater gradient patterns at 9:00 on September 24, immediately prior to the restart of the municipal well. These maps show groundwater gradient patterns after a 47 hour shutdown of WMA 26. As with the maps depicting groundwater gradients under pumping conditions, these figures show a consistent overall direction of groundwater gradient to the north-northwest. These gradient directions, and probable flow direction, vary little from the gradient directions observed under WMA 26 operating conditions.

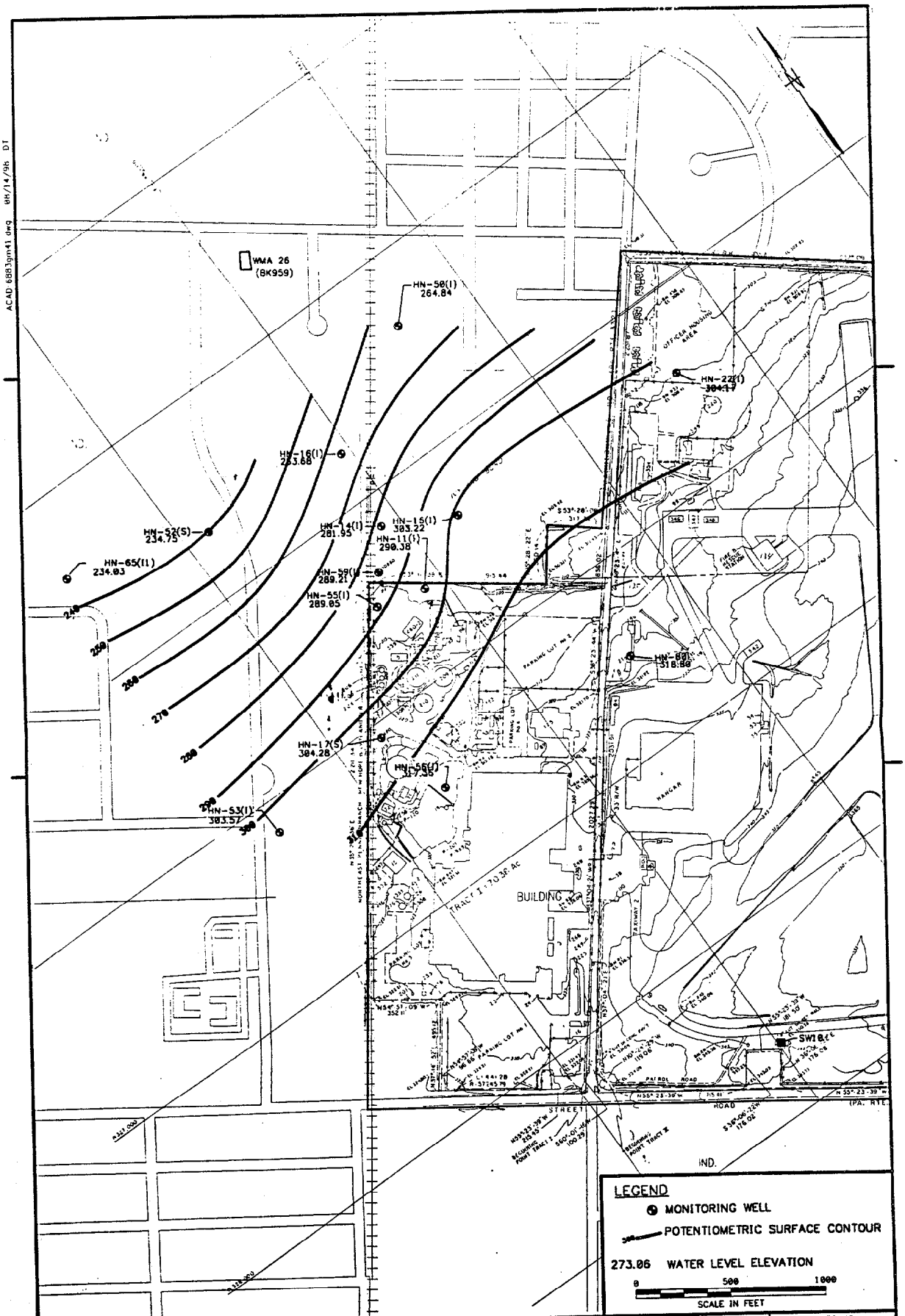
Shallow well water levels changed little if any in response to the 2 day shutdown of the municipal well. The maximum rises in water levels in the shallow wells were approximately 1.8 ft in HN-50S and 1.4 ft in HN-16S, both of which monitor the lower portion of the shallow zone. Water levels in the intermediate wells remained lower than shallow and deep wells at most well clusters, suggesting that the aquifer had not yet fully recovered from the preceding pumping operations. Water level rises in the intermediate wells in response to the municipal well shutdown ranged from 0 to slightly over 12 feet (in well HN-65I1). For the deep wells, the greatest water level recovery observed was approximately 9.2 feet in well HN-65I2.

The potentiometric surface maps do not show groundwater migrating directly from the onbase area of greatest groundwater impacts (Site 1, located in the HN-11 area) to WMA 26 under the pumping and nonpumping conditions encountered. From the Site 1 area, groundwater gradients are toward cluster HN-52. Given the pronounced strike-parallel drawdown pattern observed in the aquifer through comparisons of water levels obtained during pumping and nonpumping conditions (Figure 3-2), however, the water level data indicates that an extended area of influence and drawdown exists for WMA 26 along the strike of the geologic units and is probably large enough to capture groundwater migrating through the HN-52/HN-65 areas. Additional water level measuring points and measurements would be required to positively determine the extent of the capture zone of WMA 26.



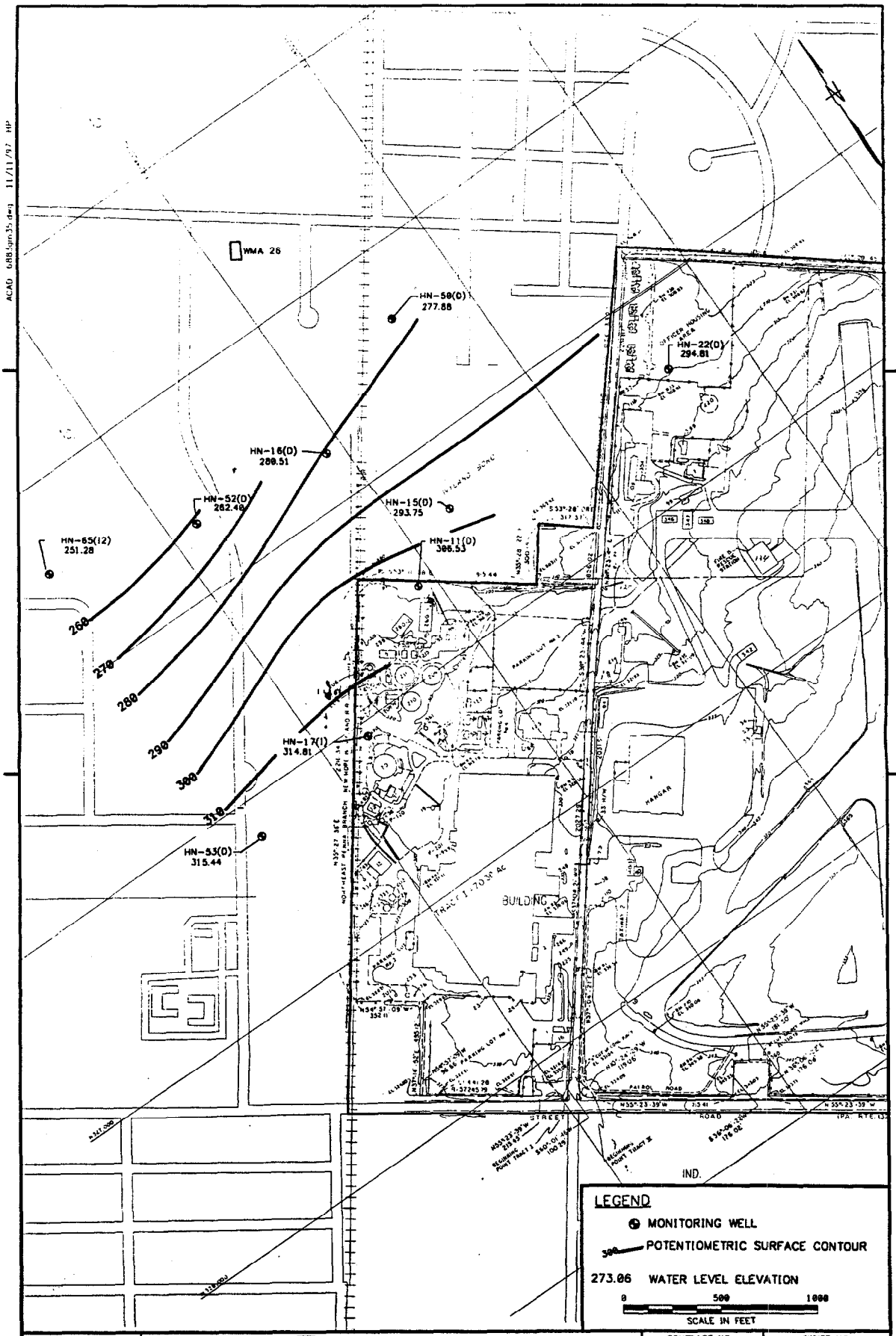
DRAWN BY HJP DATE 11/12/97	Brown & Root Environmental	CONTRACT NO. 6883	OWNER NO.
CHECKED BY DATE	POTENTIOMETRIC SURFACE MAP SHALLOW WELLS (<75 ft) SEPTEMBER 24, 9:00 AREA A/OFFSITE WATER LEVEL STUDY NAWC WARMINSTER, PA	APPROVED BY	DATE
COST/SCHED-AREA		APPROVED BY	DATE
SCALE AS NOTED		DRAWING NO. FIGURE 3-6	REV. 0

FORM CADD NO. SOUTH_BV.DWG - REV 8 - 04/16/97



DRAWN BY HJP DATE 11/11/97	Brown & Root Environmental	CONTRACT NO. 6883	OWNER NO.
CHECKED BY DATE	POTENTIOMETRIC SURFACE MAP INTERMEDIATE WELLS (75–150 ft) SEPTEMBER 24, 9:00 AREA A/OFFSITE WATER LEVEL STUDY NAWC WARMINSTER, PA	APPROVED BY	DATE
COST/SCHED–AREA		APPROVED BY	DATE
SCALE AS NOTED		DRAWING NO. FIGURE 3–7	REV. 0

FORM CADD NO. SOUTH_BV.DWG - REV 0 - 04/16/97



DRAWN BY HJP DATE 11/11/97	Brown & Root Environmental	CONTRACT NO. 6883	OWNER NO.
CHECKED BY DATE	POTENTIOMETRIC SURFACE MAP DEEP WELLS (150-275 ft) SEPTEMBER 24, 9:00 AREA A/OFFSITE WATER LEVEL STUDY NAWC WARMINSTER, PA	APPROVED BY	DATE
COST/SCHED-AREA		APPROVED BY	DATE
SCALE AS NOTED		DRAWING NO. FIGURE 3-8	REV. 0

FORM CADD NO. SOUTH_BV.DWG - REV 0 - 04/16/97

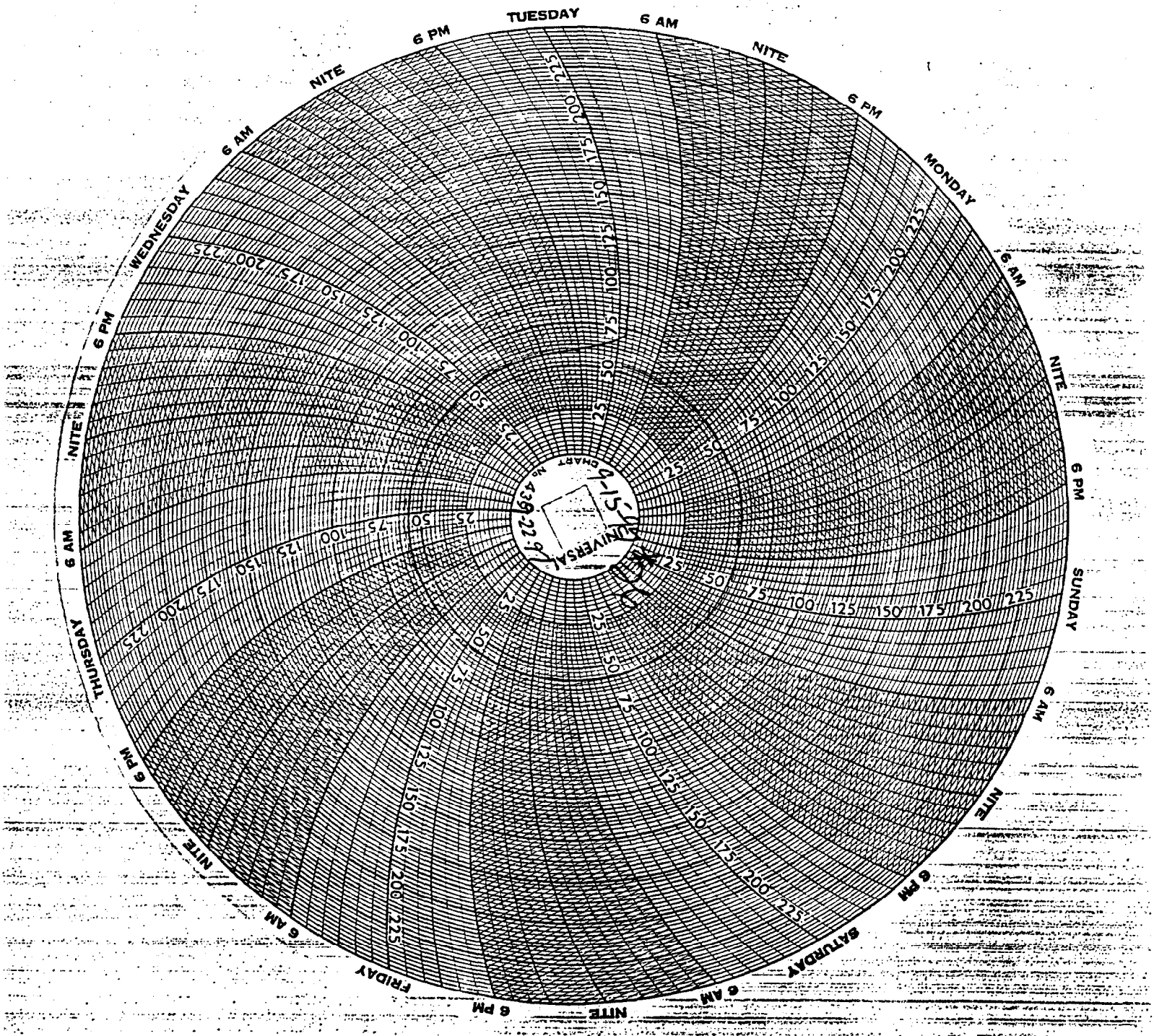
4.0 SUMMARY

The operation of WMA 26 is the dominant influence on anthropogenic water level fluctuations within the survey area, with changes in water levels attributable to WMA 26 of up to 12 feet observed in the wells monitored during the survey. Other wells also cause short term water level fluctuations within the survey area. The base water supply wells located in Area D are likely responsible for the short term fluctuations seen in wells in the southern portion of the survey area. A well most likely located near Jacksonville Road east of Area A (potentially the Aztec Corporation well) operates on a regular, cyclical schedule and influences water levels in the eastern portion of the survey area. No correlation was noted between the operation of WMA 13 (in operation daily from 6:00 AM until midnight) and water level fluctuations observed during the survey, indicating that WMA 13 is too far away to influence groundwater within the survey area.

The changes in water levels in response to the operation of WMA 26 are most pronounced along geologic strike and are also strongly depth-dependent. The capture zone of WMA 26 under pumping conditions is also expected to be elongated along strike. Water levels in the offbase area north-northwest of Area A were most affected by the municipal well, with the observed onbase effects minimal and confined to the general vicinity of Area A. Groundwater gradients and inferred flow directions across the survey area were to the north-northwest in shallow, intermediate, and deep flow zones within the bedrock aquifer during the time periods when WMA 26 was pumping and when it had been shutdown for approximately 2 days.

ATTACHMENT A

PUMPING RECORDS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SATURDAY
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FRIDAY
6 AM
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6 PM
THURSDAY
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6 PM
WEDNESDAY
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NITE
6 PM
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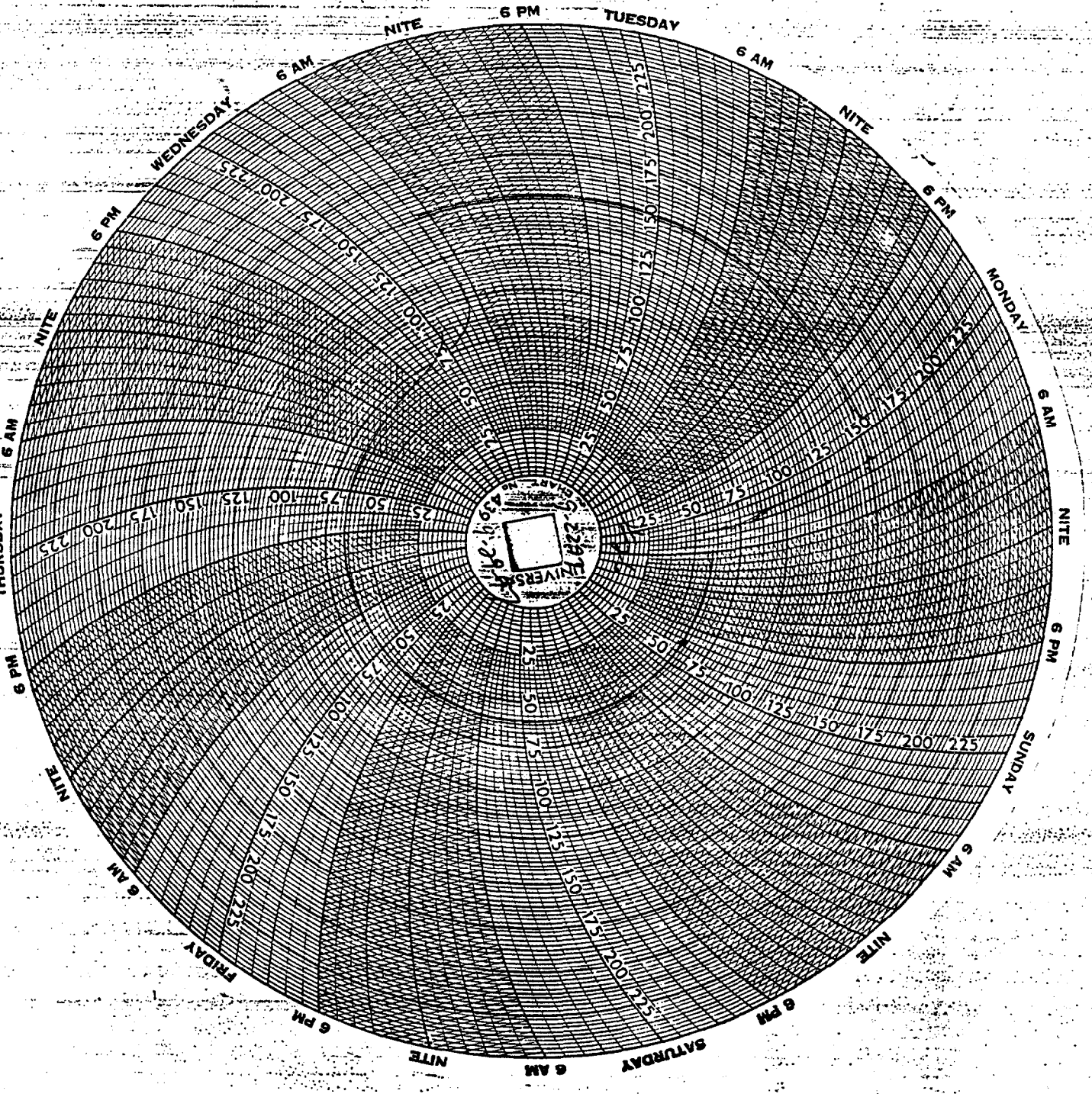
UNIVERSAL
CHART No.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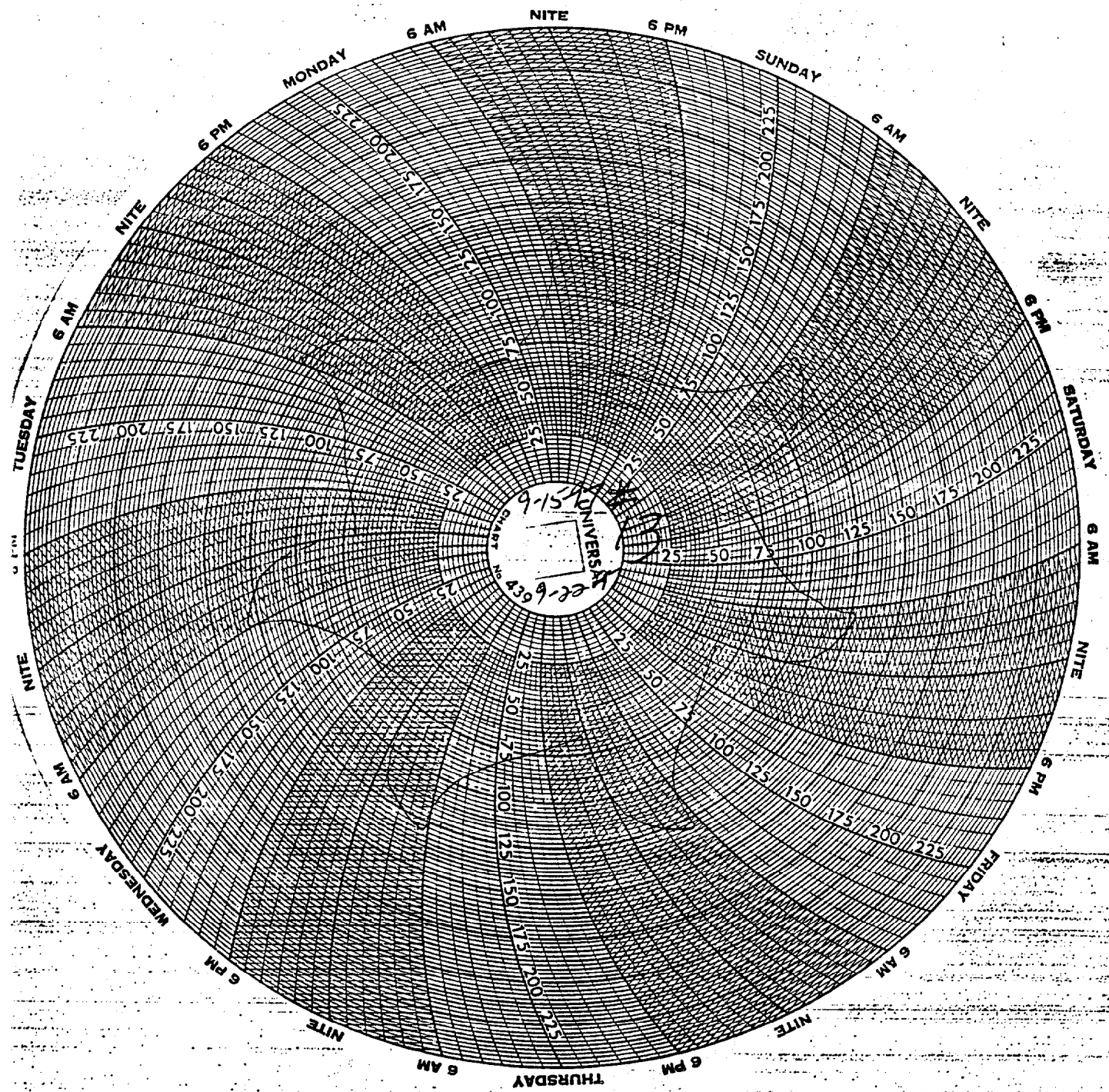
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THURSDAY
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No 439

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TUESDAY
WEDNESDAY
THURSDAY
FRIDAY
SATURDAY
NITE
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UNIVERSAL
CHART
No. 4369

#1 BASE 1997

Date	Meter Reading	Idle	Pump	Time	Rate GPM	Disch. Press	CL2 Res.	CL2 Wt.	Gallons Pumped	Int. of Man on Duty Breakdowns, etc.
8/13	2842.2 2846.5	181		10:00	135		470.27	.04	300	VB
8/15	2846.8	182		9:00	135		470.31	.04	300	[illegible]
8/18	2847.1	180		9:45	135		470.35	.04	300	JS.
8/20	2847.4	185		10:30	135		470.39	.04	300	JS.
8/22	2847.7	172		7:20	135		470.43	.04	300	VB
8/25	2862.1	170		9:30	135		470.47	.04	14400	JS.
31 8/27	2866.7		103	10:30	100		472.63	2.16	4600	JS.
41 8/29	2867.0	185		10:00	135		473.41	.78	300	JS.
9/1	2871.3	176		8:40	135		473.44	.03	4300	VB
9/3	2874.1		112	10:20	110		474.07	.63	2800	JS.
9/5	2874.3	173		10:30	135		474.50	.43	300	VB
9/8	2874.6	185		9:00	135		474.53	.03	300	JS.
9/9	2874.9	185		10:00	135		474.56	.03	300	JS.
9/12	2875.2	169		9:15	135		474.60	.04	300	JS.

#1 BASC 1997

Date	Meter Reading	Idle	Pump	Time	Rate GPM	Disch. Press	CL2 Res.	CL2 Wt.	Gallons Pumped	Int. of Man on Duty Breakdowns, etc.
9/15	2875.2 2875.5	180		9:15	135		474.64	.04	300	JS.
9/17	2875.8	185		10:40	135		474.68	.04	300	JS.
9/19	2876.0	185		9:20	135		474.72	.04	200	JS.
9/22	2877.6	179		9:30	135		474.76	.03	1600	JS.
9/23	2885.4		132	10:40	120		474.93	.18	7800	JS.
9/26	2885.4	184		9:40	135		476.18	1.25	800	JB
9/29	2886.0	175		9:40	135		476.22	.04	600	JB.
10/1	2886.3	185		9:25	130		476.26	.04	300	JB
10/3	2886.6	185		8:50	135		476.30	.04	300	JB.
10/6	2886.9	185		8:45	135		476.34	.04	300	JB
10/8	2907.5	184		8:50	135		476.38	.04	20600	JB
10/10		181		8:40	135		479.57	3.19		JB

Base #2 1997

Hours Hours Run

Date	Meter Reading	Idle	Pump	Time	Rate GPM	Disch. Press	CL2 Res.	CL2 Wt.	Gallons Pumped	Int. of Man on Duty Breakdowns, etc.
8/13	01865.4 01865.6	206		10:10	75		493.18	.04	200	VB
8/15	01865.8	200		9:10	75		493.22	.04	200	JS.
8/18	01866.0	145		10:00	75		493.26	.04	200	JS.
8/20	01866.2	198		10:40	75		493.30	.04	200	JS
8/22	01866.4	194		9:30	75		493.35	.05	200	VB
8/25	01874.5	171		9:35	75		493.39	.04	8100	JS.
8/27	01877.4		148	10:15	60		495.49	2.10	2900	JS.
8/29	01877.6	172		10:10	75		496.33	.84	200	JS
9/1	01880.2	193		8:45	75		496.37	.04	2600	VB
9/3	01881.6		160	10:00	65		497.04	.67	1400	JS
9/5	01882.4	145		10:40	75		497.42	.38	800	VB
9/8	01882.6	190		9:10	75		497.59	.17	200	J
9/10	01882.8	180		10:10	75		497.63	.04	200	JS
9/12	01883.0	182		9:00	75		497.67	.04	200	JS

Base # 2 — 1997

Date	Meter Reading	Idle	Pump	Time	Rate GPM	Disch. Press	CL2 Res.	CL2 Wt.	Gallons Pumped	Int. of Man on Duty Breakdowns, etc.
8/15	~~018830~~ 018832	170		9:20	75		497.72	.05	200	JS
8/17	018834	182		9:45	75		497.76	.04	200	JS.
9/19	018836	205		9:25	75		497.80	.04	200	JS.
9/22	018846	193		9:40	75		497.84	.04	10000	JS.
9/24	01889.0		175	10:50	63		488.07	.23	4400	JS.
9/26	01889.2	178		9:50	75		499.28	1.21	200	VB
9/29	01889.4	189		9:50	75		499.32	.04	200	JS.
10/1	01889.6	165		9:30	75		499.37	.05	200	VB
10/3	01889.8	187		9:00	75		499.42	.05	200	JS.
10/6	01890.0	200		9:00	75		499.46	.04	200	VB
10/8	01901.9	168		9:00	75		499.50	0.4	11900	VB
10/10		187		8:50	75		502.70	3.20		VB

Base 3 – 1997

Date	Meter Reading	Idle	Pump	Time	Rate GPM	Disch. Press	CL2 Res.	CL2 Wt.	Gallons Pumped	Int. of Man on Duty Breakdowns, etc.
9/3	24207 24209	199	ADDED QT	9:30	27	7/1.0	11964.5	2.1	2,000	JS
9/4	24210	175		9:05	27	7/1.0	11965.8	1.3	1,000	VB
9/5	24211	207		11:15	27	7/1.0	11966.7	0.9	1,000	VB
9/6	24212	185		7:30	27	7/1.0	11967.5	0.8	1,000	J.S.
9/7	24213	222		7:30	27	7/1.0	11968.2	0.7	1,000	J.S.
9/8	24215	196	ADDED QT	8:30	27	7/1.0	11969.1	0.9	2,000	J.S.
9/9	24216	223		8:40	27	7/1.0	11970.0	0.9	1,000	VB
9/10	24217	192		11:00	27	7/1.0	11970.8	0.8	1,000	JS
9/11	24218	176		10:20	27	7/1.0	11971.7	0.9	1,000	JS
9/12	24220	204		8:30	27	7/1.0	11972.5	0.8	2,000	JS.
9/13	24220	184		9:10	27	7/1.0	11973.6	1.1	0 — 0	VB
9/14	24221	211		9:10	27	7/1.0	11973.7	0.1	1,000	VB
9/15	24222	196		8:15	27	7/1.0	11974.3	0.6	1,000	JS.
9/16	24225	175	ADDED QT	9:10	27	7/1.0	11975.2	0.9	3,000	JS.

BASE #3 — 1997

Date	Meter Reading	Idle	Pump	Time	Rate GPM	Disch. Press	CL2 Res.	CL2 Wt.	Gallons Pumped	Int. of Man on Duty Breakdowns, etc.
9/17	24225 24228	210		8:45	27	7/1.0	11977.4	2.2	3,000	JS
9/18	24229	192		2:15	27	7/1.0	11979.9	2.5	1,000	JS.
9/19	24230	222		8:55	27	7/1.0	11980.3	0.4	1,000	JS.
9/20	24231	202		8:30	27		11981.1	0.8	1,000	[illegible]
9/21	24231	175		8:30	27		11981.6	0.5	0 — 0	[illegible]
9/22	24233	204		9:55	27	7/1.0	11982.0	0.4	2,000	JS.
9/23	24234	186		9:00	27	7/1.0	11982.8	0.8	1,000	JS.
9/24	24235	196		11:30	27	7/1.0	11984.0	1.2	2,000	JS.
9/25	24236	178		9:00	27	7/1.0	11984.8	0.8	1,000	JB
9/26	24237	206	ADDED QT	10:15	27	7/1.0	11985.6	0.8	1,000	JB
9/27	24238	185		7:30	27	7/1.0	11986.1	0.5	1,000	JS.
9/28	24239	210		7:30	27	7/1.0	11986.9	0.8	1,000	JS.
9/29	24240	183		9:00	27	7/1.0	11987.7	0.8	1,000	JS.
9/30	24242	220		9:00	27	7/1.0	11988.4	0.7	2,000	JS.

Base #3 -1997

Date	Meter Reading	Idle	Pump	Time	Rate GPM	Disch. Press	CL2 Res.	CL2 Wt.	Gallons Pumped	Int. of Man on Duty Breakdowns, etc.
10/1	24242 24243	189		8:50	27	7/1.0	11989.4	1.0	1,000	VB
10/2	24244	198		7:00	27	7/1.0	11990.2	0.8	1,000	JS.
10/3	24245	188		8:30	27	7/1.0	11991.0	0.8	1,000	JS
10/4	24246	225		9:20	27	7/1.0	11991.5	0.5	1,000	VB
10/5	24247	196		9:20	27	7/1.0	11992.3	0.8	1,000	VB
10/6	24249	178	ADDED QT	9:25	27	7/1.0	11993.2	0.9	2,000	VB
10/7	24250	215		12:00	27	7/1.0	11994.2	1.0	1,000	VB
10/8	24252	186		10.00	27	7/1.0	11995.2	1.0	2,000	VB
10/9	24253	221		9:10	27	7/1.0	11996.6	1.4	1,000	VB
10/10	24254	204		9:20	27	7/1.0	11997.6	1.0	1,000	VB
10/11	24255	175		8:50	27	7/1.0	11998.5	0.9	1,000	JB
10/12	24256	209		7:30	27	7/1.0	11999.0	0.5	1,000	JB
10/13	24258	182		9:30	27	7/1.0	11999.9	0.9	2,000	JS.
10/14	24259	220		8:50	27	7/1.0	12000.9	0.9	1,000	JS.

BASC #3 — 1997

Date	Meter Reading	Idle	Pump	Time	Rate GPM	Disch. Press	CL2 Res.	CL2 Wt.	Gallons Pumped	Int. of Man on Duty Breakdowns, etc.
10/15	24259 24260	188		9:10	27	7/1.0	12002.0	1.1	1,000	SS.
10/16	24261	220		9:15	27	7/1.0	12002.9	0.9	1,000	SS
10/17	24262	190		9:05	27	7/1.0	120033	0.4	1,000	JB
10/18	24263	220		7:40	27	7/1.0	12003.8	0.5	1,000	SS.
10/19	24264	196		7:40	27	7/1.0	12004.8	1.0	1,000	SS
10/20	24265	210		9:00	27	7/1.0	12005.7	0.9	1,000	SS.
10/21	24266	191		9:00	27	7/1.0	12006.1	0.4	1,000	SS.
10/22	24267	225		8:40	27	7/1.0	12007.1	1.0	1,000	VB
10/23	24268	192	ADDED QT	9:20	27	7/1.0	12007.5	0.4	1,000	VB
10/24	24269	175		8:40	27	7/1.0	120085	1.0	1,000	SS
10/25	24271	200		7:50	27	7/1.0	12009.0	0.5	2,000	JB
10/26	24271	175		7:50	27	7/1.0	12010.1	1.1	0 — 0	JB
10/27	24272	203		9:00	27	7/1.0	12010.9	0.2	1,000	VB
10/28	24273	178		9:20	27	7/1.0	12011.1	0.4	1,000	SS.

Base #3 - 1997

Date	Meter Reading	Idle	Pump	Time	Rate GPM	Disch. Press	CL2 Res.	CL2 Wt.	Gallons Pumped	Int. of Man on Duty Breakdowns, etc.
10/29	24273 24275	206		8:00	27	7/1.0	12012.0	0.9	2,000	VB
10/30	24276	182		7:30	27	7/1.0	12013.0	1.0	1,000	VB
10/31	24277	213		8:30	27	7/1.0	12014.2	1.2	1,000	[illegible]
11/1	24277	190	ADDED QT	9:00	27	7/1.0	12014.7	0.5	0	VB
11/2	24279	224		9:05	27	7/1.0	12015.1	0.4	2,000	VB
11/3	24282	194		9:10	27	7/1.0	12016.1	1.0	3,000	S.S.
11/4	24283	176		9:00	27	7/1.0	12018.1	2.0	1,000	S.S.
11/5		205		8:35	27	7/1.0	12019.0	0.9		VB

BASE #4 – 1997

Date	Meter Reading	Idle	Pump	Time	Rate GPM	Disch. Press	CL2 Res.	CL2 Wt.	Gallons Pumped	Int. of Man on Duty Breakdowns, etc.
9/2	25135 25138	142		9:15	25	4/1.0	9020.3	0.4	3,000	JS
9/3	25140	142		9:50	25	4/1.0	9022.4	2.1	2,000	JS.
9/4	25141	142		8:55	25	4/1.0	9023.7	1.3	1,000	VB
9/5	25142	142	ADDED QT	10:55	25	4/1.0	9024.6	0.9	1,000	VB
9/6	25144	142		7:35	25	4/1.0	9025.6	1.0	2,000	JS.
9/7	25145	142		7:40	25	4/1.0	9026.3	0.7	1,000	JS.
9/8	25146	142		8:40	25	4/1.0	9027.2	0.9	1,000	JS.
9/9	25147	141		8:30	25	4/1.0	9028.1	0.9	1,000	VB
9/10	25148	142		11:15	25	4/1.0	9028.9	0.8	1,000	JS
9/11	25149	142		10:30	25	4/1.0	9029.8	0.9	1,000	JS.
9/12	25151	142		8:40	25	4/1.0	9030.6	0.8	2,000	JS.
9/13	25151	143		9:00	25	4/1.0	9031.7	1.1	0 — 0	VB
9/14	25152	143		9:00	25	4/1.0	9031.8	0.1	1,000	VB
9/15	25153	143		8:25	25	4/1.0	9032.5	0.7	1,000	JS.

BASE #4 — 1997

Date	Meter Reading	Idle	Pump	Time	Rate GPM	Disch. Press	CL2 Res.	CL2 Wt.	Gallons Pumped	Int. of Man on Duty Breakdowns, etc.
9/16	25153 25156	143		9:30	25	4/1.0	9033.4	0.9	3,000	JS.
9/17	25159	142		9:00	25	4/1.0	9035.6	2.2	3,000	JS.
9/18	25160	139	ADDED QT	2:25	25	4/1.0	9038.1	2.5	1,000	JS
9/19	25161	142		9:05	25	4/1.0	9038.5	0.4	1,000	
9/20	25161	142		8:50	25		9039.3	0.8	0 — 0	JB
9/21	25162	142		8:50	25		9039.8	0.5	1,000	JB
9/22	25163	142		9:10	25	4/1.0	9040.2	0.4	1,000	JS.
9/23	25165	142		9:10	25	4/1.0	9041.0	0.8	2,000	JS
9/24	25166	142		11:45	25	4/1.0	9042.3	1.3	1,000	JS.
9/25	25167	142		8:50	25	4/1.0	9043.1	0.8	1,000	JB
9/26	25168	142		10:00	25	4/1.0	9043.9	0.8	1,000	JB
9/27	25169	142		7:30	25	4/1.0	9044.3	0.4	1,000	...
9/28	25170	142		7:40	25	4/1.0	9045.1	0.8	1,000	JS.
9/29	25171	142		9:10	25	4/1.0	9045.9	0.8	1,000	JS.

BASE #4 —— 1997

Date	Meter Reading	Idle	Pump	Time	Rate GPM	Disch. Press	CL2 Res.	CL2 Wt.	Gallons Pumped	Int. of Man on Duty Breakdowns, etc.
9/30	25171 25172	142		9:15	25	4/1.0	9046.7	0.8	1,000	JS.
10/1	25173	142	ADDED QT.	8:35	25	4/1.0	9047.7	1.0	1,000	VB
10/2	25174	142		7:10	25	4/1.0	9048.7	1.0	1,000	JS.
10/3	25175	142		8:35	25	4/1.0	9049.5	0.8	1,000	JS.
10/4	25176	142		9:10	25	4/1.0	9049.9	0.4	1,000	VB
10/5	25177	142		9:10	25	4/1.0	9050.7	0.8	1,000	VB
10/6	25179	142		9:15	25	4/1.0	9051.6	0.9	2,000	VB
10/7	25180	140		11:50	25	4/1.0	9052.6	1.0	1,000	VB
10/8	25182	142		9:50	25	4/1.0	9053.6	1.0	2,000	VB
10/9	25183	142		9:00	25	4/1.0	9055.0	1.4	1,000	VB
10/10	25184	142	ADDED QT	9:15	25	4/1.0	9056.0	1.0	1,000	VB
10/11	25185	141		9:10	25	4/1.0	9057.0	1.0	1,000	VB
10/12	25186	141		7:50	25	4/1.0	9057.5	0.5	1,000	VB
10/13	25188	141		9:40	25	4/1.0	9058.4	0.9	2,000	JS.

Base # 4 — 1997

Date	Meter Reading	Idle	Pump	Time	Rate GPM	Disch. Press	CL2 Res.	CL2 Wt.	Gallons Pumped	Int. of Man on Duty Breakdowns, etc.
10/14	25188 25189	141		9:00	25	4/1.0	9059.4	1.0	1,000	JS.
10/15	25190	141		9:30	25	4/1.0	9060.4	1.0	1,000	JS.
10/16	25191	141		9:30	25	4/1.0	9061.4	1.0	1,000	JS.
10/17	25192	141		7:25	25	4/1.0	9061.8	0.4	1,000	JB
10/18	25193	141		7:45	25	4/1.0	9062.3	0.5	1,000	JS
10/19	25194	141		7:50	25	4/1.0	9063.3	1.0	1,000	JS
10/20	25195	141		9:10	25	4/1.0	9064.2	0.9	1,000	JS
10/21	25196	141		9:10	25	4/1.0	9064.6	0.4	1,000	JS.
10/22	25196	140		8:30	25	4/1.0	9065.6	1.0	0 — 0	VB
10/23	25198	141	ADDED QT	9:10	25	4/1.0	9066.0	0.4	2,000	VB
10/24	25199	140		9:50	25	4/1.0	9067.0	1.0	1,000	JS.
10/25	25200	140		8:10	25	4.0/1.0	9067.6	0.6	1,000	JB
10/26	25201	140		8:10	25	4.0/1.0	9068.7	1.1	1,000	JB
10/27	25201	141		8:45	25	4/1.0	9069.3	0.6	0 — 0	VB

BASC #4 — 1997

Date	Meter Reading	Idle	Pump	Time	Rate GPM	Disch. Press	CL2 Res.	CL2 Wt.	Gallons Pumped	Int. of Man on Duty Breakdowns, etc.
10/28	~~25201~~ 25203	142		9:30	25	4/1.0	9069.7	0.4	2,000	JS
10/29	25204	142		7:50	25	4/1.0	9070.7	1.0	1,000	VB
10/30	25205	142		7:20	25	4/1.0	9071.6	0.9	1,000	VB
10/31	25206	142		8:50	25	4/1.0	9072.8	1.2	1,000	JB
11/1	25207	143		8:50	25	4/1.0	9073.3	0.5	1,000	VB
11/2	25208	143		8:55	25	4/1.0	9073.8	0.5	1,000	VB
11/3	25211	143		9:20	25	4/1.0	9074.7	0.9	3,000	JS
11/4	25212	143	ADDED QT	9:20	25	4/1.0	9076.8	2.1	1,000	JS
11/5	25214	143		8:25	25	4/1.0	9077.7	0.9	2,000	VB
11/6		138		10:35	25	4/1.0	9079.4	1.7		VB

ATTACHMENT B

BAROMETRIC PRESSURE/PRECIPITATION DATA

DEPARTMENT OF THE NAVY
NAVAL TRAINING METEOROLOGY AND OCEANOGRAPHY DETACHMENT
PO BOX 8
NAS WILLOW GROVE, PA 19090-5008

3140
Ser 00/082
16 Oct 97

From: Chief Petty Officer in Charge, Naval Training Meteorology and Oceanography Detachment
To: Charles Meyer, Brown and Root Environmental

Subj: REQUESTED WEATHER DATA

1. The requested data is enclosed. Please ensure the data is used only for the purpose of NAS JRB Willow Grove's CLEAN Contract No. N62472-90-D-1298 and Contract Task Order (CTO) No. 252; to do so would be a violation of the Freedom of Information Act.

2. Please contact me if there are any questions at (215) 443-6576.

G. L. FORNWALT

UTC LST	DIRECTION (true) (3)	SPEED (knots)	GUST (knots) (5)	VARIABILITY (true) (6)	SURFACE (miles) (7)	SURFACE (meters) (7a)	TOWER (miles) (7b)	TOWER (meters) (7c)	RUNWAY VISUAL RANGE LOCAL (feet or meters) (8)	RUNWAY VISUAL RANGE LONGLINE (meters) (8a)	WEATHER LOCAL (9)	WEATHER LONGLINE (9a)	(10)	(11)	POINT (°C) (12)	SETTING (ins) (13)	(14)	PRESSURE (inches) (22)	PRESSURE (hPa) (23)	SKY COVER (17)	(15)
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.640	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.640	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.640	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.650	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.660	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.660	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.660	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.650	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.650	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.650	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.640	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.630	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.600	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.580	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.560	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.540	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.540	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.530	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.540	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.560	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.580	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.570	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.570	[redacted]	[redacted]	[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.580	[redacted]	[redacted]	[redacted]

SYNOPTIC DATA

NO. (30)	LOW CLOUD TYPE (29)	MID CLOUD TYPE (30)	HIGH CLOUD TYPE (31)	MAX TEMP (0.1°C) (32)	MIN TEMP (0.1°C) (33)	PRECIP (water equiv.) (34)	SNOW FALL (ins) (35)	SNOW DEPTH (ins) (36)
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

STATION PRESSURE COMPUTATIONS

TIME (UTC) (41)				
STA PRESS (42)				
BAROGRAPH (43)				
BARR CORR (44)				

SUMMARY OF THE DAY (midnight to midnight)

24-HR MAX TEMP (0.1°C) (64)	24-HR MIN TEMP (0.1°C) (65)	24-HR PCPN (ins) (66)	24-HR SNOW FALL (ins) (67)
[redacted]	[redacted]	[redacted]	[redacted]

24-HR SNOW DEPTH (ins) (68)	WATER EQUIVALENT (69)
[redacted]	[redacted]

PEAK WIND SPEED (kts) (48)	PEAK WIND DRCTN (true) (49)	PEAK WIND TIME (UTC) (50)	FASTEST MINUTE WIND SPEED (kts) (51)	FASTEST MINUTE WIND DRCTN (true) (52)	FASTEST MINUTE WIND TIME (UTC) (53)
13	210				

ACTIVE RUNWAY

TIME (UTC)	RNWY NO.	TIME (UTC)	RNWY NO.
[redacted]			

HOURLY CLIMATOLOGICAL DATA

TIME UTC LST (16)	DRY BULB TEMP 0.1°C (19)	WET BULB TEMP 0.1°C (20)	RH (%) (21)	STATION PRESSURE (ins) (22)	HOURLY PRECIP (ins) (25)	PRESSURE ALTITUDE (ft) (73)	TENSION LITTLE R (ft) (74)

REMARKS, NOTES, AND MISCELLANEOUS PHENOMENA (72)

HO 12 N 75 09 W +335 FT (MSL) | LST 10 UTC 05 HRS | EC12 DEG | 18 | SEP | 1991 | KNXX WAYTRAMELON PA / WILLOWGROVE PA

DATE & TIME (UTC / LST)	WIND DIRECTION (true)	WIND SPEED (knots)	WIND GUST (knots)	WIND VARIABILITY (true)	VISIBILITY SURFACE (miles)	VISIBILITY SURFACE (meters)	VISIBILITY TOWER (miles)	VISIBILITY TOWER (meters)	RUNWAY VISUAL RANGE LOCAL (feet or meters)	RUNWAY VISUAL RANGE LONGLINE (meters)	PRESENT WEATHER LOCAL	PRESENT WEATHER LONGLINE	SKY CONDITION	TEMP (°C)	DEW POINT (°C)	ALTIMETER SETTING (ins)	REMARKS AND SUPPLEMENTAL CODED DATA	STATION PRESSURE (inches)	SEA LEVEL PRESSURE	TOTAL SKY COVER	OBSERVER'S INITIAL
(1)	(2)		(3)	(4)		(7a)	(7b)	(7c)	(8)	(9a)		(9b)	(10)				(14)	(22)			
55	[redacted]	[redacted]									[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29580	[redacted]		[redacted]
55	VR	[redacted]									[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.580	[redacted]		[redacted]
55	VR	[redacted]									[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.530	[redacted]		[redacted]
55	00	[redacted]									[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.580	[redacted]		[redacted]
55	00	[redacted]									[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.540	[redacted]		[redacted]
55	00	[redacted]			2						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29540	[redacted]		[redacted]
55	00	[redacted]			1						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29600	[redacted]		[redacted]
55	[redacted]	[redacted]			1						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29630	[redacted]		[redacted]
55	VR	[redacted]			2						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29630	[redacted]		[redacted]
55	VR	[redacted]			3						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29650	[redacted]		[redacted]
55	[redacted]	[redacted]			5						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29660	[redacted]		[redacted]
55	[redacted]	[redacted]	[redacted]		7						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29680	[redacted]		[redacted]
55	[redacted]	[redacted]			7						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29690	[redacted]		[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29660	[redacted]		[redacted]
55	[redacted]	[redacted]	[redacted]		[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29680	[redacted]		[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.660	[redacted]		[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.660	[redacted]		[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.66	[redacted]		[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.66	[redacted]		[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.670	[redacted]		[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.680	[redacted]		[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.690	[redacted]		[redacted]
55	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.700	[redacted]		[redacted]
55	[redacted]	[redacted]			7						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.700	[redacted]		[redacted]
55	[redacted]	[redacted]			7						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.700	[redacted]		[redacted]
55	[redacted]	[redacted]			7						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.700	[redacted]		[redacted]

SYNOPTIC DATA

TIME (UTC)	WD (30)	LOW CLOUD TYPE (29)	MID CLOUD TYPE (30)	HIGH CLOUD TYPE (31)	MAX TEMP (0.1°C) (32)	MIN TEMP (0.1°C) (33)	PRECIP (water equiv.) (34)	SNOW FALL (ins) (35)	SNOW DEPTH (ins) (36)
[redacted]									
[redacted]	(7)								
[redacted]									
[redacted]	(8)								
[redacted]	(9)								

STATION PRESSURE COMPUTATIONS

TIME (UTC) (41)					
STA PRESS (42)					
BAROGRAPH (43)					
BARR CORR (44)					

SUMMARY OF THE DAY (midnight to midnight)

24-HR MAX TEMP (0.1°C) (64)	24-HR MIN TEMP (0.1°C) (65)	24-HR PCPN (ins) (66)	24-HR SNOW FALL (ins)
[redacted]		T	[redacted]
		24-HR SNOW DEPTH (ins) (68)	EQUIVALENT
		[redacted]	

PEAK WIND SPEED (kts)	PEAK WIND DRCTN (true)	PEAK WIND TIME (UTC)	FASTEST 2 MINUTE SPEED (kts)	FASTEST 2 MINUTE DRCTN (true)	FASTEST 2 MINUTE TIME (UTC)
[redacted]			[redacted]		

ACTIVE RUNWAY

TIME (UTC)	RNWY NO.	TIME (UTC)	RNWY NO.

HOURLY CLIMATOLOGICAL DATA

TIME UTC / LST (16)	DRY BULB TEMP 0.1°C (15)	WET BULB TEMP 0.1°C (17)	RH (%) (21)	STATION PRESSURE (ins) (22)	HOURLY PRECIP (ins) (25)	PRESSURE ALTITUDE (ft) (73)	DENSITY ALTITUDE (ft)

CNMOC 3140/12 (Rev. 1-96) S/N 0108-LF-019-3100

SURFACE WEATHER OBSERVATIONS (AERONOMY FOR MILITARY USE) METAR/SPECI	LATITUDE	LONGITUDE	STATION ELEVATION FT. (MSL)	TIME CONVERSION (LST TO UTC)	MAG TO TRUE	DAY	MONTH	YEAR	ICAO	STATION (TYPE, NAME, LOCATION)
	40°12'N	75°01'W	+335	05 HRS	012 DEG	19	SEP	1997	KNXX	NAVTRAMETACDET WILLOW GROVE, PA

TYPE METAR SPECI (1)	DATE & TIME UTC LST (2)	WIND DIRECTION (true) (3)	WIND SPEED (knots) (4)	WIND GUST (knots) (5)	WIND VARIABILITY (true) (6)	VISIBILITY SURFACE (miles) (7)	VISIBILITY SURFACE (meters) (7a)	VISIBILITY TOWER (miles) (7b)	VISIBILITY TOWER (meters) (7c)	RUNWAY VISUAL RANGE LOCAL (feet or meters) (8)	RUNWAY VISUAL RANGE LONGLINE (meters) (8a)	PRESENT WEATHER LOCAL (9)	PRESENT WEATHER LONGLINE (9a)	SKY CONDITION (10)	TEMP (°C) (11)	DEW POINT (°C) (12)	ALTIMETER SETTING (ins) (13)	REMARKS AND SUPPLEMENTAL CODED DATA (14)	STATION PRESSURE (inches) (22)	SEA LEVEL PRESSURE (mb)	TOTAL SKY COVER (12)	OBSERVER INITIALS
ME	0555	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.670		[redacted]	
ME	0655	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.690		[redacted]	
ME	0755	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.670		[redacted]	
ME	0855	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.670		[redacted]	
ME	0955	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.700		[redacted]	
ME	1055	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.720		[redacted]	
ME	1155	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.720		[redacted]	
ME	1255	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.710		[redacted]	
ME	1355	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.720		[redacted]	
ME	1455	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.700		[redacted]	
ME	1555	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.690		[redacted]	
ME	1655	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.670		[redacted]	
ME	1755	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.650		[redacted]	
ME	1855	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.640		[redacted]	
ME	1955	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.620		[redacted]	
ME	2055	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.580		[redacted]	
ME	2155	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.580		[redacted]	
ME	2255	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.570		[redacted]	
ME	2355	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.570		[redacted]	
ME	0055	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.580		[redacted]	
ME	0155	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.580		[redacted]	
ME	0255	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.580		[redacted]	
ME	0355	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.570		[redacted]	
ME	0455	[redacted]												[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.580		[redacted]	

SYNOPTIC DATA

TIME (UTC) (26)	TIME (LST) (27)	WD (28)	LOW CLOUD TYPE (29)	MID CLOUD TYPE (30)	HIGH CLOUD TYPE (31)	MAX TEMP (0.1°C) (32)	MIN TEMP (0.1°C) (33)	PRECIP (water equiv.) (34)	SNOW FALL (ins) (35)	SNOW DEPTH (ins) (36)
GMT TO (LST)	GMT TO	[redacted]								

STATION PRESSURE COMPUTATIONS

TIME (UTC) (41)				
STA PRESS (42)				
BAROGRAPH (43)				
BARR CORR (44)				

SUMMARY OF THE DAY (midnight to midnight)

24-HR MAX TEMP (0.1°C) (64)	24-HR MIN TEMP (0.1°C) (65)	24-HR PCPN (ins) (66)	24-HR SNOW FALL (ins) (67)
[redacted]		0	[redacted]
		24-HR SNOW DEPTH (ins) (68)	WATER EQUIVALENT (69)
		[redacted]	

ACTIVE RUNWAY

TIME (UTC)	RWWY NO	TIME (UTC)	RWWY NO

HOURLY CLIMATOLOGICAL DATA

TIME UTC LST (18)	DRY BULB TEMP 0.1°C (19)	WET BULB TEMP 0.1°C (20)	RH (%) (21)	STATION PRESSURE (ins) (22)	HOURLY PRECIP (ins) (23)	PRESSURE ALTITUDE (ft) (24)	DENSITY ALTITUDE (ft)

TYPE METAR SPECI (1)	DATE & TIME ‖ UTC ‖ LST (2)	WIND DIRECTION (true) (3)	WIND SPEED (knots) (4)	WIND GUST (knots) (5)	WIND VARIABILITY (true) (6)	VISIBILITY SURFACE (miles) (7)	VISIBILITY SURFACE (meters) (7a)	VISIBILITY TOWER (miles) (7b)	VISIBILITY TOWER (meters) (7c)	RUNWAY VISUAL RANGE LOCAL (feet or meters) (8)	RUNWAY VISUAL RANGE LONGLINE (meters) (8a)	PRESENT WEATHER LOCAL (9)	PRESENT WEATHER LONGLINE (9a)	SKY CONDITION (10)	TEMP (°C) (11)	DEW POINT (°C) (12)	SEA LEVEL PRESSURE (mb) (13)	[illegible] (14)	PRESSURE (inches) (22)	PRESSURE (hPa) (23)	SKY COVER (17)	INITIALS (15)
ME	0355	[redacted]												[redacted]			2[redacted]	[redacted]	29.540	[redacted]		[redacted]
ME	0655	[redacted]												[redacted]			2[redacted]	[redacted]	29.520	[redacted]		[redacted]
ME	0755	[redacted]												[redacted]			[redacted]	[redacted]	29.520	[redacted]		[redacted]
ME	0855	[redacted]												[redacted]			[redacted]	[redacted]	29.490	[redacted]		[redacted]
ME	0955	[redacted]												[redacted]			[redacted]	[redacted]	29.480	[redacted]		[redacted]
ME	1055	[redacted]												[redacted]			[redacted]	[redacted]	29.460	[redacted]		[redacted]
SP	1120	[redacted]												[redacted]			[redacted]	[redacted]	29.470	[redacted]		[redacted]
ME	1155	[redacted]												[redacted]			[redacted]	[redacted]	29.470	[redacted]		[redacted]
ME	1255	[redacted]												[redacted]			[redacted]	[redacted]	29.430	[redacted]		[redacted]
ME	1355	[redacted]												[redacted]			[redacted]	[redacted]	29.430	[redacted]		[redacted]
ME	1455	[redacted]												[redacted]			[redacted]	[redacted]	29.430	[redacted]		[redacted]
ME	1555	[redacted]												[redacted]			[redacted]	[redacted]	29.410	[redacted]		[redacted]
ME	1655	[redacted]												[redacted]			[redacted]	[redacted]	29.390	[redacted]		[redacted]
ME	1755	[redacted]												[redacted]			[redacted]	[redacted]	29.360	[redacted]		[redacted]
ME	1855	[redacted]												[redacted]			[redacted]	[redacted]	29.350	[redacted]		[redacted]
ME	1955	[redacted]												[redacted]			[redacted]	[redacted]	29.340	[redacted]		[redacted]
ME	2055	[redacted]												[redacted]			[redacted]	[redacted]	29.340	[redacted]		[redacted]
SP	2125	[redacted]										-SHRA		[redacted]			[redacted]	[redacted]	29.340	[redacted]		[redacted]
SP	2135	[redacted]										SHRA		[redacted]			[redacted]	[redacted]	29.350	[redacted]		[redacted]
SP	2145	[redacted]										-SHRA	BR	[redacted]			[redacted]	[redacted]	29.360	[redacted]		[redacted]
ME	2155	[redacted]										[redacted]		[redacted]			[redacted]	[redacted]	29.360	[redacted]		[redacted]
SP	2237	[redacted]										-SHRA		[redacted]			[redacted]	[redacted]	29.430	[redacted]		[redacted]
ME	2255	[redacted]												[redacted]			[redacted]	[redacted]	29.440	[redacted]		[redacted]
ME	2355	[redacted]												[redacted]			[redacted]	[redacted]	29.480	[redacted]		[redacted]
ME	0065	[redacted]										-RA		[redacted]			[redacted]	[redacted]	29.550	[redacted]		[redacted]
ME	0155	[redacted]												[redacted]			[redacted]	[redacted]	29.550	[redacted]		[redacted]
ME	0255	[redacted]												[redacted]			[redacted]	[redacted]	29.590	[redacted]		[redacted]
ME	0355	[redacted]												[redacted]			[redacted]	[redacted]	29.630	[redacted]		[redacted]
ME	0455	[redacted]												FEW040			[redacted]	[redacted]	29.690	[redacted]		[redacted]

SYNOPTIC DATA

TIME (UTC) (26)	TIME (LST) (27)	WD (28)	LOW CLOUD TYPE (29)	MID CLOUD TYPE (30)	HIGH CLOUD TYPE (31)	MAX TEMP (0.1°C) (32)	MIN TEMP (0.1°C) (33)	PRECIP (water equiv.) (34)	SNOW FALL (ins) (35)	SNOW DEPTH (ins) (36)
GRD TO (LST)	GRD TO	[redacted]								
[redacted]										
[redacted]										
[redacted]										
(LST)	(LST)	[redacted]								

STATION PRESSURE COMPUTATIONS

TIME (UTC) (41)				
STA PRESS (42)				
BAROGRAPH (43)				
BARR CORR (44)				

SUMMARY OF THE DAY (midnight to midnight)

24-HR MAX TEMP (0.1°C) (64)	24-HR MIN TEMP (0.1°C) (65)	24-HR PCPN (ins) (66)	24-HR SNOW FALL (ins) (67)
[redacted]		.10	[redacted]
		24-HR SNOW DEPTH (ins) (68)	WATER EQUIVALENT (69)
		[redacted]	

PEAK WIND SPEED (kts) (48)	PEAK WIND DRCTN (true) (49)	PEAK WIND TIME (UTC) (50)	FASTEST 2-MINUTE WIND SPEED (kts) (51)	FASTEST 2-MINUTE WIND DRCTN (true) (52)	FASTEST 2-MINUTE WIND TIME (UTC) (53)
[redacted]					

ACTIVE RUNWAY

TIME (UTC)	RNWY NO.	TIME (UTC)	RNWY NO.

HOURLY CLIMATOLOGICAL DATA

TIME ‖ UTC ‖ LST (18)	DRY BULB TEMP 0.1°C (19)	WET BULB TEMP 0.1°C (20)	RH (%) (21)	STATION PRESSURE (ins) (22)	HOURLY PRECIP (ins) (25)	PRESSURE ALTITUDE (ft) (73)	DENSITY ALTITUDE (ft)

TYPE METAR SPECI (1)	DATE & TIME ▯▯ UTC ▯▯ LST (2)	WIND DIRECTION (true) (3)	WIND SPEED (knots) (4)	WIND GUST (knots) (5)	WIND VARIABILITY (true) (6)	VISIBILITY SURFACE (miles) (7)	VISIBILITY SURFACE (meters) (7a)	VISIBILITY TOWER (miles) (7b)	VISIBILITY TOWER (meters) (7c)	RUNWAY VISUAL RANGE LOCAL (feet or meters) (8)	RUNWAY VISUAL RANGE LONGLINE (meters) (8a)	PRESENT WEATHER LOCAL (9)	PRESENT WEATHER LONGLINE (9a)	SKY CONDITION (10)	TEMP (°C) (11)	DEW POINT (°C) (12)	ALTIMETER SETTING (ins) (13)	REMARKS AND SUPPLEMENTAL CODED DATA (14)	STATION PRESSURE (inches) (22)	SEA LEVEL PRESSURE (ins) (16)	TOTAL SKY COVER (17)	OBSERVER INITIALS (15)
ME	0555	[redacted]	[redacted]			[redacted]								[redacted]					29.660	[redacted]	[redacted]	[redacted]
ME	0655	[redacted]	[redacted]											[redacted]					29.620	[redacted]	[redacted]	[redacted]
ME	0755	[redacted]	[redacted]											[redacted]					29.670	[redacted]	[redacted]	[redacted]
ME	0855	[redacted]	[redacted]											[redacted]					29.700	[redacted]	[redacted]	[redacted]
ME	0955	VR	[redacted]											[redacted]					29.730	[redacted]	[redacted]	[redacted]
ME	1055	VR	[redacted]											[redacted]					29.760	[redacted]	[redacted]	[redacted]
ME	1155	[redacted]	[redacted]											[redacted]					29.800	[redacted]	[redacted]	[redacted]
ME	1255	[redacted]		[redacted]										[redacted]					29.810	[redacted]	[redacted]	[redacted]
ME	1355	[redacted]												[redacted]					29.830	[redacted]	[redacted]	[redacted]
ME	[redacted]	[redacted]		[redacted]										[redacted]					29.850	[redacted]	[redacted]	[redacted]
ME	1555	[redacted]	[redacted]	[redacted]										[redacted]					29.850	[redacted]	[redacted]	[redacted]
ME	1655	[redacted]	[redacted]	[redacted]										[redacted]					29.840	[redacted]	[redacted]	[redacted]
ME	1755	VR	[redacted]	[redacted]										[redacted]					29.830	[redacted]	[redacted]	[redacted]
ME	1855	[redacted]	[redacted]	[redacted]										[redacted]					29.820	[redacted]	[redacted]	[redacted]
ME	1955	[redacted]	[redacted]											[redacted]					29.820	[redacted]	[redacted]	[redacted]
ME	2055	VR	[redacted]											[redacted]					29.830	[redacted]	[redacted]	[redacted]
ME	2155	[redacted]	[redacted]											[redacted]					29.840	[redacted]	[redacted]	[redacted]
ME	[redacted]	[redacted]	[redacted]											[redacted]					29.860	[redacted]	[redacted]	[redacted]
ME	2355	[redacted]	[redacted]											[redacted]					29.880	[redacted]	[redacted]	[redacted]
ME	0055	[redacted]	[redacted]											[redacted]					29.890	[redacted]	[redacted]	[redacted]
ME	0155	[redacted]	[redacted]											[redacted]					29.910	[redacted]	[redacted]	[redacted]
ME	0255	[redacted]	[redacted]											[redacted]					29.920	[redacted]	[redacted]	[redacted]
ME	0355	[redacted]	[redacted]											[redacted]					29.930	[redacted]	[redacted]	[redacted]
ME	0455	[redacted]	[redacted]											[redacted]					29.930	[redacted]	[redacted]	[redacted]

SYNOPTIC DATA

TIME (UTC) (26)	TIME (LST) (27)	WD (28)	LOW CLOUD TYPE (29)	MID CLOUD TYPE (30)	HIGH CLOUD TYPE (31)	MAX TEMP (0.1°C) (32)	MIN TEMP (0.1°C) (33)	PRECIP (water equiv.) (34)	SNOW FALL (ins) (35)	SNOW DEPTH (ins) (36)
WD TO (LST)	WD TO	[redacted]								
[redacted]										
WD (LST)	WD (LST)	[redacted]								

REMARKS NOTEX AND MISCELLANEOUS PHENOMENA (77)

STATION PRESSURE COMPUTATIONS

TIME (UTC) (41)				
STA PRESS (42)				
BAROGRAPH (43)				
BARR CORR (44)				

[redacted]

SUMMARY OF THE DAY (midnight to midnight)

24-HR MAX TEMP (0.1°C) (64)	24-HR MIN TEMP (0.1°C) (65)	24-HR PCPN (ins) (66)	24-HR SNOW FALL (ins) (67)
[redacted]		0	[redacted]
		24-HR SNOW DEPTH (ins) (68)	WATER EQUIVALENT (69)
		[redacted]	

PEAK WIND SPEED (kts) (48)	PEAK WIND DIRCTN (true) (49)	PEAK WIND TIME (UTC) (50)	FASTEST 2-MINUTE WIND SPEED (kts) (51)	FASTEST 2-MINUTE WIND DIRCTN (true) (52)	FASTEST 2-MINUTE WIND TIME (UTC) (53)
[redacted]					

ACTIVE RUNWAY

TIME (UTC)	RNWY NO.	TIME (UTC)	RNWY NO

HOURLY CLIMATOLOGICAL DATA

TIME ▯ UTC ▯ LST (18)	DRY BULB TEMP 0.1°C (19)	WET BULB TEMP 0.1°C (20)	RH (%) (21)	STATION PRESSURE (ins) (22)	HOURLY PRECIP (ins) (23)	PRESSURE ALTITUDE (ft) (73)	DENSITY ALTITUDE (ft) (74)

SURFACE WEATHER OBSERVATIONS (ABRIDGED FOR MILITARY USE) (METAR/SPECI)	LATITUDE	LONGITUDE	STATION ELEVATION FT. (MSL)	TIME CONVERSION (LST TO UTC)	MAG TO TRUE	DAY	MONTH	YEAR	ICAO	STATION (TYPE, NAME, LOCATION)
	40 2N	75 09W	+335	HRS 05 HRS	DEG 012 DEG	22	SEP	1997	KNXX	NAVTRAMETOC DET WILLOW GROVE PA

TYPE METAR SPECI (1)	DATE & TIME UTC LST (2)	WIND DIRECTION (true) (3)	WIND SPEED (knots) (4)	WIND GUST (knots) (5)	WIND VARIABILITY (true) (6)	VISIBILITY SURFACE (miles) (7)	VISIBILITY SURFACE (meters) (7a)	VISIBILITY TOWER (miles) (7b)	VISIBILITY TOWER (meters) (7c)	RUNWAY VISUAL RANGE LOCAL (feet or meters) (8)	RUNWAY VISUAL RANGE LONGLINE (meters) (8a)	PRESENT WEATHER LOCAL (9)	PRESENT WEATHER LONGLINE (9a)	SKY CONDITION (10)	TEMP (°C) (11)	DEW POINT (°C) (12)	ALTIMETER SETTING (inHg) (13)	REMARKS AND SUPPLEMENTAL CODED DATA (14)	STATION PRESSURE (inches) (22)	SEA LEVEL PRESSURE (inHg) (22a)	TOTAL SKY COVER (17)	OBSERVER'S INITIALS (15)
ME	0555	[redacted]				[redacted]								[redacted]					29.940	[redacted]	[redacted]	[redacted]
ME	0655	[redacted]												[redacted]					29.940			
ME	0755	[redacted]												[redacted]					29.930			
ME	0855	[redacted]												[redacted]					29.950			
ME	0955	[redacted]												[redacted]					29.960			
ME	1055	[redacted]												[redacted]					29.970			
ME	1155	[redacted]	3											[redacted]					29.980			
ME	1255	[redacted]	3											[redacted]					29.980			
ME	1355	[redacted]	3											[redacted]					29.970			
ME	1455	[redacted]	3											[redacted]					29.970			
ME	1555	[redacted]												[redacted]					29.950			
ME	1655	[redacted]												[redacted]					29.920			
ME	1755	[redacted]												[redacted]					29.900			
ME	1855	[redacted]												[redacted]					29.870			
ME	1955	[redacted]												[redacted]					29.840			
ME	2055	[redacted]												[redacted]					29.830			
ME	2155	[redacted]												[redacted]					29.820			
ME	2255	[redacted]												[redacted]					29.820			
ME	2355	[redacted]												[redacted]					29.810			
ME	0055	[redacted]												[redacted]					29.820			
ME	0155	[redacted]												[redacted]					29.800			
ME	0255	[redacted]												[redacted]					29.800			
ME	0355	[redacted]	00											[redacted]					29.800			
ME	0455	[redacted]	03											[redacted]					29.770		7	

SYNOPTIC DATA

TIME (UTC) (26)	TIME (LST) (27)	WD (28)	LOW CLOUD TYPE (29)	MID CLOUD TYPE (30)	HIGH CLOUD TYPE (31)	MAX TEMP (0.1°C) (32)	MIN TEMP (0.1°C) (33)	PRECIP (water equiv.) (34)	SNOW FALL (tenths) (35)	SNOW DEPTH (tenths) (36)
WD TO (LST)	WD TO	[redacted]								

STATION PRESSURE COMPUTATIONS

TIME (UTC) (41)				
STA PRESS (42)				
BAROGRAPH (43)				
BARR CORR (44)				

SUMMARY OF THE DAY (midnight to midnight)

24-HR MAX TEMP (0.1°C) (64)	24-HR MIN TEMP (0.1°C) (65)	24-HR PCPN (ins) (66)	24-HR SNOW FALL (ins) (67)
[redacted]		0	[redacted]
		24-HR SNOW DEPTH (ins) (68)	WATER EQUIVALENT (69)
		[redacted]	

PEAK WIND			FASTEST 2-MINUTE WIND		
SPEED	DEPTH	TIME	SPEED	DEPTH	TIME

ACTIVE RUNWAY

TIME (UTC)	RWY NO.	TIME (UTC)	RWY NO.

HOURLY CLIMATOLOGICAL DATA

TIME UTC LST (18)	DRY BULB TEMP 0.1°C (19)	WET BULB TEMP 0.1°C (20)	RH (%) (21)	STATION PRESSURE (ins) (22)	HOURLY PRECIP (ins) (25)	PRESSURE ALTITUDE (ft) (73)	DENSITY ALTITUDE (ft) (74)

FOR OFFICIAL USE ONLY METAR/SPECI

40°12'N 75°09'W | 335 | LST 05 HRS UTC HRS | DEG 012 DEG | DAY 23 | MONTH SEP | YEAR 1997 | ICAO KNXX | STATION (TYPE, NAME, LOCATION) NAVTRAMETOC DET WILLOWGROVE,PA

TYPE METAR SPECI (1)	DATE & TIME UTC LST (2)	WIND DIRECTION (true) (3)	WIND SPEED (knots) (4)	WIND GUST (knots) (5)	WIND VARIABILITY (true) (6)	VISIBILITY SURFACE (miles) (7)	VISIBILITY SURFACE (meters) (7a)	VISIBILITY TOWER (miles) (7b)	VISIBILITY TOWER (meters) (7c)	RUNWAY VISUAL RANGE LOCAL (feet or meters) (8)	RUNWAY VISUAL RANGE LONGLINE (meters) (8a)	PRESENT WEATHER LOCAL (9)	PRESENT WEATHER LONGLINE (9a)	SKY CONDITION (10)	TEMP (°C) (11)	DEW POINT (°C) (12)	ALTIMETER SETTING (inc) (13)	REMARKS AND SUPPLEMENTAL CODED DATA (14)	STATION PRESSURE (inches) (22)	SEA LEVEL PRESSURE (hPa) (23)	TOTAL SKY COVER (17)	OBSERVER INITIALS (15)
ME	0555	[redacted]																	29.750			
ME	0655	[redacted]																				
ME	0755	[redacted]																	29.740			
ME	0855	[redacted]																	29.710			
ME	0955	[redacted]																	29.700			
ME	1055	[redacted]																	29.680			
ME	1155	[redacted]																	29.680			
																			29.670			
ME	1255	[redacted]																				
ME	1355	[redacted]																	29.660			
ME	1455	[redacted]																	29.650			
ME	1555	[redacted]																	29.650			
SP	1634	[redacted]												-BHRA					29.640			
ME	1655	[redacted]												-RA					29.640			
SP	1724	[redacted]																	29.640			
ME	1755	[redacted]																	29.630			
																			29.620			
ME	1855	[redacted]																				
ME	1955	[redacted]																	29.590			
SP	2025	[redacted]												-SHRA					29.590			
ME	2056	[redacted]												-SHRA					29.600			
																			29.590			
ME	2155	[redacted]																				
ME	2255	[redacted]																	29.600			
ME	2355	[redacted]																	29.610			
																			29.610			
ME	0055	[redacted]																				
ME	0155	[redacted]																	29.640			
ME	0255	[redacted]																	29.660			
ME	0355	[redacted]																	29.670			
ME	0455	[redacted]																	29.680			
																			29.690			

SYNOPTIC DATA

TIME (UTC) (26)	TIME (LST) (27)	WD (28)	LOW CLOUD TYPE (29)	MID CLOUD TYPE (30)	HIGH CLOUD TYPE (31)	MAX TEMP (0.1°C) (32)	MIN TEMP (0.1°C) (33)	PRECIP (water equiv) (34)	SNOW FALL (ins) (35)	SNOW DEPTH (ins) (36)
MID TO (LST)	MID TO	[redacted]								
1	[redacted]									
2										

STATION PRESSURE COMPUTATIONS

TIME (UTC) (41)					
STA PRESS (42)					
BAROGRAPH (43)					
BARR CORR (44)					

SUMMARY OF THE DAY (midnight to midnight)

24-HR MAX TEMP (0.1°C) (64)	24-HR MIN TEMP (0.1°C) (65)	24-HR PCPN (ins) (66)	24-HR SNOW FALL (ins) (67)
[redacted]	[redacted]	T	[redacted]
		24-HR SNOW DEPTH (ins) (68)	EQUIVALENT (69)
		[redacted]	

PEAK WIND

SPEED	DRCTN	TIME	SPEED	DRCTN	TIME
[redacted]					

ACTIVE RUNWAY

TIME (UTC)	RNWY NO.	TIME (UTC)	RNWY NO.

HOURLY CLIMATOLOGICAL DATA

TIME UTC LST (18)	DRY BULB TEMP 0.1°C (19)	WET BULB TEMP 0.1°C (20)	RH (%) (21)	STATION PRESSURE (ins) (22)	HOURLY PRECI (ins) (25)	PRESSURE ALTITUDE (ft) (26)	DENSITY ALTITUDE (ft) (27)

METAR/SPECI | 40°12'N | 75°09' | +335 | UTC 05 HRS | 012 DEG | 24 | SEP | 1997 | KNXX | NAVTRAMETOC DET WILLOW GROVE, PA.

TYPE METAR SPECI (1)	DATE & TIME [ ] UTC [ ] LST (2)	WIND DIRECTION (true) (3)	WIND SPEED (knots) (4)	WIND GUST (knots) (5)	WIND VARIABILITY (true) (6)	VISIBILITY SURFACE (miles) (7)	VISIBILITY SURFACE (meters) (7a)	VISIBILITY TOWER (miles) (7b)	VISIBILITY TOWER (meters) (7c)	RUNWAY VISUAL RANGE LOCAL (feet or meters) (8)	RUNWAY VISUAL RANGE LONGLINE (meters) (8a)	PRESENT WEATHER LOCAL (9)	PRESENT WEATHER LONGLINE (9a)	SKY CONDITION (10)	TEMP (°C) (11)	DEW POINT (°C) (12)	ALTIMETER SETTING (ins) (13)	REMARKS AND SUPPLEMENTAL CODED DATA (14)	STATION PRESSURE (inches) (22)	SEA LEVEL PRESSURE (hPa) (22a)	TOTAL SKY COVER (17)	OBSERVER INITIALS (15)
ME	0555	[redacted]	[redacted]			[redacted]								[redacted]					29.700	[redacted]	[redacted]	[redacted]
ME	0655	[redacted]																	29.730			
ME	0755	[redacted]																	29.740			
ME	0855	[redacted]																	29.760			
ME	0955	[redacted]																	29.780			
ME	1055	[redacted]																	29.810			
ME	1155	[redacted]																	29.840			
ME	1255	[redacted]																	29.840			
ME	1355	[redacted]																	29.850			
ME	1455	[redacted]																	29.840			
ME	1555	[redacted]																	29.830			
ME	1655	[redacted]																	29.810			
ME	1755	[redacted]																	29.770			
ME	1855	[redacted]																	29.760			
ME	1955	[redacted]																	29.740			
ME	2055	[redacted]																	29.730			
ME	2155	[redacted]																	29.720			
ME	2255	[redacted]																	29.720			
ME	2355	[redacted]																	29.700			
ME	0055	[redacted]																	29.700			
ME	0155	[redacted]																	29.680			
ME	0255	[redacted]																	29.650			
ME	0355	[redacted]																	29.650			
ME	0455	[redacted]																	29.620			

SYNOPTIC DATA

TIME (UTC) (26)	TIME (LST) (27)	NO (28)	LOW CLOUD TYPE (29)	MID CLOUD TYPE (30)	HIGH CLOUD TYPE (31)	MAX TEMP (0.1°C) (32)	MIN TEMP (0.1°C) (33)	PRECIP (water equiv.) (34)	SNOW FALL (ins) (35)	SNOW DEPTH (ins) (36)
MID TO (LST)	MID TO	[redacted]								
0[redacted]		(1)	[redacted]							
115[redacted]		(2)								
17[redacted]		(3)								
23[redacted]		(4)								

STATION PRESSURE COMPUTATIONS

TIME (UTC) (41)				
STA PRESS (42)				
BAROGRAPH (43)				
BARR CORR (44)				

[redacted]

SUMMARY OF THE DAY (midnight to midnight)

24-HR MAX TEMP (0.1°C) (64)	24-HR MIN TEMP (0.1°C) (65)	24-HR PCPN (ins) (66)	24-HR SNOW FALL (ins) (67)
[redacted]		0	[redacted]
		24-HR SNOW DEPTH (ins) (68)	WATER EQUIVALENT (69)
		[redacted]	

PEAK WIND

SPEED (kts)	DRCTN (true)	TIME (UTC)	SPEED (kts)	DRCTN (true)	TIME (UTC)

ACTIVE RUNWAY

TIME (UTC)	RNWY NO	TIME (UTC)	RNWY NO.

HOURLY CLIMATOLOGICAL DATA

TIME [ ] UTC [ ] LST (18)	DRY BULB TEMP 0.1°C (19)	WET BULB TEMP 0.1°C (20)	RH (%) (21)	STATION PRESSURE (ins) (22)	HOURLY PRECIP (ins) (23)	PRESSURE ALTITUDE (ft) (23)	DENSITY ALTITUDE (ft) (24)

ARR DATE (OR MILITARY USE) METAR/SPECI | 110 12 N | 7509 W | 335 (1) MSL | LST 10 UTC 05 (2) HRS HRS | 0012 DEG DEG | 25 | SEP | 1997 | KNXX | NAVTRAHEIOC LET WILLOW GROVE PA

TYPE METAR SPECI (1)	DATE & TIME ‖ UTC LST (2)	WIND DIRECTION (true) (3)	WIND SPEED (knots) (4)	WIND GUST (knots) (5)	WIND VARIABILITY (true) (6)	VISIBILITY SURFACE (miles) (7)	VISIBILITY SURFACE (meters) (7a)	VISIBILITY TOWER (miles) (7b)	VISIBILITY TOWER (meters) (7c)	RUNWAY VISUAL RANGE LOCAL (feet or meters) (8)	RUNWAY VISUAL RANGE LONGLINE (meters) (8a)	PRESENT WEATHER LOCAL (9)	PRESENT WEATHER LONGLINE (9a)	SKY CONDITION (10)	TEMP (°C) (11)	DEW POINT (°C) (12)	ALTIMETER SETTING (ins) (13)	REMARKS AND SUPPLEMENTAL CODED DATA (14)	STATION PRESSURE (inches) (22)	SEA LEVEL PRESSURE (mBs) (22a)	TOTAL SKY COVER (17)	OBSERVER'S INITIALS (15)
ME	0055	[redacted]												[redacted]					29.570	[redacted]	[redacted]	JLK
ME	0155	[redacted]												[redacted]					29.570	[redacted]	[redacted]	[redacted]
ME	0255	[redacted]												[redacted]					29.550	[redacted]	[redacted]	[redacted]
ME	0355	[redacted]												[redacted]					29.530	[redacted]	[redacted]	[redacted]
ME	0455	[redacted]												[redacted]					29.510	[redacted]	[redacted]	[redacted]
ME	0555	[redacted]												[redacted]					29.500	[redacted]	[redacted]	[redacted]
ME	1155	[redacted]												[redacted]					29.50[illegible]	[redacted]	[redacted]	[redacted]
ME	1255	[redacted]												[redacted]					29.4[illegible]	[redacted]	[redacted]	[redacted]
ME	1355	[redacted]												[redacted]					29.470	[redacted]	[redacted]	[redacted]
ME	1455	[redacted]												[redacted]					29.450	[redacted]	[redacted]	[redacted]
ME	1555	[redacted]												[redacted]					29.430	[redacted]	[redacted]	[redacted]
ME	1655	[redacted]												[redacted]					29.390	[redacted]	[redacted]	[redacted]
ME	1755	[redacted]												[redacted]					29.350	[redacted]	[redacted]	[redacted]
ME	1855	[redacted]												[redacted]					29.310	[redacted]	[redacted]	[redacted]
ME	1955	[redacted]												[redacted]					29.290	[redacted]	[redacted]	[redacted]
ME	2055	[redacted]												[redacted]					29.270	[redacted]	[redacted]	[redacted]
ME	2155	[redacted]												[redacted]					29.270	[redacted]	[redacted]	[redacted]
ME	2255	[redacted]												[redacted]					29.280	[redacted]	[redacted]	[redacted]
ME	2355	[redacted]												[redacted]					29.300	[redacted]	[redacted]	[redacted]
ME	0055	[redacted]												[redacted]					29.300	[redacted]	[redacted]	[redacted]
ME	0155	[redacted]												[redacted]					29.310	[redacted]	[redacted]	[redacted]
ME	0255	[redacted]												[redacted]					29.310	[redacted]	[redacted]	[redacted]
ME	0355	[redacted]												[redacted]					29.320	[redacted]	[redacted]	[redacted]
ME	0455	[redacted]												SCT010	13	12	29.68	[redacted]	29.320	[redacted]	[redacted]	JLK

SYNOPTIC DATA

TIME (UTC) (26)	TIME (LST) (27)	RR (28)	LOW CLOUD TYPE (29)	MID CLOUD TYPE (30)	HIGH CLOUD TYPE (31)	MAX TEMP (0.1°C) (32)	MIN TEMP (0.1°C) (33)	PRECIP (water) (34)	SNOW FALL (ins) (35)	SNOW DEPTH (ins) (36)
GMT TO (LST)	GMT TO	[redacted]								

STATION PRESSURE COMPUTATIONS

TIME (UTC) (41)				
STA PRESS (42)				
BAROGRAPH (43)				
BARA CORR (44)				

SUMMARY OF THE DAY (midnight to midnight)

24-HR MAX TEMP (0.1°C) (64)	24-HR MIN TEMP (0.1°C) (65)	24-HR PCPN (ins) (66)	24-HR SNOW FALL (ins) (67)
[redacted]		0	[redacted]
		24-HR SNOW DEPTH (ins) (68)	WATER EQUIVALENT (69)
		[redacted]	

PEAK WIND SPEED (kts)	PEAK WIND DRCTN	PEAK WIND TIME (UTC)	FASTEST 2-MINUTE WIND SPEED (kts)	FASTEST 2-MINUTE WIND DRCTN (true)	FASTEST 2-MINUTE WIND TIME (UTC)
[redacted]					

ACTIVE RUNWAY

TIME (UTC)	RWY NO.	TIME (UTC)	RWY NO.

HOURLY CLIMATOLOGICAL DATA

TIME ‖ UTC ‖ LST (18)	DRY BULB TEMP 0.1°C (19)	WET BULB TEMP 0.1°C (20)	RH (%) (21)	STATION PRESSURE (ins) (22)	HOURLY PRECIP (ins) (25)	PRESSURE ALTITUDE (ft) (*)	DENSITY ALTITUDE (ft) (*)

METAR SPECI (1)	TIME UTC / LST (2)	DIRECTION (true) (3)	SPEED (knots) (4)	GUST (knots) (5)	VARIABILITY (true) (6)	SURFACE (miles) (7)	SURFACE (meters) (7a)	TOWER (miles) (7b)	TOWER (meters) (7c)	RUNWAY VISUAL RANGE LOCAL (feet or meters) (8)	RUNWAY VISUAL RANGE LONGLINE (meters) (8a)	WEATHER LOCAL (9)	WEATHER LONGLINE (9a)	(10)	(°C) (11)	POINT (°C) (12)	SETTING (ins) (13)	(14)	PRESSURE (inches) (22)	PRESSURE (hPa) (22a)	SKY COVER (16)	INITIALS (15)
ME	0555	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	18	[redacted]	[redacted]	29.320	[redacted]	[redacted]	[redacted]
ME	0655	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.340	[redacted]	[redacted]	[redacted]
ME	0755	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.350	[redacted]	[redacted]	[redacted]
ME	0855	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.360	[redacted]	[redacted]	[redacted]
ME	0955	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.390	[redacted]	[redacted]	[redacted]
ME	1055	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.450	[redacted]	[redacted]	[redacted]
ME	1155	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.440	[redacted]	[redacted]	[redacted]
ME	1255	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.420	[redacted]	[redacted]	[redacted]
ME	1355	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.480	[redacted]	[redacted]	[redacted]
ME	1455	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.500	[redacted]	[redacted]	[redacted]
ME	1555	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.510	[redacted]	[redacted]	[redacted]
ME	1655	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.500	[redacted]	[redacted]	[redacted]
ME	1755	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.510	[redacted]	[redacted]	[redacted]
ME	1855	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.510	[redacted]	[redacted]	[redacted]
ME	1955	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.530	[redacted]	[redacted]	[redacted]
ME	2055	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.530	[redacted]	[redacted]	[redacted]
ME	2155	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.560	[redacted]	[redacted]	[redacted]
ME	2255	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.590	[redacted]	[redacted]	[redacted]
ME	2355	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.600	[redacted]	[redacted]	[redacted]
ME	0055	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.640	[redacted]	[redacted]	[redacted]
ME	0155	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.660	[redacted]	[redacted]	[redacted]
ME	0255	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.680	[redacted]	[redacted]	[redacted]
ME	0355	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.710	[redacted]	[redacted]	[redacted]
ME	0455	[redacted]	[redacted]			[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.720	[redacted]	[redacted]	[redacted]

SYNOPTIC DATA

TIME (UTC) (26)	TIME (LST) (27)	NO (28)	LOW CLOUD TYPE (29)	MID CLOUD TYPE (30)	HIGH CLOUD TYPE (31)	MAX TEMP (0.1°C) (32)	MIN TEMP (0.1°C) (33)	PRECIP (water equiv.) (34)	SNOW FALL (ins) (35)	SNOW DEPTH (ins) (36)
MID TO (LST)	MID TO	[redacted]								
[redacted]	[redacted]	[redacted]								
[redacted]	[redacted]	[redacted]								
[redacted]	[redacted]	[redacted]								
(LST)	MID (LST)	[redacted]								

REMARKS NOTED ON REVERSE OF CHECKLIST

STATION PRESSURE COMPUTATIONS

TIME (UTC) (41)				
STA PRESS (42)				
BAROGRAPH (43)				
BARR CORR (44)				

[redacted]

SUMMARY OF THE DAY (yesterday to yesterday)

24-HR MAX TEMP (0.1°C) (64)	24-HR MIN TEMP (0.1°C) (65)	24-HR PCPN (ins) (66)	24-HR SNOW FALL (ins) (67)
[redacted]		0	[redacted]
		24-HR SNOW DEPTH (ins) (68)	WATER EQUIVALENT (69)
		[redacted]	

PEAK WIND SPEED (kts) (48)	PEAK WIND DRCTN (true) (49)	PEAK WIND TIME (UTC) (50)	FASTEST 2-MINUTE WIND SPEED (kts) (51)	FASTEST 2-MINUTE WIND DRCTN (true) (52)	FASTEST 2-MINUTE WIND TIME (UTC) (53)
[redacted]					

ACTIVE RUNWAY

TIME (UTC)	RWY NO.	TIME (UTC)	RWY NO

HOURLY CLIMATOLOGICAL DATA

TIME UTC / LST (18)	DRY BULB TEMP 0.1°C (19)	WET BULB TEMP 0.1°C (20)	RH (%) (21)	STATION PRESSURE (ins) (22)	HOURLY PRECP (ins) (23)	PRESSURE ALTITUDE (ft) (23)	DENSITY ALTITUDE (ft) (24)

TYPE METAR SPECI (1)	DATE & TIME (2)	WIND DIRECTION (true) (3)	WIND SPEED (knots) (4)	WIND GUST (knots) (5)	WIND VARIABILITY (true) (6)	VISIBILITY SURFACE (miles) (7)	VISIBILITY SURFACE (meters) (7a)	VISIBILITY TOWER (miles) (7b)	VISIBILITY TOWER (meters) (7c)	RUNWAY VISUAL RANGE LOCAL (feet or meters) (8)	RUNWAY VISUAL RANGE LONGLINE (meters) (8a)	PRESENT WEATHER LOCAL (9)	PRESENT WEATHER LONGLINE (9a)	SKY CONDITION (10)	TEMP (°C) (11)	DEW POINT (°C) (12)	ALTIMETER SETTING (ins) (13)	REMARKS / RD SUPPLEMENTAL CODED DATA (14)	STATION PRESSURE (inches) (22)	SEA LEVEL PRESSURE (hPa) (22a)	AO SKY OVER (17)	REMARKS INITIALS (15)
ME	0555	[redacted]												[redacted]	[redacted]			[redacted]	29.720	[redacted]	[redacted]	[redacted]
ME	0655	[redacted]												[redacted]	[redacted]			[redacted]	29.730	[redacted]	[redacted]	[redacted]
ME	0755	[redacted]												[redacted]	[redacted]			[redacted]	29.730	[redacted]	[redacted]	[redacted]
ME	0855	[redacted]												[redacted]	[redacted]			[redacted]	29.720	[redacted]	[redacted]	[redacted]
ME	0955	[redacted]												[redacted]	[redacted]			[redacted]	29.730	[redacted]	[redacted]	[redacted]
ME	1055	[redacted]												[redacted]	[redacted]			[redacted]	29.740	[redacted]	[redacted]	[redacted]
ME	1155	[redacted]												[redacted]	[redacted]			[redacted]	29.760	[redacted]	[redacted]	[redacted]
ME	1255	[redacted]												[redacted]	[redacted]			[redacted]	29.770	[redacted]	[redacted]	[redacted]
ME	1355	[redacted]												[redacted]	[redacted]			[redacted]	29.780	[redacted]	[redacted]	[redacted]
ME	1455	[redacted]												[redacted]	[redacted]			[redacted]	29.790	[redacted]	[redacted]	[redacted]
ME	1555	[redacted]												[redacted]	[redacted]			[redacted]	29.790	[redacted]	[redacted]	[redacted]
ME	1655	[redacted]												[redacted]	[redacted]			[redacted]	29.780	[redacted]	[redacted]	[redacted]
ME	1755	[redacted]												[redacted]	[redacted]			[redacted]	29.770	[redacted]	[redacted]	[redacted]
ME	1855	[redacted]												[redacted]	[redacted]			[redacted]	29.750	[redacted]	[redacted]	[redacted]
ME	1955	[redacted]												[redacted]	[redacted]			[redacted]	29.740	[redacted]	[redacted]	[redacted]
ME	2055	[redacted]												[redacted]	[redacted]			[redacted]	29.730	[redacted]	[redacted]	[redacted]
ME	2155	[redacted]												[redacted]	[redacted]			[redacted]	29.720	[redacted]	[redacted]	[redacted]
ME	2255	[redacted]												[redacted]	[redacted]			[redacted]	29.720	[redacted]	[redacted]	[redacted]
ME	2355	[redacted]												[redacted]	[redacted]			[redacted]	29.720	[redacted]	[redacted]	[redacted]
ME	0055	[redacted]												[redacted]	[redacted]			[redacted]	29.740	[redacted]	[redacted]	[redacted]
ME	0155	[redacted]												[redacted]	[redacted]			[redacted]	29.750	[redacted]	[redacted]	[redacted]
ME	0255	[redacted]												[redacted]	[redacted]			[redacted]	29.750	[redacted]	[redacted]	[redacted]
ME	0355	[redacted]												[redacted]	[redacted]			[redacted]	29.750	[redacted]	[redacted]	[redacted]
ME	0455	[redacted]												[redacted]	[redacted]			[redacted]	29.750	[redacted]	[redacted]	[redacted]
																		[redacted]	29.730	[redacted]	[redacted]	[redacted]

SYNOPTIC DATA

TIME (UTC) (26)	TIME (LST) (27)	WD (28)	LOW CLOUD TYPE (29)	MID CLOUD TYPE (30)	HIGH CLOUD TYPE (31)	MAX TEMP (0.1°C) (32)	MIN TEMP (0.1°C) (33)	PRECIP (water equiv.) (34)	SNOW FALL (ins) (35)	SNOW DEPTH (ins) (36)
WD TO (LST)	WD TO	[redacted]								
[redacted]										
WD (LST)	WD (LST)									

STATION PRESSURE COMPUTATIONS

TIME (UTC) (41)					
STA PRESS (42)					
BAROGRAPH (43)					
BARR CORR (44)					
[redacted]					

SUMMARY OF THE DAY (midnight to midnight)

24-HR MAX TEMP (0.1°C) (51)	24-HR MIN TEMP (0.1°C) (52)	24-HR PCPN (ins) (60)	24-HR SNOW FALL (ins) (67)
[redacted]	[redacted]	0	[redacted]
		24-HR SNOW DEPTH (ins) (68)	WATER EQUIVALENT (69)
		[redacted]	

PEAK WIND SPEED (kts)	PEAK WIND DRCTN (true)	PEAK WIND TIME (UTC)	FASTEST 2-MINUTE WIND SPEED (kts) (51)	FASTEST 2-MINUTE WIND DRCTN (true) (52)	FASTEST 2-MINUTE WIND TIME (UTC) (53)
[redacted]					

ACTIVE RUNWAY

TIME (UTC)	RWY NO.	TIME (UTC)	RWY NO

HOURLY CLIMATOLOGICAL DATA

TIME (UTC) (LST) (18)	DRY BULB TEMP 0.1°C (19)	WET BULB TEMP 0.1°C (20)	RH (%) (21)	STATION PRESSURE (ins) (22)	HOURLY PRECIP (ins) (25)	PRESSURE ALTITUDE (ft) (*5)	DENSITY ALTITUDE (ft) (*6)

TYPE METAR SPECI (1)	DATE & TIME UTC LST (2)	WIND DIRECTION (true) (3)	WIND SPEED (knots) (4)	WIND GUST (knots) (5)	WIND VARIABILITY (true) (6)	VISIBILITY SURFACE (miles) (7)	VISIBILITY SURFACE (meters) (7a)	VISIBILITY TOWER (miles) (7b)	VISIBILITY TOWER (meters) (7c)	RUNWAY VISUAL RANGE LOCAL (feet or meters) (8)	RUNWAY VISUAL RANGE LONGLINE (meters) (8a)	PRESENT WEATHER LOCAL (9)	PRESENT WEATHER LONGLINE (9a)	SKY CONDITION (10)	TEMP (°C) (11)	DEW POINT (°C) (12)	ALTIMETER SETTING (ins) (13)	REMARKS AND SUPPLEMENTAL CODED DATA (14)	STATION PRESSURE (inches) (22)	SEA LEVEL PRESSURE (mb) (24)	TOTAL SKY COVER (17)	OBSERVER INITIALS (15)
ME	0555	[redacted]	05			[redacted]								[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.770	[redacted]	[redacted]	[redacted]
ME	0655	[redacted]																	29.700			
ME	0755																		29.700			
SP	0837																		29.700			
ME	0855																		29.700			
ME	0955																		29.680			
ME	1055																		29.660			
ME	1155																		29.660			
ME	1255																		29.660			
SP	1346																		29.670			
ME	1355																		29.660			
ME	1455																		29.610			
ME	1555																		29.610			
ME	1655																		29.570			
ME	1755																		29.560			
ME	1855																		29.500			
ME	1955																		29.470			
ME	2055																		29.440			
SP	2139											-RA							29.400			
ME	2155											-RA							29.400			
ME	2255											-RA							29.360			
ME	2355											-RA							29.310			
ME	0055											-RA							29.280			
ME	0155											-RA							29.230			
ME	0255											-RA							29.180			
ME	0355											-RA							29.130			
ME	0455																29.41		29.050			

SYNOPTIC DATA

TIME (UTC) (26)	TIME (LST) (27)	WD (28)	LOW CLOUD TYPE (29)	MID CLOUD TYPE (30)	HIGH CLOUD TYPE (31)	MAX TEMP (0.1°C) (32)	MIN TEMP (0.1°C) (33)	PRECIP (water equiv) (34)	SNOW FALL (ins) (35)	SNOW DEPTH (ins) (36)
MID TO (LST)	MID TO	[redacted]								
[redacted]										
MID (LST)	MID (LST)									

STATION PRESSURE COMPUTATIONS

TIME (UTC) (41)				
STA PRESS (42)				
BAROGRAPH (43)				
BARR CORR (44)				

SUMMARY OF THE DAY (midnight to midnight)

24-HR MAX TEMP (0.1°C) (45)	24-HR MIN TEMP (0.1°C) (46)	24-HR PCPN (ins) (48)	24-HR SNOW FALL (ins) (47)
[redacted]	[redacted]	.29	[redacted]
		24-HR SNOW DEPTH (ins) (49)	WATER EQUIVALENT (50)
		[redacted]	

PEAK WIND SPEED (kts) (48)	PEAK WIND DRCTN (true) (49)	PEAK WIND TIME (UTC) (50)	FASTEST [redacted] SPEED (kts) (51)	FASTEST [redacted] DRCTN (true) (52)	FASTEST [redacted] TIME (UTC) (53)
[redacted]					

ACTIVE RUNWAY

TIME (UTC)	RNWY NO.	TIME (UTC)	RNWY NO.

HOURLY CLIMATOLOGICAL DATA

TIME (LST) (18)	DRY BULB TEMP 0.1°C (19)	WET BULB TEMP 0.1°C (20)	RH (%) (21)	STATION PRESSURE (ins) (22)	HOURLY PRECIP (ins) (23)	PRESSURE ALTITUDE (ft) (73)	DENSITY ALTITUDE (ft) (74)

METAR SPECI | 41 | 2N | 15 | 325 | UTC | HRS | DEG | 27 | SEP | 1997 | KNXX | NAVIGATION [illegible]

TYPE METAR SPECI (1)	DATE & TIME ☐ UTC ☐ LST (2)	WIND DIRECTION (true) (3)	WIND SPEED (knots) (4)	WIND GUST (knots) (5)	WIND VARIABILITY (true) (6)	VISIBILITY SURFACE (miles) (7)	VISIBILITY SURFACE (meters) (7a)	VISIBILITY TOWER (miles) (7b)	VISIBILITY TOWER (meters) (7c)	RUNWAY VISUAL RANGE LOCAL (feet or meters) (8)	RUNWAY VISUAL RANGE LONGLINE (meters) (8a)	PRESENT WEATHER LOCAL (9)	PRESENT WEATHER LONGLINE (9a)	SKY CONDITION (10)	TEMP (°C) (11)	DEW POINT (°C) (12)	ALTIMETER SETTING (ins) (13)	REMARKS AND SUPPLEMENTAL CODED DATA (14)	STATION PRESSURE (inches) (22)	SEA LEVEL PRESSURE (ins)	TOTAL SKY COVER (18)	OBSERVER INITIALS (15)
ME	0055	[redacted]				[redacted]						[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29.000	[redacted]		[redacted]
ME	[illegible]	[redacted]										-RZ	[redacted]						28.92[illegible]			
[illegible]	[illegible]	[redacted]										-RZ							28.92[illegible]			
[illegible]	[illegible]	[redacted]																	28.920			
ME	0955	[redacted]																	28.930			
SP	1030	[redacted]										-DZ	[redacted]						28.950			
ME	1055	[redacted]										-DZ							28.970			
ME	1155	[redacted]																	28.990			
ME	1255	[redacted]																	29.010			
ME	1305	[redacted]																	29.030			
ME	1455	[redacted]																	29.060			
ME	1555	[redacted]																	29.100			
ME	1655	[redacted]																	29.100			
ME	1755	[redacted]																	29.100			
ME	1855	[redacted]																	29.090			
ME	1955	[redacted]																	29.090			
ME	2055	[redacted]																	29.090			
ME	2155	[redacted]																	29.090			
ME	2255	[redacted]																	29.110			
ME	2355	[redacted]																	29.140			
ME	0055	[redacted]																	29.150			
ME	0155	[redacted]																	29.150			
ME	0255	[redacted]																	29.150			
ME	0355	[redacted]																	29.140			
ME	0455	[redacted]																	29.110			

SYNOPTIC DATA

TIME (UTC) (26)	TIME (LST) (27)	WD (28)	LOW CLOUD TYPE (29)	MID CLOUD TYPE (30)	HIGH CLOUD TYPE (31)	MAX TEMP (0.1°C) (32)	MIN TEMP (0.1°C) (33)	PRECIP (water equiv.) (34)	SNOW FALL (ins) (35)	SNOW DEPTH (ins) (36)
WND TO (LST)	WND TO									
[redacted]										

STATION PRESSURE COMPUTATIONS

TIME (UTC) (41)				
STA PRESS (42)				
BAROGRAPH (43)				
BARR CORR (44)				

SUMMARY OF THE DAY (midnight to midnight)

24-HR MAX TEMP (0.1°C) (64)	24-HR MIN TEMP (0.1°C) (65)	24-HR PCPN (ins) (66)	24-HR SNOW FALL (ins) (67)
[redacted]	[redacted]	.05	[redacted]
		24-HR SNOW DEPTH (ins) (68)	WATER EQUIVALENT (69)
		[redacted]	

PEAK WIND

SPEED (kts)	DRCTN (true)	TIME (UTC)
[redacted]		

ACTIVE RUNWAY

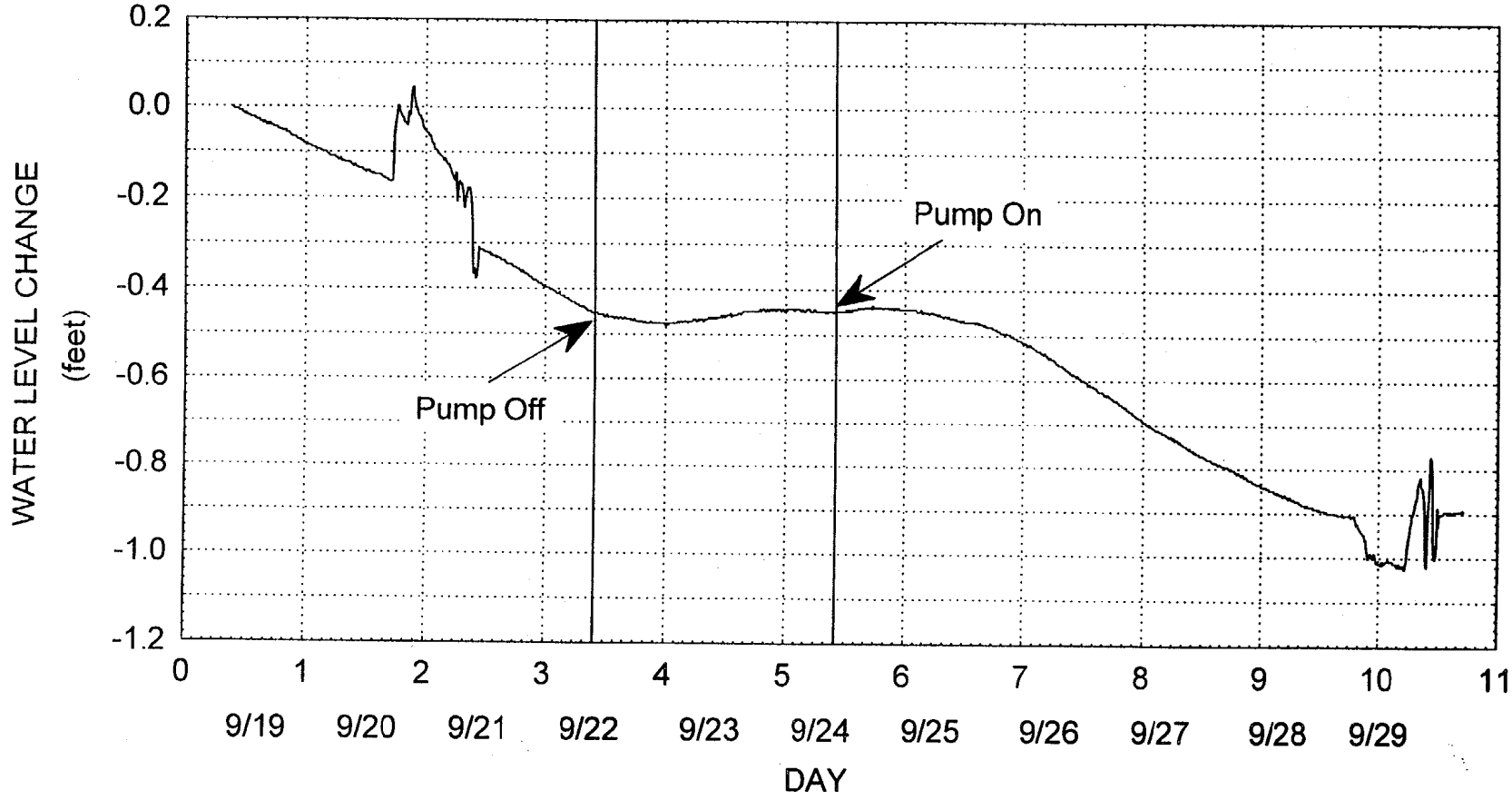
TIME (UTC)	RNWY NO	TIME (UTC)	RNWY NO

HOURLY CLIMATOLOGICAL DATA

TIME ☐ UTC ☐ LST (18)	DRY BULB TEMP 0.1°C (19)	WET BULB TEMP 0.1°C (20)	RH (%) (21)	STATION PRESSURE (ins) (22)	HOURL PRECP (ins) (23)	PRESSURE ALTITUDE (ft) (24)	DENSITY ALTITUDE (ft) (25)

ATTACHMENT C
WATER LEVEL GRAPHS

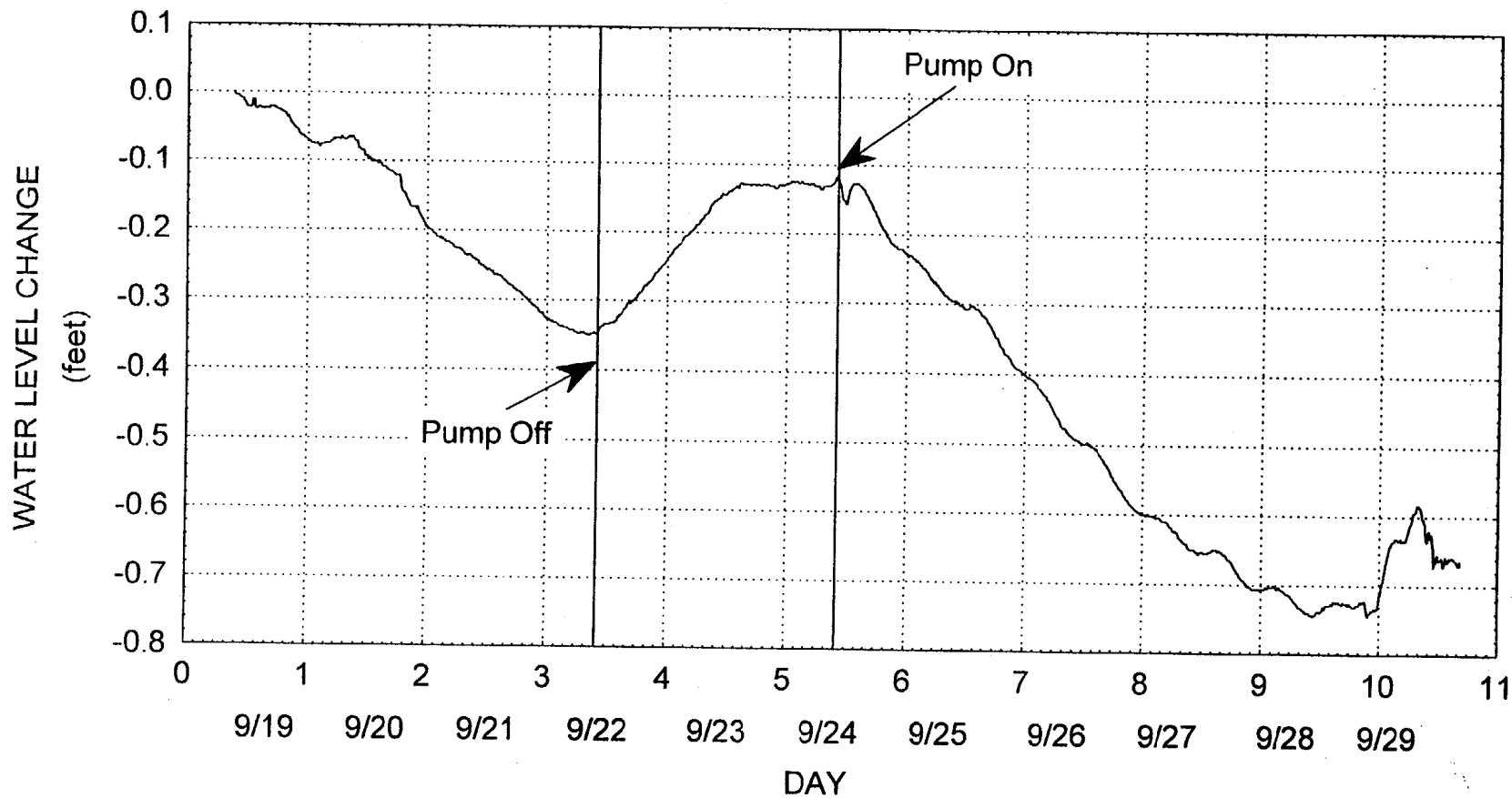
HN11-S
NAVAL AIR WARFARE CENTER
WARMINSTER, PENNSYLVANIA



HN11-I

NAVAL AIR WARFARE CENTER

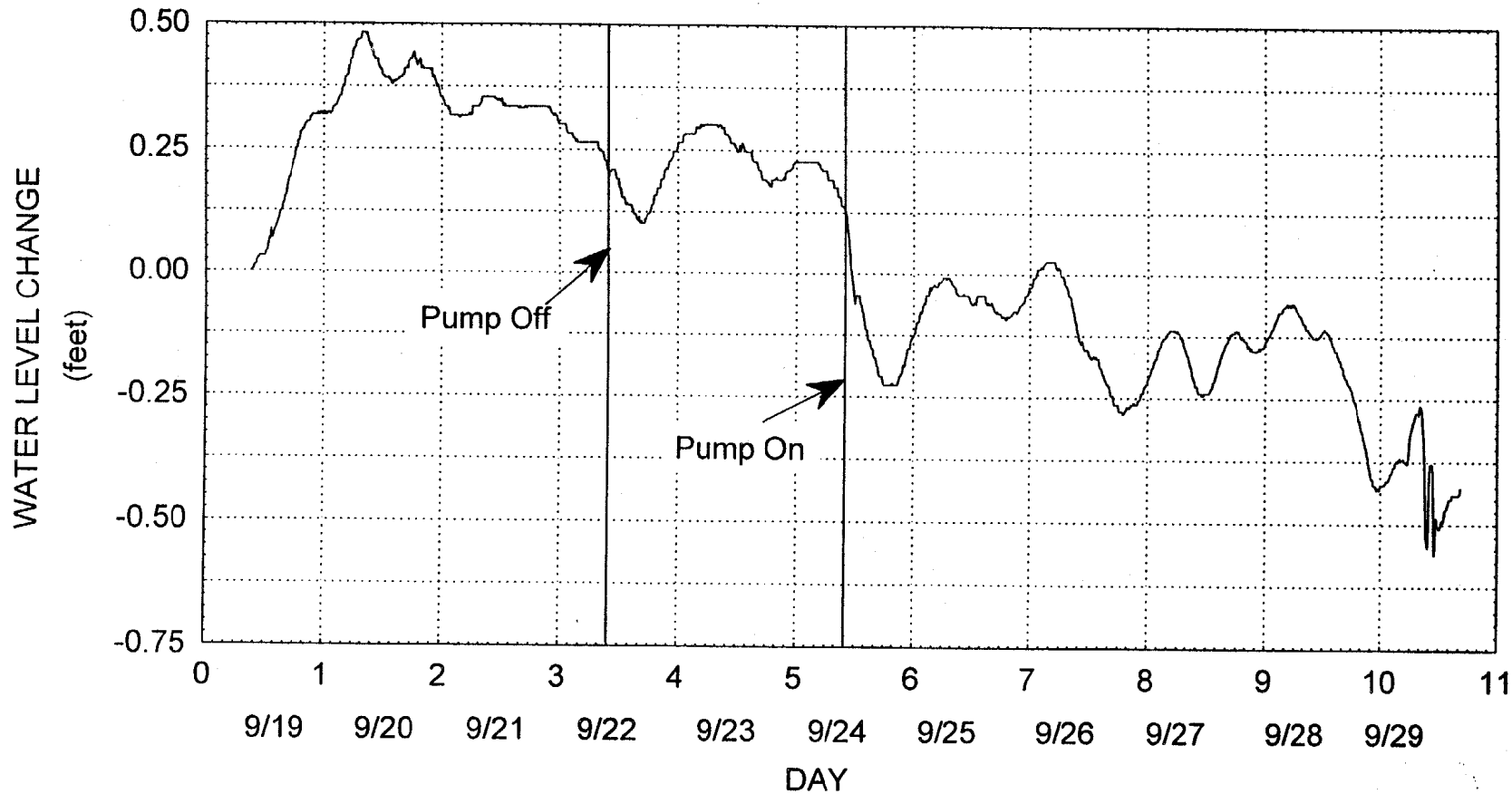
WARMINSTER, PENNSYLVANIA



HN11-D

NAVAL AIR WARFARE CENTER

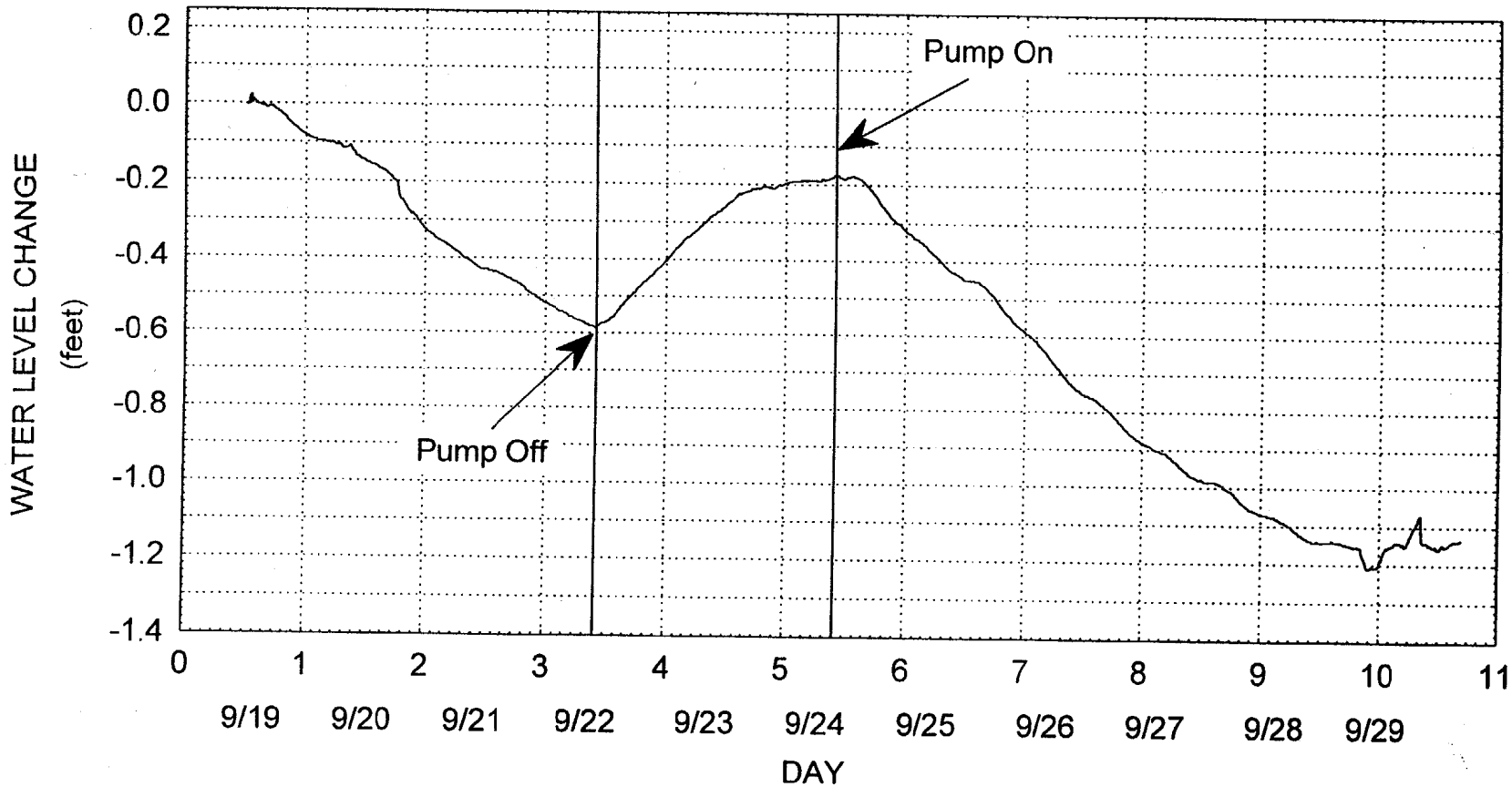
WARMINSTER, PENNSYLVANIA



HN14-I

NAVAL AIR WARFARE CENTER

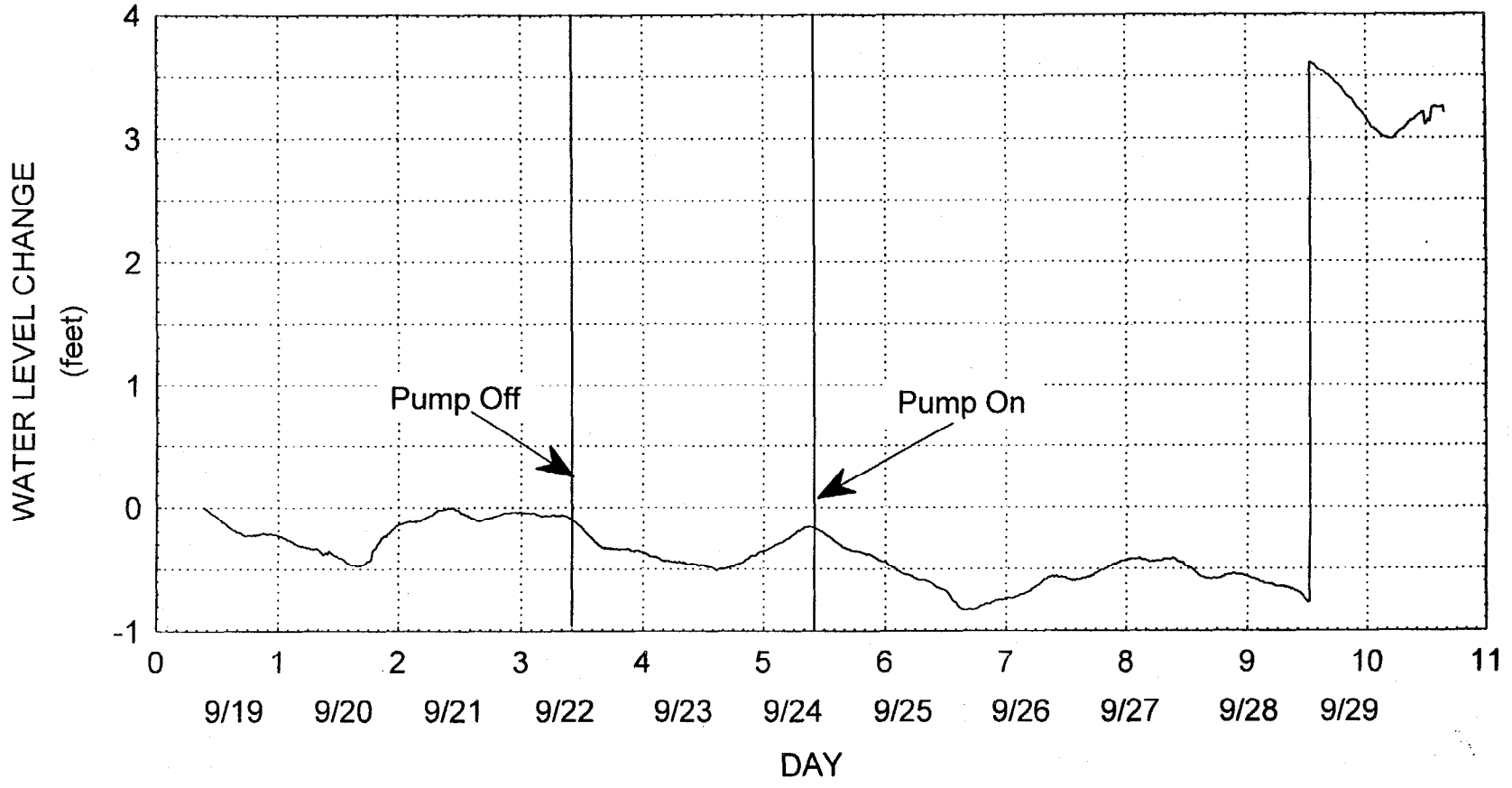
WARMINSTER, PENNSYLVANIA



HN15-I

NAVAL AIR WARFARE CENTER

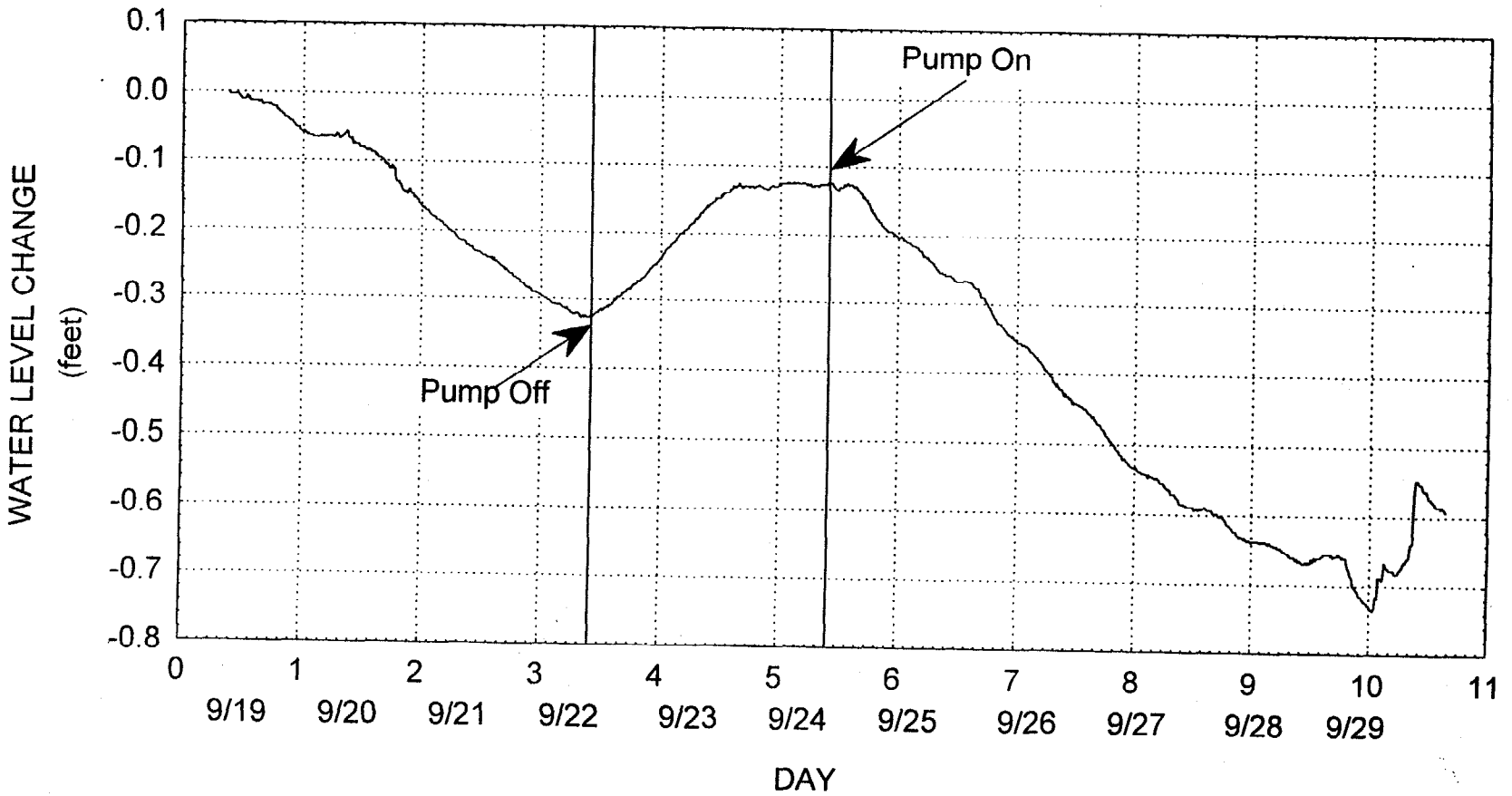
WARMINSTER, PENNSYLVANIA



HN15-S

NAVAL AIR WARFARE CENTER

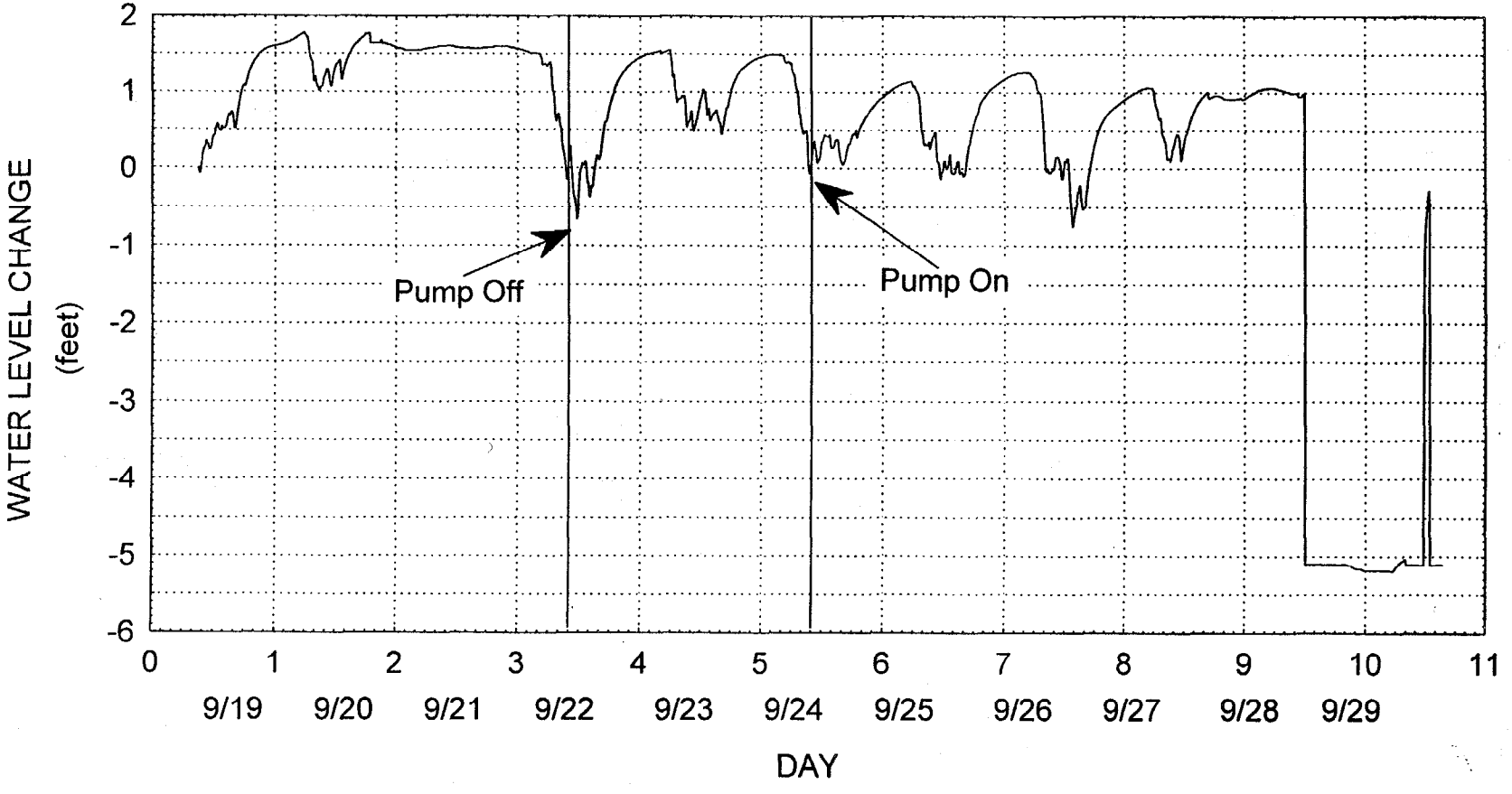
WARMINSTER, PENNSYLVANIA



HN15-D

NAVAL AIR WARFARE CENTER

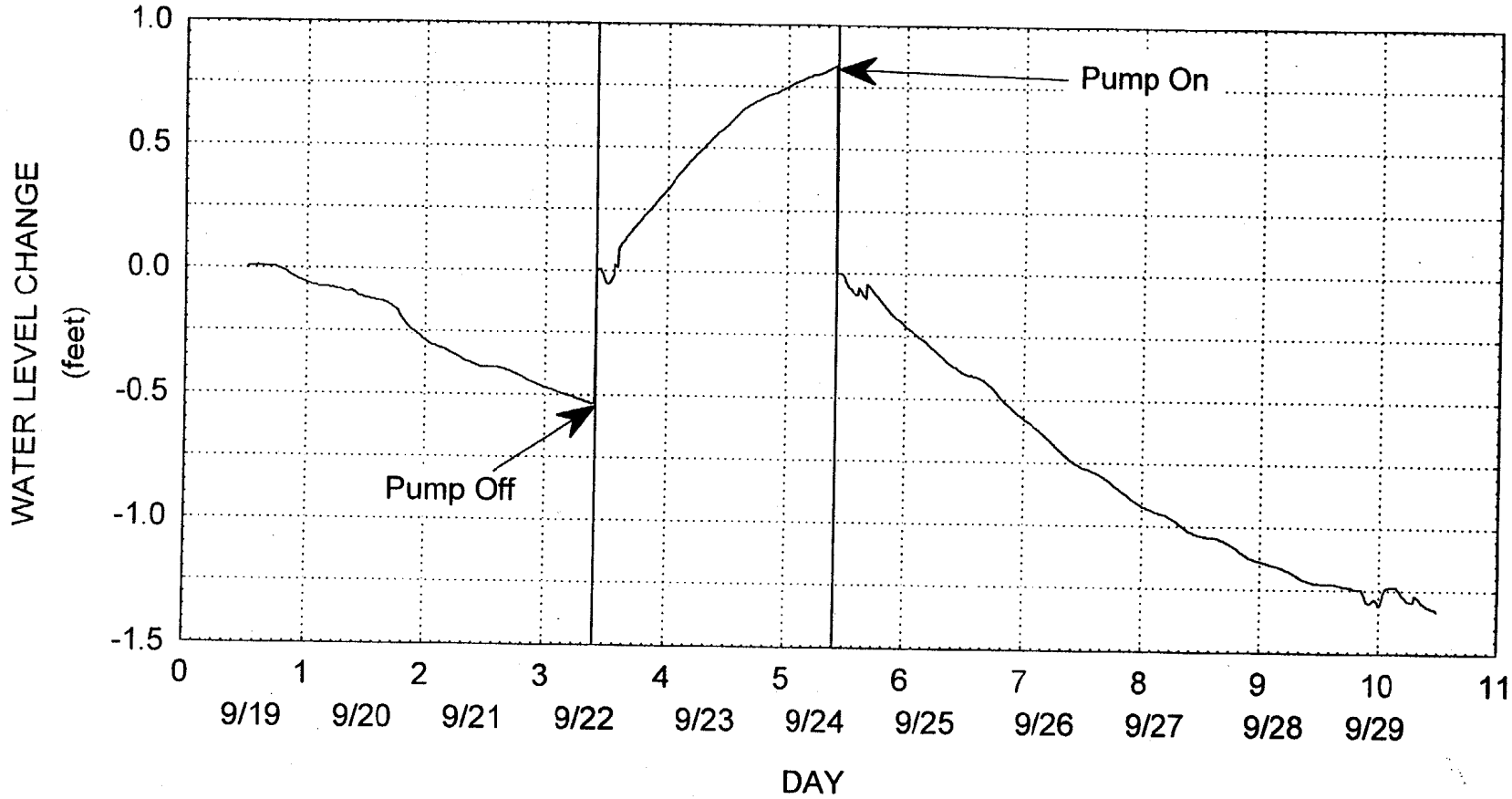
WARMINSTER, PENNSYLVANIA



HN16-S

NAVAL AIR WARFARE CENTER

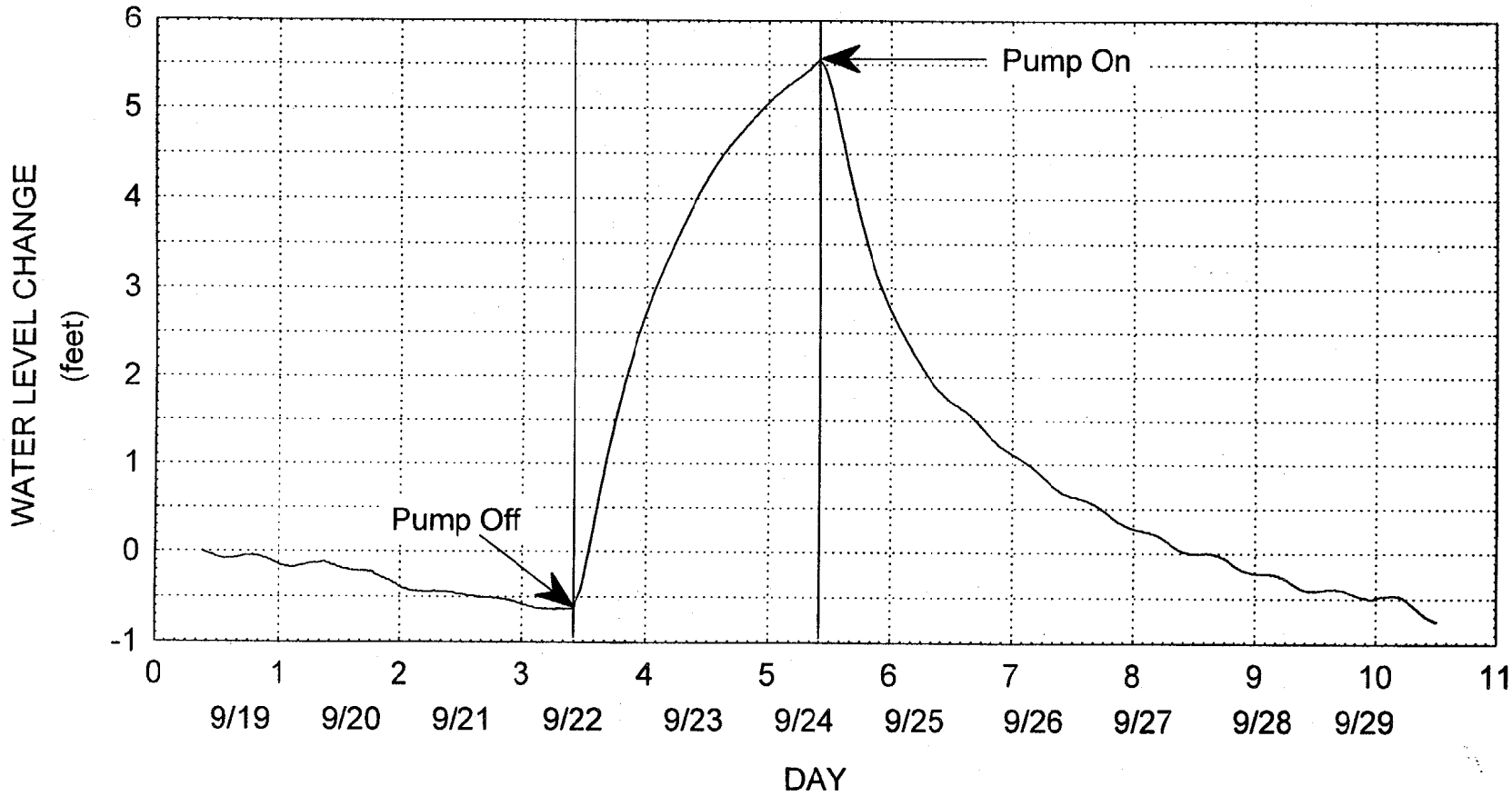
WARMINSTER, PENNSYLVANIA



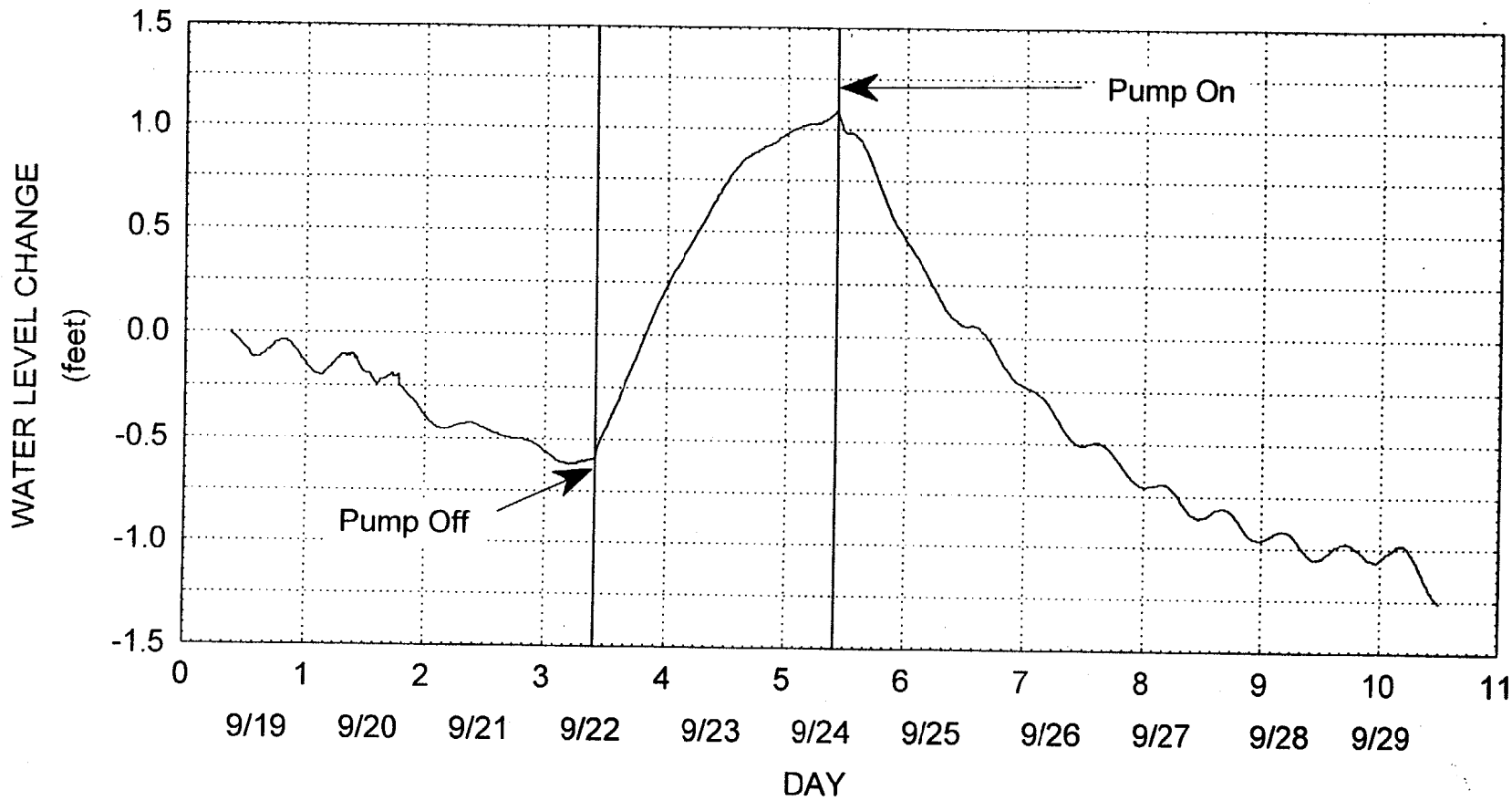
HN16-I

NAVAL AIR WARFARE CENTER

WARMINSTER, PENNSYLVANIA



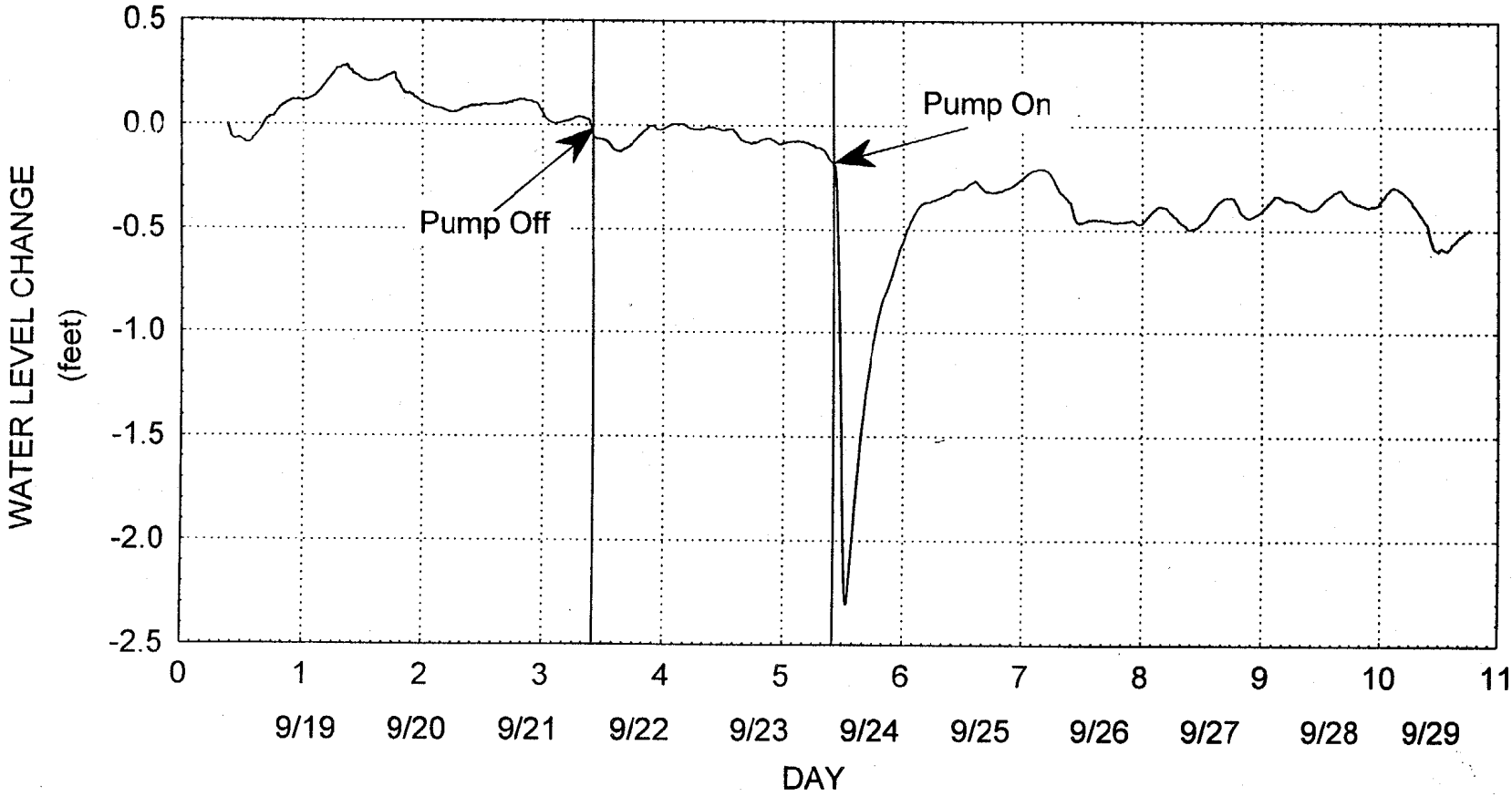
HN16-D
NAVAL AIR WARFARE CENTER
WARMINSTER, PENNSYLVANIA



HN17-I

NAVAL AIR WARFARE CENTER

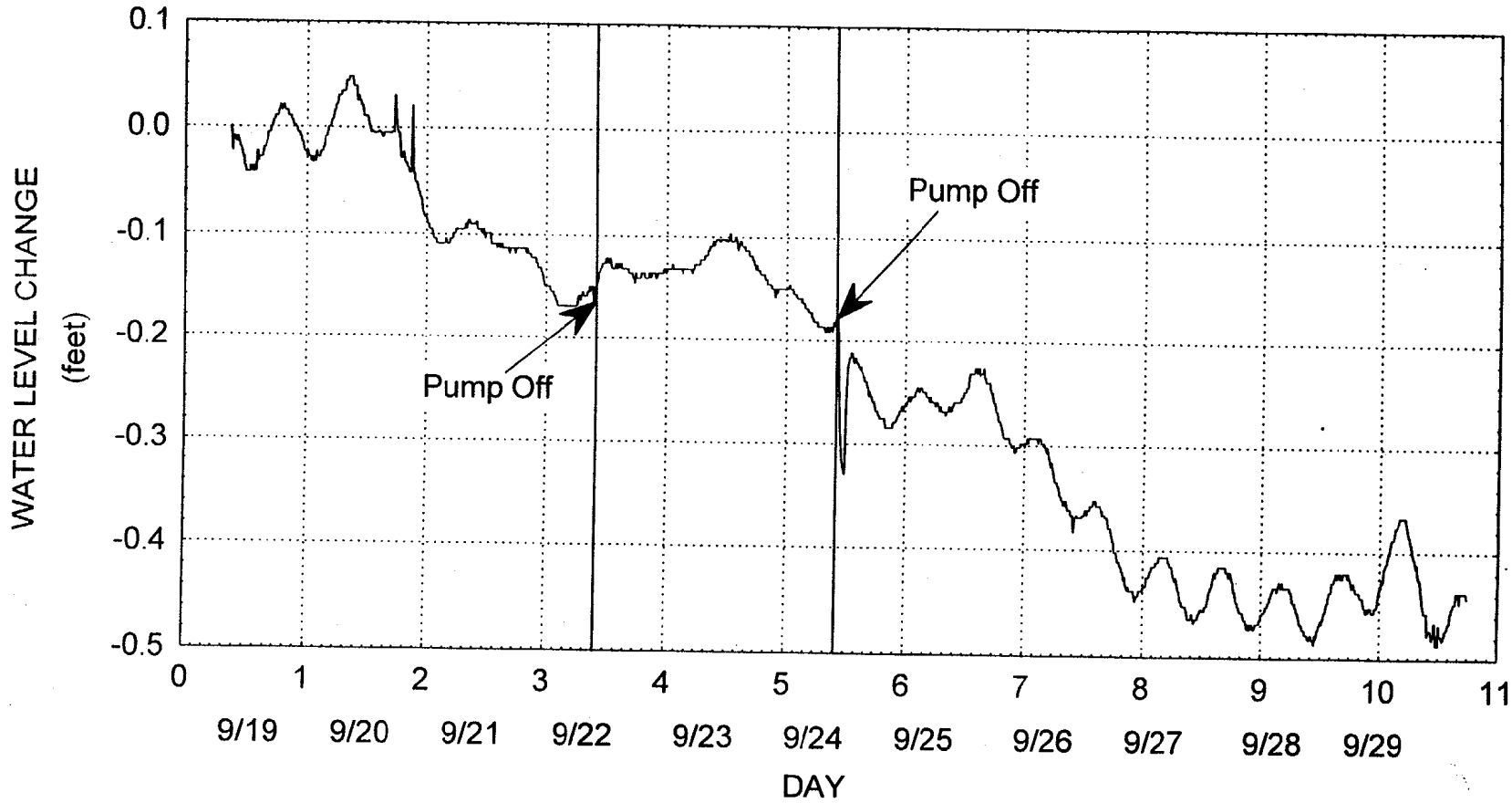
WARMINSTER, PENNSYLVANIA



HN17-S

NAVAL AIR WARFARE CENTER

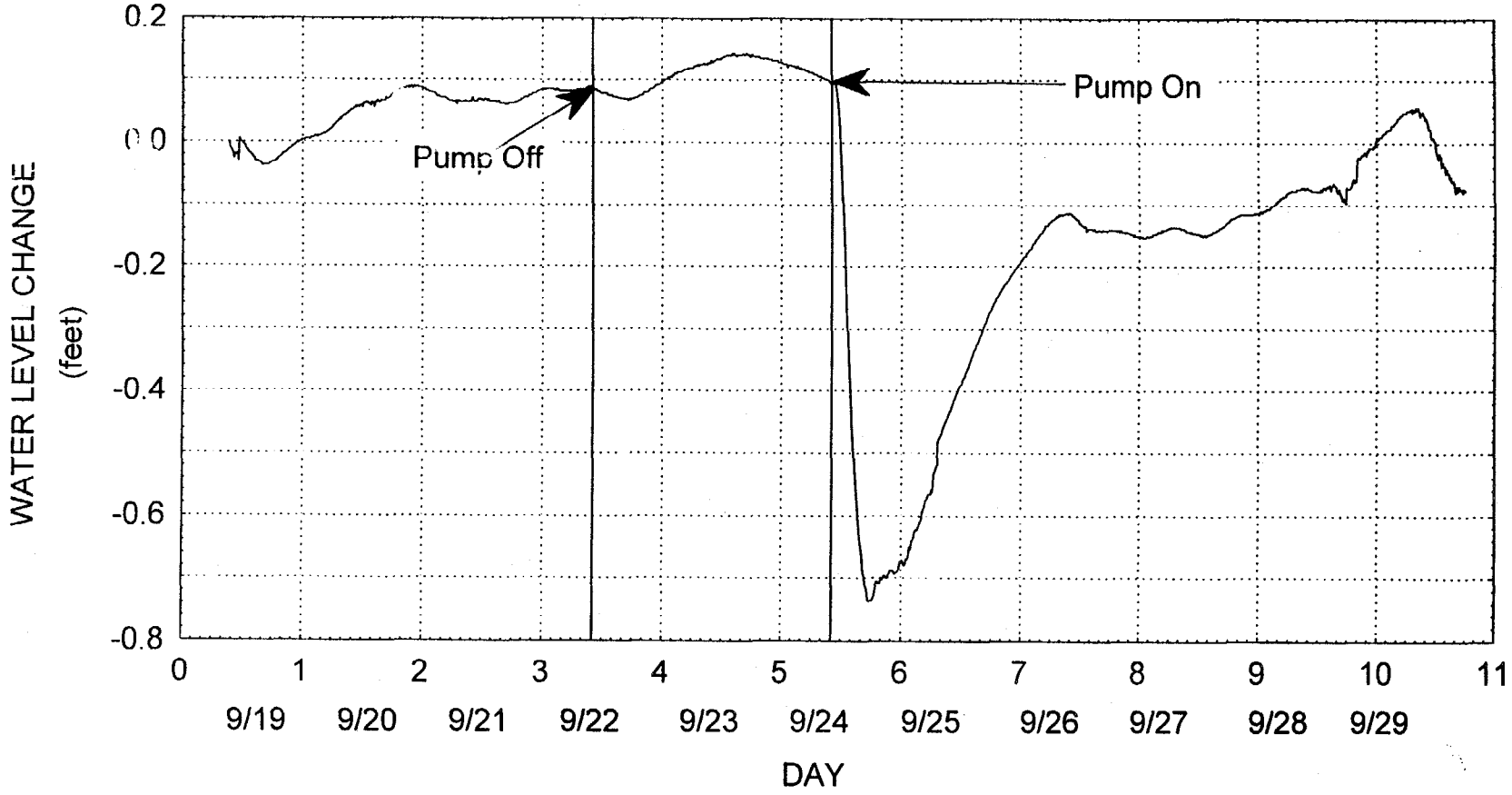
WARMINSTER, PENNSYLVANIA



HN17-D

NAVAL AIR WARFARE CENTER

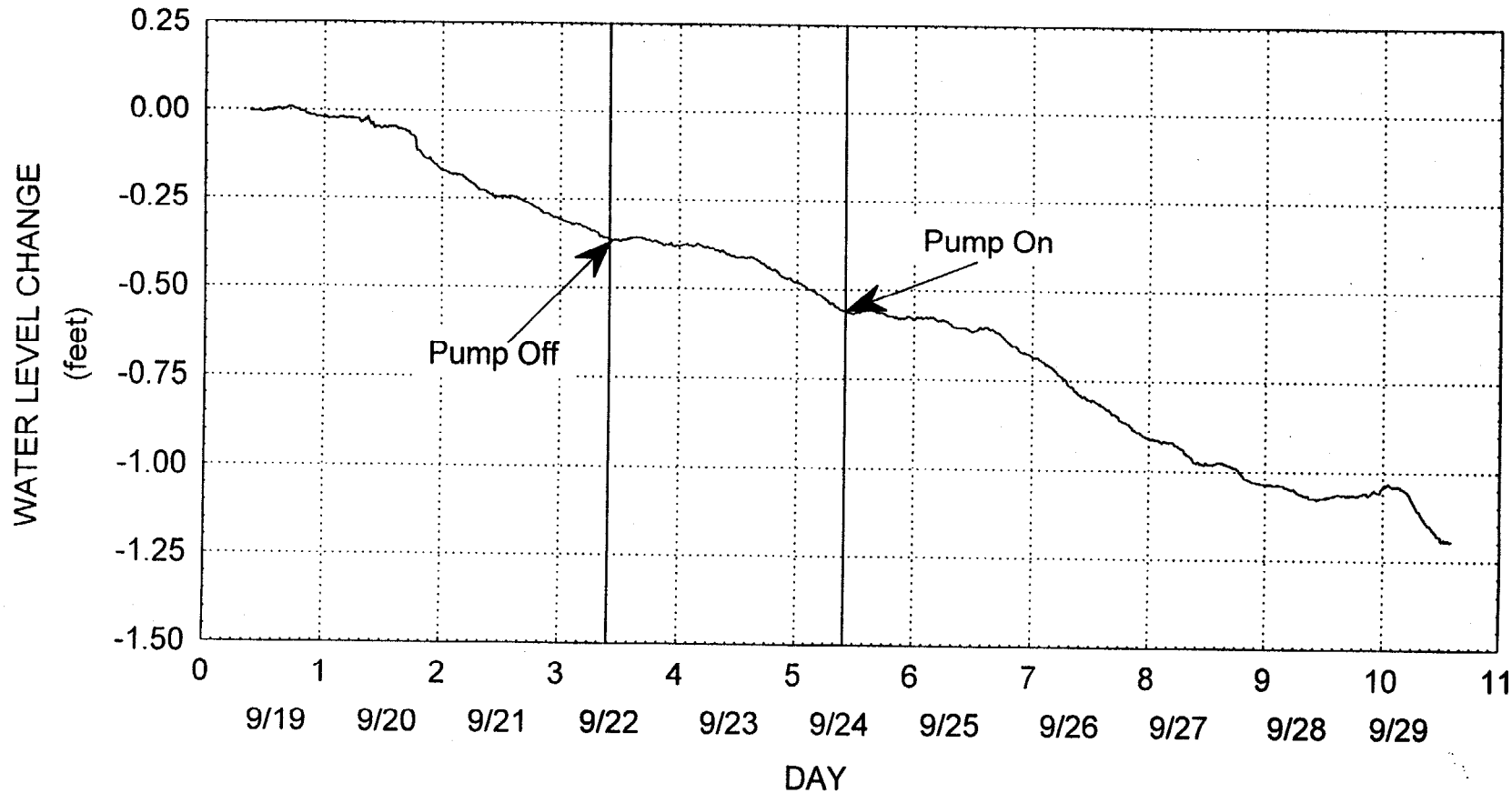
WARMINSTER, PENNSYLVANIA



HN22-S

NAVAL AIR WARFARE CENTER

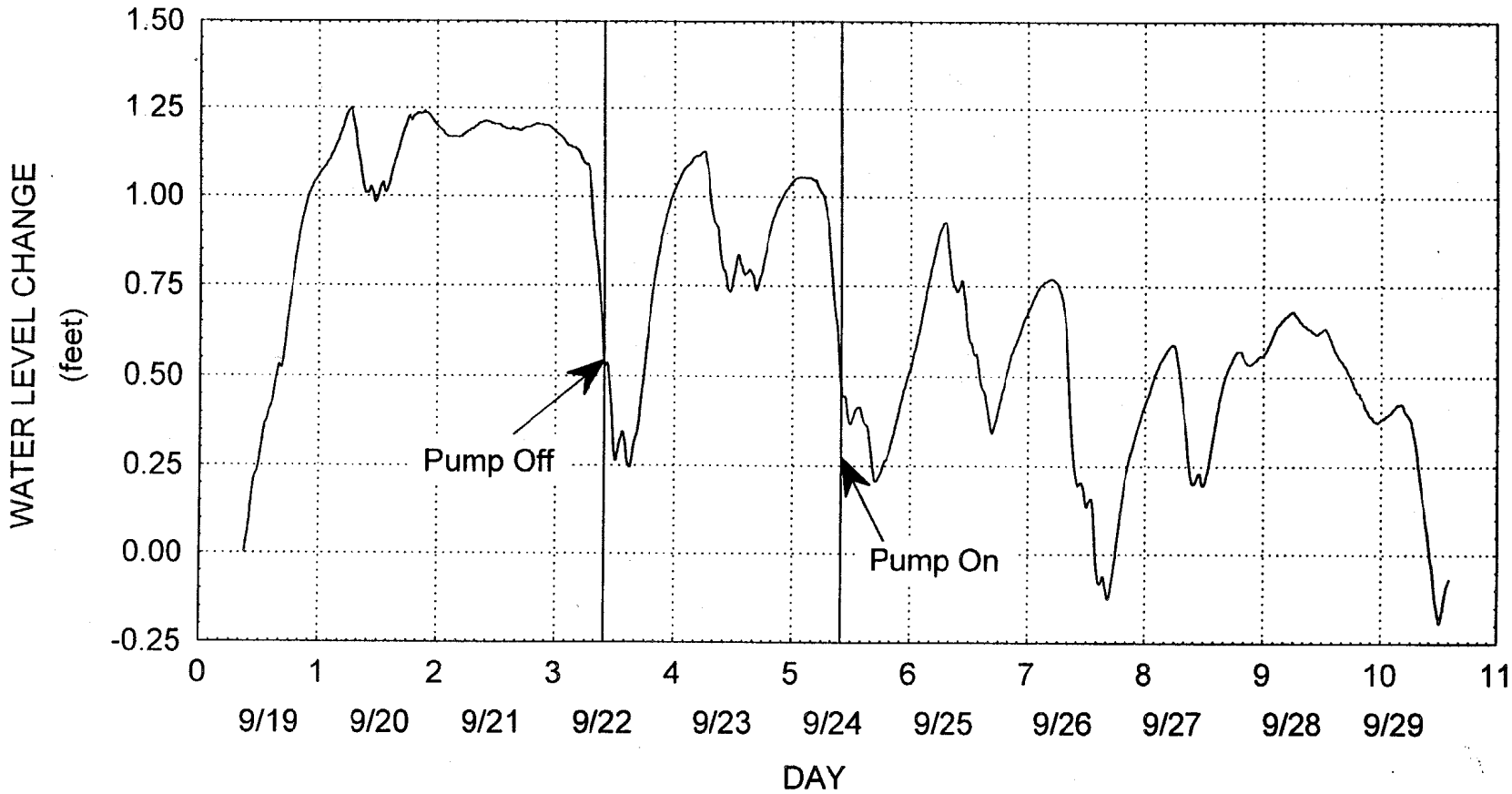
WARMINSTER, PENNSYLVANIA



HN22-I

NAVAL AIR WARFARE CENTER

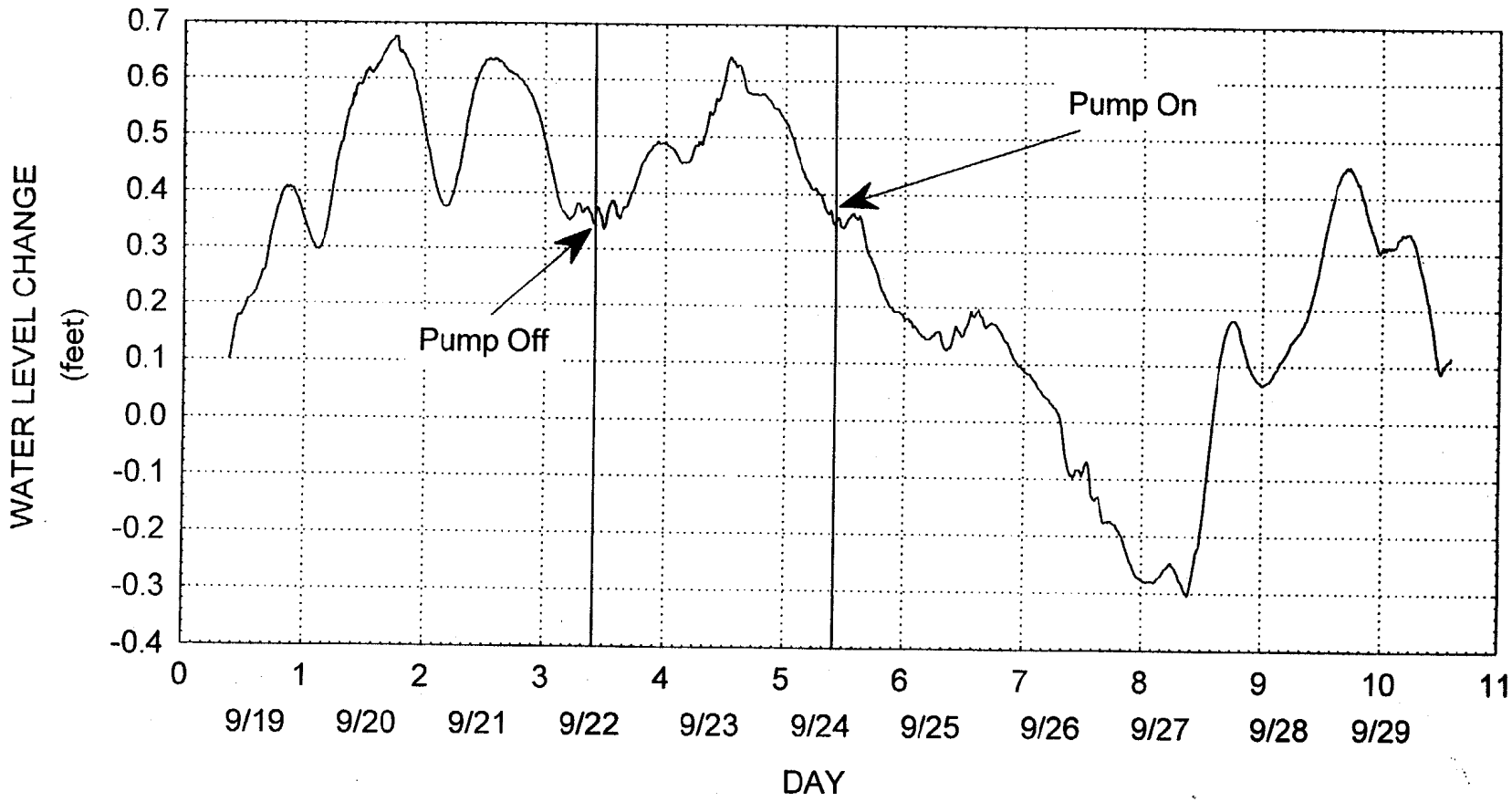
WARMINSTER, PENNSYLVANIA



HN22-D

NAVAL AIR WARFARE CENTER

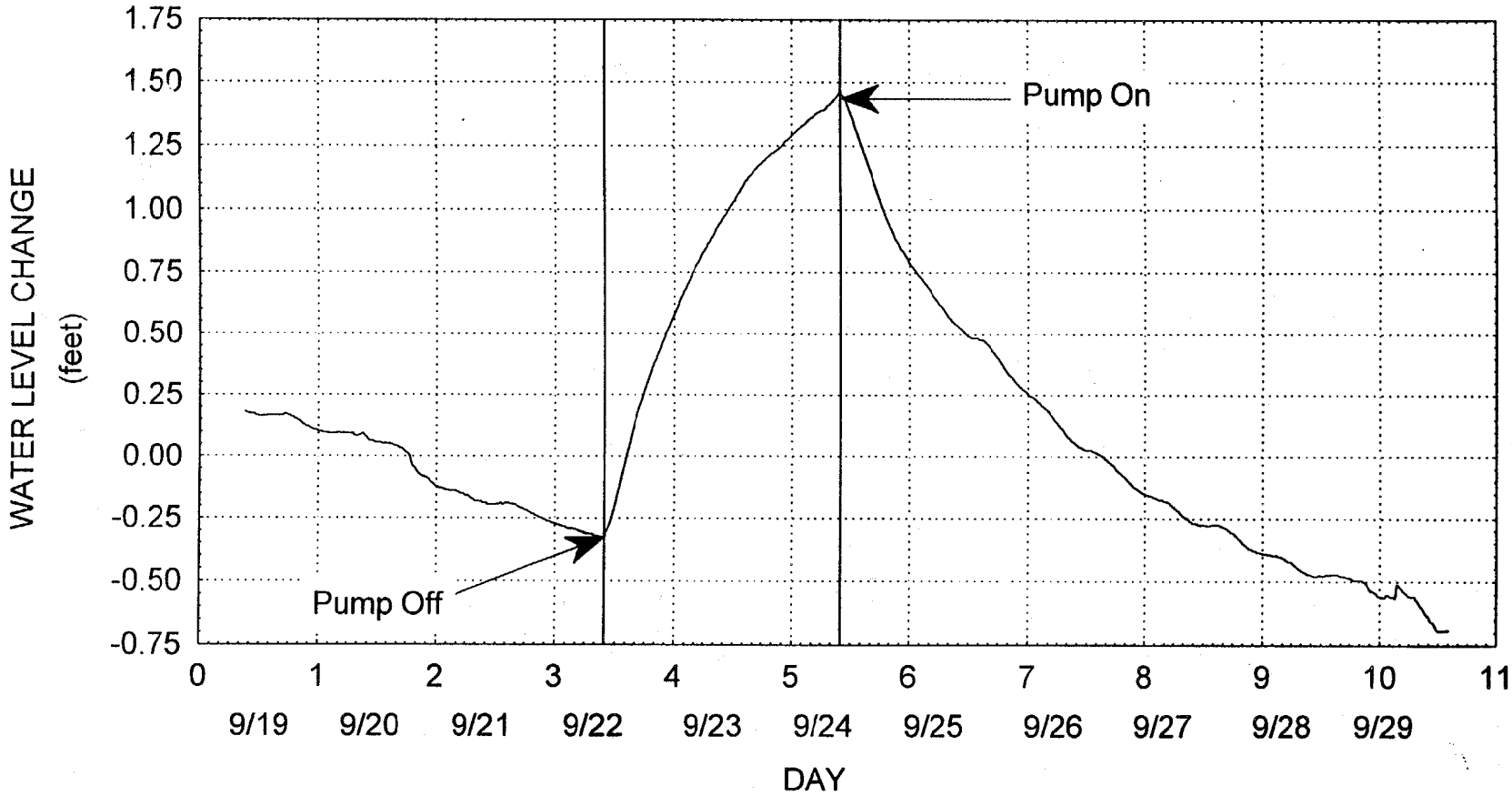
WARMINSTER, PENNSYLVANIA



HN50-S

NAVAL AIR WARFARE CENTER

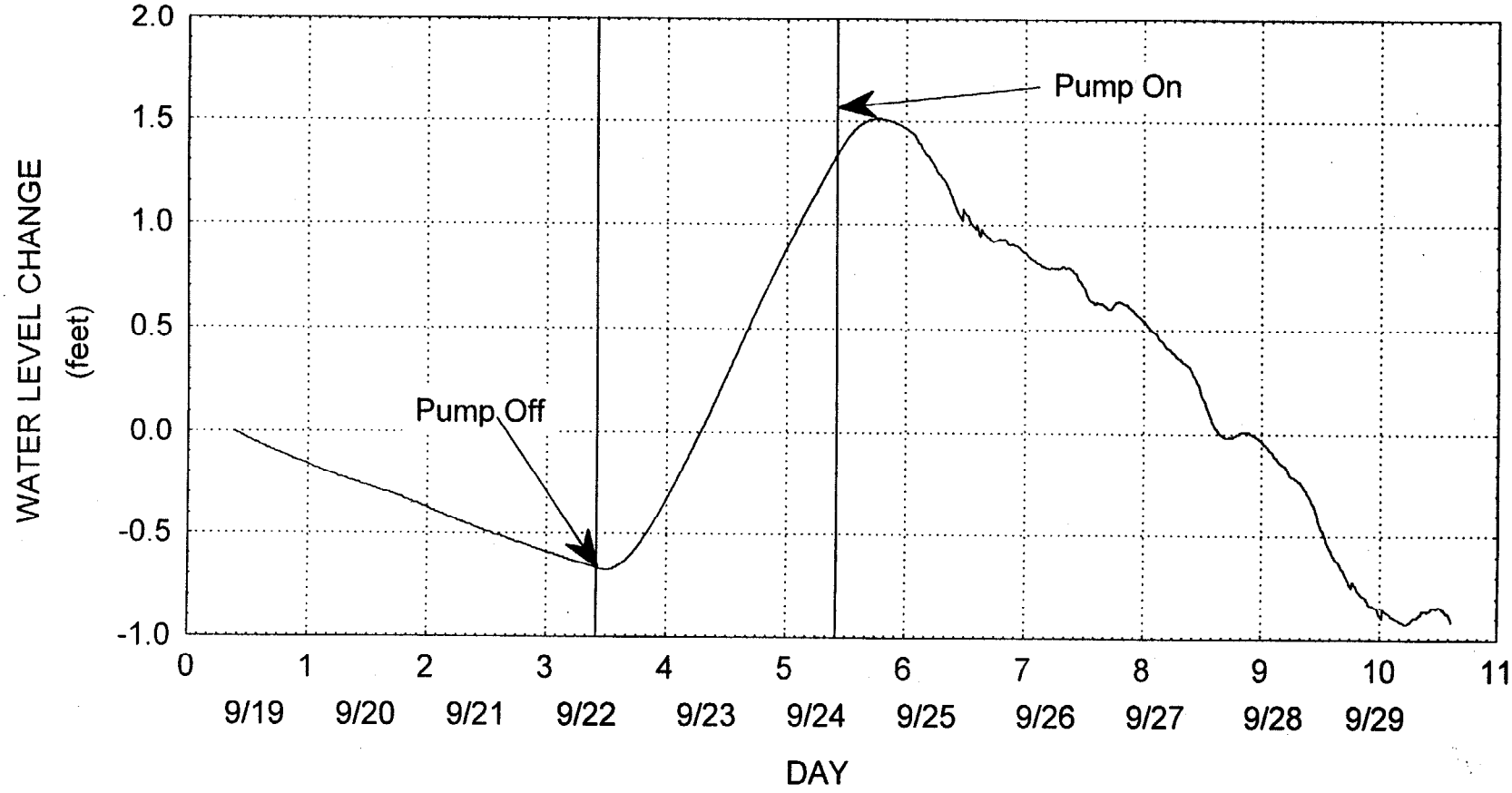
WARMINSTER, PENNSYLVANIA



HN50-I

NAVAL AIR WARFARE CENTER

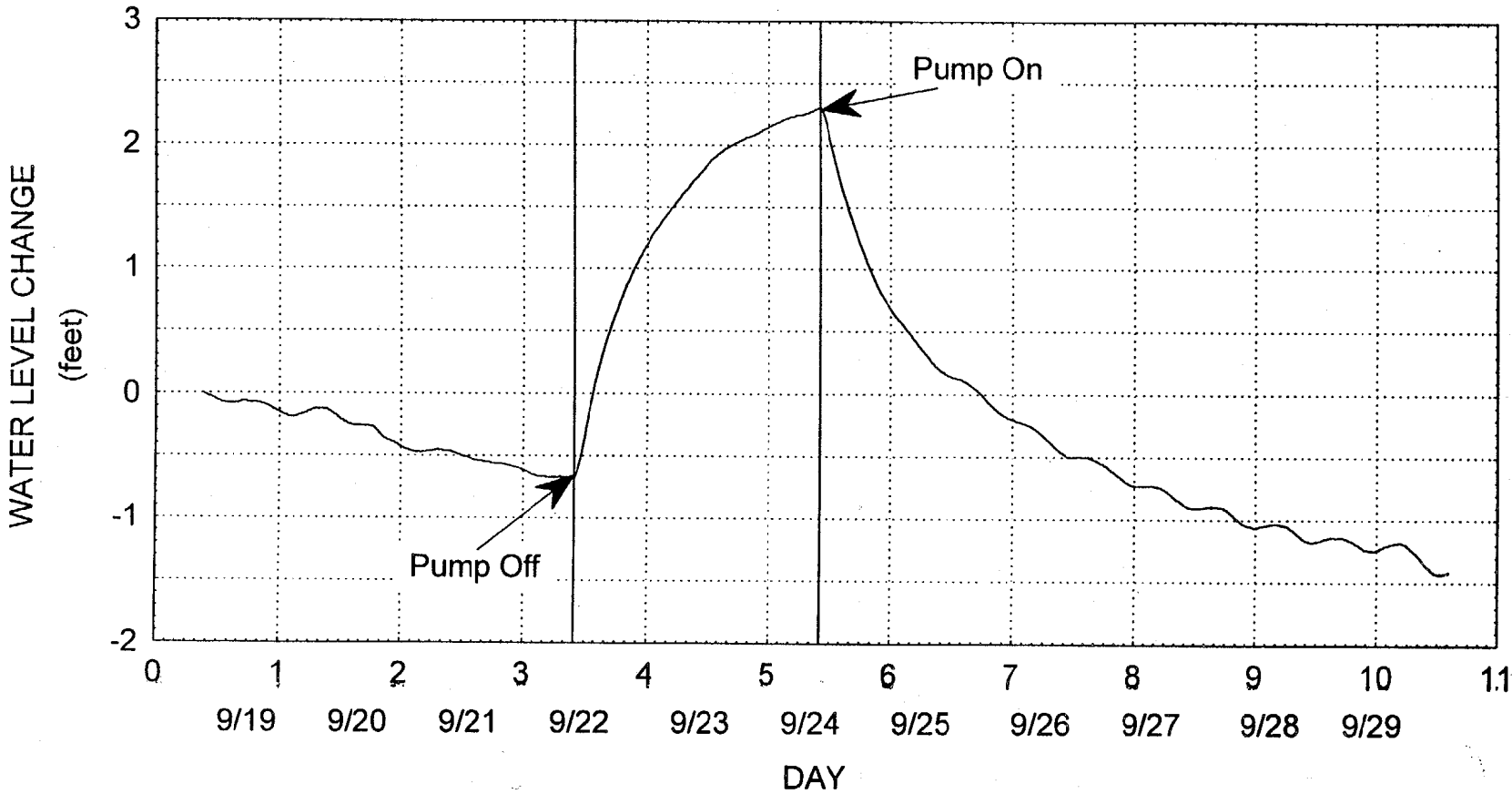
WARMINSTER, PENNSYLVANIA



HN50-D

NAVAL AIR WARFARE CENTER

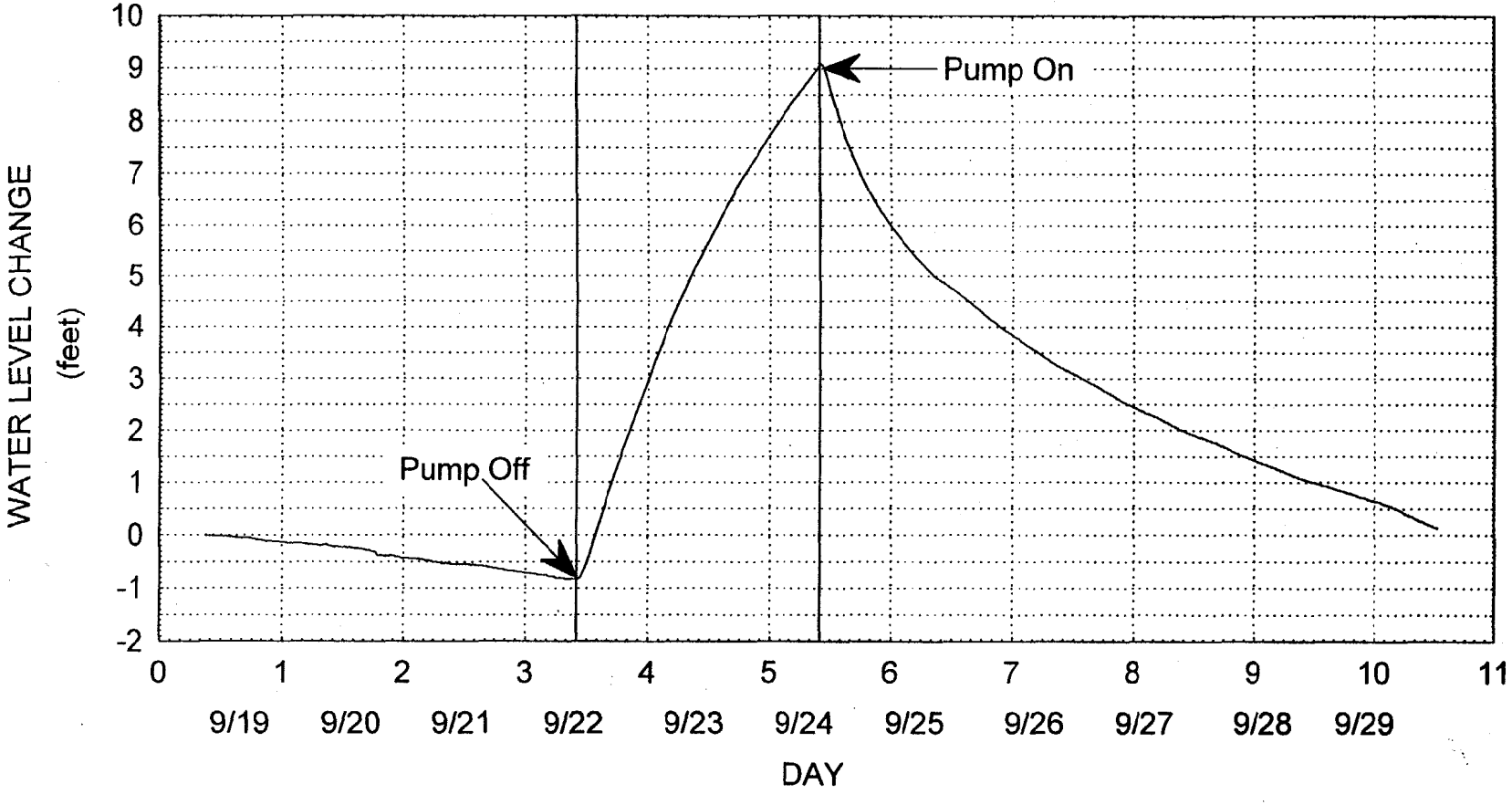
WARMINSTER, PENNSYLVANIA



HN52-S

NAVAL AIR WARFARE CENTER

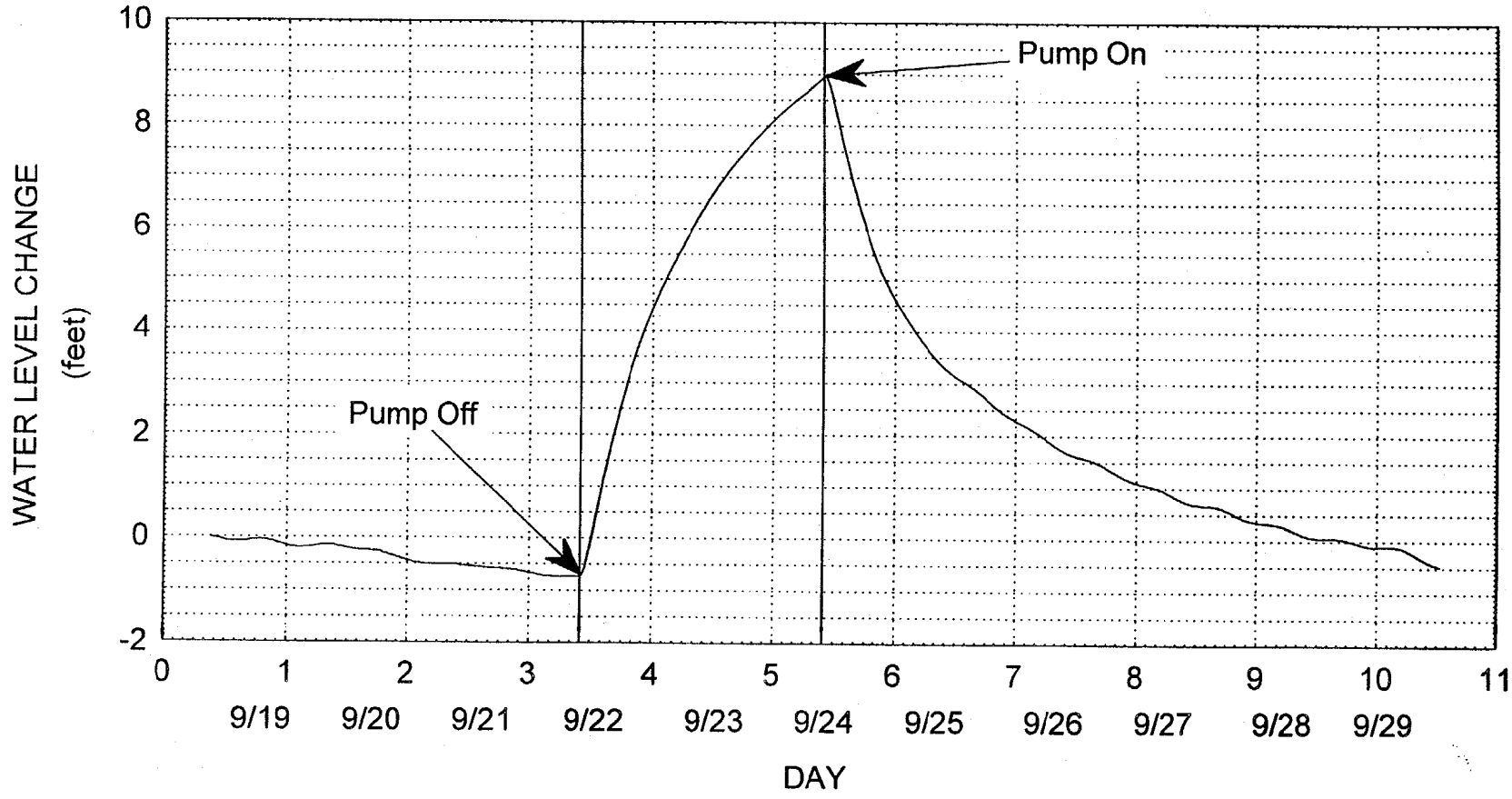
WARMINSTER, PENNSYLVANIA



HN52-I

NAVAL AIR WARFARE CENTER

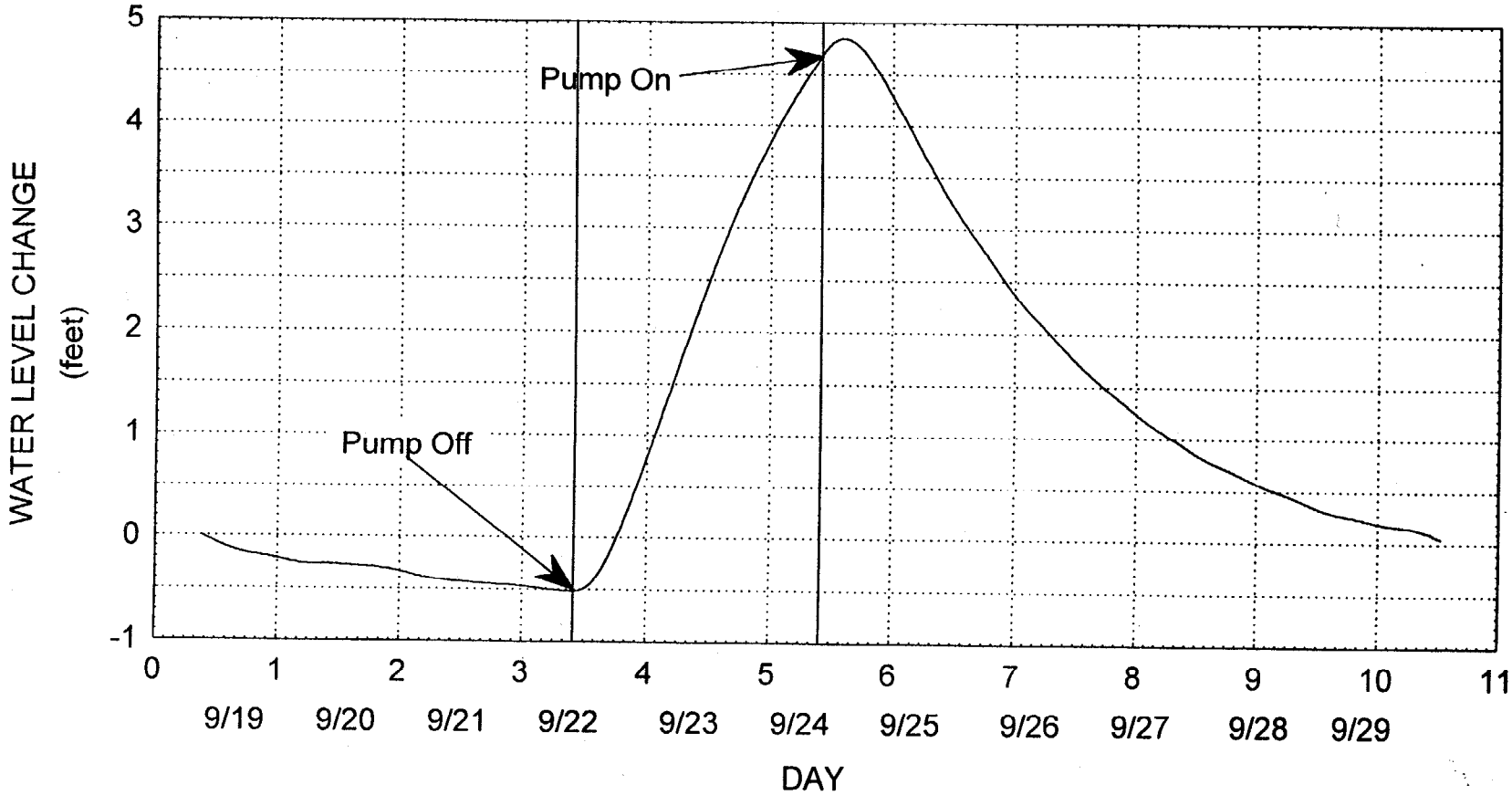
WARMINSTER, PENNSYLVANIA



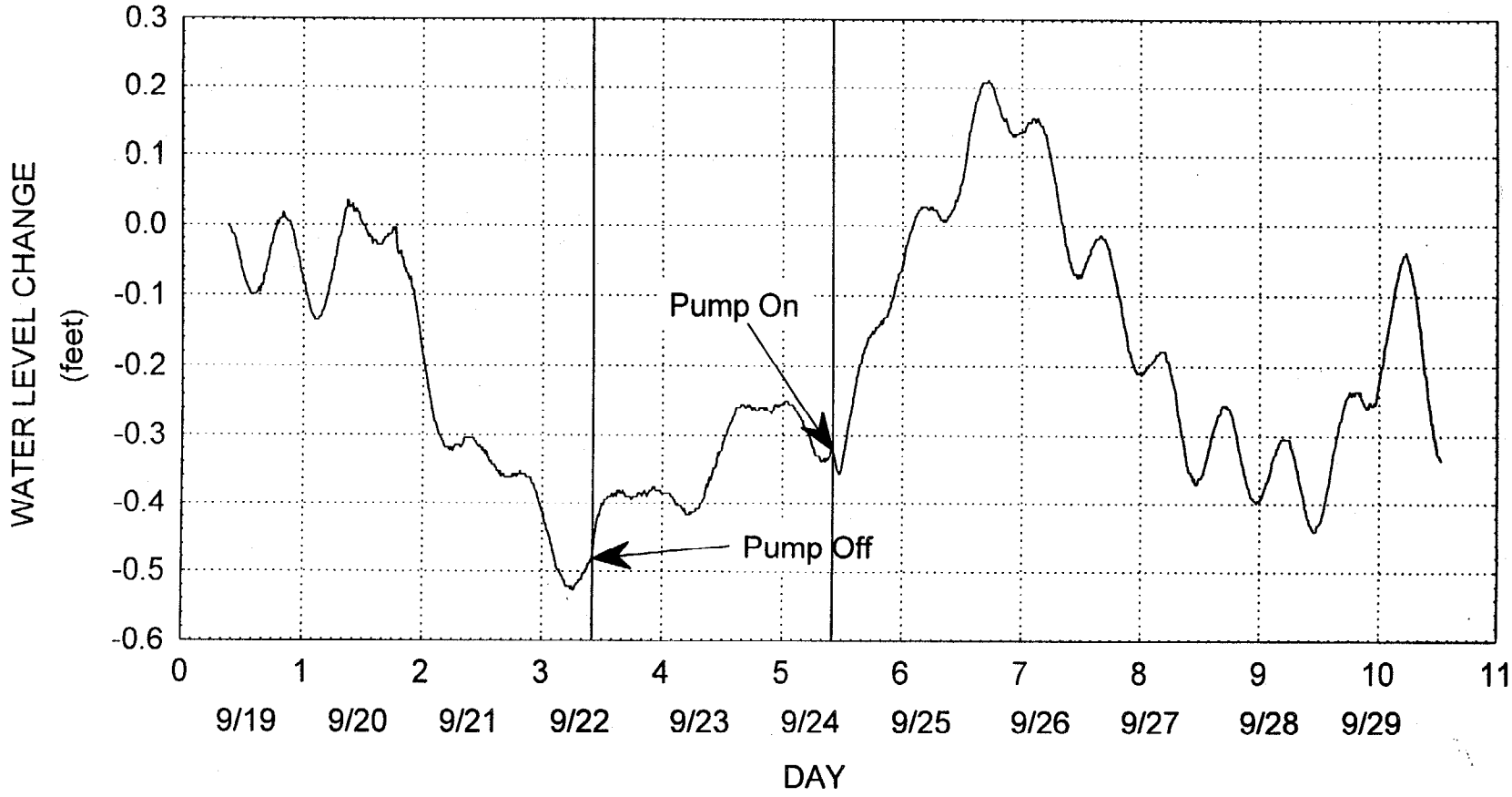
HN52-D

NAVAL AIR WARFARE CENTER

WARMINSTER, PENNSYLVANIA



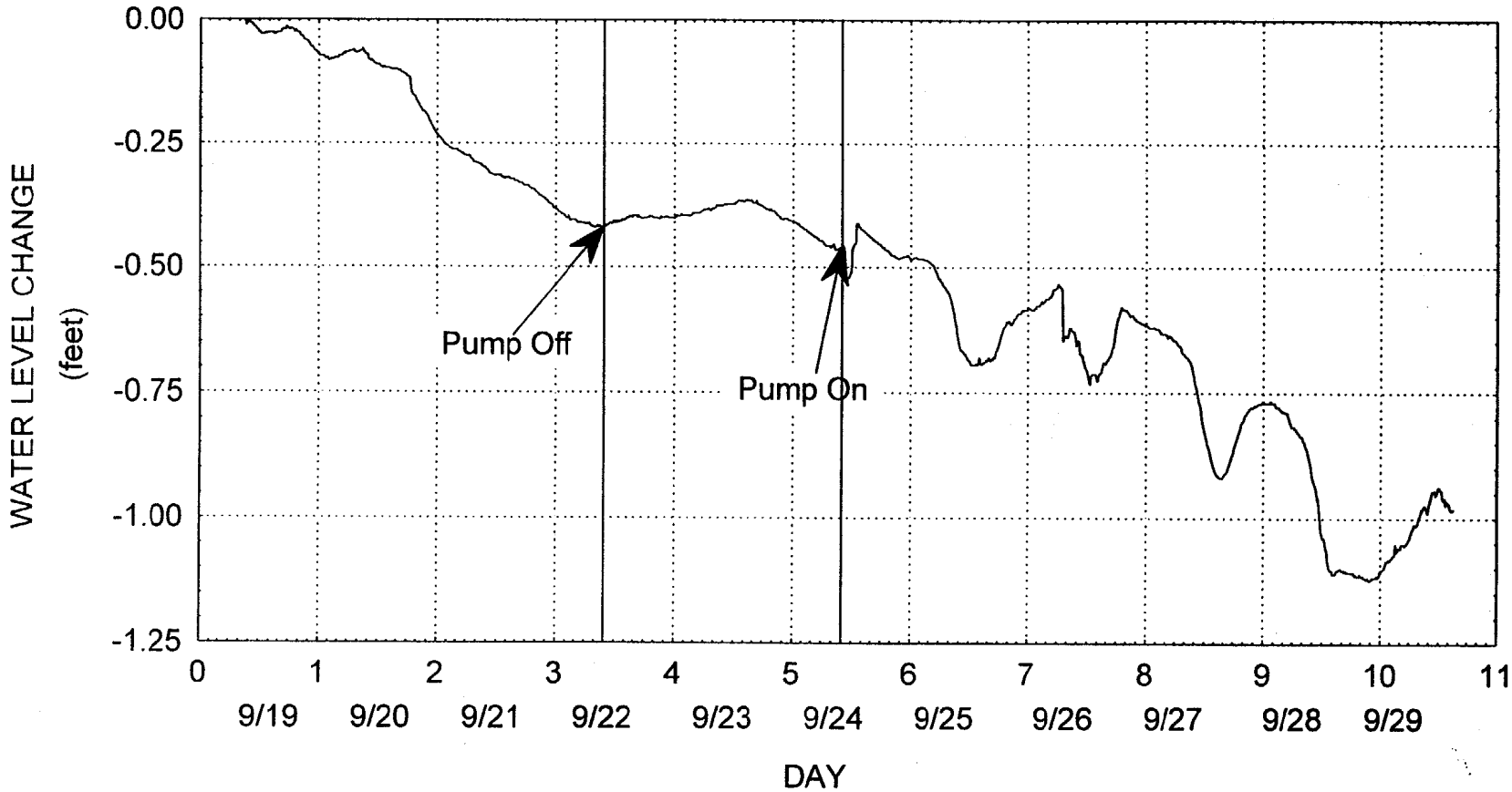
HN52-DD
NAVAL AIR WARFARE CENTER
WARMINSTER, PENNSYLVANIA



HN53-S

NAVAL AIR WARFARE CENTER

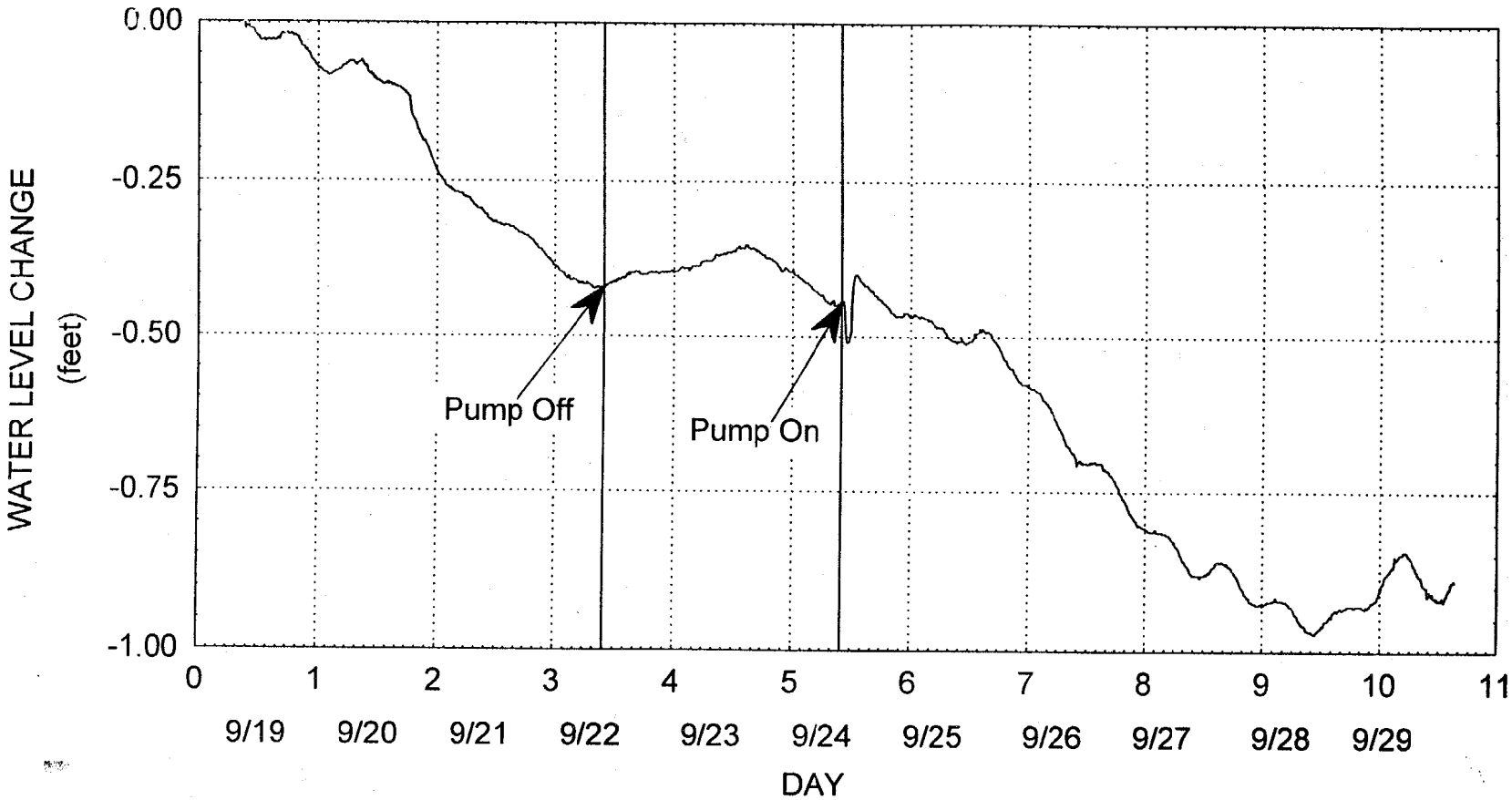
WARMINSTER, PENNSYLVANIA



HN53-I

NAVAL AIR WARFARE CENTER

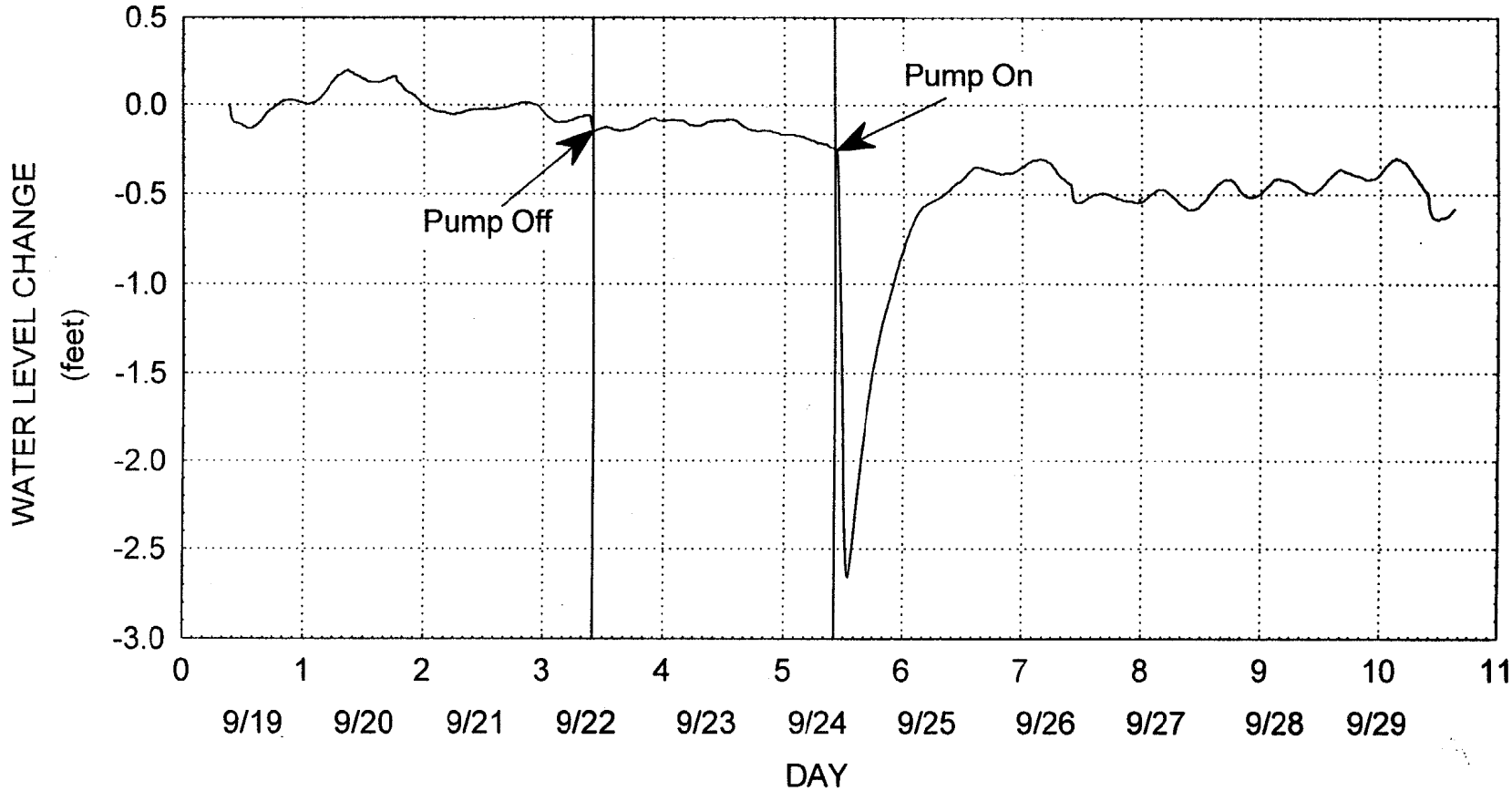
WARMINSTER, PENNSYLVANIA



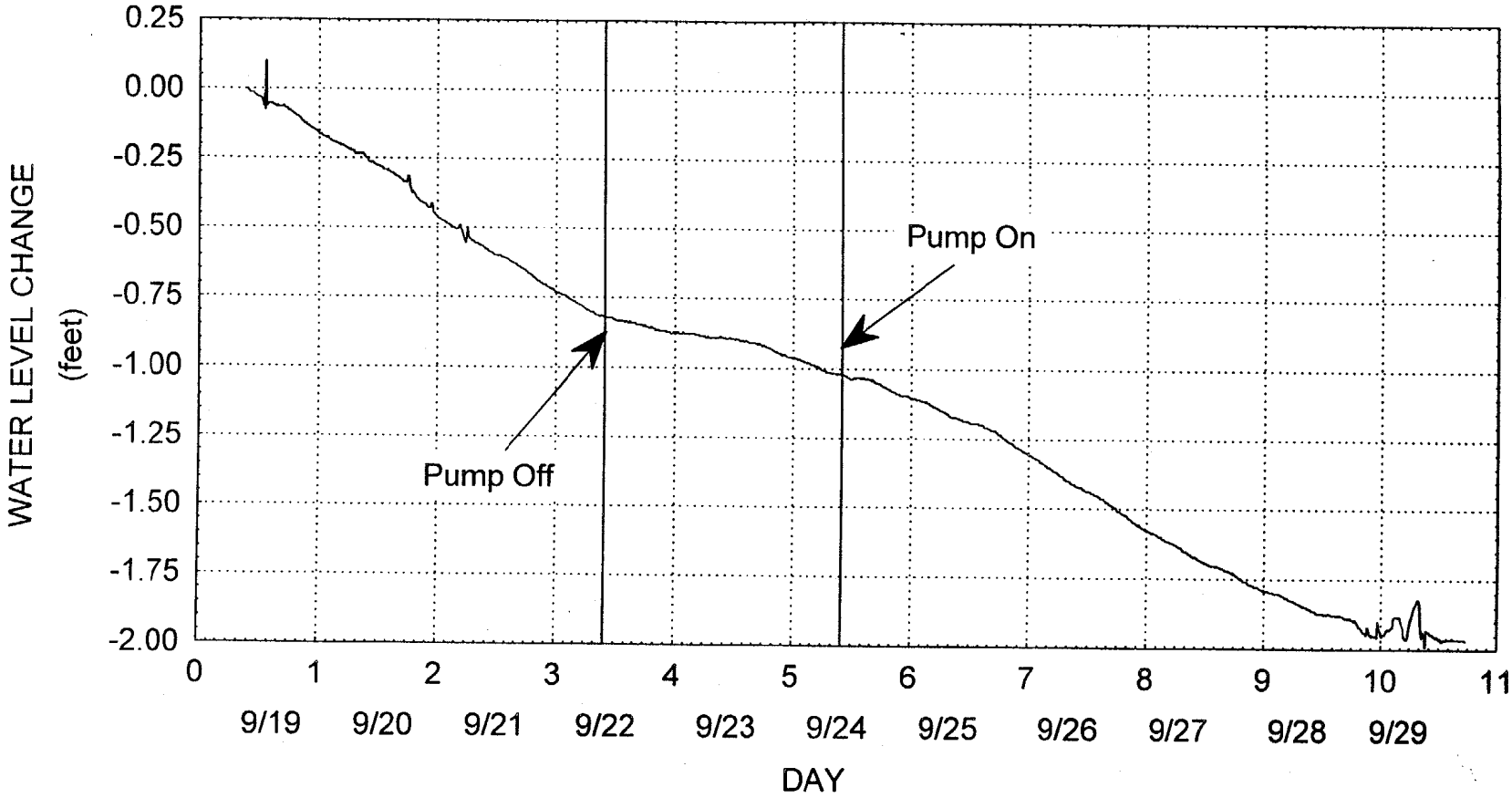
HN53-D

NAVAL AIR WARFARE CENTER

WARMINSTER, PENNSYLVANIA



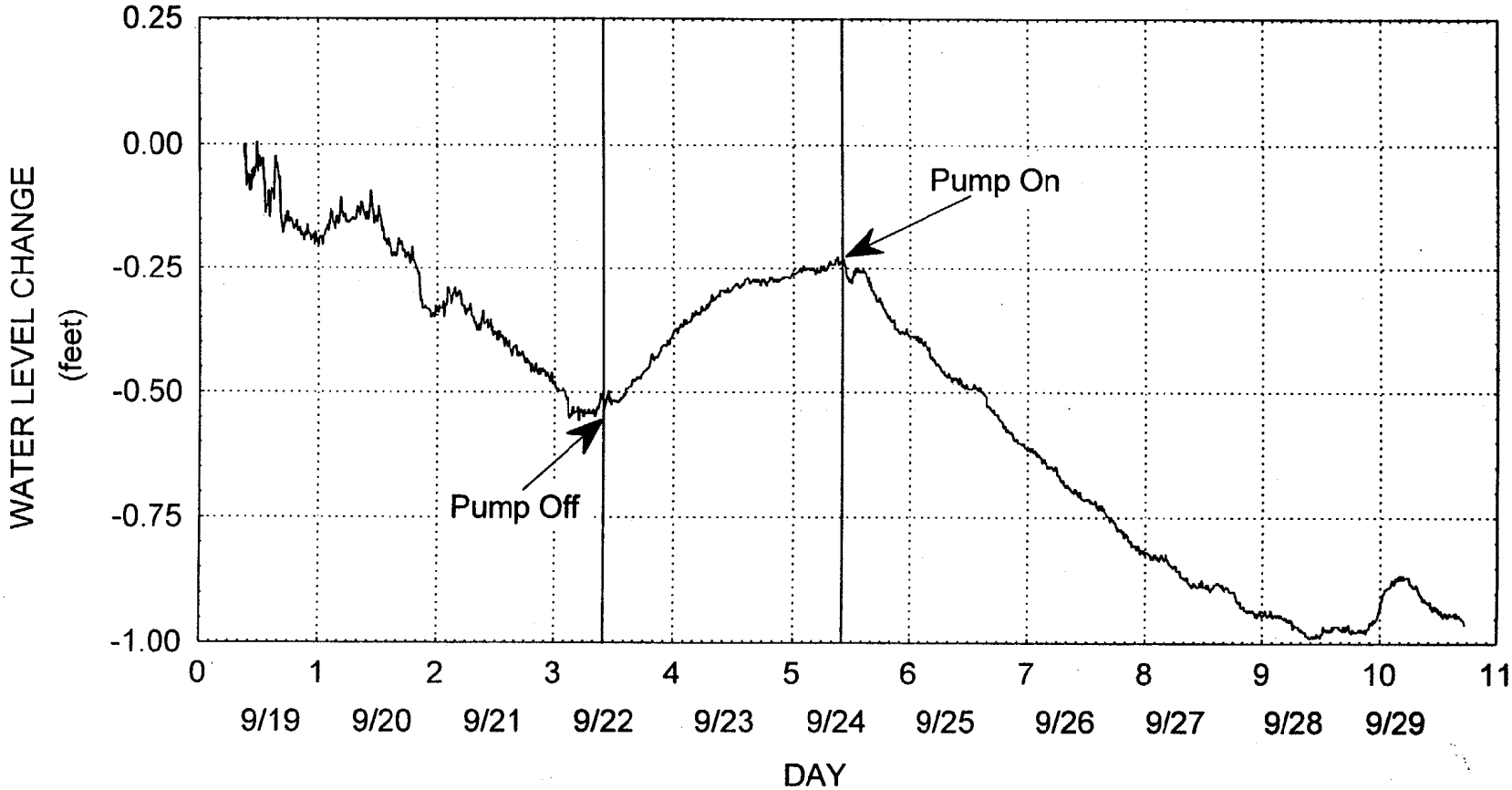
HN55-S
NAVAL AIR WARFARE CENTER
WARMINSTER, PENNSYLVANIA



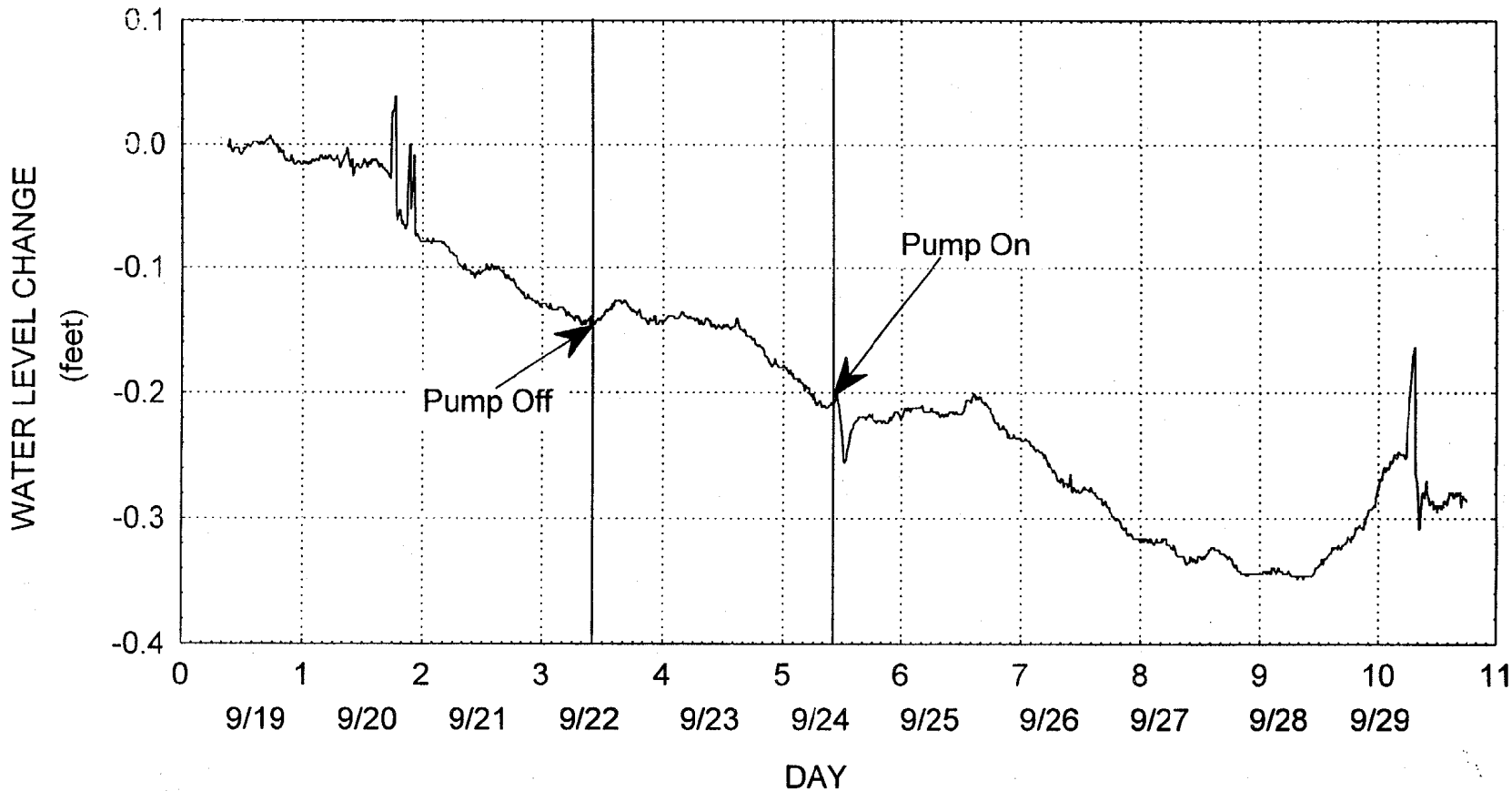
HN55-I

NAVAL AIR WARFARE CENTER

WARMINSTER, PENNSYLVANIA



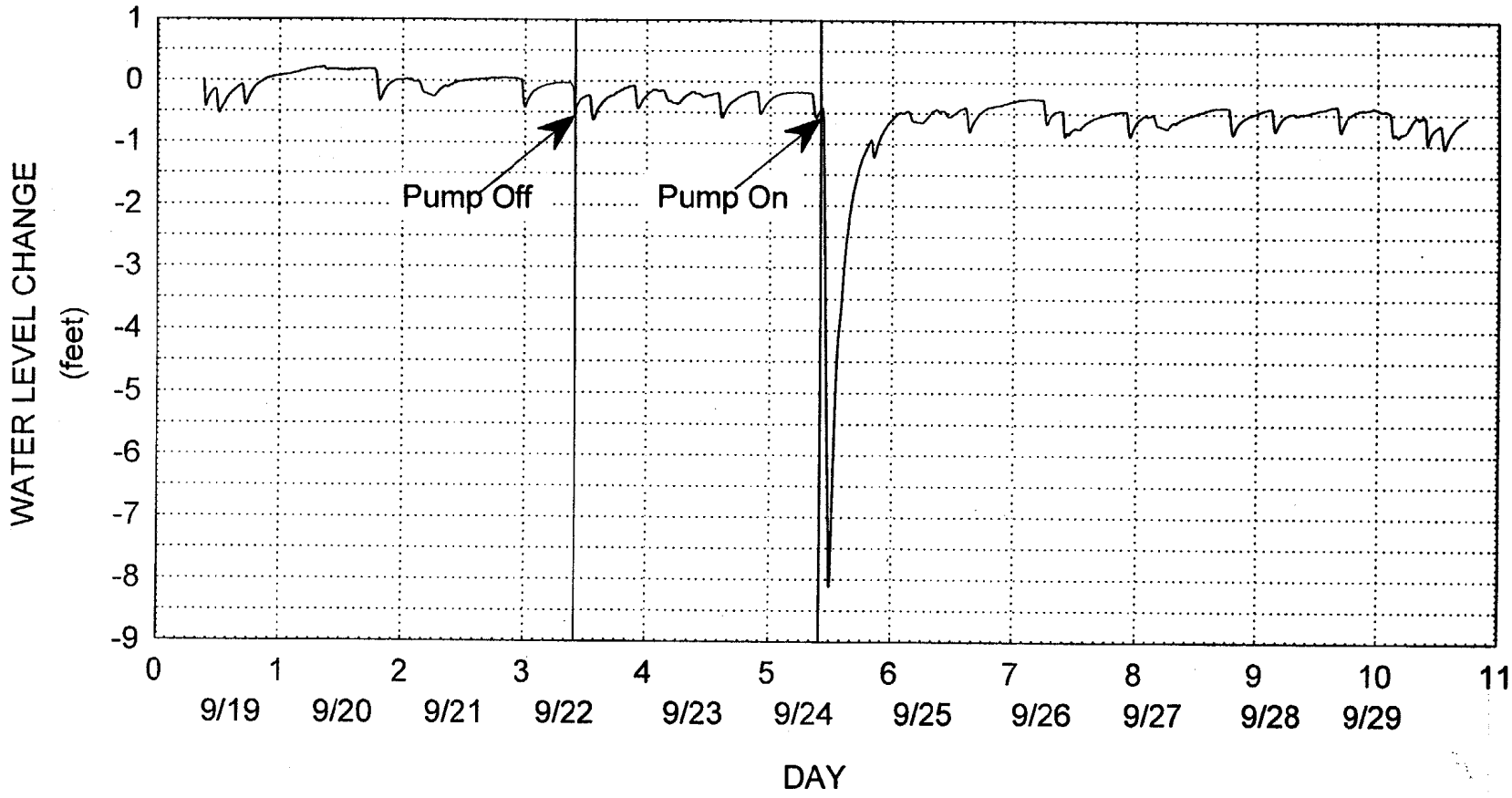
HN56-S
NAVAL AIR WARFARE CENTER
WARMINSTER, PENNSYLVANIA



HN56-I

NAVAL AIR WARFARE CENTER

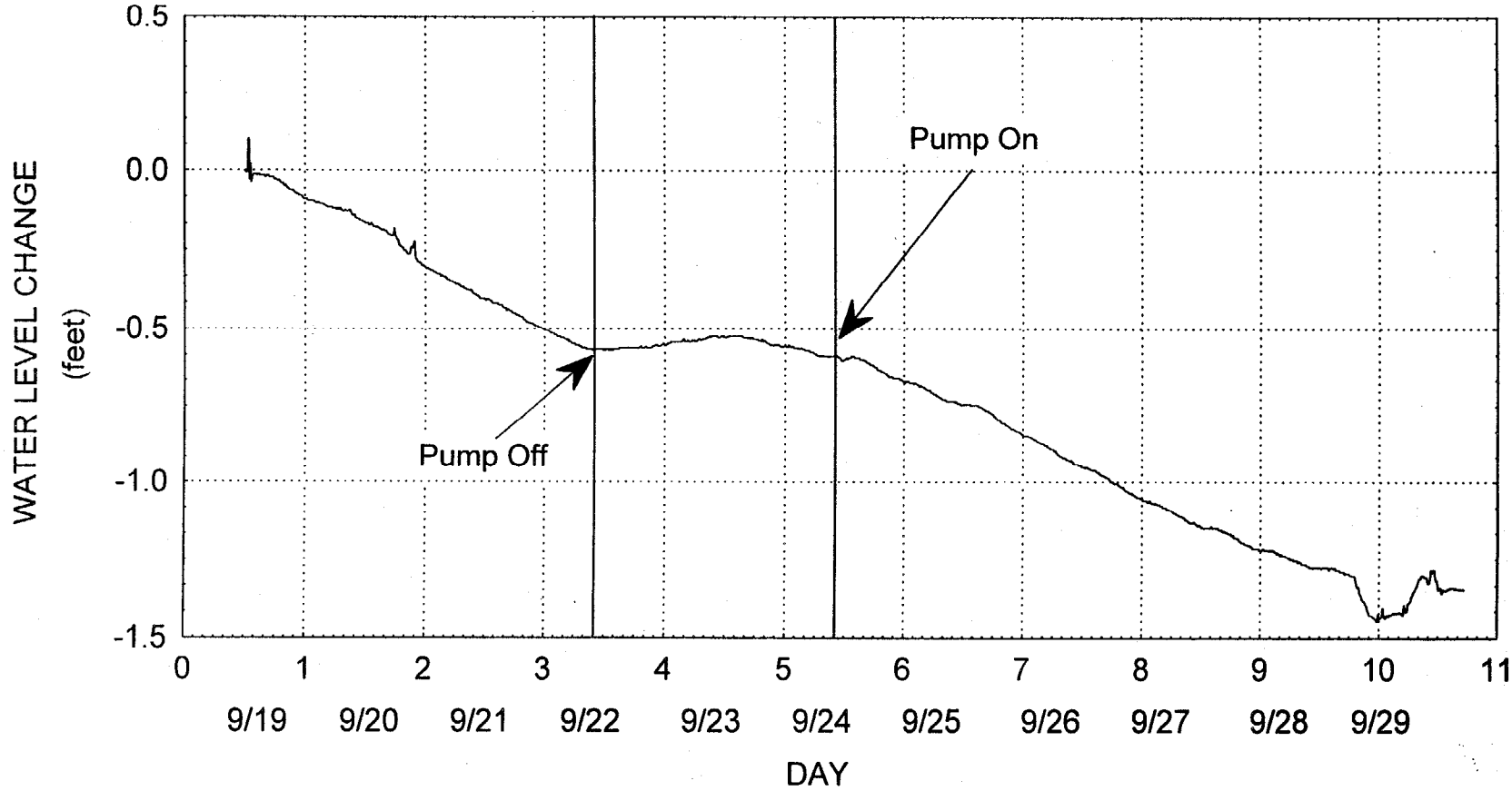
WARMINSTER, PENNSYLVANIA



HN59-I

NAVAL AIR WARFARE CENTER

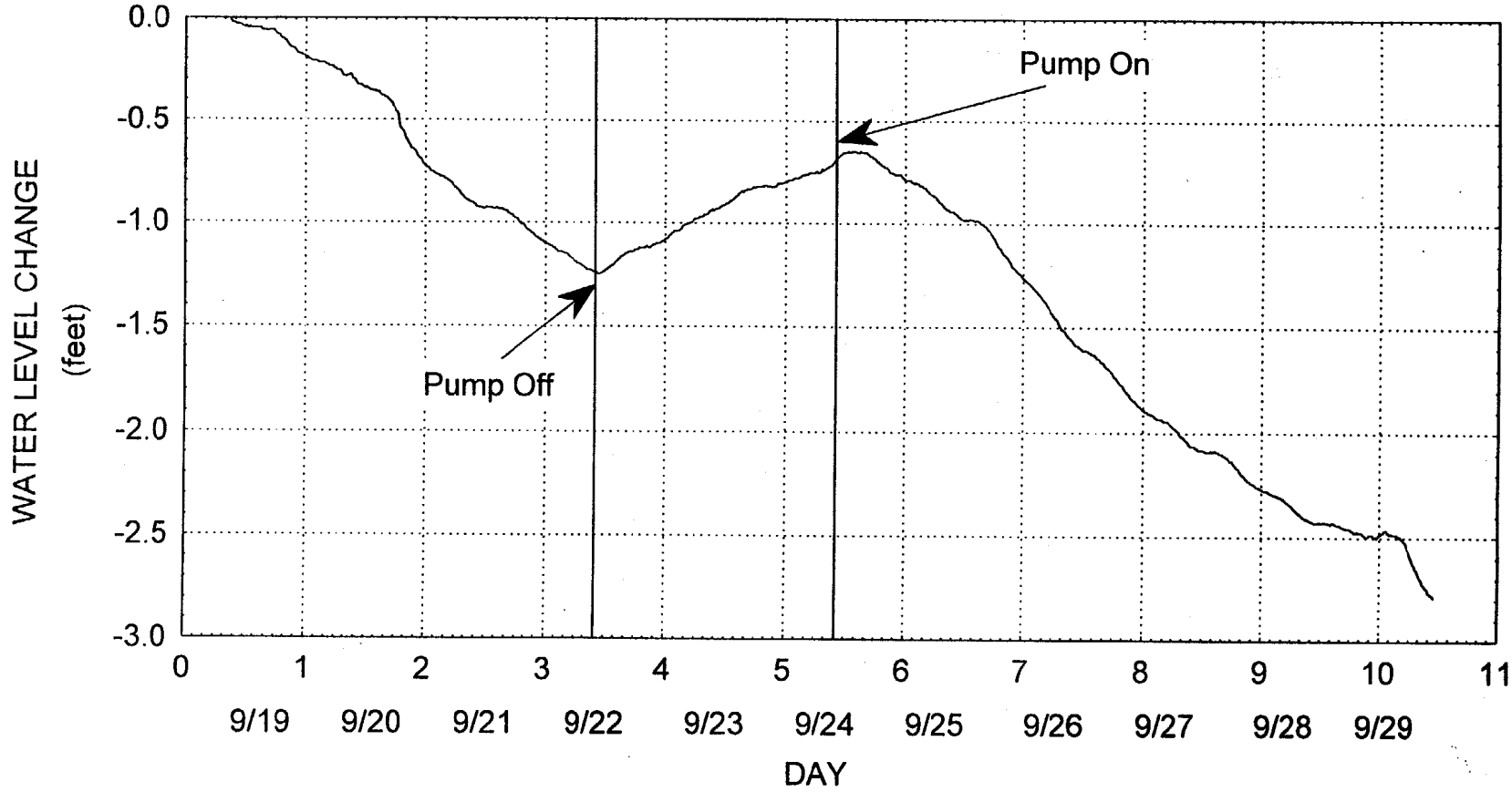
WARMINSTER, PENNSYLVANIA



HN65-S1

NAVAL AIR WARFARE CENTER

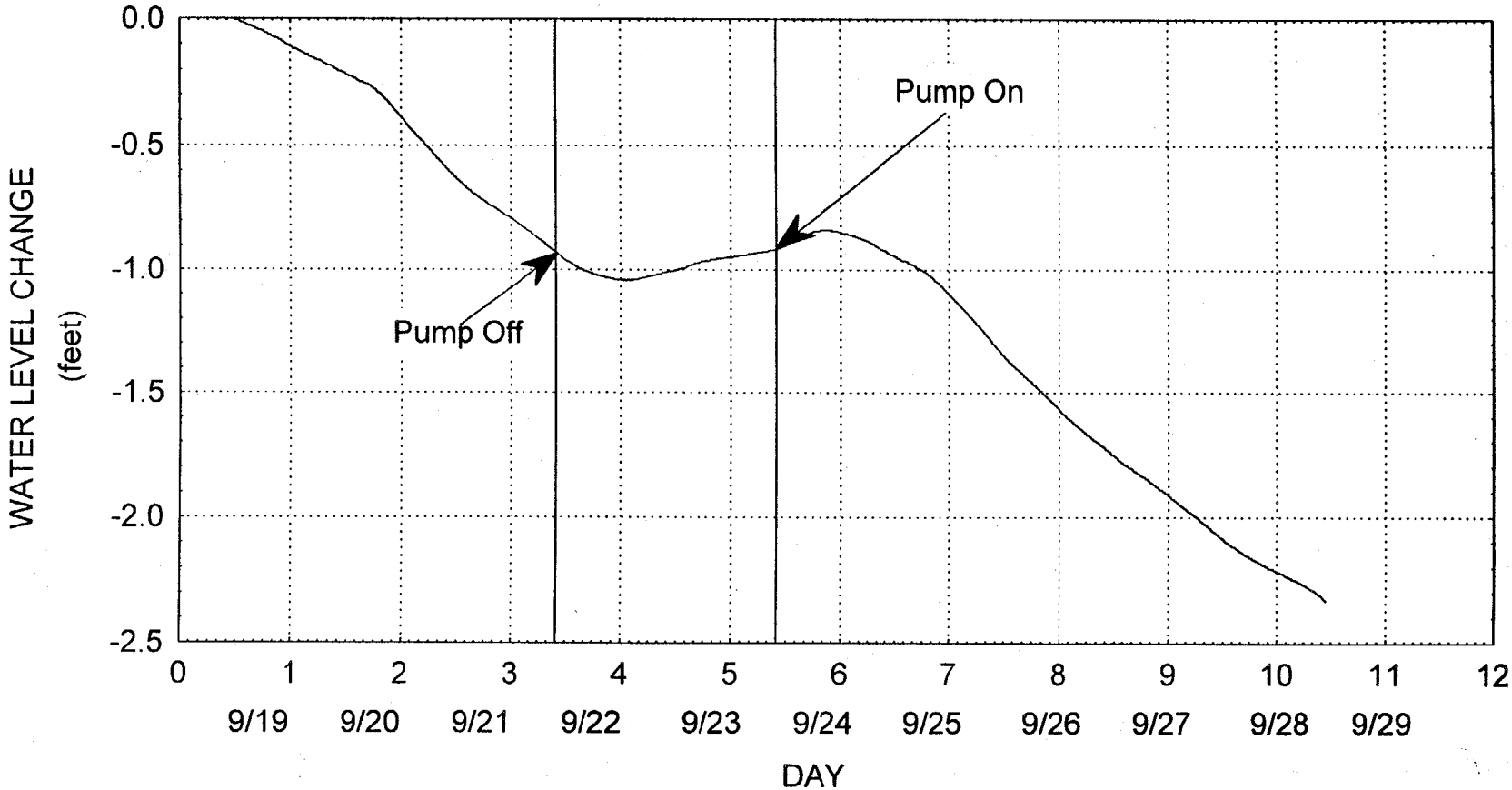
WARMINSTER, PENNSYLVANIA



HN65-S2

NAVAL AIR WARFARE CENTER

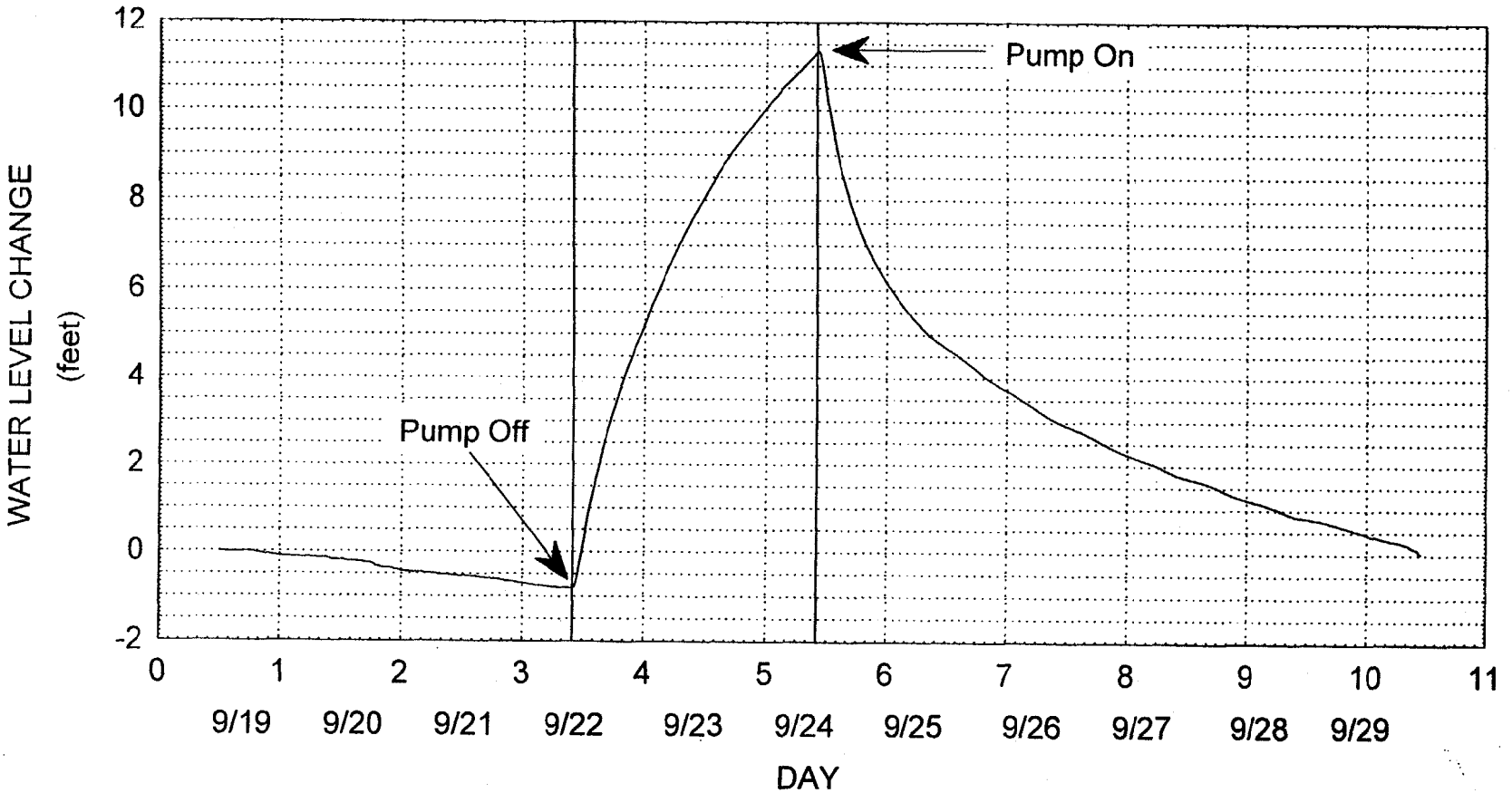
WARMINSTER, PENNSYLVANIA



HN65-I

NAVAL AIR WARFARE CENTER

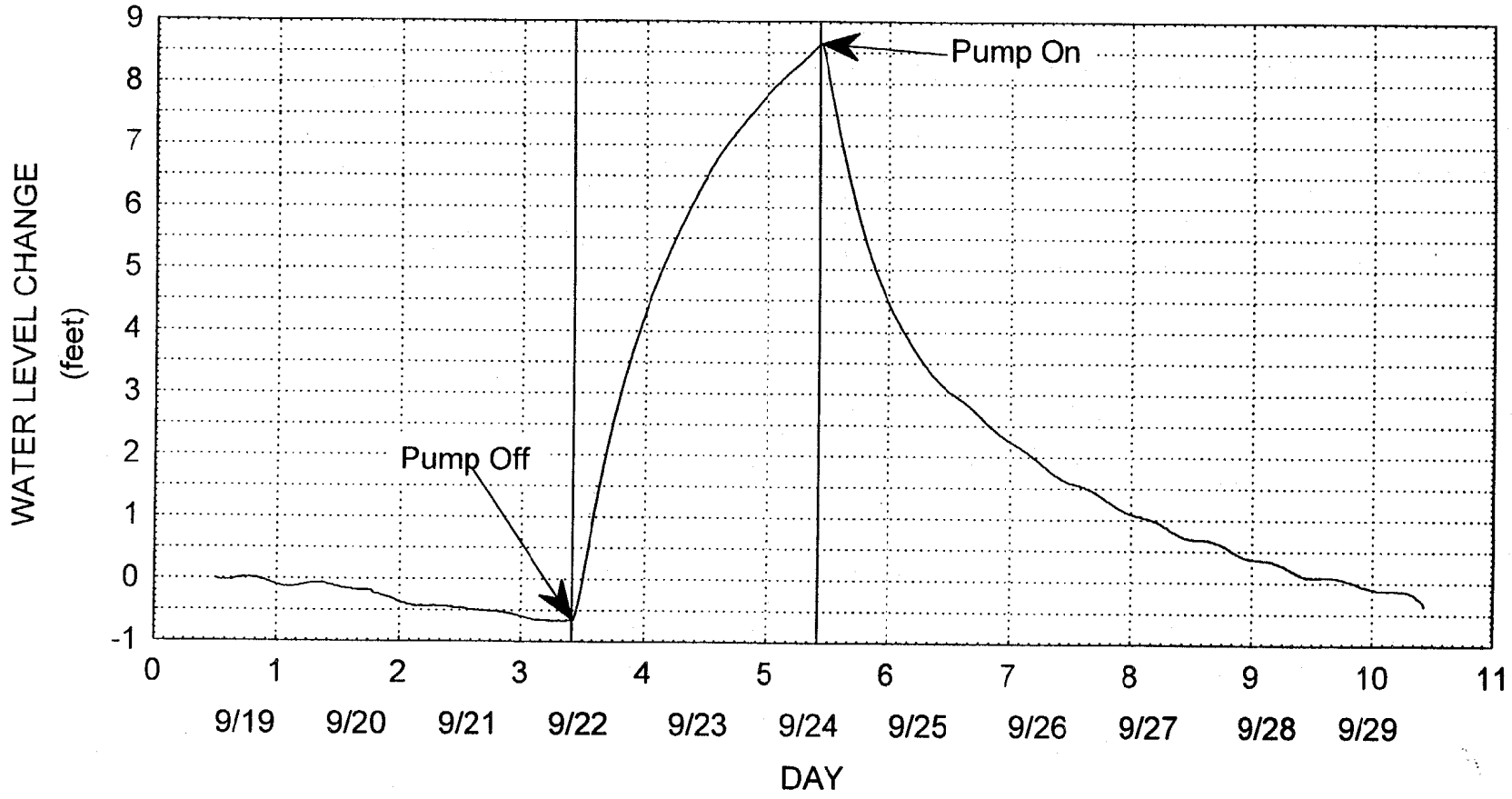
WARMINSTER, PENNSYLVANIA



HN65-I2

NAVAL AIR WARFARE CENTER

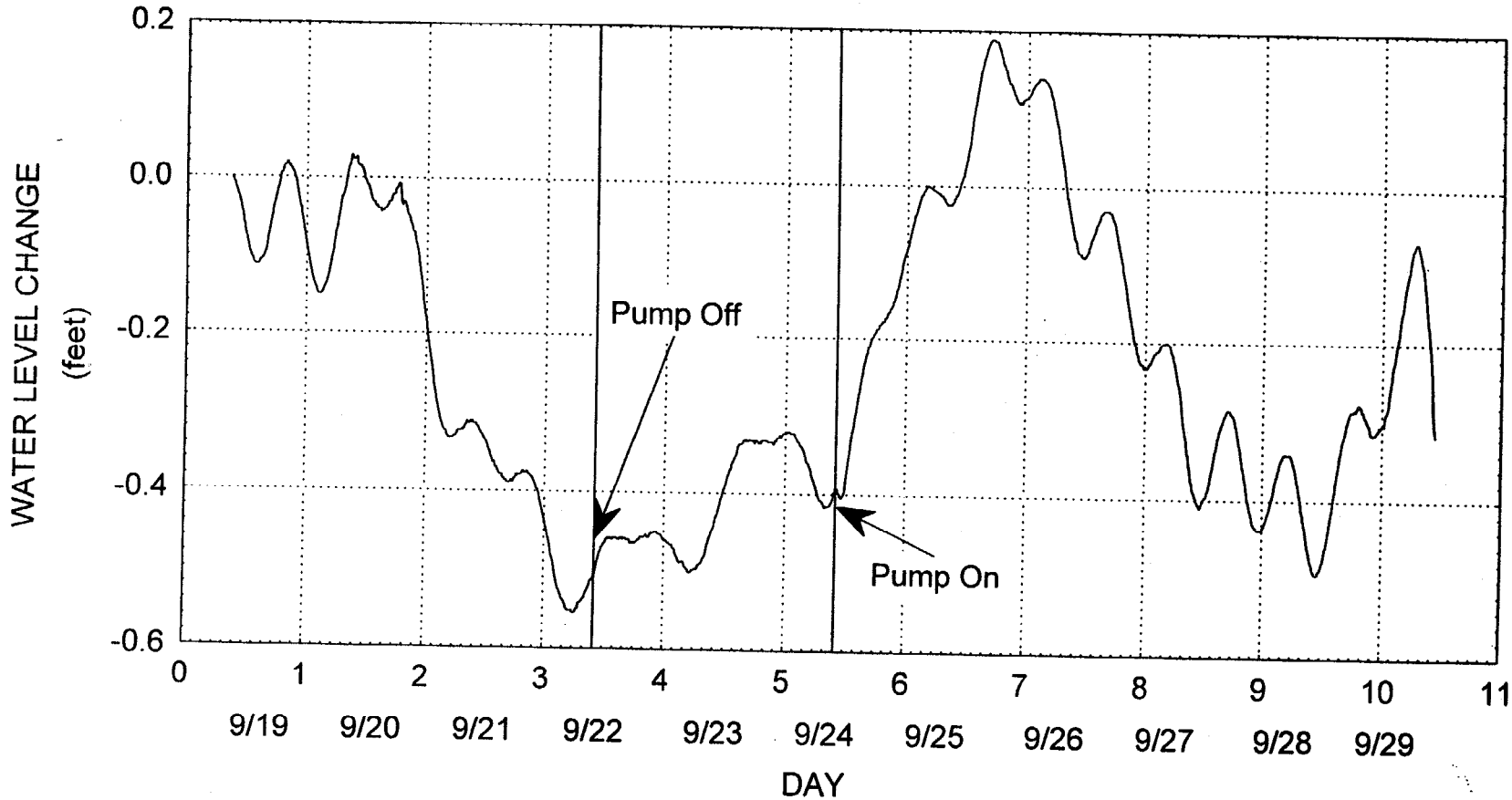
WARMINSTER, PENNSYLVANIA



HN65-D

NAVAL AIR WARFARE CENTER

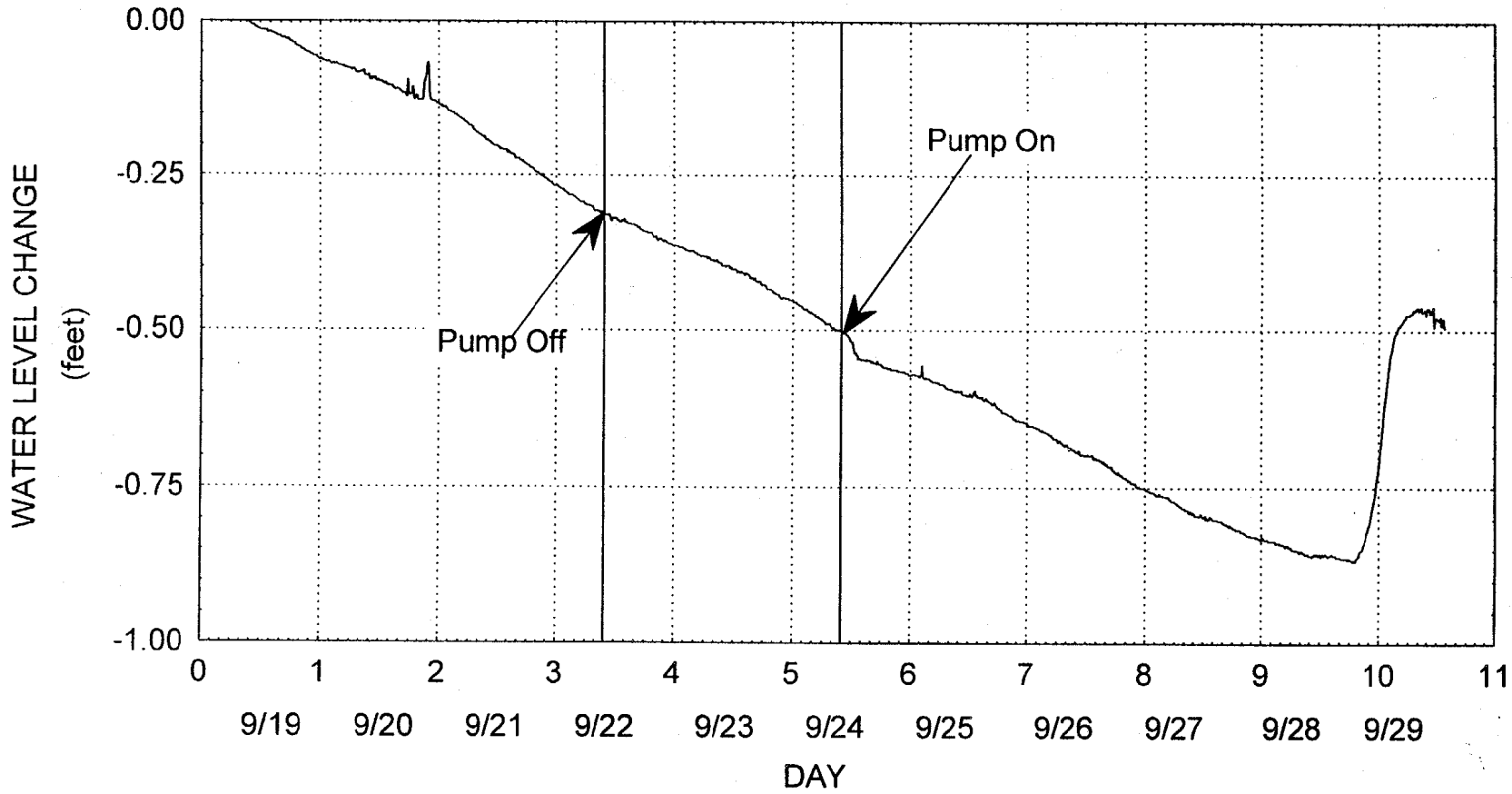
WARMINSTER, PENNSYLVANIA



HN80-S

NAVAL AIR WARFARE CENTER

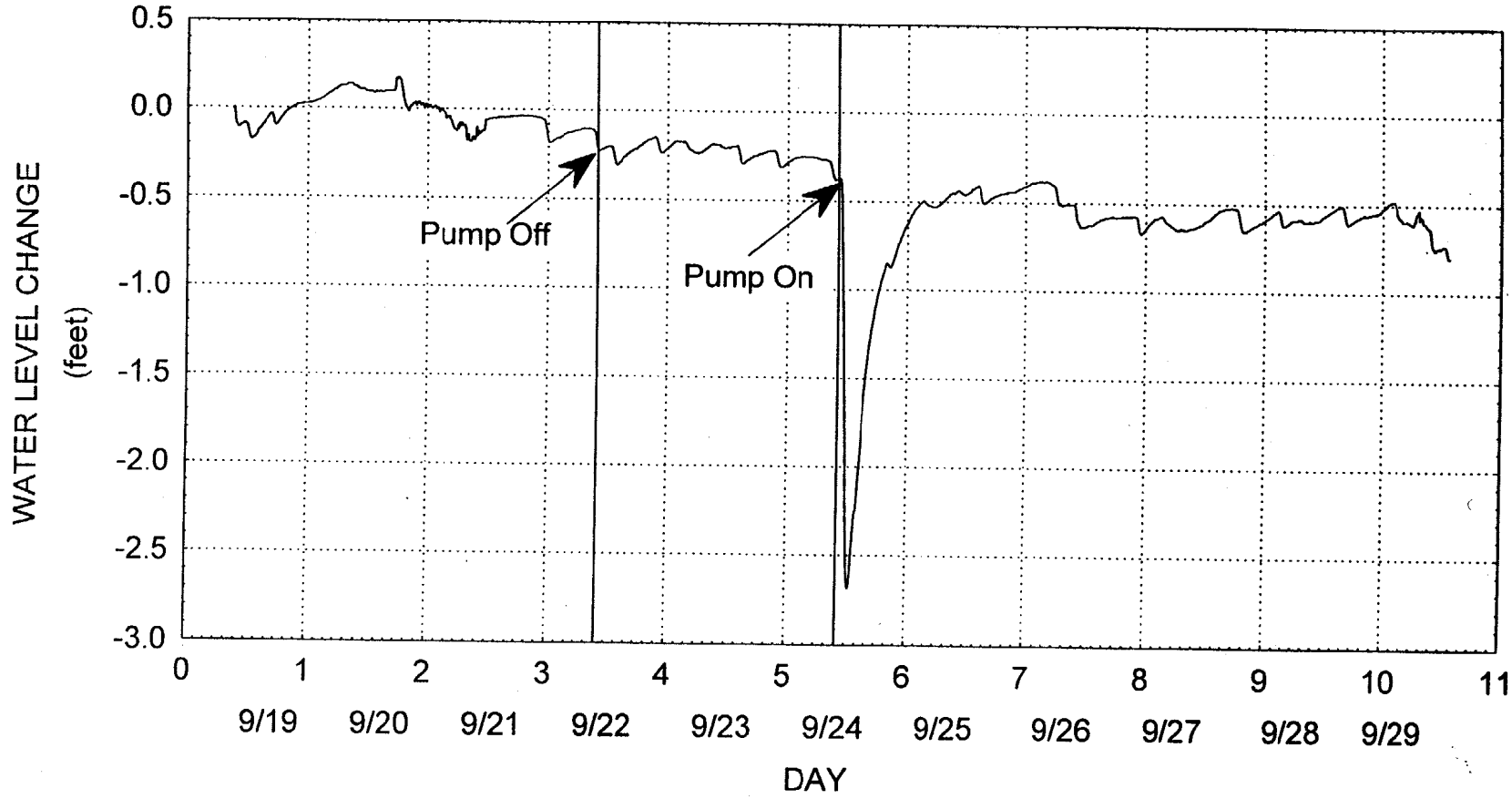
WARMINSTER, PENNSYLVANIA



HN80-I

NAVAL AIR WARFARE CENTER

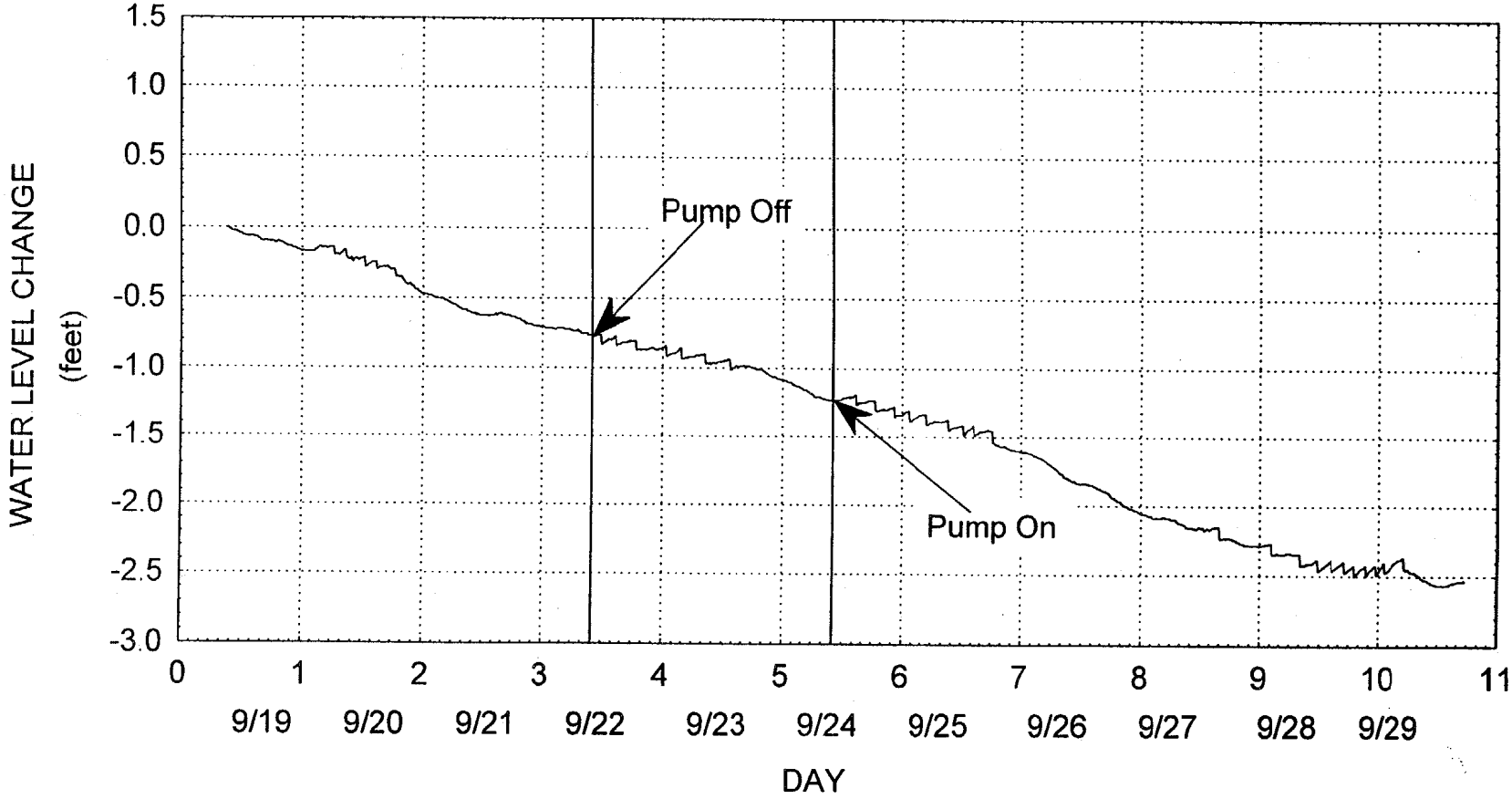
WARMINSTER, PENNSYLVANIA

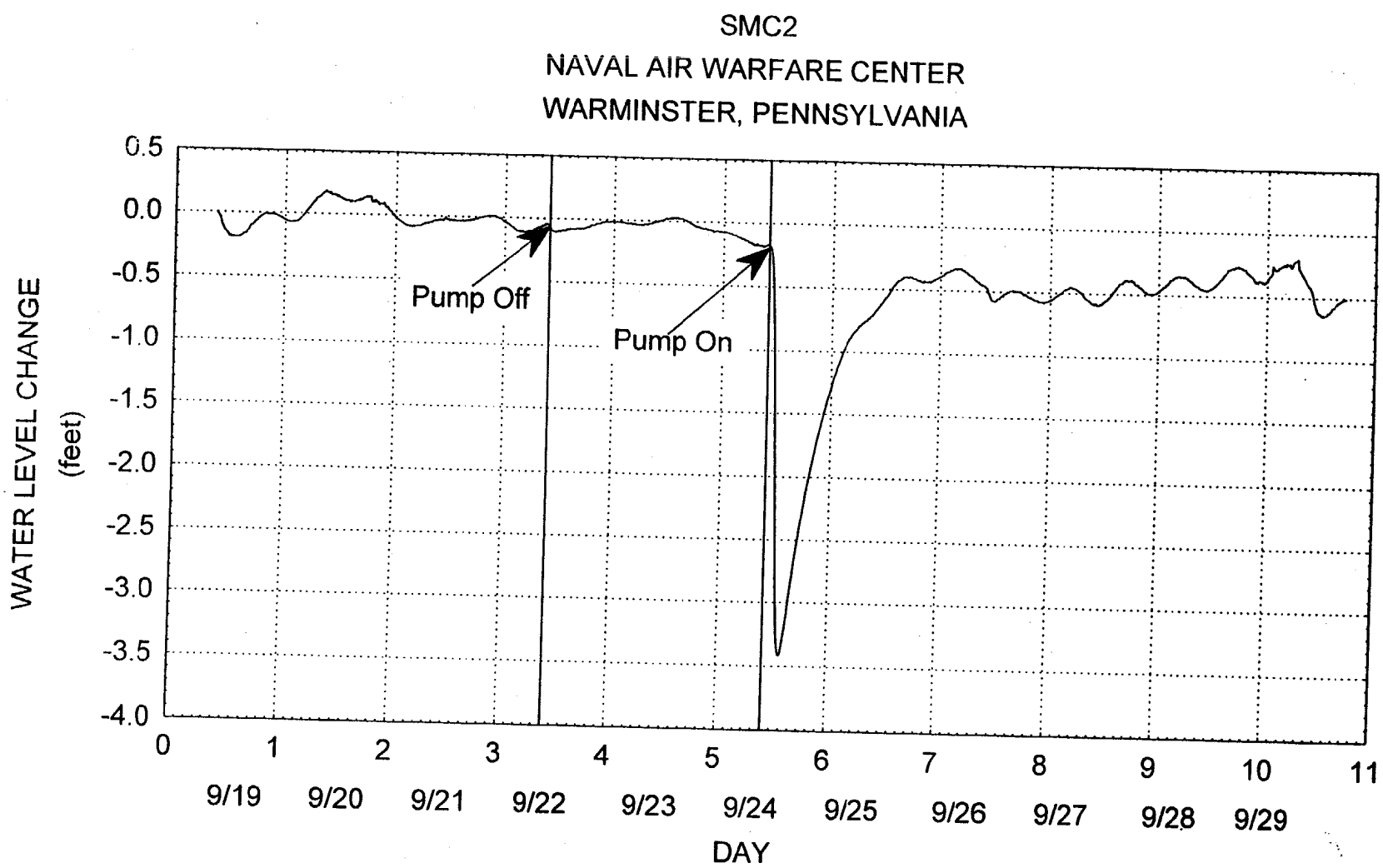


SMC1

NAVAL AIR WARFARE CENTER

WARMINSTER, PENNSYLVANIA




SMC2
NAVAL AIR WARFARE CENTER
WARMINSTER, PENNSYLVANIA
WATER LEVEL CHANGE
(feet)
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
-3.5
-4.0
Pump Off
Pump On
0
1
2
3
4
5
6
7
8
9
10
11
9/19
9/20
9/21
9/22
9/23
9/24
9/25
9/26
9/27
9/28
9/29
DAY