

Department of Natural Resources  
Resource Assessment Service  
MARYLAND GEOLOGICAL SURVEY  
Richard A. Ortt, Jr., Director

**ADMINISTRATIVE REPORT NO. 17-02-03**

**HYDROGRAPHS AND TABLES SHOWING GROUND-WATER LEVEL  
RECORDS FOR SELECTED OBSERVATION WELLS  
IN ANNE ARUNDEL COUNTY, MARYLAND**

**AND**

**HYDROGRAPH SHOWING SURFACE-WATER FLOW  
IN SAWMILL CREEK**

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Prepared in cooperation with the  
Anne Arundel County Department of Public Works

**2017**

## SUMMARY

Since monitoring began 2004, water levels in the **Aquia aquifer** in Southern Anne Arundel County at the Deale Athletic Field (AA Fe 92) have declined from about 24 ft in 2004 to about 35 ft below sea level in 2016. While fluctuating by as much as 8 ft as a result of local pumpage, the overall water-level trend since about 2006 has been relatively flat. The flattening of the trend is largely a result of a reduction of withdrawals from the Aquia aquifer in St. Mary's County as pumpage was shifted to the deeper Upper Patapsco aquifer to avoid elevated arsenic concentrations in the Aquia.

The most recent water levels in the **Magothy aquifer** range from sea level west of Annapolis (AA Dd 42) to about 36 ft below sea level at the Annapolis well field (AA De 1); although water levels in AA De 1 are affected significantly by a nearby production in that well field. Most water levels show some stabilization since about 2008 with the exception of AA Fe 93 in Southern Anne Arundel County which continues to decline.

The most recent water levels in the **Upper Patapsco aquifer** range from about 72 ft above sea level in northern Anne Arundel County (AA Ad 108) to about 27 ft below sea level on the Broadneck Peninsula (AA Cf 134). Recent water-level trends in the Upper Patapsco aquifer are stable or recovering in the Glen Burnie area (AA Ad 108 and AA Bd 159) and Broadneck Peninsula (AA Cf 134 and AA Cg 24). In the Broad Creek and City of Annapolis well fields (AA De 95 and AA De 219, respectively) and south of Annapolis (AA De 128), water levels are generally declining.

The most recent water levels in the **Lower Patapsco aquifer** range from about 76 ft above sea level in northern Anne Arundel County (AA Bd 160) to about 80 ft below sea level at the Crofton Meadows well field (AA Cc 137). Water-level trends in the Lower Patapsco aquifer are stable or recovering in the Glen Burnie area. In the Crofton Meadows well field, water levels have declined between approximately 25 ft (AA Cc 89) and 40 ft (AA Cc 115) since 2014. The water-level trend at the Arnold well field (AA Cf 137) was relatively stable between 1988 and about 2010, declined between 2010 and 2012, and has been stable or slightly recovered since 2012 (AA Cf 137 and AA Cf 167). Recent water levels at the Broad Creek well field (AA De 206) are declining.

The most recent water levels in the **Patuxent aquifer** range from about 35 ft above sea level south of Ft. Meade (AA Cb 1) to about 107 ft below sea level in the Arnold well field (AA Cf 166). Beginning in about 2006, the water-level trend has been relatively stable in the Dorsey Road well field (AA Ad 90). Recent reduction in Patuxent pumpage from the Dorsey Road well field has caused water levels to recover significantly, higher than any levels recorded since the mid-1990s. In the Crofton Meadows well field (AA Cc 102 and 135), water levels have somewhat recovered over the past couple years. In the Arnold well field (AA Cf 166—remote test well) water levels have been relatively stable.

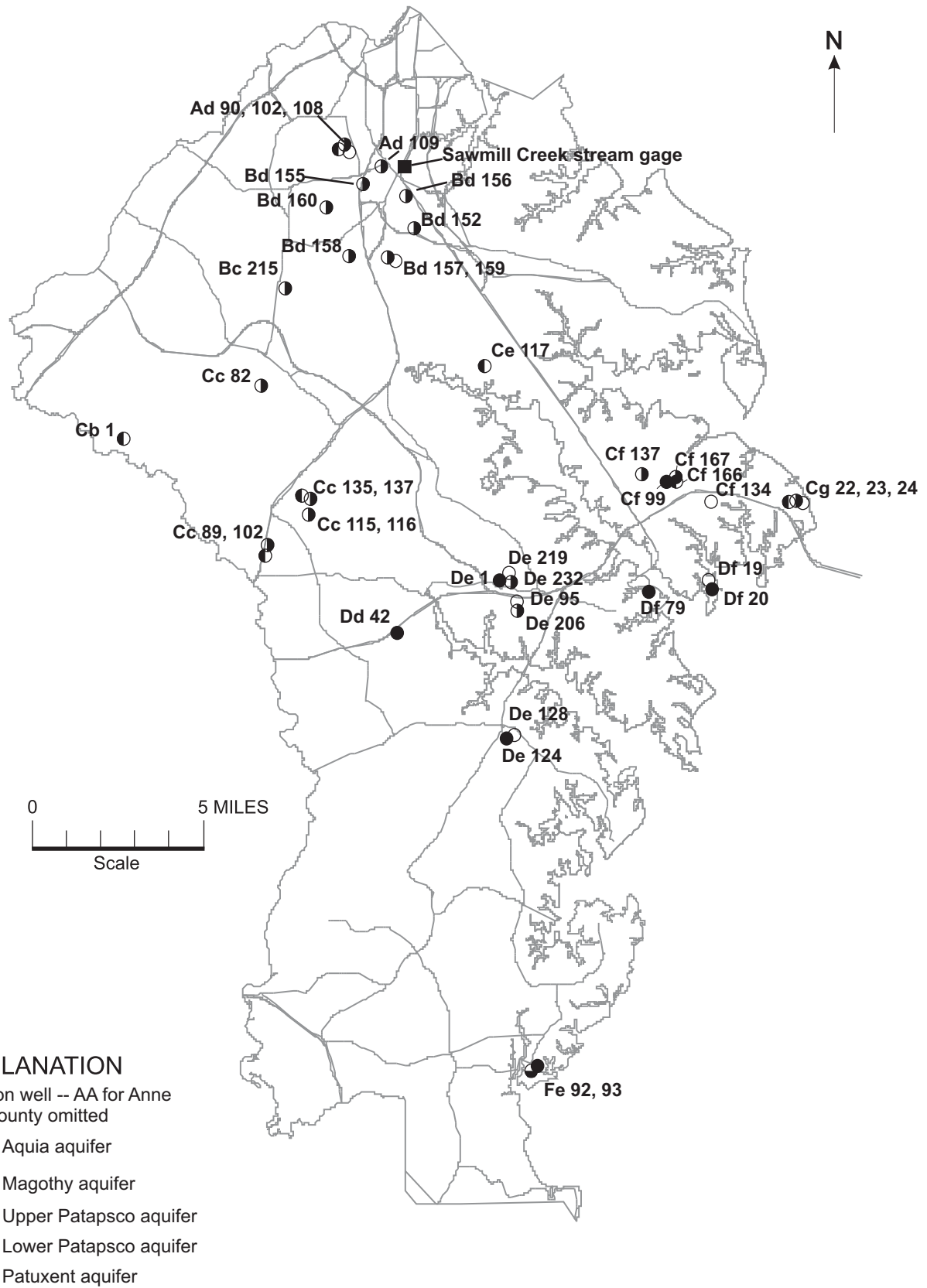
The daily discharge in **Sawmill Creek** showed similar patterns to measurements over the past several years, with daily discharge ranging between approximately 2 and 30 cubic feet per second over the past year.

## GROUND-WATER MONITORING WELLS

Well Number	Location	Aquifer
AA Ad 90	Aviation Blvd., Glen Burnie	Patuxent
AA Ad 102	Aviation Blvd., Glen Burnie	Lower Patapsco
AA Ad 108	Aviation Blvd., Glen Burnie	Upper Patapsco
AA Ad 109	Dorsey Road, Glen Burnie	Lower Patapsco
AA Bc 215	Telegraph Road	Lower Patapsco
AA Bd 152	Woodside School, Glen Burnie	Lower Patapsco
AA Bd 155	State Highway Administration, Glen Burnie	Lower Patapsco
AA Bd 156	Baltimore-Annapolis Bike Trail, Glen Burnie	Lower Patapsco
AA Bd 157	Rippling Woods Elementary School, Glen Burnie	Lower Patapsco
AA Bd 158	Center for Applied Technology, Glen Burnie	Lower Patapsco
AA Bd 159	Rippling Woods ES, near Glen Burnie	Upper Patapsco
AA Bd 160	Queenstown Park, near Glen Burnie	Lower Patapsco
AA Cb 1	Patuxent Wildlife Refuge Center	Patuxent
AA Cc 82	King Heights Water-Treatment Plant	Lower Patapsco
AA Cc 89	Crofton Water-Treatment Plant	Lower Patapsco
AA Cc 102	Crofton Water-Treatment Plant	Patuxent
AA Cc 115	Crofton Meadows Water-Treatment Plant	Lower Patapsco
AA Cc 116	Crofton Meadows Water-Treatment Plant	Lower Patapsco
AA Cc 135	Crofton Meadows Water-Treatment Plant	Patuxent
AA Cc 137	Crofton Meadows Water-Treatment Plant	Lower Patapsco
AA Ce 117	Severndale Water-Treatment Plant	Patuxent
AA Cf 99	Traffic Engineering Building, Broad Neck	Magothy
AA Cf 134	Amberly Water-Treatment Plant	Upper Patapsco
AA Cf 137	Arnold Water-Treatment Plant	Lower Patapsco
AA Cf 166	Arnold Water-Treatment Plant (remote site)	Patuxent
AA Cf 167	Arnold Water-Treatment Plant (remote site)	Lower Patapsco
AA Cg 22	Sandy Point State Park	Patuxent
AA Cg 23	Sandy Point State Park	Lower Patapsco
AA Cg 24	Sandy Point State Park	Upper Patapsco
AA Dd 42	Route 50 and Howard Grove Road	Magothy
AA De 1	City of Annapolis Water Works Building	Magothy
AA De 95	Broad Creek Water-Treatment Plant	Upper Patapsco
AA De 128	Central Avenue well field	Upper Patapsco
AA De 206	Broad Creek Water-Treatment Plant	Lower Patapsco
AA De 219	City of Annapolis	Upper Patapsco
AA De 232	City of Annapolis	Lower Patapsco
AA Df 19	U.S. Navy Radio Station	Upper Patapsco
AA Df 20	U.S. Navy Radio Station	Magothy
AA Df 79	U.S. Naval Academy	Magothy
AA Fe 92	Deale Athletic Field	Aquia
AA Fe 93	Deale Athletic Field	Magothy

## SURFACE-WATER MONITORING GAGE

Gage Number 01589500	Sawmill Creek
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**Figure 1. Location of observation wells and stream gage.**

WELL NUMBER: AA Ad 90

PERMIT NUMBER: AA-04-0298

LOCATION: Aviation Blvd., Glen Burnie

LAT. 39° 10' 32", LONG. 76° 38' 59"

AQUIFER: Patuxent Formation of Lower Cretaceous age

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 453 ft;

Casing diameter: 6 in. to 443 ft;

Screen diameter: 6 in. from 443 to 453 ft.

INSTRUMENTATION: Periodic measurements.

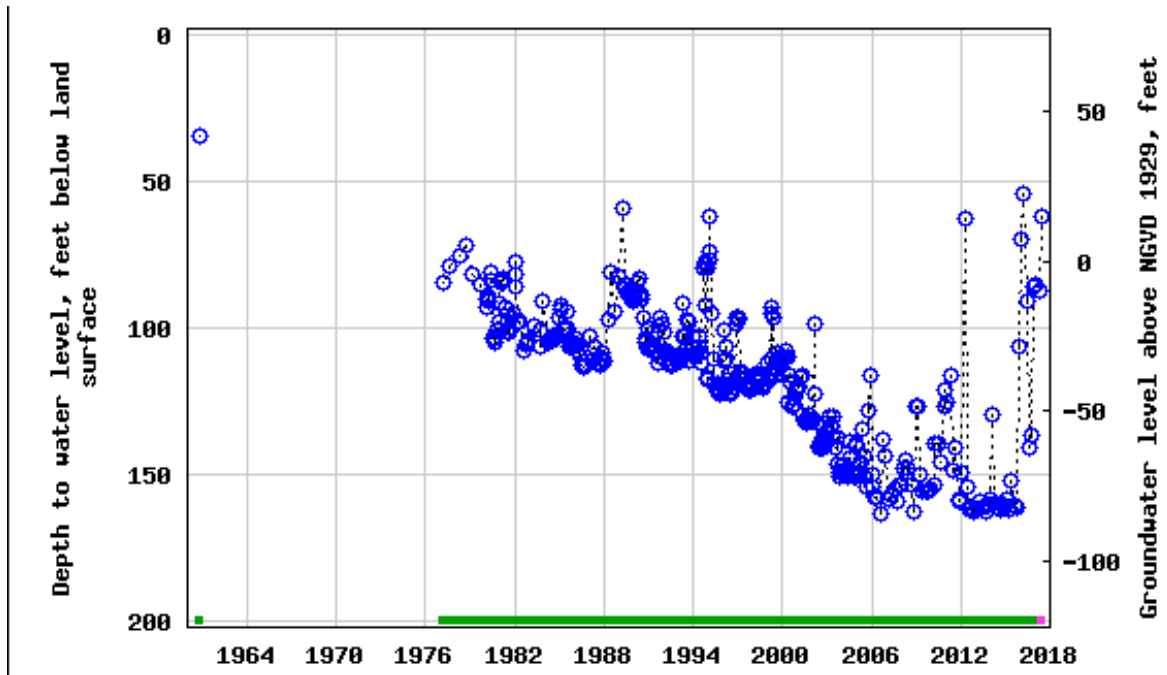
DATUM: Altitude of land surface is 77.85 ft above NGVD of 1929.

MEASURING POINT: Top of hole in flange 2.2 ft above land surface.

PERIOD OF RECORD: April 1977 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
8/2/16	140.76
9/16/16	136.84
11/16/16	86.09
2/1/17	85.42
4/27/17	87.28
6/7/17	61.94



WELL NUMBER: AA Ad 102

PERMIT NUMBER: AA-81-2641

LOCATION: Aviation Blvd., Glen Burnie

LAT. 39° 10' 32", LONG. 76° 38' 59"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 108 ft;

Casing diameter: 6 in. to 80 ft;

Screen diameter: 6 in. from 80 to 90 ft.

INSTRUMENTATION: Periodic measurements.

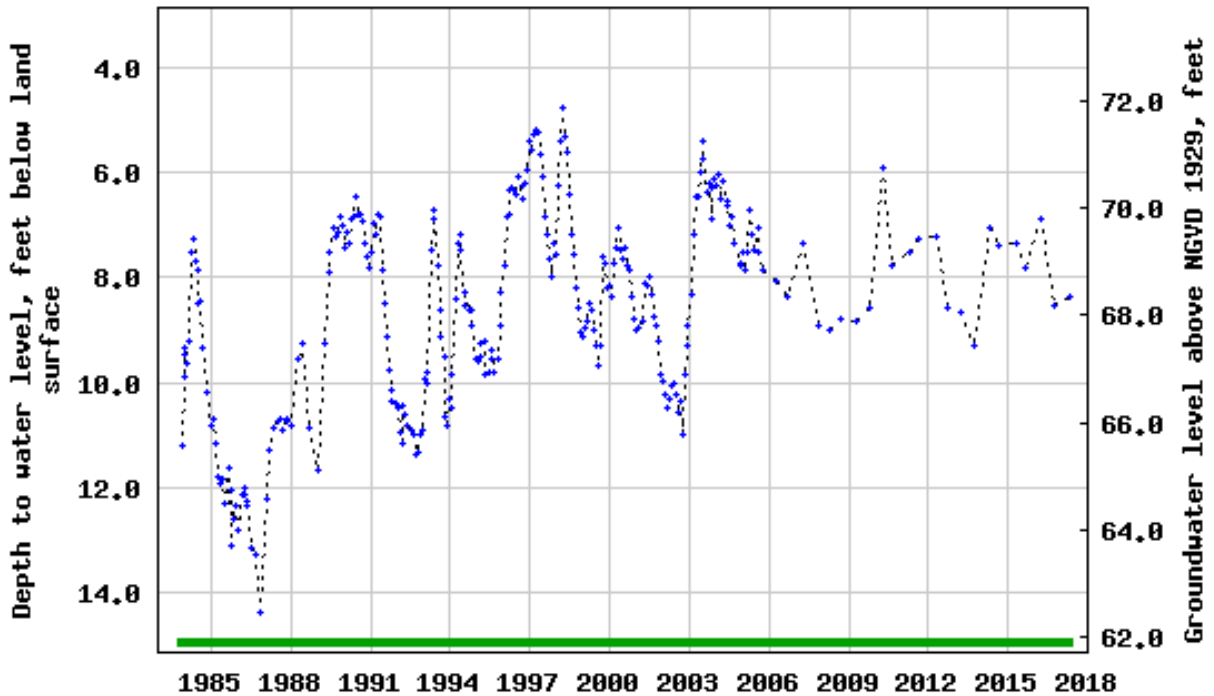
DATUM: Altitude of land surface is 76.72 ft above NGVD of 1929.

MEASURING POINT: Top of casing 5.27 ft above land surface.

PERIOD OF RECORD: December 1983 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/16/2016	8.53
4/27/2017	8.35



WELL NUMBER: AA Ad 108

PERMIT NUMBER: AA-81-3475

LOCATION: Aviation Blvd., Glen Burnie

LAT. 39° 10' 32", LONG. 76° 38' 59"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, water-table well, depth 11.5 ft;

Casing diameter: 4 in. to 6 ft;

Screen diameter: 4 in. from 6 to 11 ft.

INSTRUMENTATION: Periodic measurements.

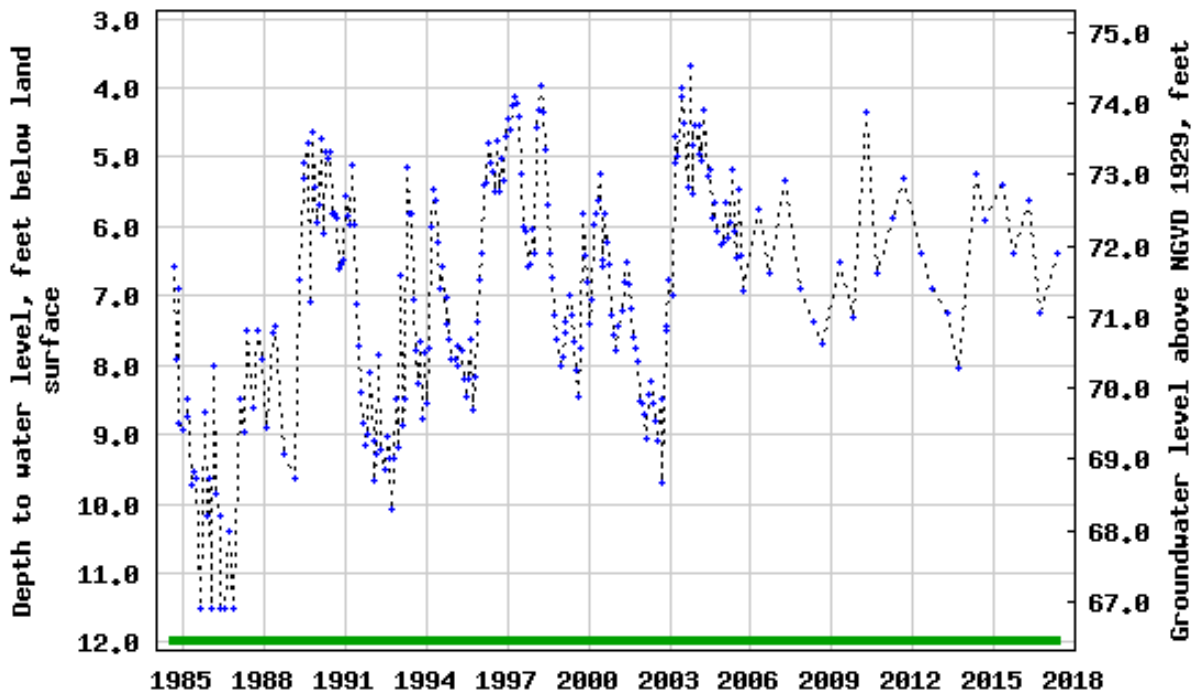
DATUM: Altitude of land surface is 78.31 ft above NGVD of 1929.

MEASURING POINT: Top of casing 5.5 ft above land surface.

PERIOD OF RECORD: August 1984 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/16/2016	7.23
4/27/2017	6.38



WELL NUMBER: AA Ad 109

PERMIT NUMBER: AA-81-4890

LOCATION: Dorsey Road, Glen Burnie

LAT. 39° 10' 06", LONG. 76° 38' 01"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 46 ft;

Casing diameter: 4 in. to 36 ft;

Screen diameter: 4 in. from 36 to 46 ft.

INSTRUMENTATION: Periodic measurements.

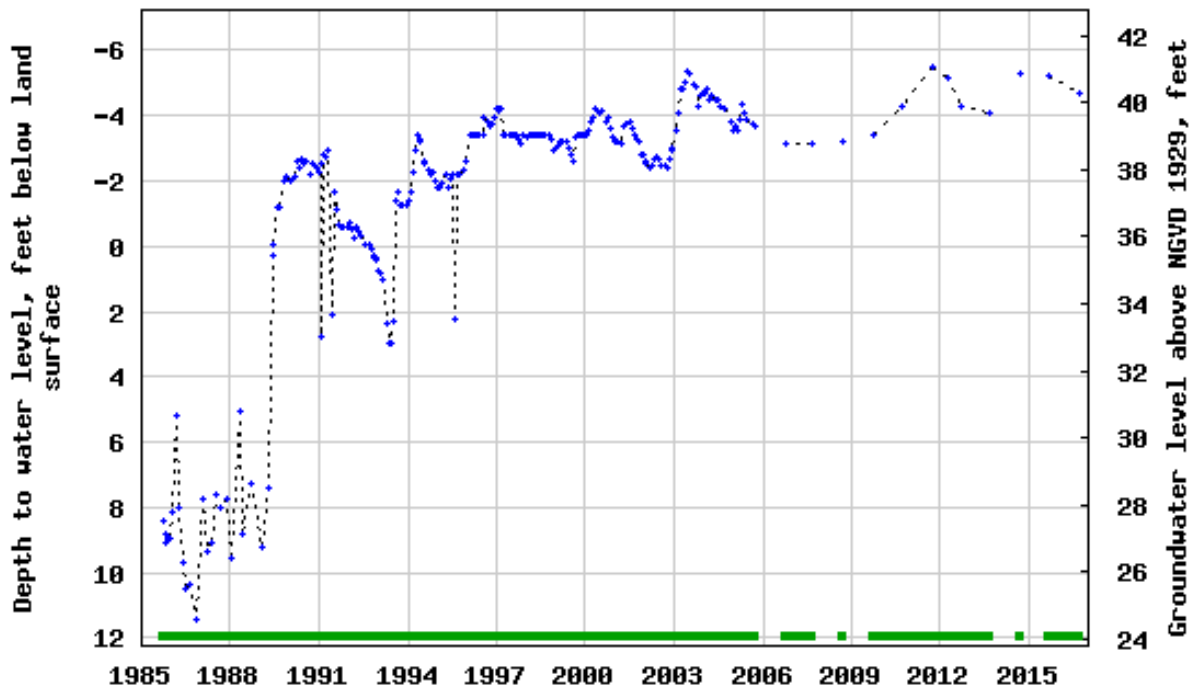
DATUM: Altitude of land surface is 35.78 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 4.29 ft above land surface.

PERIOD OF RECORD: October 1985 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM (READINGS ABOVE LAND-SURFACE INDICATED BY "-")

Date	Water level
9/9/2015	-5.20
9/6/2016	-4.67





WELL NUMBER: AA Bc 215

PERMIT NUMBER: AA-81-1035

LOCATION: Telegraph Road

LAT. 39° 07' 00", LONG. 76° 41' 26"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, production, artesian well, depth 325 ft;

Casing diameter: 16 in. to 236 ft

Screen diameter: 10 in. from 235 to 239 ft, 250 to 284 ft, and 288 to 316 ft.

INSTRUMENTATION: Periodic measurements.

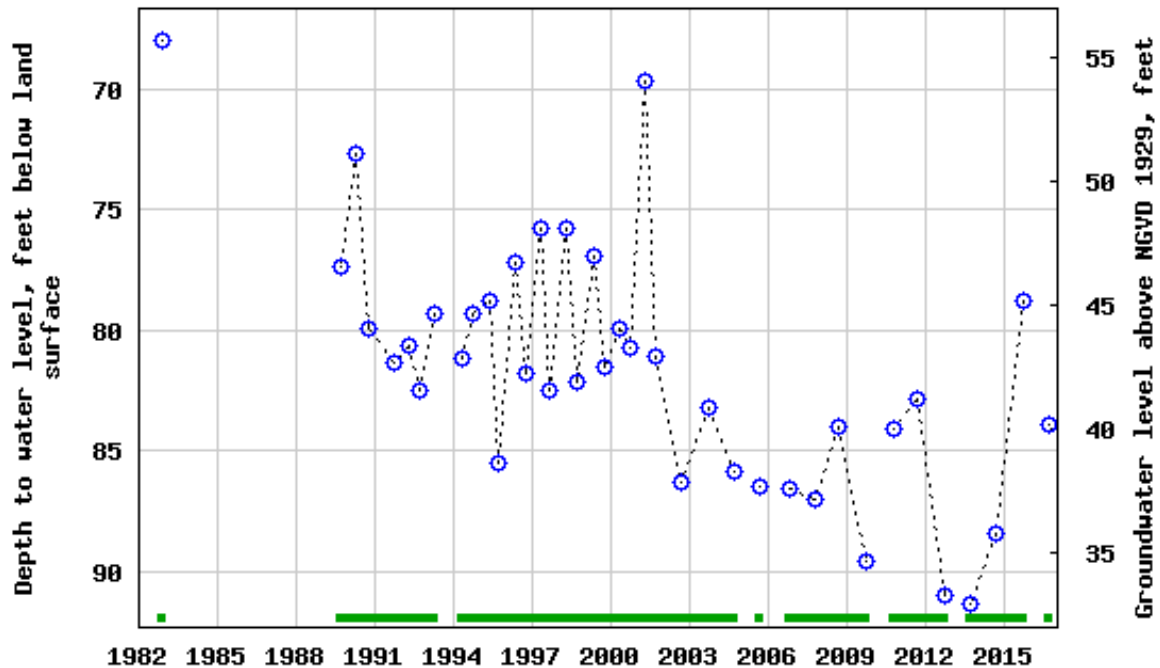
DATUM: Altitude of land surface is 124 ft above NGVD of 1929.

MEASURING POINT: Top of riser pipe 1 ft above land surface.

PERIOD OF RECORD: December 1989 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/4/2015	78.81
9/16/2016	83.95



WELL NUMBER: AA Bd 152

PERMIT NUMBER: AA-81-3463

LOCATION: Woodside School, Glen Burnie

LAT. 39° 08' 21", LONG. 76° 36' 54"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 103 ft;

Casing diameter: 6 in. to 90 ft;

Screen diameter: 4 in. from 90 to 100 ft.

INSTRUMENTATION: Periodic measurements.

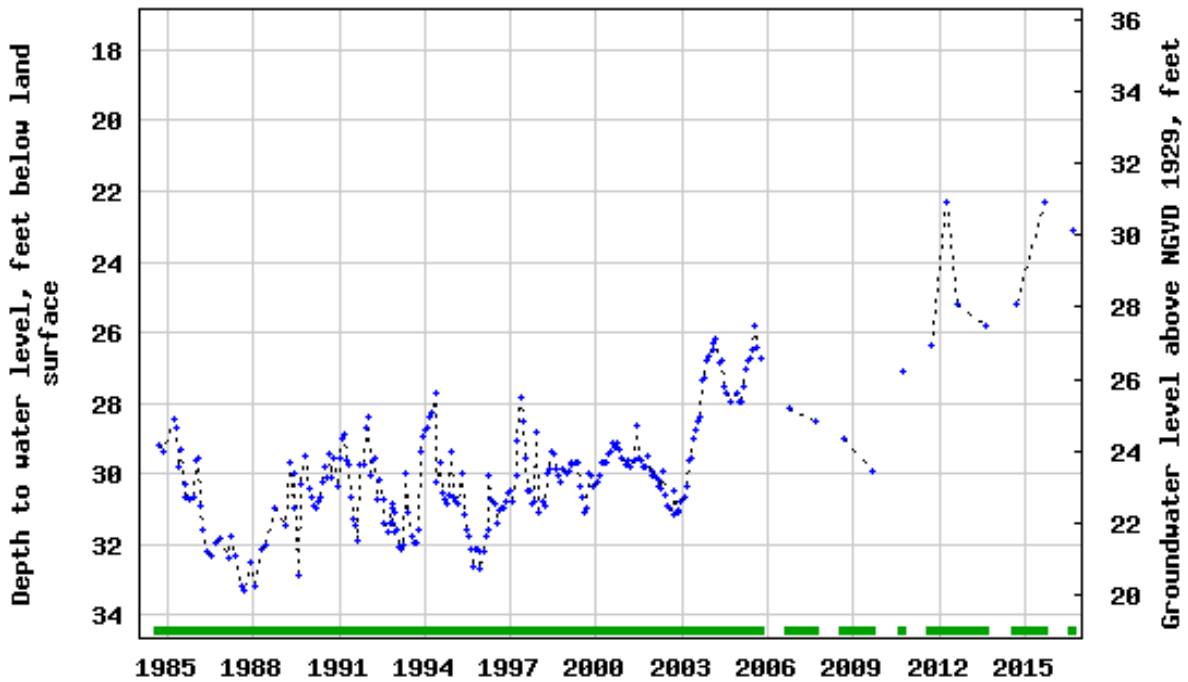
DATUM: Altitude of land surface is 53.29 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 3.0 ft above land surface.

PERIOD OF RECORD: March 1985 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/3/2015	22.31
9/6/2016	23.11



WELL NUMBER: AA Bd 155

PERMIT NUMBER: AA-81-3460

LOCATION: State Highway Administration, Glen Burnie

LAT. 39° 09' 38", LONG. 76° 38' 37"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 159 ft;

Casing diameter: 6 in. to 145 ft;

Screen diameter: 4 in. from 145 to 155 ft.

INSTRUMENTATION: Periodic measurements.

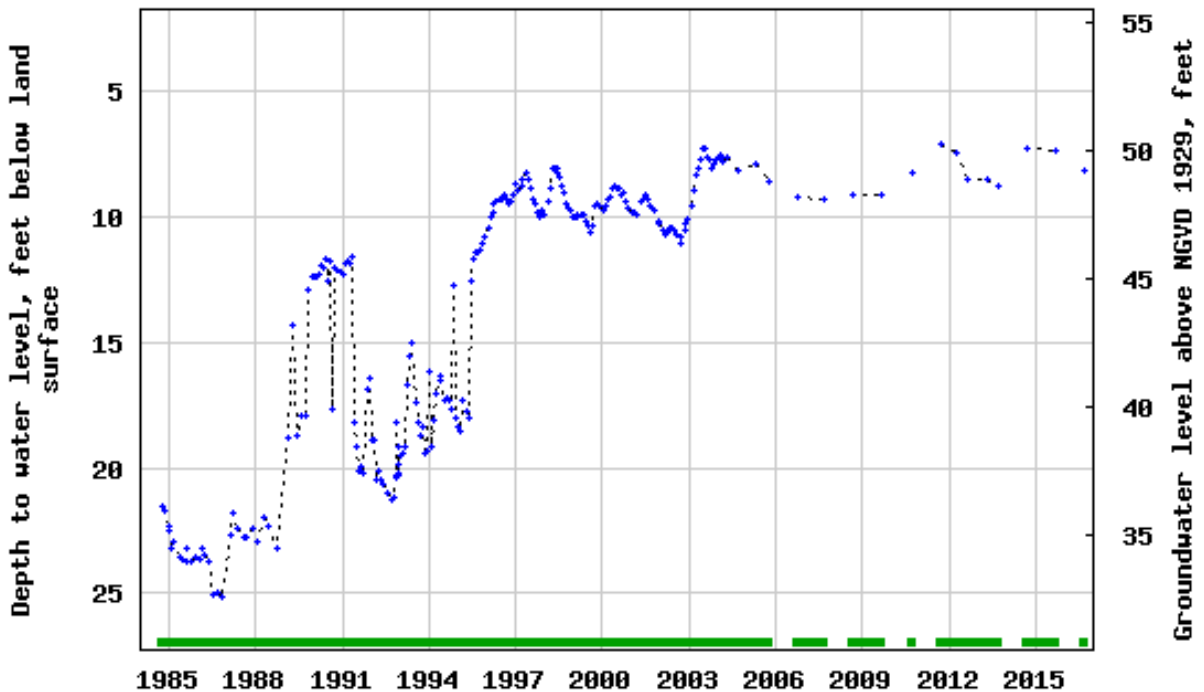
DATUM: Altitude of land surface is 57.50 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 2.5 ft above land surface.

PERIOD OF RECORD: October 1984 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/3/2015	7.35
9/6/2016	8.18



WELL NUMBER: AA Bd 156

PERMIT NUMBER: AA-81-3462

LOCATION: Baltimore-Annapolis Bike Trail, 0.3 mi. north  
of Aquahart Rd., Glen Burie

LAT. 39° 09' 22", LONG. 76° 37' 10"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 173 ft;

Casing diameter: 6 in. to 160 ft; 4 in. from 170 to 173 ft;

Screen diameter: 4 in. from 160 to 170 ft.

INSTRUMENTATION: Periodic measurements.

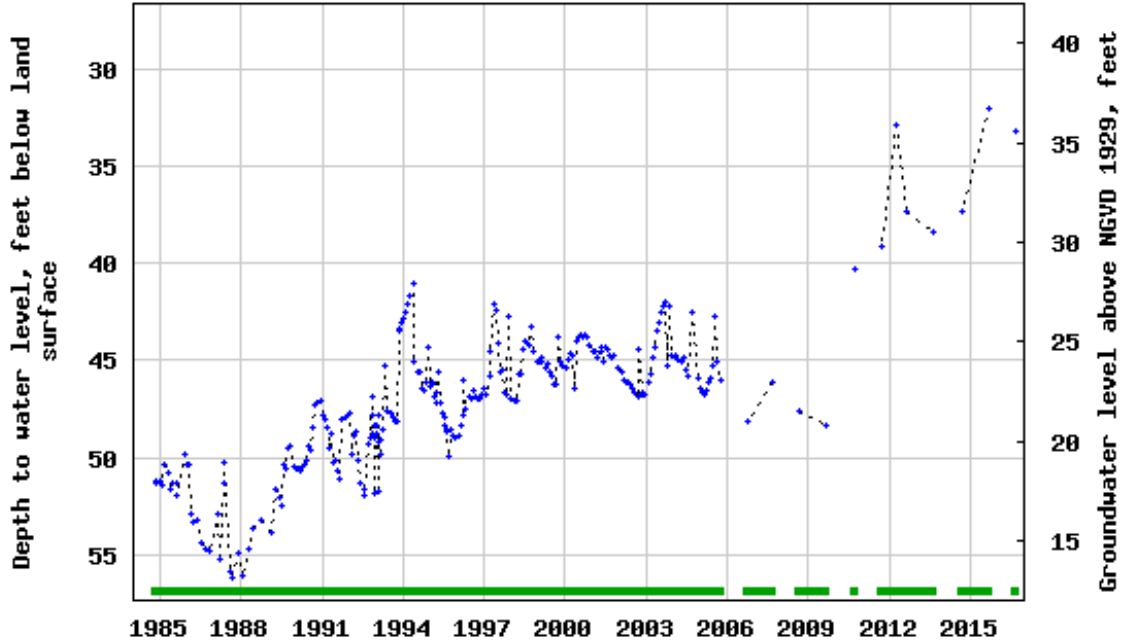
DATUM: Altitude of land surface is 68.99 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 2.26 ft above land surface.

PERIOD OF RECORD: October 1984 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/3/2015	32.09
9/6/2016	33.24



WELL NUMBER: AA Bd 157

PERMIT NUMBER: AA-81-3464

LOCATION: Rippling Woods Elementary School, Glen Burnie LAT. 39° 07' 37", LONG. 76° 37' 44"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 180 ft;

Casing diameter: 6 in. to 167 ft;

Screen diameter: 4 in. from 167 to 177 ft.

INSTRUMENTATION: Periodic measurements.

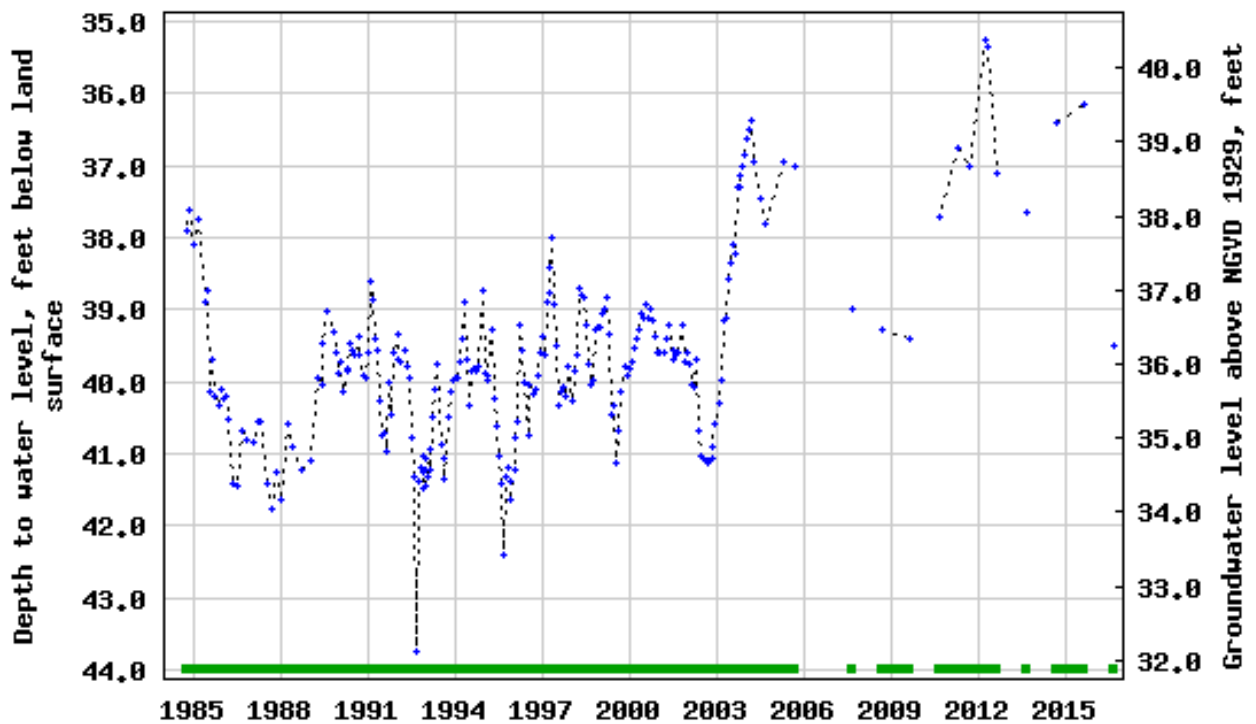
DATUM: Altitude of land surface is 75.75 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 2.5 ft above land surface.

PERIOD OF RECORD: March 1985 to current year\*.

WATER LEVEL IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/3/2015	36.15
9/6/2016	39.51



WELL NUMBER: AA Bd 158

PERMIT NUMBER: AA-81-3459

LOCATION: Center for Applied Technology, Glen Burnie

LAT. 39° 07' 44", LONG. 76° 37" 00"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 187 ft;

Casing diameter: 6 in. to 174 ft;

Screen diameter: 4 in. from 174 to 184 ft.

INSTRUMENTATION: Periodic measurements.

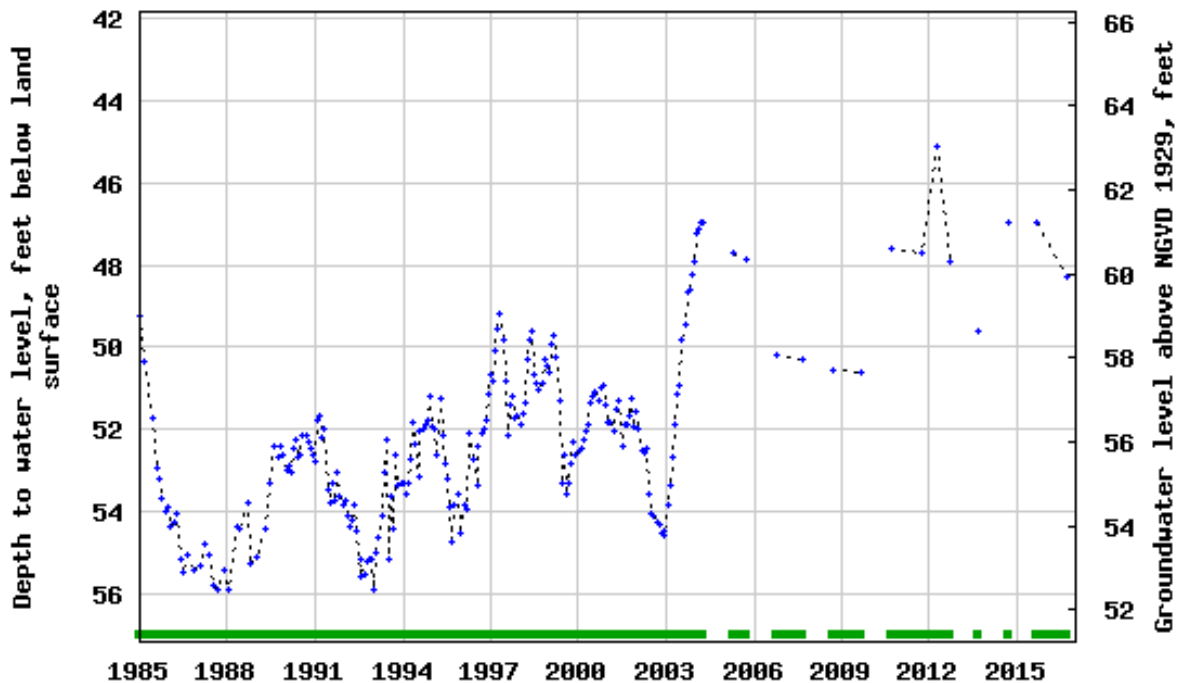
DATUM: Altitude of land surface is 108.25 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 2.6 ft above land surface.

PERIOD OF RECORD: January 1985 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/9/2015	46.94
9/6/2016	48.31



WELL NUMBER: AA Bd 159  
LOCATION: Rippling Woods Elementary School,  
near Glen Burnie

PERMIT NUMBER: AA-81-3949  
LAT. 39° 07' 37", LONG. 76° 37' 44"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 100 ft;

Casing diameter: 6 in. to 89 ft;

Screen diameter: 4 in. from 89 to 99 ft.

INSTRUMENTATION: Periodic measurements.

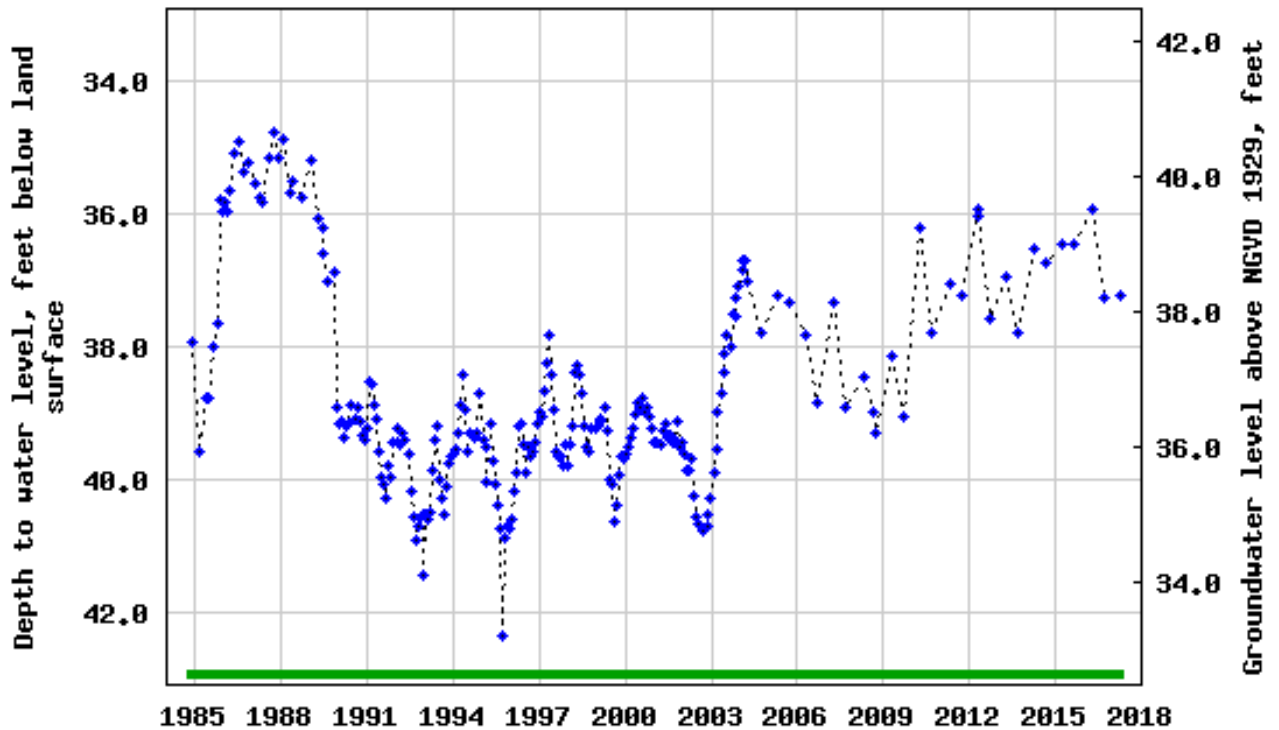
DATUM: Altitude of land surface is 75.48 ft above NGVD of 1929.

MEASURING POINT: Top of casing 2.5 ft above land surface.

PERIOD OF RECORD: 1984 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/6/2016	37.27
4/18/2017	37.22



WELL NUMBER: AA Bd 160

PERMIT NUMBER: AA-81-3461

LOCATION: Queenstown Park, near Glen Burnie

LAT. 39° 09' 08", LONG. 76° 39' 44"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 118 ft;

Casing diameter: 6 in. to 105 ft;

Screen diameter: 4 in. from 105 to 115 ft.

INSTRUMENTATION: Periodic measurements.

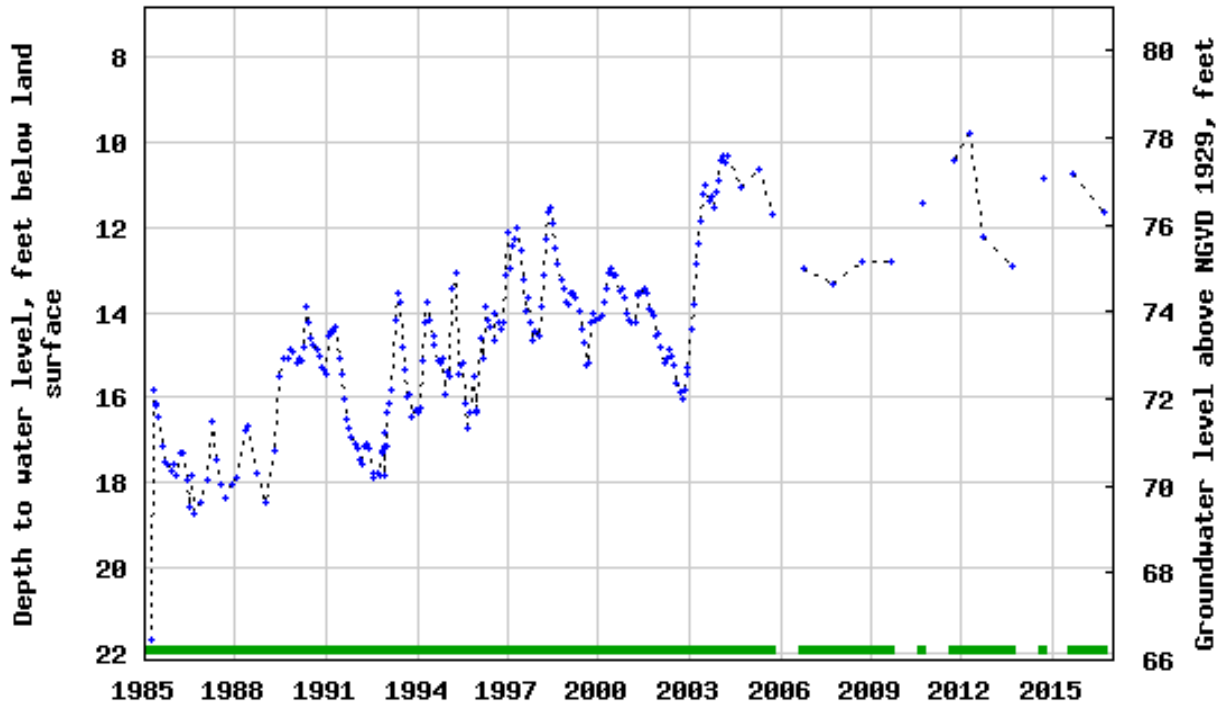
DATUM: Altitude of land surface is 88 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 2.5 ft above land surface.

PERIOD OF RECORD: March 1985 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/9/2015	10.75
9/6/2016	11.65





WELL NUMBER: AA Cb 1

PERMIT NUMBER: AA-03-5695

LOCATION: Patuxent Wildlife Refuge Center

LAT. 39° 03' 03", LONG. 76° 46' 32"

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 505 ft;

Casing diameter: 6 in. to 485 ft;

Screen diameter: 6 in. from 485 to 505 ft.

INSTRUMENTATION: Periodic measurements.

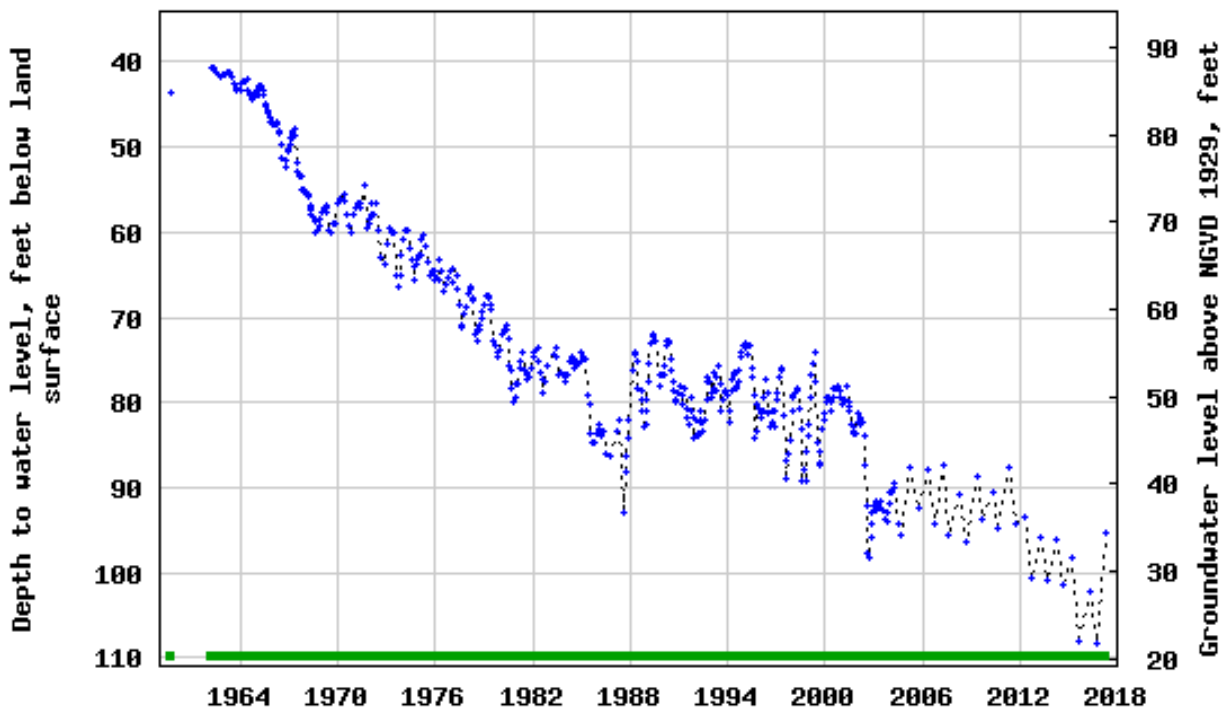
DATUM: Altitude of land surface is 129.10 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 3.35 ft above land surface.

PERIOD OF RECORD: March 1962 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/7/2016	108.35
4/18/2017	95.22



WELL NUMBER: AA Cc 82

PERMIT NUMBER: AA-04-6965

LOCATION: King Heights Water-Treatment Plant

LAT. 39° 04' 22", LONG. 76° 41' 45"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 458 ft;

Casing diameter: 1 in. to 455 ft;

Screen diameter: 1.25 in. from 455 to 458 ft.

INSTRUMENTATION: Periodic measurements.

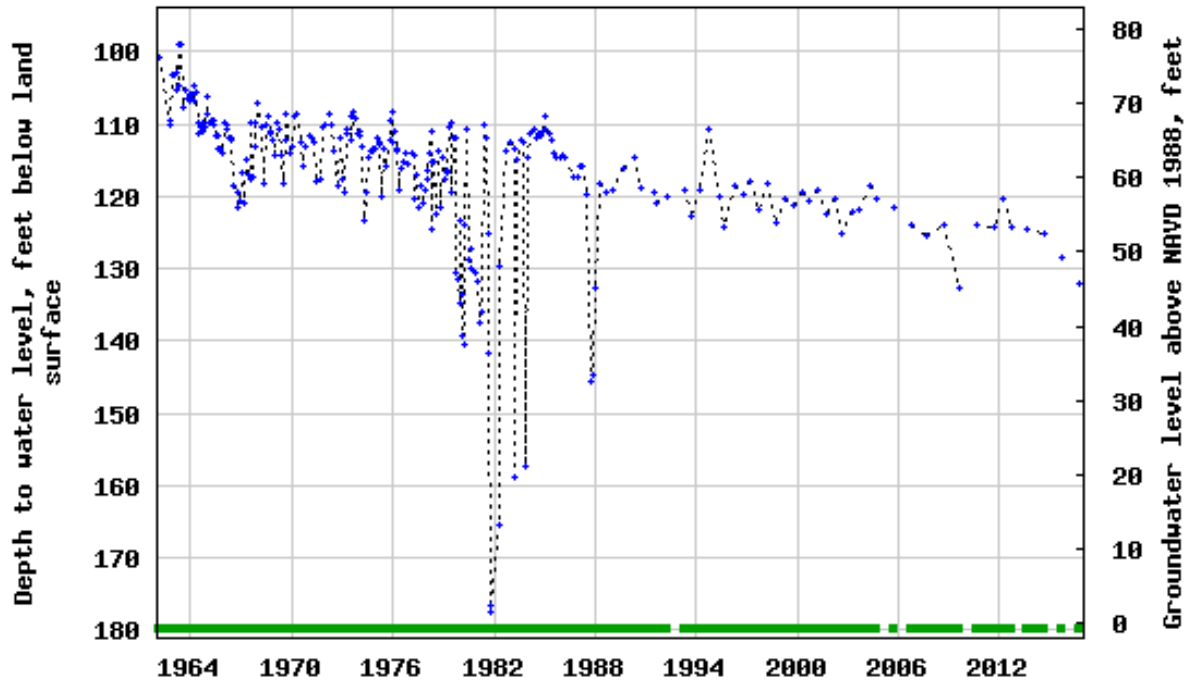
DATUM: Altitude of land surface is 178.39 ft above NGVD of 1929.

MEASURING POINT: Top of casing 0.5 ft above land surface.

PERIOD OF RECORD: 1962 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
8/31/2015	128.37
9/7/2016	132.06



WELL NUMBER: AA Cc 89

PERMIT NUMBER: AA-65-0672

LOCATION: Crofton Water-Treatment Plant

LAT. 39° 00' 10", LONG. 76° 41' 57"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 605 ft;

Casing diameter: 4 in. to 575 ft;

Screen diameter: 4 in. from 575 to 605 ft.

INSTRUMENTATION: Periodic measurements.

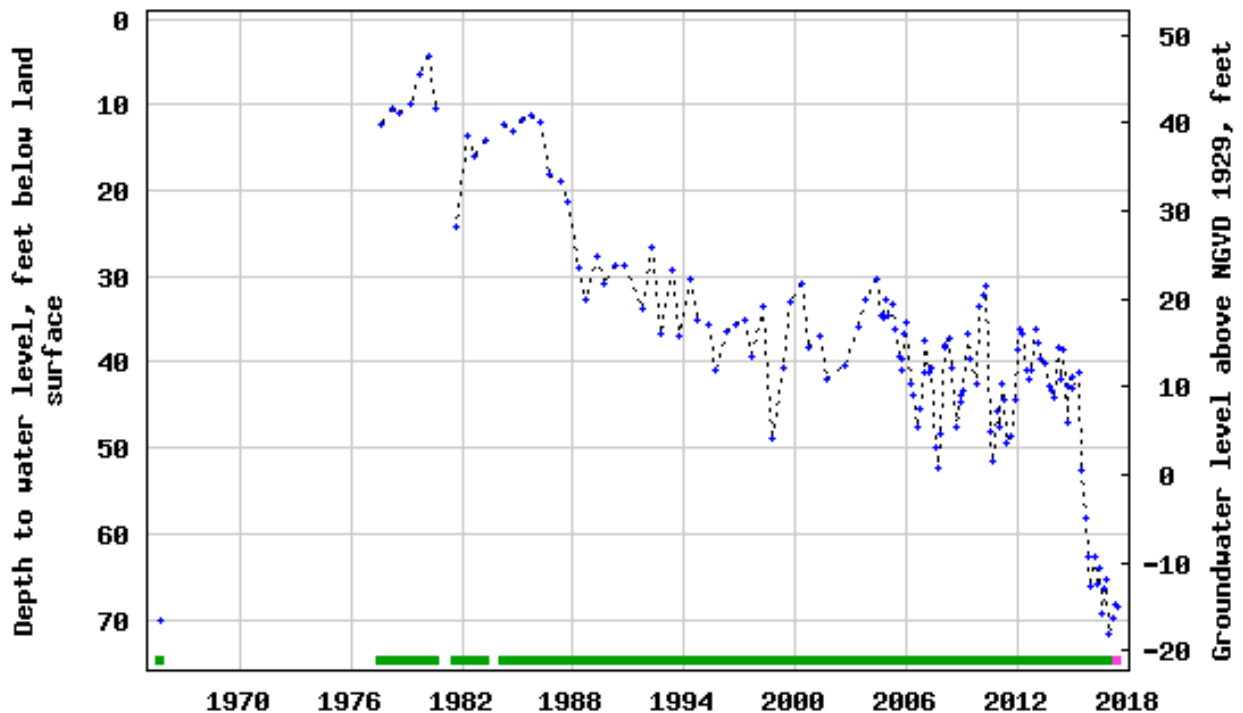
DATUM: Altitude of land surface is 53 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 3.6 ft above land surface.

PERIOD OF RECORD: 1977 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
8/2/2016	69.38
9/16/2016	66.51
10/7/2016	65.48
11/16/2016	71.85
2/6/2017	69.78
4/27/2017	68.27
6/9/17	68.64



WELL NUMBER: AA Cc 102

PERMIT NUMBER: AA-72-0907

LOCATION: Crofton Water-Treatment Plant

LAT. 39° 00' 04", LONG. 76° 42' 00"

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 960 ft;

Casing diameter: 4 in. to 850 ft;

Screen diameter: 4 in. from 850 to 960 ft.

INSTRUMENTATION: Periodic measurements.

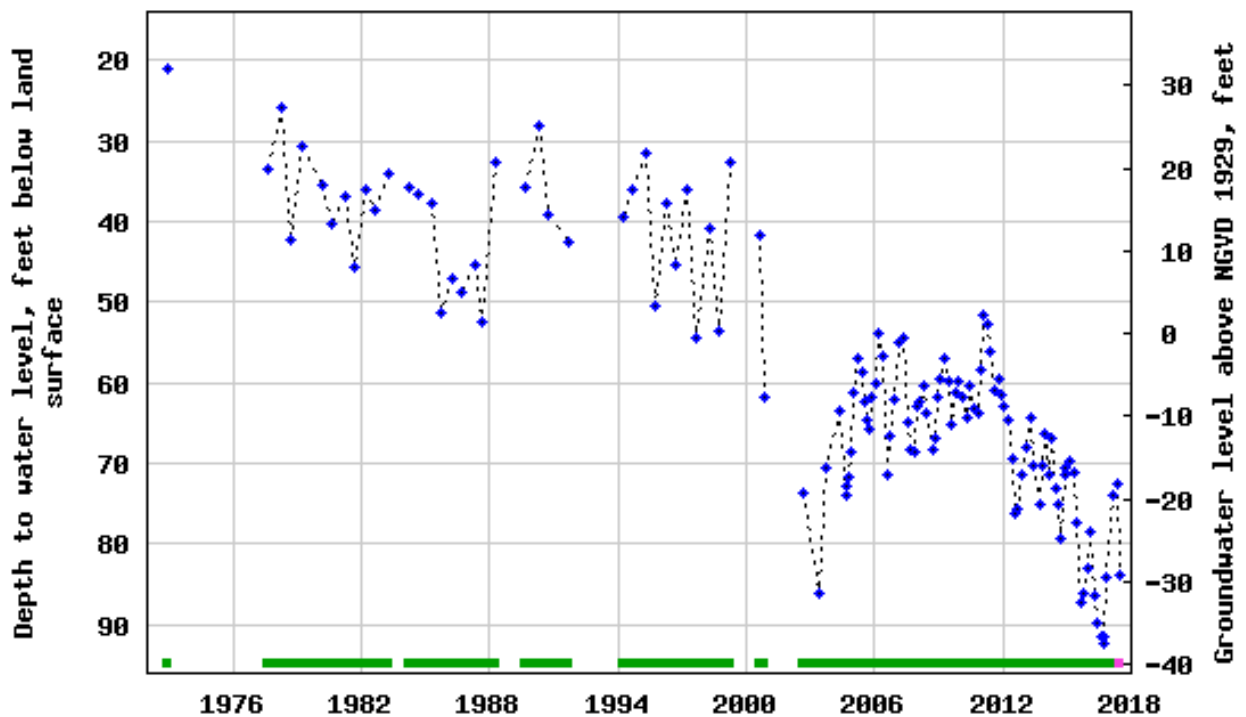
DATUM: Altitude of land surface is 54 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 3.3 ft above land surface.

PERIOD OF RECORD: 1972 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
8/2/2016	91.59
9/16/2016	92.30
10/7/2016	91.40
11/16/2016	84.23
2/6/2017	73.90
4/27/2017	72.56
6/9/2017	83.74



WELL NUMBER: AA Cc 115

PERMIT NUMBER: AA-73-9755

LOCATION: Crofton Meadows Water-Treatment Plant

LAT. 39° 01' 03", LONG. 76° 40' 26"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 671 ft;

Casing diameter: 4 in. to 661 ft;

Screen diameter: 4 in. from 661 to 671 ft;

INSTRUMENTATION: Periodic measurements.

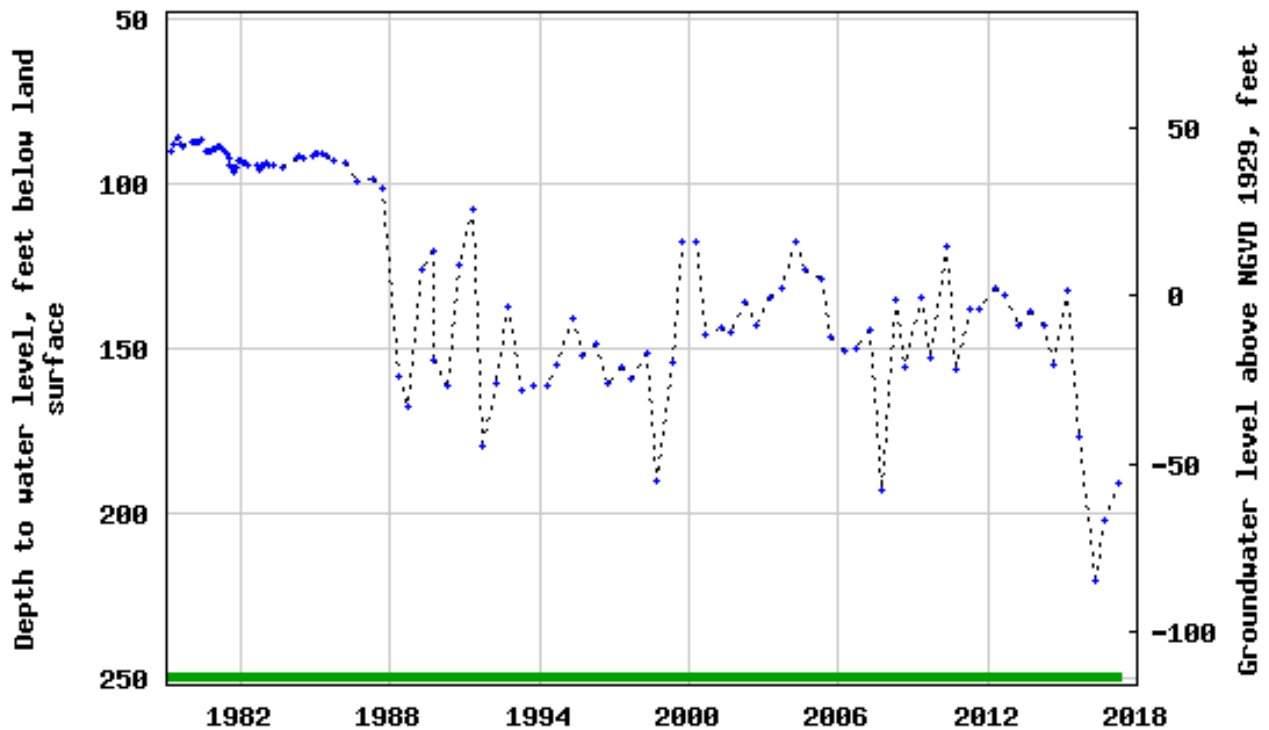
DATUM: Altitude of land surface is 134.38 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 3.55 ft above land surface.

PERIOD OF RECORD: 1979 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/16/2016	201.87
4/18/2017	190.92



WELL NUMBER: AA Cc 116

PERMIT NUMBER: AA-73-9756

LOCATION: Crofton Meadows Water-Treatment Plant

LAT. 39° 01' 03", LONG. 76° 40' 26"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 483 ft;

Casing diameter: 4 in. to 473 ft;

Screen diameter: 4 in. from 473 to 483 ft;

INSTRUMENTATION: Periodic measurements.

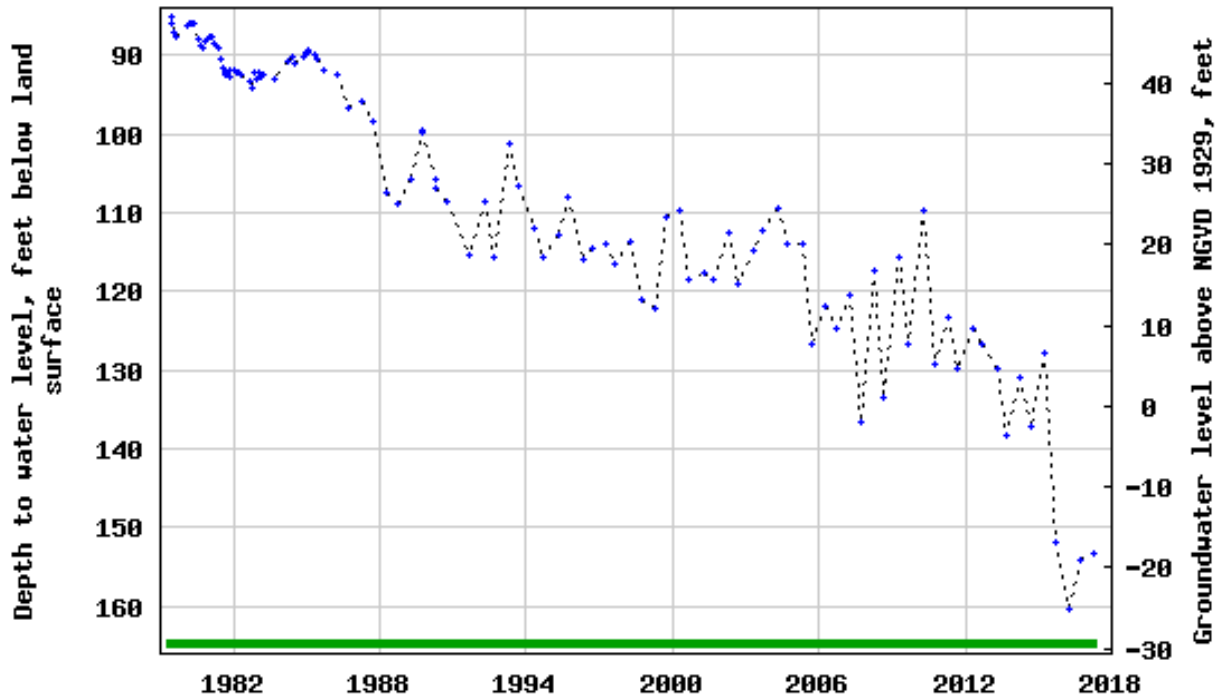
DATUM: Altitude of land surface is 134.35 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 3.0 ft above land surface.

PERIOD OF RECORD: 1979 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/15/2016	154.32
4/18/2017	153.23



WELL NUMBER: AA Cc 135

PERMIT NUMBER: AA-93-0998

LOCATION: Crofton Meadows Water-Treatment Plant

LAT. 39° 01' 26", LONG. 76° 40' 30"

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,100 ft.

Casing diameter: 4 in. to 299 ft; 2 in. from 299 to 985 ft, and 1,035 to 1,070 ft;

Screen diameter: 2 in. from 985 to 1,035 ft, and 1,070 to 1,100 ft.

INSTRUMENTATION: Periodic measurements.

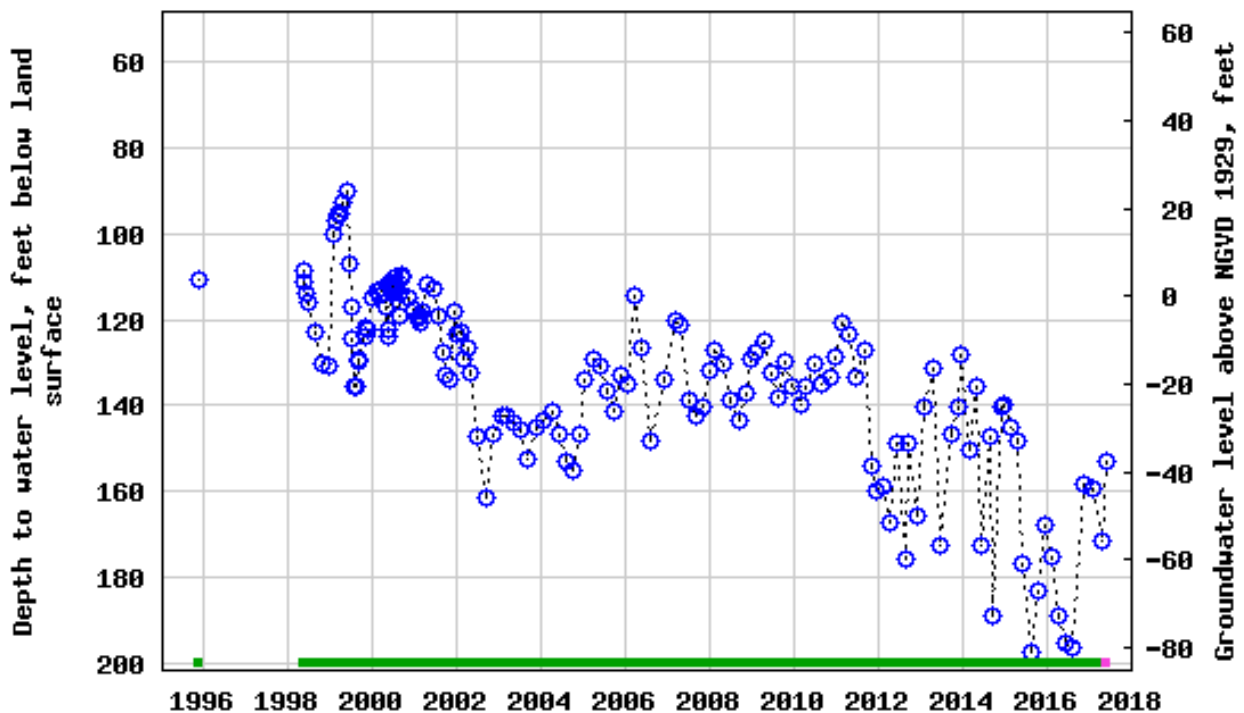
DATUM: Altitude of land surface is 114.81 ft above NGVD of 1929.

MEASURING POINT: Top of 6-inch steel flange 3.48 ft above land surface.

PERIOD OF RECORD: 1997 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
8/2/2016	196.12
11/16/2016	158.36
2/6/2017	159.39
4/27/2017	171.30
6/5/2017	153.10



WELL NUMBER: AA Cc 137

PERMIT NUMBER: AA-93-0993

LOCATION: Crofton Meadows Water-Treatment Plant

LAT. 39° 01' 26", LONG. 76° 40' 29"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 690 ft.

Casing diameter: 4 in. to 300 ft; 2 in. from 300 to 476 ft, 506 to 536 ft, and 576 to 606 ft;

Screen diameter: 2 in. from 476 to 506 ft, 536 to 576 ft, and 606 to 686 ft.

INSTRUMENTATION: Periodic measurements.

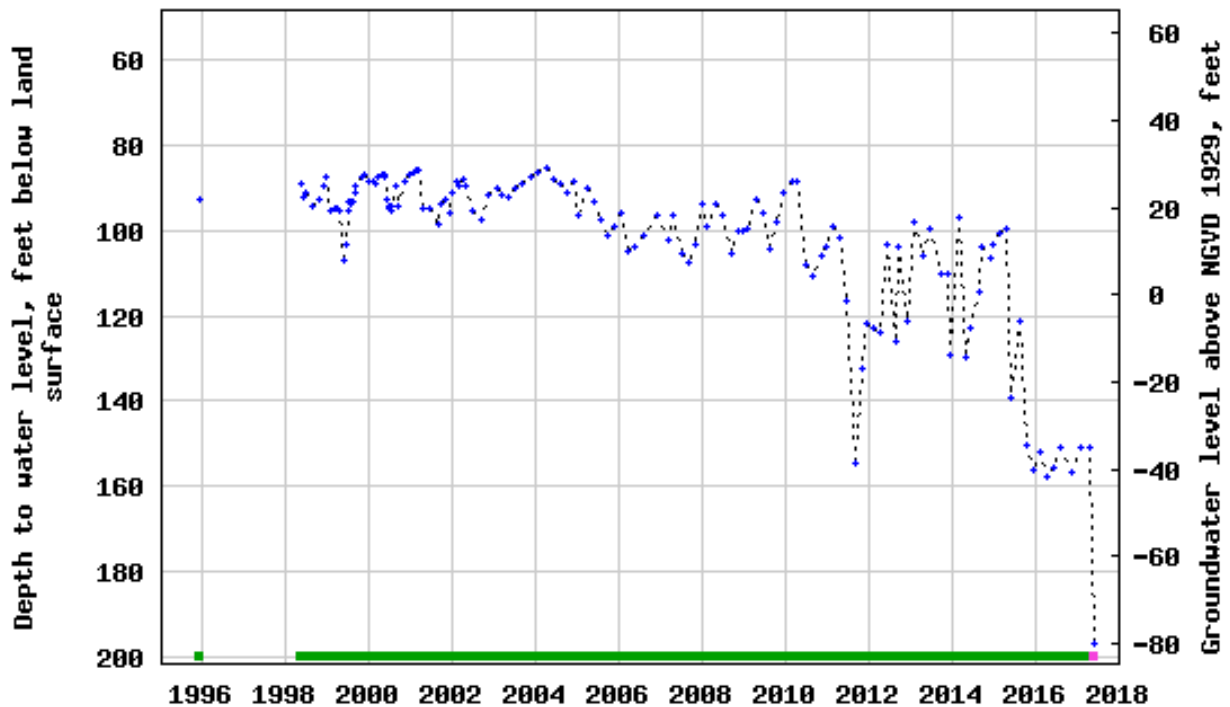
DATUM: Altitude of land surface is 117.00 ft above NGVD of 1929.

MEASURING POINT: Top of 4-inch PVC casing 2.2 ft above land surface.

PERIOD OF RECORD: 1997 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
8/2/2016	151.08
11/16/2016	156.58
2/6/2017	150.98
4/27/2017	150.79
6/5/2017	196.03





WELL NUMBER: AA Ce 117

PERMIT NUMBER: AA-73-0172

LOCATION: Severndale Water-Treatment Plant

LAT. 39° 04' 50", LONG. 76° 34' 34"

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 922 ft;

Casing diameter: 6 in. to 836 ft, 851 to 870 ft, and 890 to 907 ft;

Screen diameter: 6 in. from 836 to 851 ft, 870 to 890 ft, and 907 to 922 ft.

INSTRUMENTATION: Periodic measurements.

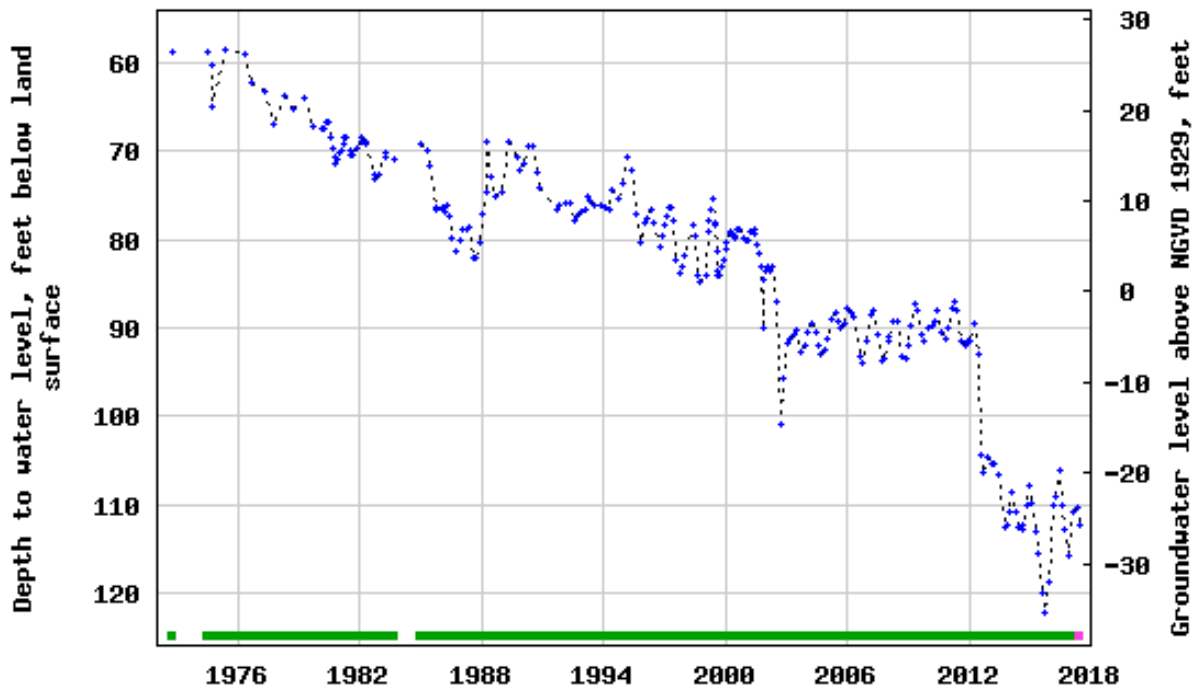
DATUM: Altitude of land surface is 86.0 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 0.5 ft above land surface.

PERIOD OF RECORD: 1977 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
8/2/2016	109.97
9/16/2016	112.71
11/16/2016	115.76
2/6/2017	110.68
4/27/2017	110.27
6/6/2017	112.41



WELL NUMBER: AA Cf 99

PERMIT NUMBER: AA-70-0199

LOCATION: Traffic Engineering Building, Broad Neck

LAT. 39° 01' 50", LONG. 76° 28' 30"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 220 ft.

Casing diameter: 2 in. to 210 ft.

Screen diameter: 2 in. from 210 to 220 ft.

INSTRUMENTATION: Periodic measurements.

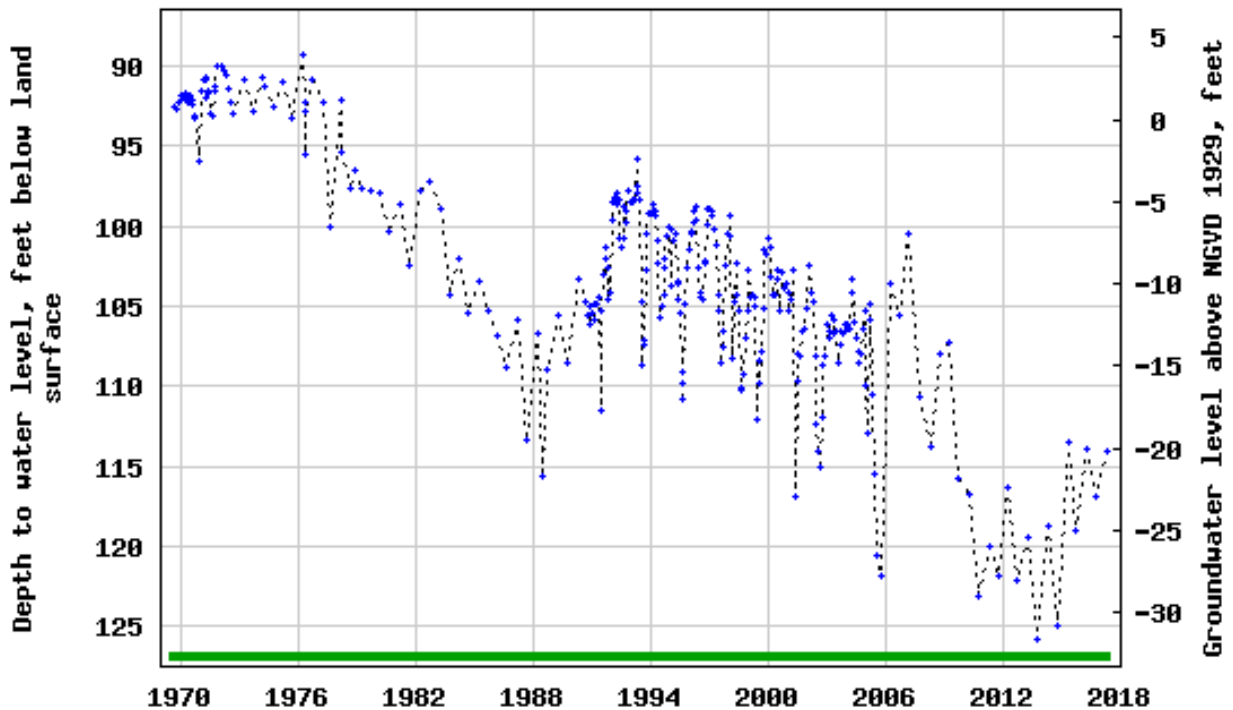
DATUM: Altitude of land surface is 93.70 ft above NGVD of 1929.

MEASURING POINT: Top of casing 3.60 ft above land surface.

PERIOD OF RECORD: January 1971 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/2/2016	116.93
4/13/2017	114.02



WELL NUMBER: AA Cf 134

PERMIT NUMBER: AA-70-0171

LOCATION: Amberly Water-Treatment Plant

LAT. 39° 01' 21", LONG. 76° 27' 05"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 590 ft.

Casing diameter: 24 in. to 370 ft; 16 in. from 270 to 360 ft, 363 to 370 ft, 392 to 455 ft, 495 to 502 ft, 528 to 542 ft, 560 to 566 ft, and 580 to 590 ft.

Screen diameter: 16 in. from 360 to 363 ft, 370 to 392 ft, 455 to 495 ft, 502 to 528 ft, 542 to 560 ft, and 566 to 580 ft.

INSTRUMENTATION: Periodic measurements.

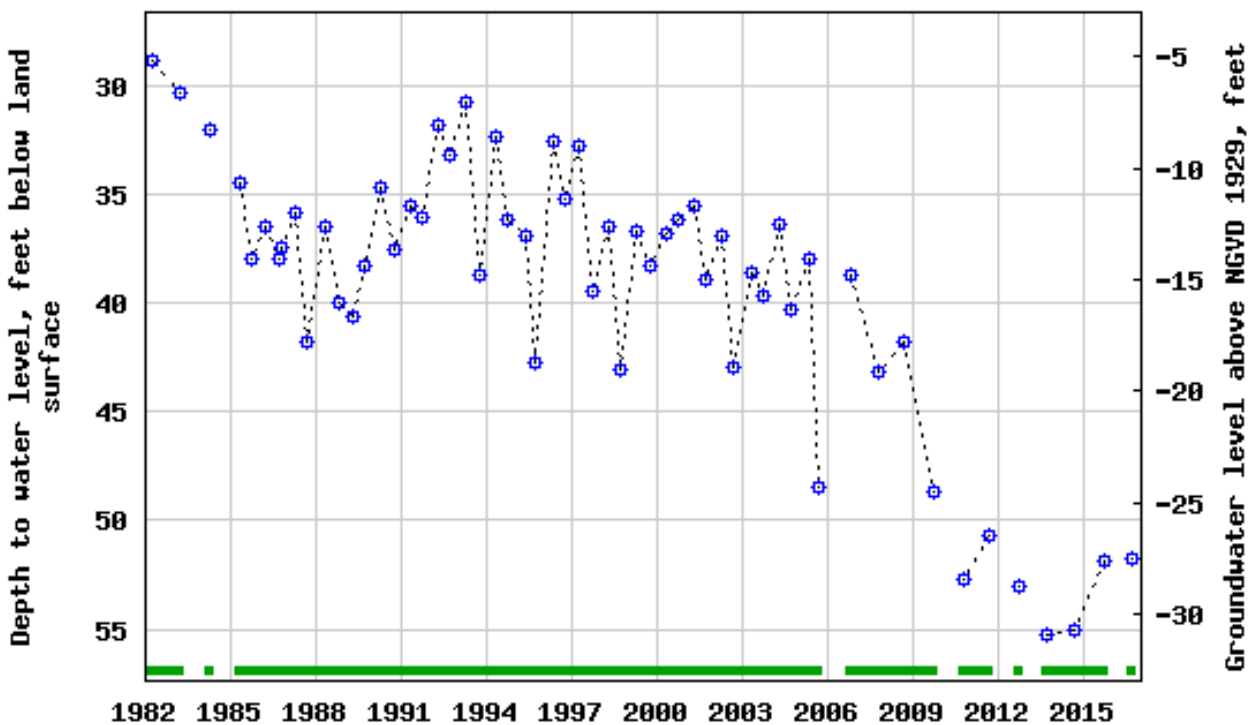
DATUM: Altitude of land surface is 24 ft above NGVD of 1929.

MEASURING POINT: Top of riser pipe 1.45 ft above land surface.

PERIOD OF RECORD: January 1982 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/3/2015	51.90
9/12/2016	51.73



WELL NUMBER: AA Cf 137

PERMIT NUMBER: AA-86-0401

LOCATION: Arnold Water-Treatment Plant

LAT. 39° 02' 05", LONG. 76° 29' 27"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,030 ft.

Casing diameter: 6 in. to 543 ft, 4 in. from 543 to 791 ft, 816 to 826 ft, 856 to 876 ft, 896 to 916 ft, and 966 to 976 ft.

Screen diameter: 4 in. from 791 to 816 ft, 826 to 856 ft, 876 to 896 ft, and 916 to 966 ft.

INSTRUMENTATION: Periodic measurements.

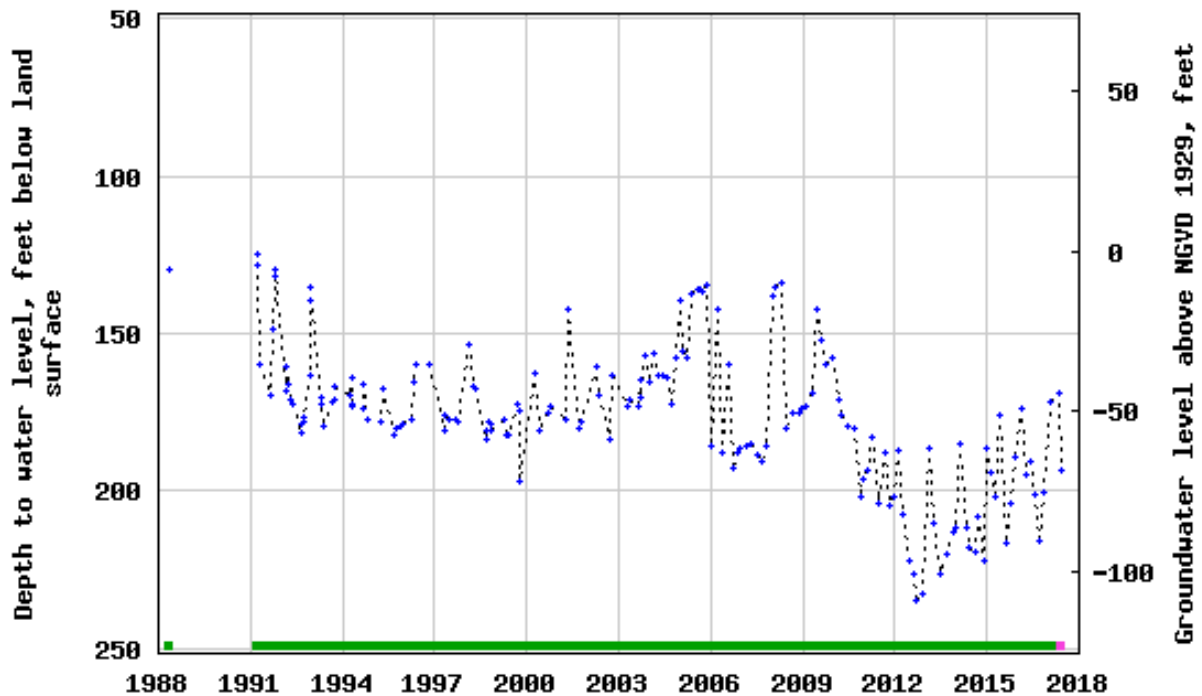
DATUM: Altitude of land surface is 124 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 0.5 ft above land surface.

PERIOD OF RECORD: 1989 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
8/2/2016	200.89
9/16/2016	215.55
11/16/2016	200.71
2/6/2017	171.56
4/27/2017	169.00
6/8/2017	193.23



WELL NUMBER: AA Cf 166

PERMIT NUMBER: AA-95-3107

LOCATION: Arnold Water-Treatment Plant

LAT. 39° 01' 54", LONG. 76° 28' 29"

AQUIFER: Patuxent aquifer in the Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,535 ft.

Casing diameter: 6 in. to 420 ft, 4 in. from 420 to 1,320 ft, 1,340 to 1,360 ft, and 1,400 to 1,500 ft.

Screen diameter: 4 in. from 1,320 to 1,340 ft, 1,360 to 1,400 ft, and 1,500 to 1,530 ft.

INSTRUMENTATION: Periodic measurements.

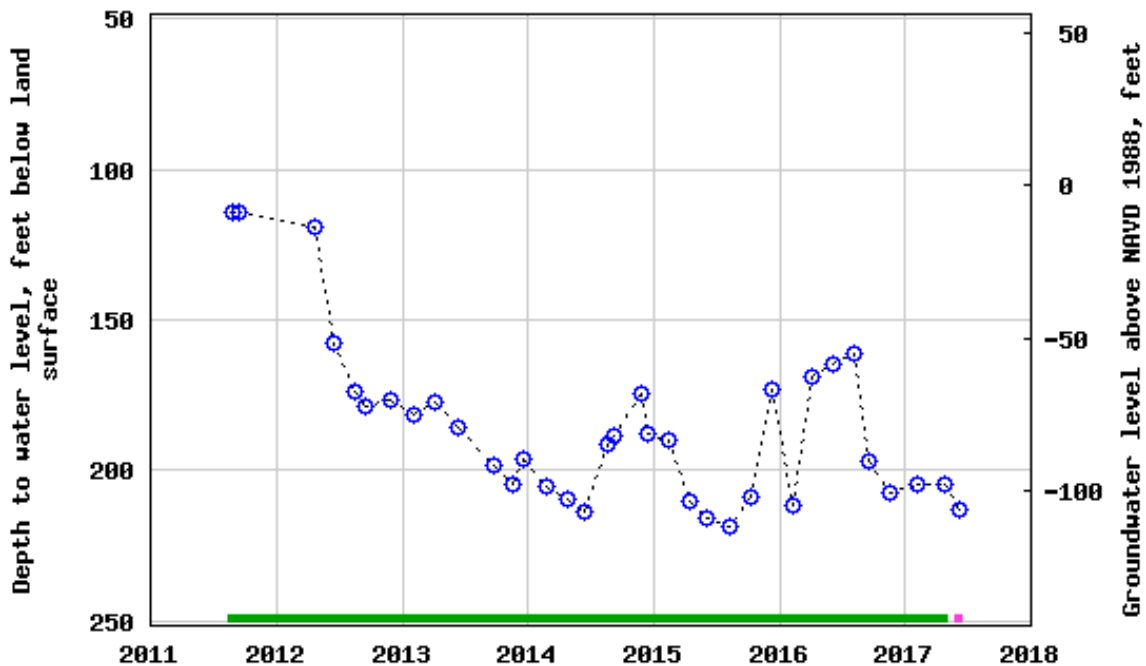
DATUM: Altitude of land surface is 106 ft above NGVD of 1929.

MEASURING POINT: Top of access cover at land surface.

PERIOD OF RECORD: 2011 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
8/2/2016	161.20
9/16/2016	196.93
11/16/2016	207.30
2/6/2017	204.87
4/27/2017	204.40
6/8/2017	213.19



WELL NUMBER: AA Cf 167

PERMIT NUMBER: AA-95-3108

LOCATION: Arnold Water-Treatment Plant

LAT. 39° 01' 54", LONG. 76° 28' 29"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,505 ft.

Casing diameter: 6 in. to 420 ft, 4 in. from 420 to 750 ft, 775 to 815 ft, 840 to 855 ft, 865 to 880 ft, 890 to 915 ft, 925 to 935 ft, 945 to 960 ft, and 1,000 to 1,032 ft.

Screen diameter: 4 in. from 750 to 775 ft, 815 to 840 ft, 855 to 865 ft, 880 to 890 ft, 915 to 925 ft, 935 to 945 ft, 960 to 1,000 ft, and 1,032 to 1,047 ft.

INSTRUMENTATION: Periodic measurements.

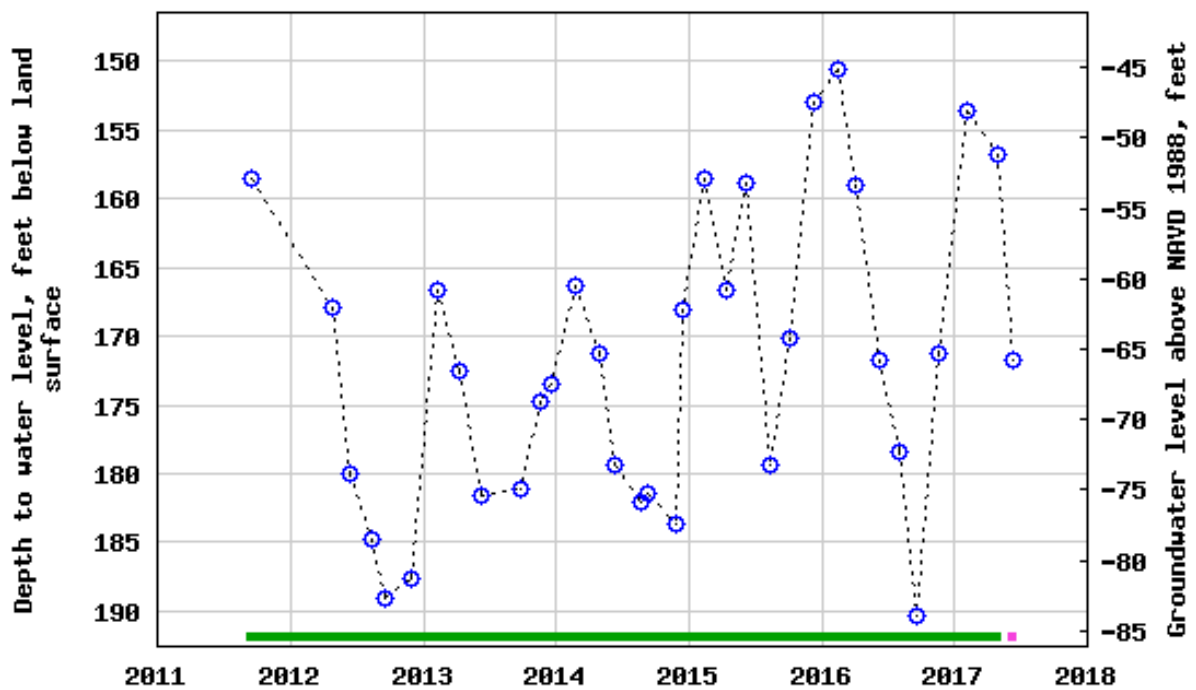
DATUM: Altitude of land surface is 124 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 0.5 ft above land surface.

PERIOD OF RECORD: 1989 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
8/2/2016	178.48
9/16/2016	190.27
11/16/2016	171.32
2/6/2017	153.57
4/27/2017	156.84
6/8/2017	171.65



WELL NUMBER: AA Cg 22

PERMIT NUMBER: AA-73-8606

LOCATION: Sandy Point State Park

LAT. 39° 01' 23", LONG. 76° 24' 16"

AQUIFER: Patuxent Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,760 ft.

Casing diameter: 10 in. to 163 ft; 4 in. to 1,735 ft, and from 1,755 to 1,760 ft.

Screen diameter: 4 in. from 1,735 to 1,755 ft.

INSTRUMENTATION: Periodic measurements.

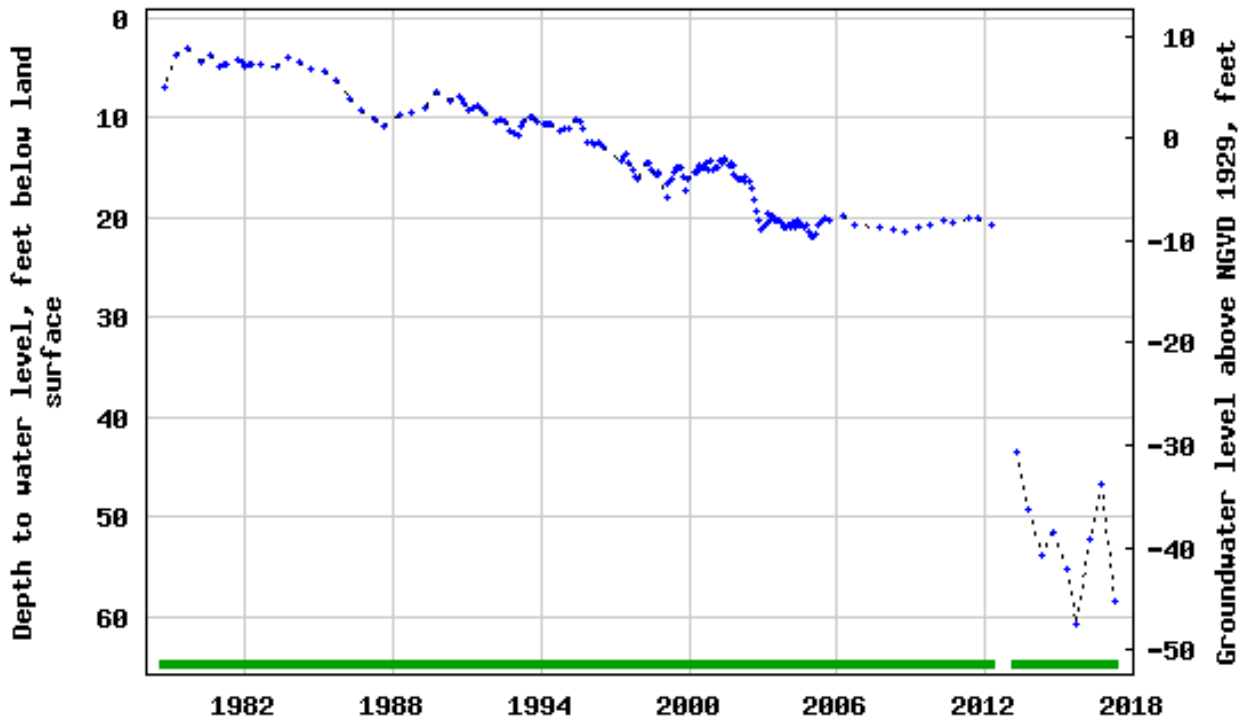
DATUM: Altitude of land surface is 12.61 ft above NGVD of 1929.

MEASURING POINT: Top of casing 3.44 ft above land surface.

PERIOD OF RECORD: 1979 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/21/2016	46.70
4/13/2017	58.58



WELL NUMBER: AA Cg 23

PERMIT NUMBER: AA-73-8959

LOCATION: Sandy Point State Park

LAT. 39° 01' 23", LONG. 76° 24' 16"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 986 ft.

Casing diameter: 10 in. to 163 ft; 4 in. to 968 ft and 978 to 986 ft.

Screen diameter: 4 in. from 968 to 978 ft.

INSTRUMENTATION: Periodic measurements.

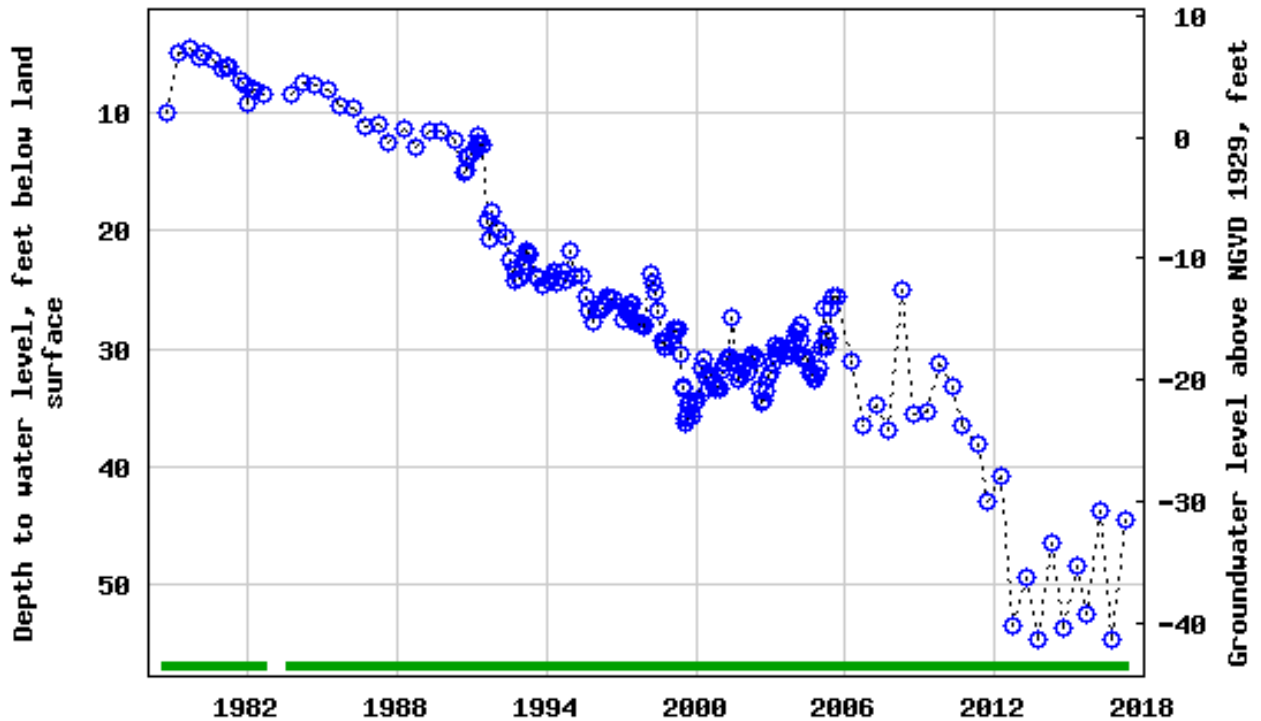
DATUM: Altitude of land surface is 12.57 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 3.43 ft above land surface.

PERIOD OF RECORD: 1978 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/21/2016	54.61
4/13/2017	44.46





WELL NUMBER: AA Cg 24

PERMIT NUMBER: AA-73-8960

LOCATION: Sandy Point State Park

LAT. 39° 01' 23", LONG. 76° 24' 16"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 664 ft.

Casing diameter: 12 in. to 68 ft; 6 in. to 158 ft; 4 in. from 158 to 605 ft, 615 to 648 ft, and 658 to 664 ft.

Screen diameter: 4 in. from 605 to 615 ft, and 648 to 658 ft.

INSTRUMENTATION: Periodic measurements.

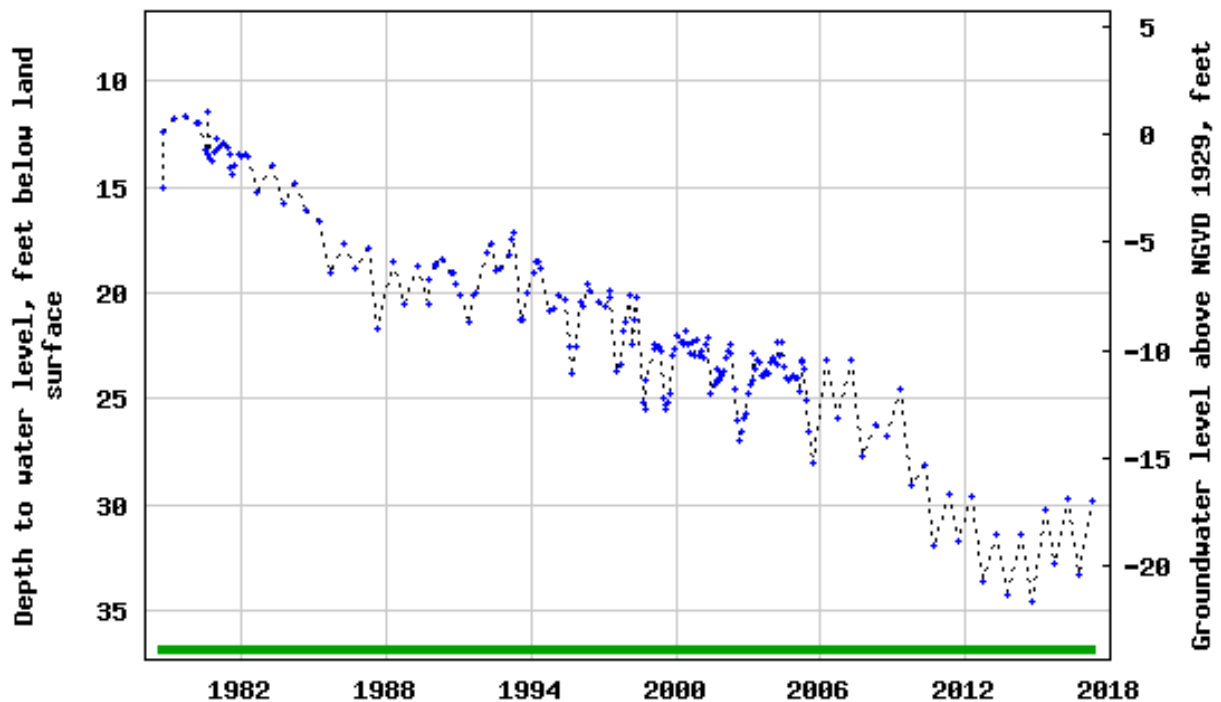
DATUM: Altitude of land surface is 12.68 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 3.16 ft above land surface.

PERIOD OF RECORD: 1978 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/21/2016	33.30
4/13/2017	29.79



WELL NUMBER: AA Dd 42

PERMIT NUMBER: AA-71-0231

LOCATION: Route 50 and Howard Grove Road

LAT. 38° 58' 08", LONG. 76° 37' 35"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 275 ft.

Casing diameter: 4 in. to 190 ft; 2 in. from 220 to 225 ft, and 235 to 265 ft.

Screen diameter: 2 in. from 190 to 200 ft, 225 to 235 ft, and 265 to 275 ft.

INSTRUMENTATION: Periodic measurements.

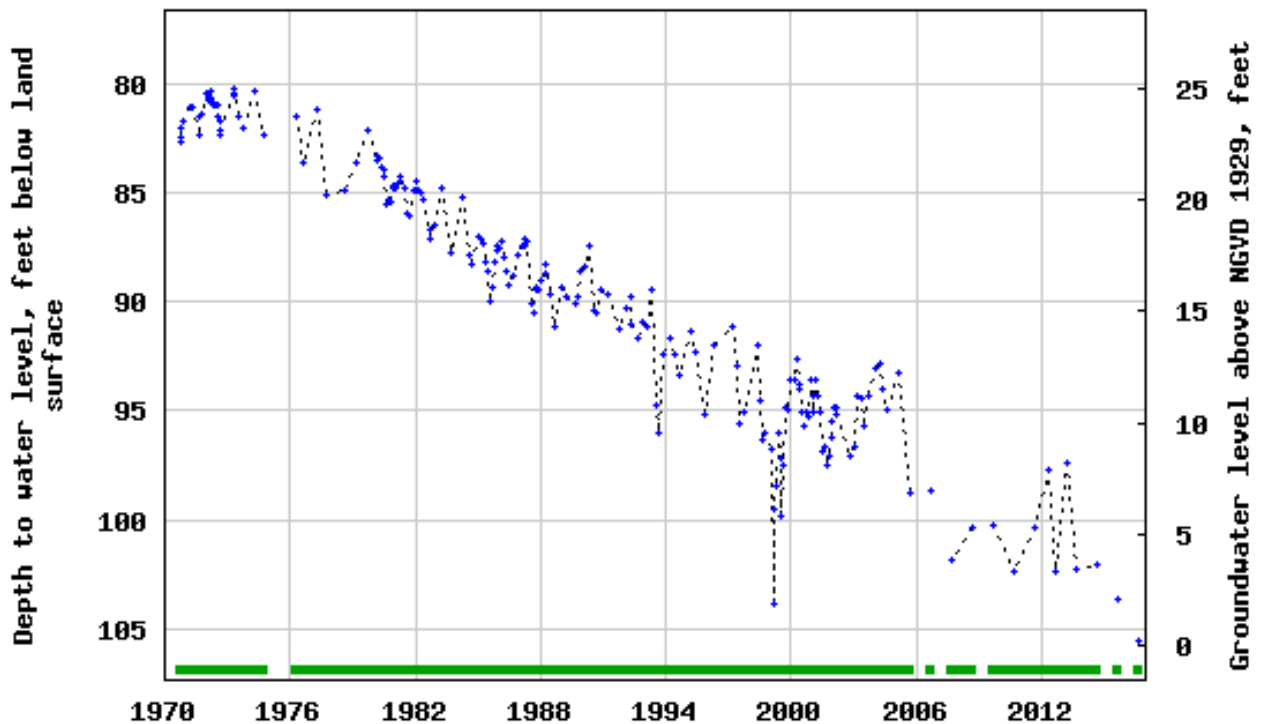
DATUM: Altitude of land surface is 105.48 ft above NGVD of 1929.

MEASURING POINT: Top of casing 0.72 ft above land surface.

PERIOD OF RECORD: 1970 to current year.

WATER LEVEL IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/17/2015	103.66
9/16/2016	105.58



WELL NUMBER: AA De 1

PERMIT NUMBER: --

LOCATION: City of Annapolis

LAT. 38° 59' 15", LONG. 76° 34' 03"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 237 ft.

Casing diameter: 10 in. to 207 ft.

Screen diameter: 6 in. from 207 to 237 ft.

INSTRUMENTATION: Periodic measurements.

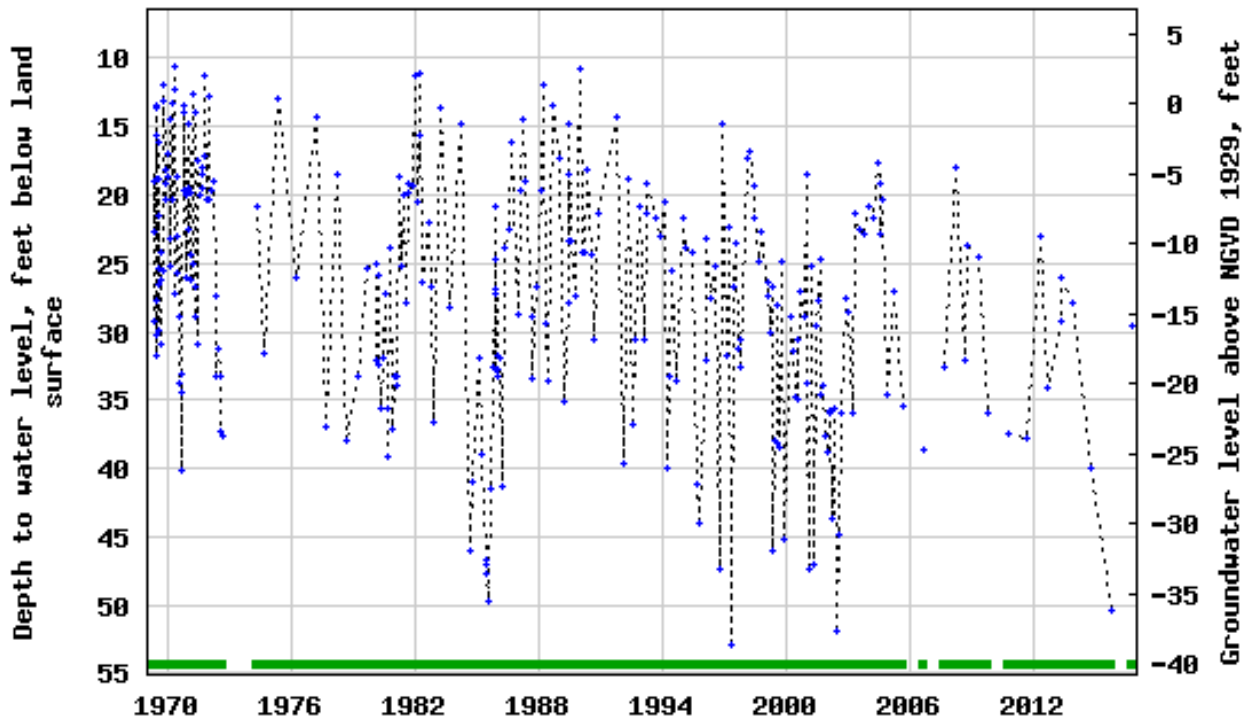
DATUM: Altitude of land surface is 13.72 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 2.0 ft above land surface.

PERIOD OF RECORD: 1969 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/28/2015	50.45
10/11/2016	29.58



WELL NUMBER: AA De 95

PERMIT NUMBER: AA-68-0175

LOCATION: Broad Creek Water-Treatment Plant

LAT. 38° 58' 53", LONG. 76° 33' 30"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 480 ft.

Casing diameter: 6 in. to 465 ft.

Screen diameter: 6 in. from 465 to 480 ft.

INSTRUMENTATION: Periodic measurements.

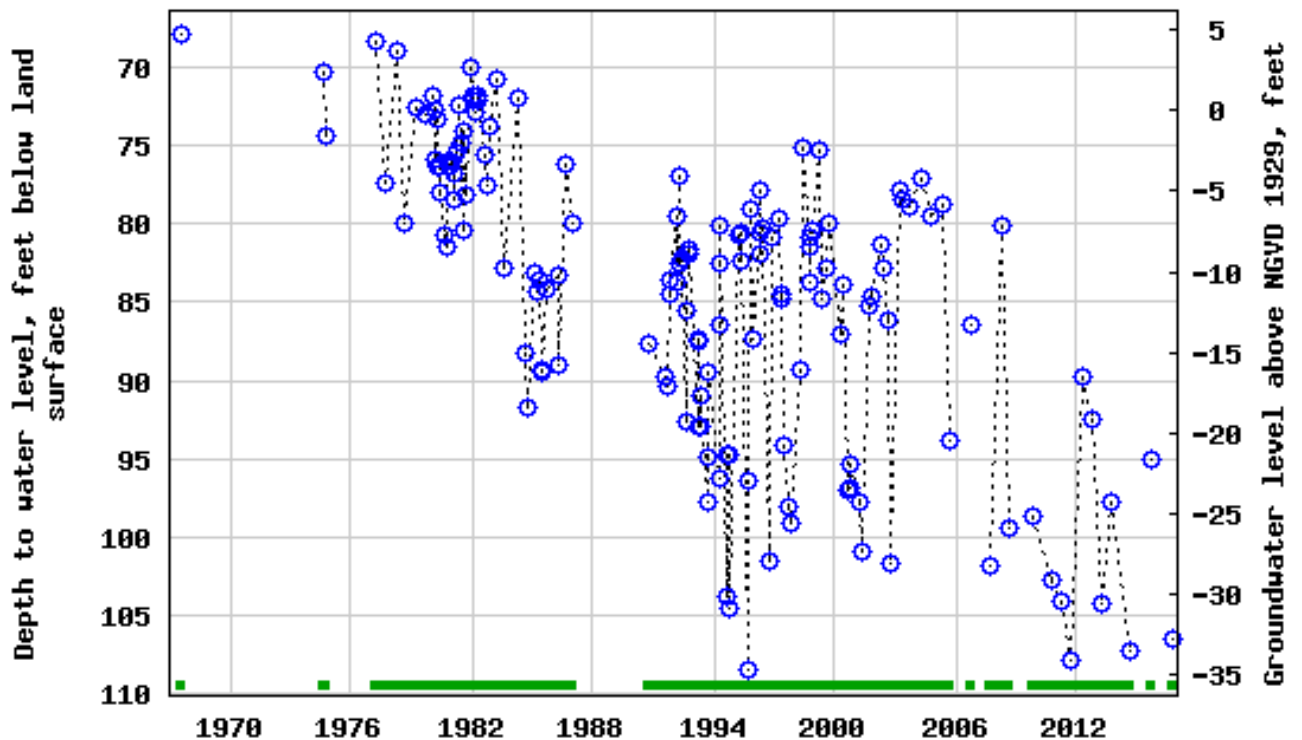
DATUM: Altitude of land surface is 71.28 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 5.3 ft above land surface.

PERIOD OF RECORD: 1974 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/17/2015	95.01
9/16/2016	106.42



WELL NUMBER: AA De 128

PERMIT NUMBER: AA-73-8278

LOCATION: Central Avenue well field

LAT. 38° 55' 30", LONG. 76° 33' 47"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 708 ft;

Casing diameter: 24 in. to 547 ft; 12 in. to 554 ft, and 644 to 686 ft;

Screen diameter: 12 in. from 554 to 644 ft, and 686 to 708 ft.

INSTRUMENTATION: Periodic measurements.

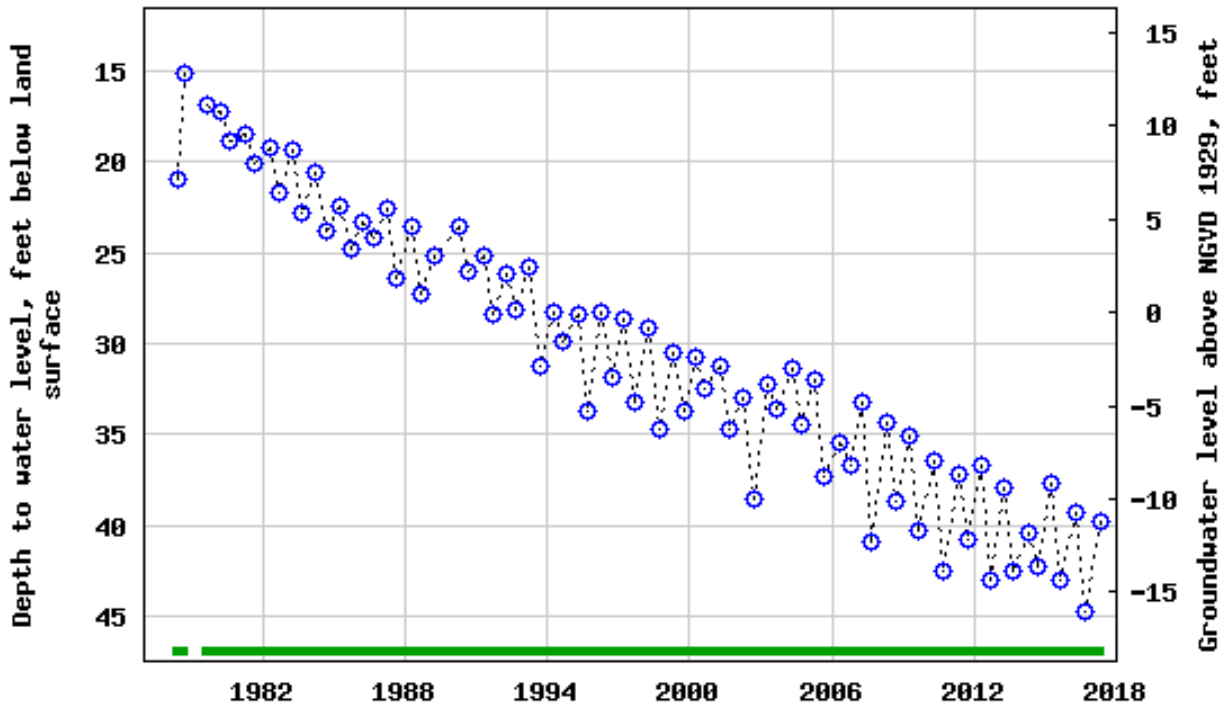
DATUM: Altitude of land surface is 28.31 ft above NGVD of 1929.

MEASURING POINT: Top of 24 in. casing 3.65 ft above land surface.

PERIOD OF RECORD: 1978 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/13/2016	44.66
4/20/2017	39.76



WELL NUMBER: AA De 206

PERMIT NUMBER: AA-88-9908

LOCATION: Broad Creek Water Treatment Plant

LAT. 38° 58' 33", LONG. 76° 33' 28"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,013 ft;

Casing diameter: 4 in. to 288 ft; 2 in. from 288 to 775 ft;

Screen diameter: 2 in. from 775 to 1,013 ft.

INSTRUMENTATION: Periodic measurements.

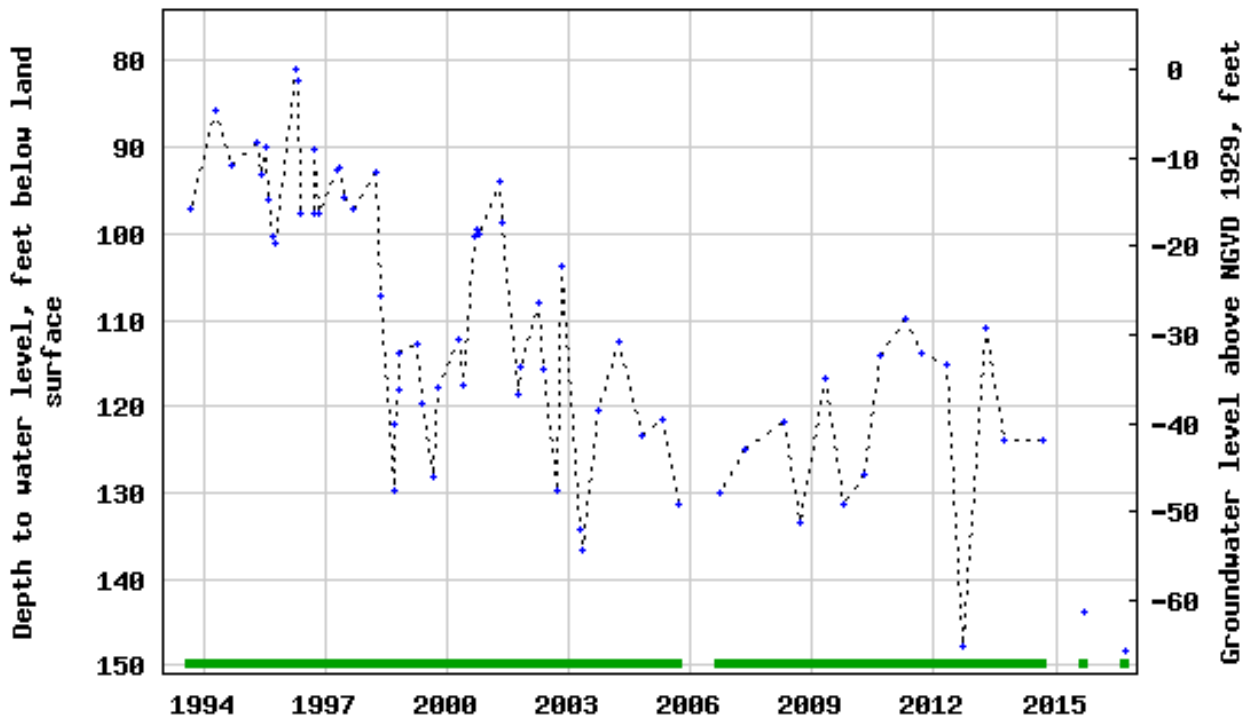
DATUM: Altitude of land surface is 82 ft above NGVD of 1929.

MEASURING POINT: Top of hole in flange 2.8 ft above land surface.

PERIOD OF RECORD: 1993 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/17/2015	143.92
9/16/2016	148.43



WELL NUMBER: AA De 219

PERMIT NUMBER: AA-94-8258

LOCATION: City of Annapolis

LAT. 38° 59' 15", LONG. 76° 33' 53"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 520 ft;

Casing diameter: 24 in. to 436 ft; 12 in. from 367 to 427 ft.

Screen diameter: 12 in. from 427 to 432 ft, 440 to 460 ft, 466 to 472 ft, 476 to 482 ft, 492 to 500 ft, and 506 to 515 ft.

INSTRUMENTATION: Periodic measurements.

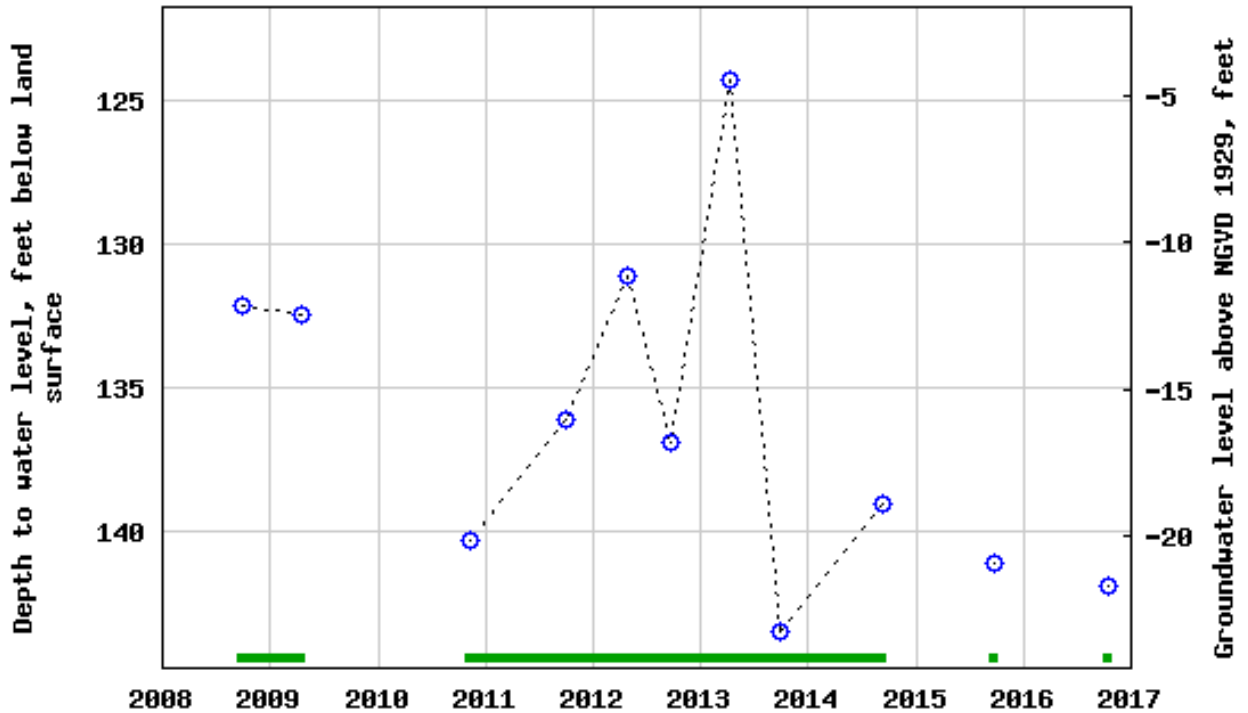
DATUM: Altitude of land surface is 120 ft above NGVD of 1929.

MEASURING POINT: Top of 2-inch measuring tube 3 ft above land surface.

PERIOD OF RECORD: 2010 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/25/2015	141.10
10/12/2016	141.93



WELL NUMBER: AA De 232

PERMIT NUMBER: AA-95-4626

LOCATION: City of Annapolis

LAT. 38° 59' 18", LONG. 76° 33' 53"

AQUIFER: Lower Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 1,173 ft;

Casing diameter: 24 in. to 829 ft; 14 in. from 739 to 834 ft, 856 to 871 ft, 878 to 886 ft, 894 to 902 ft, 936 to 958 ft, 970 to 1,009 ft, 1,014 to 1,070 ft, and 1,120 to 1,130 ft.

Screen diameter: 14 in. from 834 to 856 ft, 871 to 878 ft, 886 to 894 ft, 902 to 936 ft, 958 to 970 ft, 1,009 to 1,014 ft, 1,070 to 1,120 ft, and 1,130 to 1,146 ft.

INSTRUMENTATION: Periodic measurements.

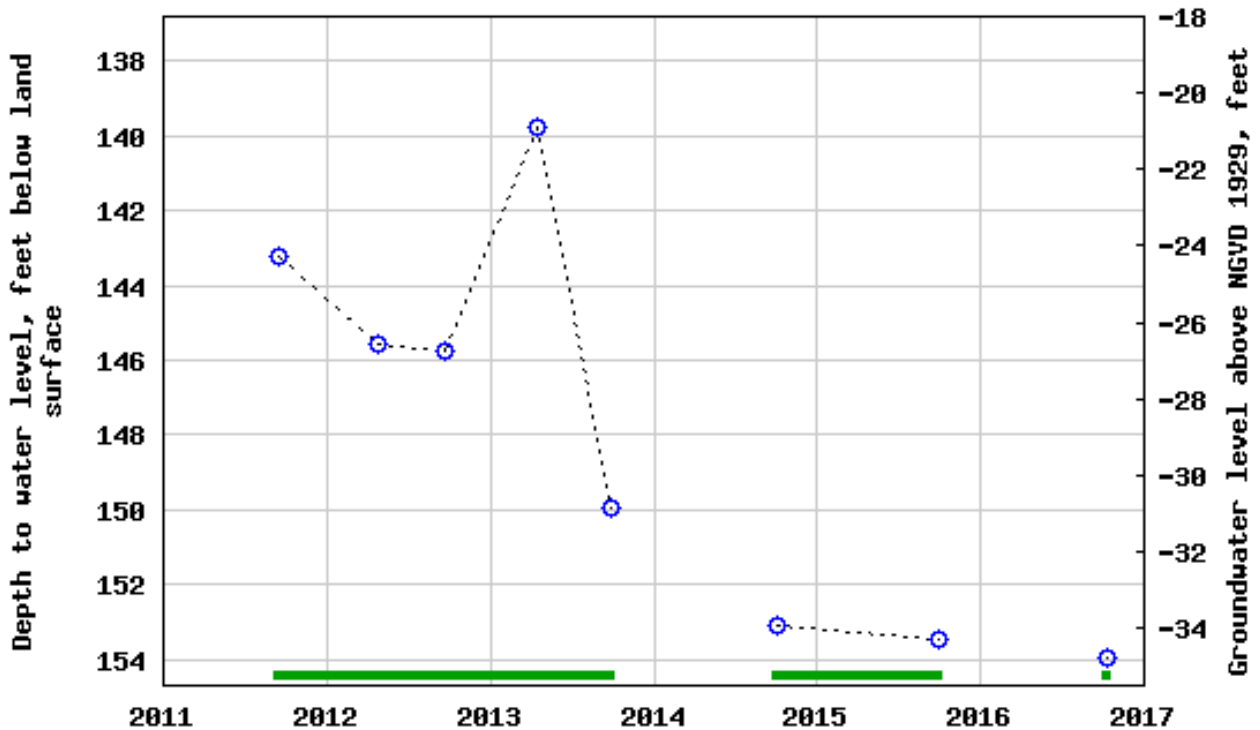
DATUM: Altitude of land surface is 119 ft above NGVD of 1929.

MEASURING POINT: Top of 2-inch measuring tube 1.8 ft above land surface.

PERIOD OF RECORD: 2011 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/28/2015	153.45
10/10/2016	153.95





WELL NUMBER: AA Df 19

PERMIT NUMBER: --

LOCATION: U.S. Navy Radio Station

LAT. 38° 59' 22", LONG. 76° 27' 04"

AQUIFER: Upper Patapsco aquifer in the Patapsco Formation of Lower Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 590 ft;

Casing diameter: 10 in. to 565 ft;

Screen diameter: 10 in. from 565 to 590 ft.

INSTRUMENTATION: Periodic measurements.

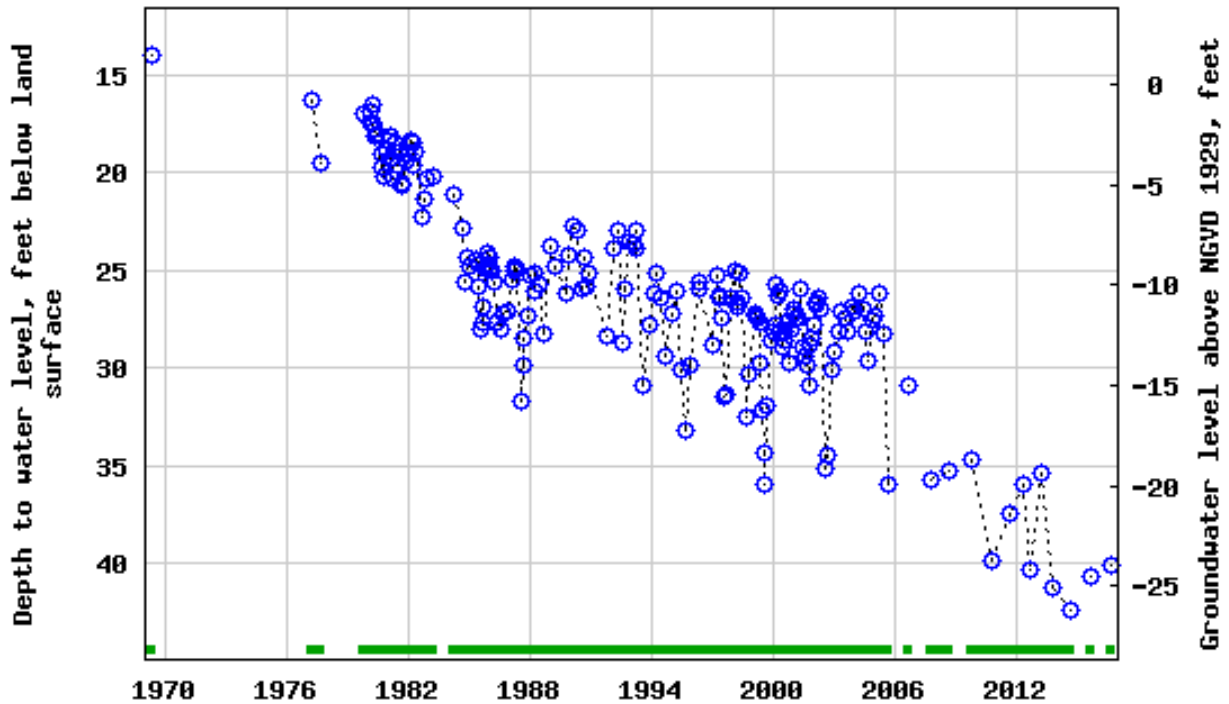
DATUM: Altitude of land surface is 15.84 ft above NGVD of 1929.

MEASURING POINT: Top of flange 2.5 ft above land surface.

PERIOD OF RECORD: 1977 to current year.

WATER LEVEL IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/17/2015	40.63
9/16/2016	40.04



WELL NUMBER: AA Df 20

PERMIT NUMBER: --

LOCATION: U.S. Navy Radio Station

LAT. 38° 59' 16", LONG. 76° 27' 07"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 255 ft.

Casing diameter: 10 in. to 150 ft; 8 in. from 135 to 233 ft;

Screen diameter: 8 in. from 233 to 253 ft.

INSTRUMENTATION: Periodic measurements.

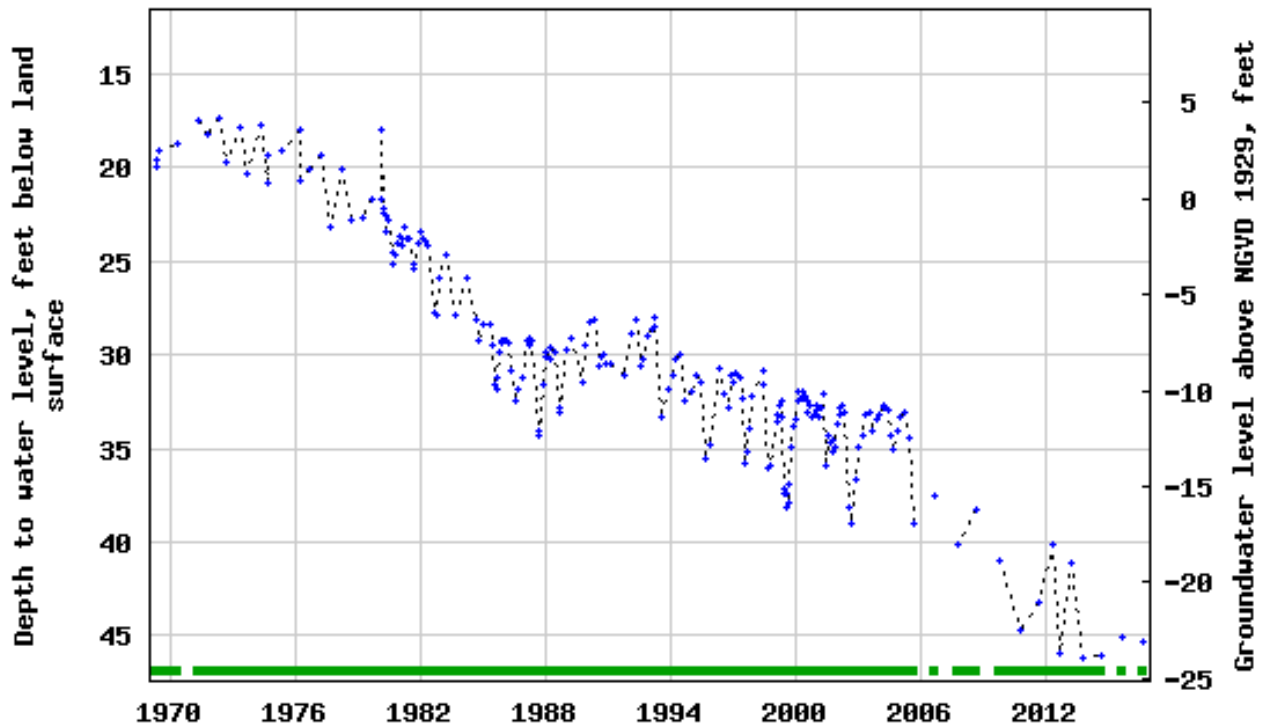
DATUM: Altitude of land surface is 21.62 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 3.0 ft above land surface.

PERIOD OF RECORD: 1969 to current year.

WATER LEVEL IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/17/2015	45.03
9/16/2016	45.25



WELL NUMBER: AA Df 79

PERMIT NUMBER: AA-03-7867

LOCATION: U.S. Naval Academy

LAT. 38° 59' 05", LONG. 76° 29' 36"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 705 ft.

Casing diameter: 6 in. to 300 ft; 320 to 572 ft, and 592 to 675 ft;

Screen diameter: 6 in. from 300 to 320 ft, 572 to 592 ft, and 675 to 695 ft.

INSTRUMENTATION: Periodic measurements.

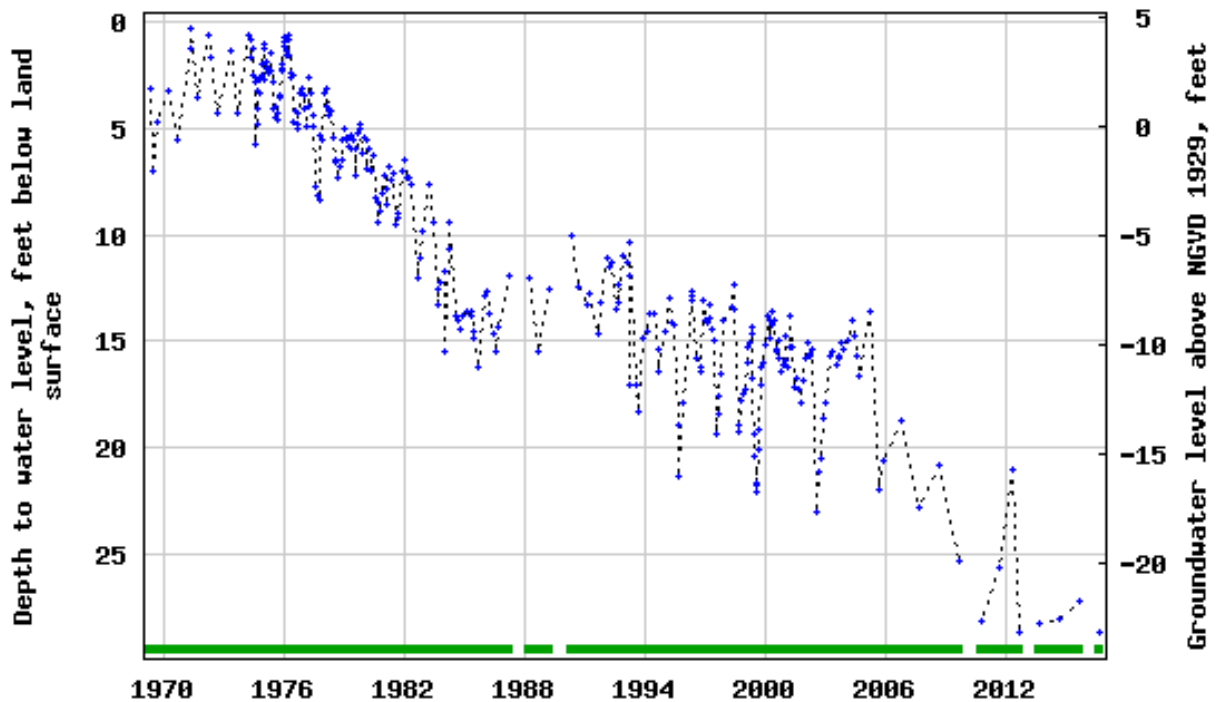
DATUM: Altitude of land surface is 5.17 ft above NGVD of 1929.

MEASURING POINT: Top of recorder platform 2.8 ft above land surface.

PERIOD OF RECORD: 1969 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/1/2015	27.15
9/12/2016	28.65



WELL NUMBER: AA Fe 92

PERMIT NUMBER: AA-94-5386

LOCATION: Deale Athletic Field

LAT. 38° 46' 44", LONG. 76° 33' 12"

AQUIFER: Aquia Formation of Upper Paleocene age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 205 ft.

Casing diameter: 4.5 in. to 170 ft, and 200 to 205 ft.

Screen diameter: 4.5 in. from 170 to 200 ft.

INSTRUMENTATION: Periodic measurements.

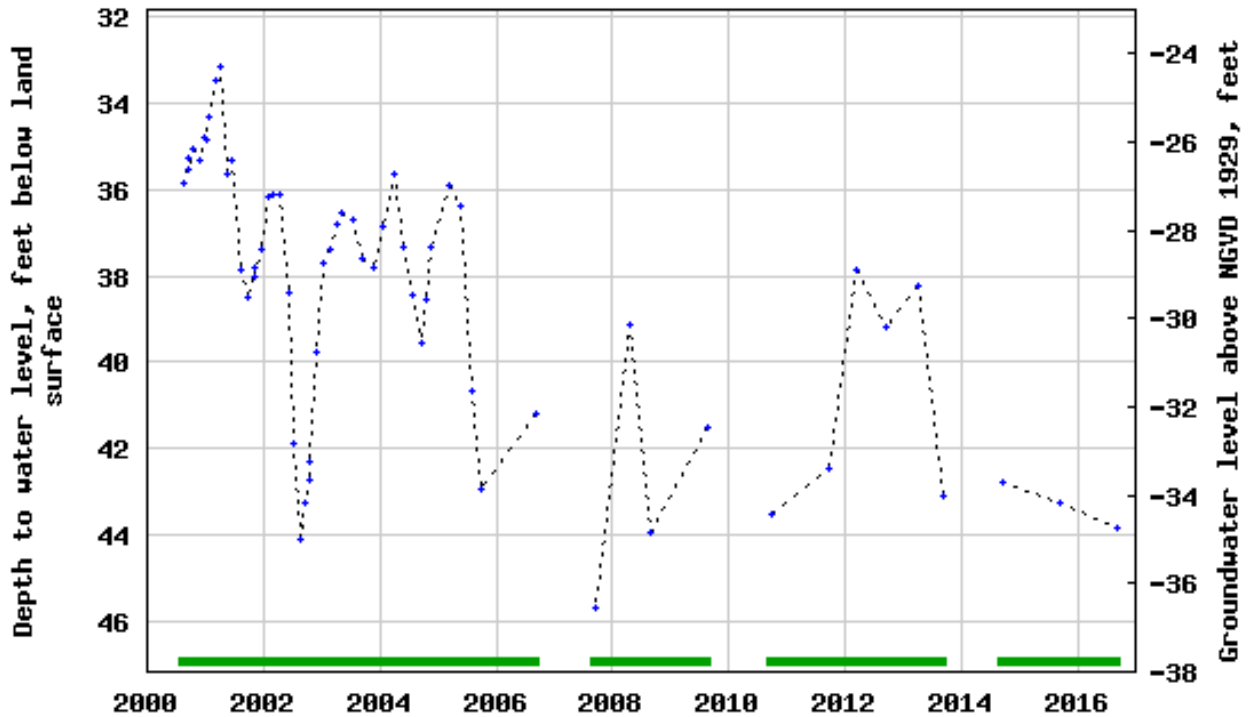
DATUM: Altitude of land surface is 9 ft above sea level from topographic map.

MEASURING POINT: Top of recorder platform, 3.0 ft above land surface.

PERIOD OF RECORD: September 2000 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/17/2015	43.24
9/12/2016	43.84



WELL NUMBER: AA Fe 93

PERMIT NUMBER: AA-94-5391

LOCATION: Deale Athletic Field

LAT. 38° 46' 44", LONG. 76° 33' 12"

AQUIFER: Magothy Formation of Upper Cretaceous age.

WELL CHARACTERISTICS: Drilled, observation, artesian well, depth 470 ft.

Casing diameter: 4.5 in. to 429 ft, 449 to 454 ft, and 464 to 470 ft.

Screen diameter: 4.5 in. from 429 to 449 ft, and 454 to 464 ft.

INSTRUMENTATION: Periodic measurements.

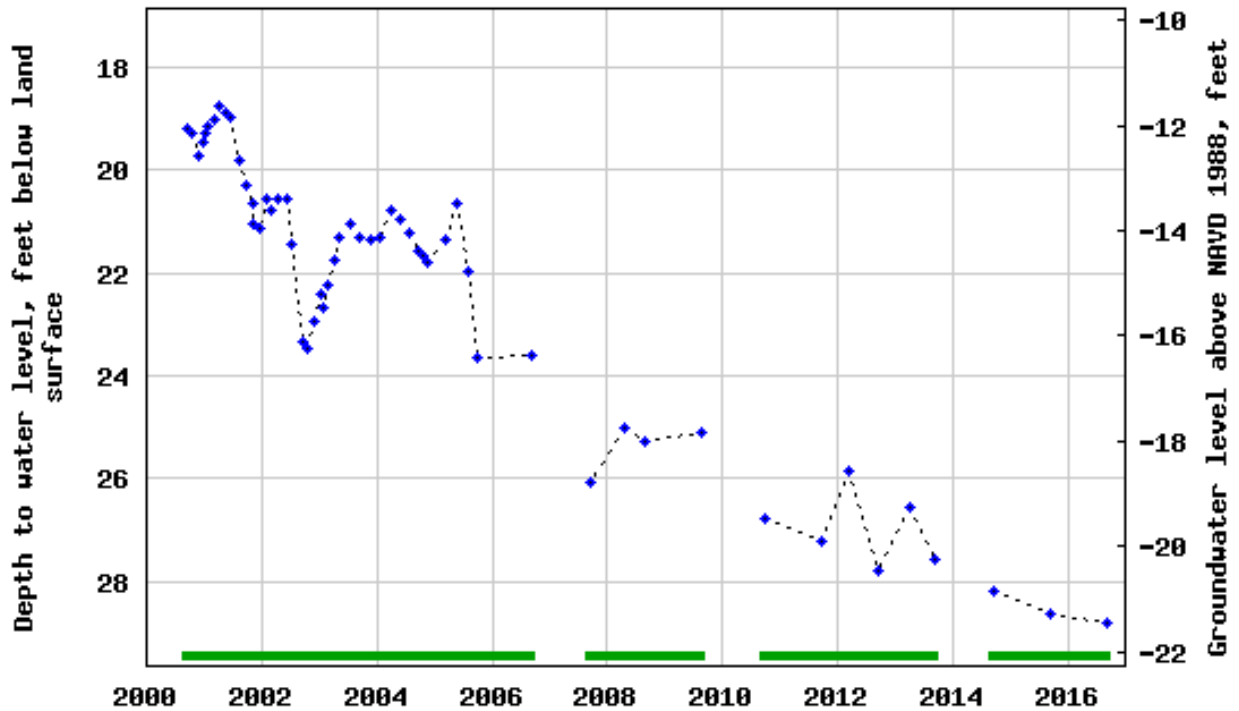
DATUM: Altitude of land surface is 9 ft above sea level from topographic map.

MEASURING POINT: Top of recorder platform, 3.35 ft above land surface.

PERIOD OF RECORD: September 2000 to current year.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM

Date	Water level
9/17/2015	28.61
9/12/2016	28.82



GAGE NUMBER: 01589500  
LOCATION: Sawmill Creek  
DRAINAGE AREA: 4.97 mi<sup>2</sup>.

LAT. 39° 10' 12", LONG. 76° 37' 51"

GAGE: Water-stage recorder and concrete control. Datum of gage is 26.07 ft above NGVD of 1929.  
PERIOD OF RECORD: May 1944 to September 1952. Annual maximum, water years 1965-70. September 1983 to current year.

