

CHRISTINA RIVER BASIN

01480870 EAST BRANCH BRANDYWINE CREEK BELOW DOWNINGTOWN, PA

LOCATION.--Lat 39°58'07", long 75°40'25", Chester County, Hydrologic Unit 02040205, on left bank at downstream side of Sugars Bridge (U.S. Highway 322), 2,000 ft upstream from Valley Creek, 1.5 mi north of Marshallton, and 3.3 mi southeast of Downingtown.

DRAINAGE AREA.--89.9 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1972 to current year.

REVISED RECORDS.--WDR PA-75-1: 1972(P), 1973, 1974.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 195 ft above sea level, from topographic map. Feb. 1 to Apr. 10, and June 25 to Nov. 17, 1972, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records fair. Flow regulated since November 1973 by Marsh Creek Reservoir (station 01480684) about 7.5 mi upstream. Satellite and landline telemetry at station.

**DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES**

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	45	45	54	69	203	108	68	59	40	25	26
2	38	43	43	74	185	117	112	67	57	42	24	26
3	39	43	42	660	160	102	104	67	61	49	24	26
4	55	42	43	169	135	160	103	71	55	38	23	27
5	53	42	44	117	125	118	114	68	48	36	24	57
6	48	45	44	109	105	112	100	68	46	38	23	96
7	50	43	44	109	81	127	96	68	46	34	24	46
8	182	43	48	101	107	97	95	74	43	33	24	35
9	148	44	55	140	99	93	118	74	43	32	25	29
10	288	44	47	162	85	94	321	70	42	35	24	63
11	75	53	45	71	80	94	185	68	42	33	24	33
12	59	54	43	69	88	90	256	67	42	33	23	26
13	52	50	43	82	128	88	180	80	43	34	23	31
14	49	48	42	83	92	92	157	69	53	32	41	31
15	47	47	42	239	82	108	142	64	51	32	32	31
16	45	46	42	150	80	116	111	63	42	33	28	3080
17	47	47	42	138	79	138	117	62	42	31	26	1440
18	46	45	38	706	276	152	100	61	46	29	24	729
19	44	46	40	375	154	107	96	85	42	30	24	256
20	46	50	39	156	117	98	110	76	40	46	25	287
21	46	54	39	138	104	162	107	67	42	33	29	228
22	45	53	41	148	96	894	122	66	42	33	28	256
23	47	52	41	145	89	255	123	88	46	34	26	179
24	46	52	41	450	88	214	123	186	44	31	26	216
25	46	50	39	206	87	187	107	133	42	30	25	271
26	46	89	38	150	88	125	103	103	42	29	82	260
27	46	62	39	131	86	117	92	82	41	28	52	181
28	46	49	41	125	140	120	82	60	42	23	31	82
29	46	47	43	119	---	115	73	59	42	28	26	71
30	45	46	46	104	---	108	72	60	40	27	27	278
31	44	---	39	74	---	101	---	60	---	26	26	---
TOTAL	1947	1474	1318	5554	3105	4704	3729	2354	1366	1032	888	8397
MEAN	62.8	49.1	42.5	179	111	152	124	75.9	45.5	33.3	28.6	280
MAX	288	89	55	706	276	894	321	186	61	49	82	3080
MIN	33	42	38	54	69	88	72	59	40	23	23	26

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1999, BY WATER YEAR (WY)

MEAN	92.5	114	170	189	179	218	211	171	117	111	74.6	94.7
MAX	304	242	577	527	409	525	594	410	315	421	177	292
(WY)	1997	1997	1997	1979	1979	1994	1983	1989	1982	1984	1996	1979
MIN	41.2	43.6	40.8	30.9	74.6	61.6	53.1	75.9	45.5	33.3	28.6	29.5
(WY)	1987	1974	1981	1981	1980	1985	1985	1999	1999	1999	1999	1980

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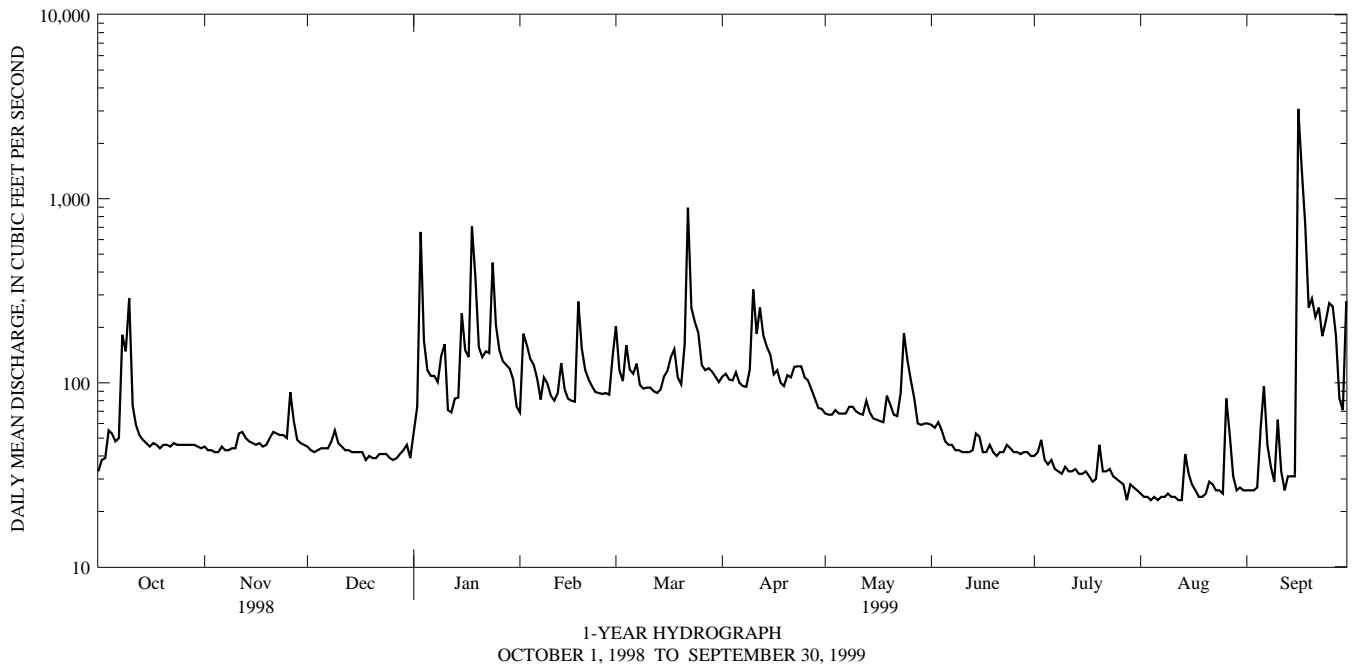
01480870 EAST BRANCH BRANDYWINE CREEK BELOW DOWNINGTOWN, PA--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1974 - 1999	
ANNUAL TOTAL	43561		35868			
ANNUAL MEAN	119		98.3		145	
HIGHEST ANNUAL MEAN					257	1984
LOWEST ANNUAL MEAN					59.7	1981
HIGHEST DAILY MEAN	1190	Apr 2	3080	Sep 16	3080	Sep 16 1999
LOWEST DAILY MEAN	33	Oct 1	23	Jul 28 ^a	23	Sep 12 1995
ANNUAL SEVEN-DAY MINIMUM	38	Sep 27	24	Aug 2	24	Aug 2 1999
INSTANTANEOUS PEAK FLOW			b 7200	Sep 16	c 8160	Jun 22 1972
INSTANTANEOUS PEAK STAGE			14.79	Sep 16	14.79	Sep 16 1999
10 PERCENT EXCEEDS	240		161		279	
50 PERCENT EXCEEDS	79		54		94	
90 PERCENT EXCEEDS	42		29		41	

a Also Aug. 4, 6, 12, 13.

b From rating curve extended above 3,600 ft³/s on basis of runoff comparison with nearby station.

c From rating curve extended above 3,600 ft³/s on basis of slope-area measurement of peak flow at gage height 13.40 ft.



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WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1965 to September 1966, October 1970 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: February 1972 to current year.
 pH: February 1972 to current year.
 WATER TEMPERATURES: February 1972 to current year.
 DISSOLVED OXYGEN: February 1972 to current year.

INSTRUMENTATION.--Water-quality monitor since February 1972.

REMARKS.--Data collection discontinued during winter months since 1981 water year. Other interruptions in the record were due to malfunctions of the recording instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 652 microsiemens, Feb. 6, 1977; minimum, 67 microsiemens, July 1, 1984.
 pH: Maximum, 9.9, May 13, June 5, 1973; minimum, 5.4, Oct. 24, 26, 1973.
 WATER TEMPERATURE: Maximum, 33.0°C, July 18, 1977; minimum, 0.0°C, many days during winters.
 DISSOLVED OXYGEN: Maximum, 19.4 mg/L, Mar. 18, 1989; minimum, 0.8 mg/L, July 23, 1984.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	AGENCY ANA-LYZING SAMPLE NUMBER (00028)	AGENCY COLLECTING SAMPLE NUMBER (00027)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	SPE-CIFIC CONDUCTANCE (µS/CM) (00095)	TEMPERATURE (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT 1998	13...	80020	1028	53	8.8	7.7	308	16.0	110	28

DATE	MAGNESIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTASSIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM AD-SORPTION RATIO (00931)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	ANC WATER UNFLTRD FET FIELD (MG/L AS CACO3) (00410)	CHLORIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUORIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	
OCT 1998	13...	9.2	4.1	.6	15	22	81	23	<.10	12	23

DATE	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITROGEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	PHOSPHORUS, ORTHO, DIS-SOLVED (MG/L AS P) (00671)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L) (70301)	ALUMINUM, DIS-SOLVED (µG/L AS AL) (01106)	ARSENIC, DIS-SOLVED (µG/L AS AS) (01000)	BORON, DIS-SOLVED (µG/L AS B) (01020)	CADMIUM, DIS-SOLVED (µG/L AS CD) (01025)	
OCT 1998	13...	.033	2.44	<.010	.074	174	<10	<1	107	<1.0

DATE	CHROMIUM, DIS-SOLVED (µG/L AS CR) (01030)	COPPER, DIS-SOLVED (µG/L AS CU) (01040)	IRON, DIS-SOLVED (µG/L AS FE) (01046)	LEAD, DIS-SOLVED (µG/L AS PB) (01049)	MANGANESE, DIS-SOLVED (µG/L AS MN) (01056)	MERCURY, DIS-SOLVED (µG/L AS HG) (71890)	MOLYBDENUM, DIS-SOLVED (µG/L AS MO) (01060)	NICKEL, DIS-SOLVED (µG/L AS NI) (01065)	ZINC, DIS-SOLVED (µG/L AS ZN) (01090)	
OCT 1998	13...	<1.0	2.6	35	<1.0	22	<.1	1.5	1.2	<20

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	AGENCY ANALYZING SAMPLE (CODE NUMBER) (00028)	AGENCY COLLECTING SAMPLE (CODE NUMBER) (00027)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS- SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	SPE- CIFIC CON- DUCT- ANCE (µS/CM) (00095)	TEMPER- ATURE WATER (DEG C) (00010)	COLI- FORM, FECAL, µM-MF (COLS./ 100 ML) (31616)	E. COLI WATER WHOLE TOTAL UREASE (COL / 100 ML) (31633)
MAR 1999										
11...	1005	1028	1028	92	14.1	7.7	283	4.5	73	--
22...	1040	1028	1028	973	11.4	7.4	152	6.5	2100	--
31...	0750	1028	1028	99	--	7.7	265	8.5	K80	--
APR										
16...	0800	1028	1028	101	9.4	7.5	258	11.5	460	--
29...	0835	1028	1028	71	10.4	7.5	286	12.5	190	--
MAY										
03...	1055	1028	1028	66	11.3	7.7	295	14.0	660	--
18...	1037	1028	1028	58	9.9	7.8	285	16.0	150	110
25...	1440	1028	1028	116	9.4	7.7	244	18.0	4500	--
JUN										
02...	1155	1028	1028	59	6.7	7.7	303	22.0	530	--
23...	1335	1028	1028	48	9.6	7.9	334	23.5	K1600	--
28...	1012	1028	1028	42	6.2	7.5	342	24.0	390	--
JUL										
15...	1115	1028	1028	33	8.5	7.7	386	20.5	K390	--
19...	0907	1028	1028	29	6.4	7.4	405	24.0	470	--
20...	1205	1028	1028	47	5.5	7.2	342	24.5	K65	--
26...	1140	1028	1028	30	8.0	7.7	360	24.5	920	--
AUG										
03...	1055	1028	1028	23	6.8	7.4	390	24.0	680	--
16...	1235	1028	1028	29	6.8	7.6	349	24.5	550	--
26...	1116	1028	1028	92	6.8	7.0	220	20.5	5000	1000
SEP										
08...	1115	1028	1028	35	6.9	7.3	330	23.0	4000	--
14...	1200	1028	1028	34	6.8	7.5	379	20.0	410	--
16...	0832	1028	1028	249	6.9	7.4	166	19.5	12000	16000
27...	1150	1028	1028	254	7.0	7.2	232	16.0	K1400	--

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BIOLOGICAL DATA
BENTHIC MACROINVERTEBRATES

Benthic Macroinvertebrate	10/13/98 Count
Platyhelminthes	
Turbellaria (Flatworms)	
Tricladida	
Planariidae	2
Mollusca	
Gastropoda (Snails)	
Basommatophora	
Ancyliidae	
<i>Ferrissia</i>	3
Bivalvia (Clams)	
Veneroida	
Sphaeriidae	1
Annelida (Segmented Worms)	
Oligochaeta	7
Arthropoda	
Acariformes	
Hydrachnidia (Water Mites)	88
Crustacea	
Amphipoda (Scuds)	
Gammaridae	
<i>Gammarus</i>	16
Insecta	
Ephemeroptera (Mayflies)	
Baetidae	
<i>Baetis</i>	3
<i>Pseudocloeon</i>	1
Caenidae	
<i>Caenis</i>	15
Ephemerellidae	
<i>Serratella</i>	23
Heptageniidae	
<i>Stenonema</i>	22
Isonychiidae	
<i>Isonychia</i>	1
Leptohyphidae	
<i>Tricorythodes</i>	36
Trichoptera (Caddisflies)	
Helicopsychidae	
<i>Helicopsyche</i>	2
Hydropsychidae	
<i>Cheumatopsyche</i>	96
<i>Hydropsyche</i>	267
Hydroptilidae	
<i>Leucotrichia</i>	8
Philopotamidae	
<i>Chimarra</i>	2
Polycentropidae	
<i>Neureclipsis</i>	1
Uenoidae	
<i>Neophylax</i>	2
Lepidoptera	
Pyrallidae (Moths)	
<i>Petrophila</i>	15
Coleoptera (Beetles)	
Elmidae (Rifle Beetles)	
<i>Ancyronyx</i>	3
<i>Optioservus</i>	151
<i>Oulimnius</i>	7
<i>Stenelmis</i>	28
Psephenidae (Water Pennies)	
<i>Psephenus</i>	6
Diptera (True Flies)	
Chironomidae (Midges)	15
Empididae (Dance Flies)	
<i>Hemerodromia</i>	3
Simuliidae (Black Flies)	
<i>Simulium</i>	5
Tipulidae (Crane Flies)	
<i>Antocha</i>	32
Total count	861
Total number of taxa	30

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SPECIFIC CONDUCTANCE, MICROSIEMENS PER CENTIMETER AT 25° CELSIUS, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	387	357	372	371	310	343	---	---	---	---	---	---
2	391	332	357	362	299	328	---	---	---	---	---	---
3	399	343	369	358	319	340	---	---	---	---	---	---
4	387	310	344	356	323	337	---	---	---	---	---	---
5	354	316	337	375	325	351	---	---	---	---	---	---
6	355	318	343	370	335	354	---	---	---	---	---	---
7	369	337	352	380	318	353	---	---	---	---	---	---
8	366	204	296	373	307	348	---	---	---	---	---	---
9	273	184	238	365	321	347	---	---	---	---	---	---
10	237	181	201	358	311	339	---	---	---	---	---	---
11	303	237	265	360	303	335	---	---	---	---	---	---
12	318	287	303	335	299	321	---	---	---	---	---	---
13	326	300	316	350	327	337	---	---	---	---	---	---
14	337	314	325	355	300	327	---	---	---	---	---	---
15	354	319	336	346	275	312	---	---	---	---	---	---
16	369	339	356	346	300	327	---	---	---	---	---	---
17	356	305	333	337	307	325	---	---	---	---	---	---
18	355	302	332	341	297	322	---	---	---	---	---	---
19	362	318	346	343	313	331	---	---	---	---	---	---
20	355	309	341	353	311	332	---	---	---	---	---	---
21	361	328	347	354	297	329	---	---	---	---	---	---
22	364	335	351	350	299	328	---	---	---	---	---	---
23	368	325	348	343	300	327	---	---	---	---	---	---
24	376	317	346	347	296	327	---	---	---	---	---	---
25	373	324	353	346	319	331	---	---	---	---	---	---
26	370	316	346	329	237	272	---	---	---	---	---	---
27	354	313	340	294	247	267	---	---	---	---	---	---
28	356	332	342	311	279	297	---	---	---	---	---	---
29	350	321	339	332	290	311	---	---	---	---	---	---
30	361	320	345	333	296	316	---	---	---	---	---	---
31	374	314	347	---	---	---	---	---	---	---	---	---
MONTH	399	181	331	380	237	327	---	---	---	---	---	---
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	232	200	211	285	266	276	316	286	302
2	---	---	---	273	230	247	275	257	267	321	287	306
3	---	---	---	285	268	276	278	258	270	319	290	305
4	---	---	---	---	---	---	---	---	---	317	289	304
5	---	---	---	---	---	---	---	---	---	317	297	308
6	---	---	---	288	267	277	282	263	272	315	299	306
7	---	---	---	277	244	261	280	264	272	318	296	306
8	---	---	---	294	268	281	283	266	275	306	279	295
9	---	---	---	295	278	286	285	212	272	299	269	287
10	---	---	---	296	278	288	212	167	191	303	274	291
11	---	---	---	298	278	289	238	211	223	---	---	---
12	---	---	---	302	280	291	222	190	205	314	295	305
13	---	---	---	306	277	294	235	219	226	304	274	288
14	---	---	---	351	276	300	241	231	236	305	280	295
15	---	---	---	---	---	---	264	233	240	328	282	306
16	---	---	---	---	---	---	273	253	263	311	279	300
17	---	---	---	334	285	314	263	242	253	317	286	302
18	---	---	---	285	237	255	273	250	262	320	274	298
19	---	---	---	295	272	281	286	257	267	303	258	279
20	---	---	---	298	279	290	270	249	258	296	276	283
21	---	---	---	298	176	279	263	250	257	306	284	295
22	---	---	---	---	---	---	267	246	254	310	281	299
23	---	---	---	231	201	220	263	244	253	313	260	283
24	295	270	280	236	222	230	260	237	249	284	162	232
25	298	275	284	251	229	236	271	246	258	245	209	230
26	286	270	280	270	251	261	272	252	261	273	238	251
27	293	268	282	275	256	267	282	260	270	290	257	273
28	284	219	260	274	252	264	288	270	280	314	280	302
29	---	---	---	270	254	263	308	280	291	316	286	304
30	---	---	---	274	257	268	303	285	295	311	276	296
31	---	---	---	279	263	273	---	---	---	321	273	300
MONTH	298	219	277	351	176	269	308	167	257	328	162	291

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SPECIFIC CONDUCTANCE, MICROSIEMENS PER CENTIMETER AT 25° CELSIUS, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	321	287	305	363	336	355	443	374	419	431	381	407
2	331	293	315	373	336	355	454	367	409	440	419	430
3	326	297	313	371	289	333	408	343	385	449	400	430
4	331	300	318	382	327	357	418	356	394	446	408	430
5	348	305	330	408	343	377	413	369	398	475	198	403
6	362	315	341	396	342	365	408	366	395	310	211	256
7	359	314	343	397	357	379	455	381	422	338	269	320
8	357	291	332	407	370	388	442	378	419	385	328	349
9	390	348	367	410	383	398	434	377	412	435	380	403
10	389	349	368	413	351	386	448	375	415	401	283	320
11	364	336	351	411	345	385	441	397	422	424	337	375
12	377	333	357	414	361	396	433	403	423	468	418	438
13	378	326	357	402	349	382	445	417	435	474	368	412
14	352	302	323	401	363	387	435	270	344	418	366	389
15	346	309	325	402	380	394	392	321	352	426	387	404
16	360	334	348	417	372	397	413	349	385	398	82	201
17	360	331	349	424	367	402	416	362	393	---	---	---
18	361	326	344	426	361	403	442	394	415	---	---	---
19	369	323	349	429	302	384	428	396	413	---	---	---
20	374	323	356	405	263	358	432	399	416	---	---	---
21	372	331	358	401	364	383	417	356	395	---	---	---
22	359	329	348	400	373	385	421	362	395	256	239	248
23	358	313	336	398	357	381	430	381	414	273	254	265
24	344	315	333	407	352	385	457	384	416	280	242	259
25	359	326	344	411	354	389	462	428	441	---	---	---
26	371	324	351	410	356	392	---	---	---	---	---	---
27	381	327	360	435	383	414	---	---	---	---	---	---
28	383	335	363	417	338	386	387	286	341	316	284	300
29	366	330	353	463	340	414	433	381	405	320	294	307
30	364	342	356	467	396	428	430	380	404	323	188	237
31	---	---	---	432	382	413	429	392	409	---	---	---
MONTH	390	287	343	467	263	386	462	270	403	475	82	345

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	8.0	7.4	7.6	8.2	7.3	7.6	---	---	---	---	---	---
2	8.0	7.5	7.7	8.3	7.3	7.6	---	---	---	---	---	---
3	8.2	7.6	7.8	8.2	7.3	7.6	---	---	---	---	---	---
4	7.7	7.5	7.6	8.3	7.4	7.6	---	---	---	---	---	---
5	8.0	7.5	7.7	8.4	7.4	7.7	---	---	---	---	---	---
6	8.0	7.5	7.7	8.3	7.4	7.7	---	---	---	---	---	---
7	8.1	7.5	7.7	8.4	7.4	7.7	---	---	---	---	---	---
8	7.6	7.3	7.5	8.3	7.3	7.6	---	---	---	---	---	---
9	7.5	7.3	7.4	8.5	7.3	7.7	---	---	---	---	---	---
10	7.4	7.3	7.3	7.9	7.3	7.5	---	---	---	---	---	---
11	7.4	7.3	7.3	7.9	7.2	7.4	---	---	---	---	---	---
12	7.4	7.3	7.3	7.9	7.2	7.5	---	---	---	---	---	---
13	7.4	7.3	7.3	8.0	7.3	7.5	---	---	---	---	---	---
14	7.4	7.3	7.3	8.2	7.3	7.6	---	---	---	---	---	---
15	7.8	7.4	7.6	8.4	7.2	7.6	---	---	---	---	---	---
16	7.8	7.5	7.6	8.4	7.3	7.6	---	---	---	---	---	---
17	7.9	7.4	7.6	8.3	7.2	7.6	---	---	---	---	---	---
18	7.9	7.3	7.5	8.6	7.2	7.7	---	---	---	---	---	---
19	7.7	7.2	7.4	8.8	7.3	7.8	---	---	---	---	---	---
20	7.9	7.2	7.5	8.4	7.3	7.6	---	---	---	---	---	---
21	8.0	7.3	7.6	8.7	7.3	7.7	---	---	---	---	---	---
22	8.0	7.4	7.6	8.7	7.4	7.8	---	---	---	---	---	---
23	8.0	7.4	7.6	8.6	7.4	7.7	---	---	---	---	---	---
24	8.1	7.4	7.6	8.5	7.3	7.7	---	---	---	---	---	---
25	8.1	7.3	7.6	8.7	7.3	7.8	---	---	---	---	---	---
26	8.1	7.3	7.6	7.4	7.2	7.3	---	---	---	---	---	---
27	7.9	7.3	7.5	7.6	7.2	7.3	---	---	---	---	---	---
28	7.8	7.3	7.5	7.7	7.3	7.4	---	---	---	---	---	---
29	7.9	7.3	7.5	7.8	7.3	7.4	---	---	---	---	---	---
30	7.9	7.3	7.5	7.9	7.2	7.5	---	---	---	---	---	---
31	8.0	7.3	7.5	---	---	---	---	---	---	---	---	---
MONTH	8.2	7.2	7.5	8.8	7.2	7.6	---	---	---	---	---	---

CHRISTINA RIVER BASIN

01480870 EAST BRANCH BRANDYWINE CREEK BELOW DOWNINGTOWN, PA--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	7.8	7.5	7.6	8.0	7.4	7.7	8.3	7.4	7.8
2	---	---	---	8.1	7.5	7.7	8.8	7.4	7.9	8.2	7.4	7.8
3	---	---	---	8.3	7.5	7.8	8.9	7.4	8.0	7.8	7.4	7.6
4	---	---	---	---	---	---	---	---	---	8.4	7.4	7.8
5	---	---	---	---	---	---	---	---	---	8.5	7.4	7.8
6	---	---	---	8.0	7.6	7.8	8.8	7.5	8.0	8.0	7.4	7.6
7	---	---	---	8.2	7.6	7.8	8.9	7.5	8.0	7.9	7.4	7.6
8	---	---	---	8.1	7.6	7.8	8.9	7.5	8.1	8.1	7.4	7.6
9	---	---	---	8.1	7.5	7.8	8.3	7.4	7.7	8.1	7.4	7.7
10	---	---	---	8.2	7.5	7.8	7.8	7.4	7.6	8.3	7.4	7.7
11	---	---	---	8.1	7.5	7.7	7.7	7.4	7.5	---	---	---
12	---	---	---	8.4	7.5	7.8	7.9	7.4	7.6	8.5	7.4	7.9
13	---	---	---	8.2	7.5	7.8	8.2	7.5	7.7	7.7	7.3	7.5
14	---	---	---	8.2	7.5	7.8	8.4	7.5	7.8	8.1	7.4	7.7
15	---	---	---	---	---	---	8.6	7.5	7.9	8.1	7.4	7.7
16	---	---	---	---	---	---	7.9	7.5	7.7	8.0	7.4	7.7
17	---	---	---	8.4	7.4	7.8	8.6	7.5	7.9	7.9	7.4	7.6
18	---	---	---	8.3	7.4	7.7	8.6	7.5	8.0	7.9	7.3	7.6
19	---	---	---	8.5	7.4	7.8	8.8	7.5	8.1	7.5	7.3	7.4
20	---	---	---	8.6	7.5	7.9	8.5	7.5	7.8	8.0	7.4	7.6
21	---	---	---	8.2	7.3	7.7	8.8	7.5	8.1	8.0	7.5	7.7
22	---	---	---	---	---	---	8.9	7.5	8.0	8.0	7.5	7.7
23	---	---	---	7.7	7.4	7.6	8.1	7.4	7.7	7.6	7.4	7.5
24	8.1	7.8	7.9	7.9	7.5	7.7	8.6	7.4	7.9	7.5	7.3	7.4
25	8.0	7.7	7.8	8.1	7.5	7.7	8.5	7.5	7.9	7.7	7.4	7.6
26	8.1	7.7	7.8	8.2	7.5	7.8	8.5	7.4	7.9	7.7	7.5	7.6
27	8.1	7.7	7.8	8.2	7.5	7.8	8.5	7.4	7.9	7.7	7.5	7.6
28	7.8	7.5	7.7	8.2	7.6	7.8	8.3	7.4	7.8	7.8	7.5	7.6
29	---	---	---	8.7	7.6	7.9	8.4	7.4	7.8	7.8	7.5	7.6
30	---	---	---	8.8	7.6	8.0	8.4	7.4	7.8	7.9	7.5	7.6
31	---	---	---	8.7	7.5	8.0	---	---	---	7.8	7.5	7.6
MONTH	8.1	7.5	7.8	8.8	7.3	7.8	8.9	7.4	7.8	8.5	7.3	7.6
	JUNE			JULY			AUGUST			SEPTEMBER		
1	7.8	7.4	7.6	7.8	7.4	7.6	8.3	7.2	7.6	7.6	7.3	7.4
2	7.9	7.4	7.6	8.1	7.4	7.7	8.2	7.3	7.6	7.5	7.2	7.4
3	7.9	7.3	7.6	8.0	7.4	7.6	8.5	7.3	7.7	7.5	7.2	7.3
4	8.0	7.5	7.7	8.1	7.4	7.6	8.6	7.3	7.8	7.3	7.1	7.2
5	8.1	7.5	7.7	7.9	7.3	7.5	8.4	7.3	7.7	7.2	6.9	7.1
6	8.1	7.5	7.7	7.9	7.3	7.5	8.4	7.3	7.7	7.0	6.8	6.9
7	8.0	7.4	7.7	7.8	7.3	7.5	8.4	7.3	7.7	7.2	7.0	7.1
8	8.0	7.4	7.6	7.9	7.3	7.5	7.7	7.2	7.4	7.6	7.1	7.3
9	7.8	7.3	7.5	8.0	7.4	7.6	7.9	7.2	7.4	7.6	7.3	7.4
10	7.7	7.3	7.5	7.8	7.3	7.5	7.8	7.3	7.4	7.5	7.3	7.4
11	7.9	7.4	7.6	8.1	7.4	7.6	7.8	7.2	7.4	7.5	7.3	7.3
12	7.8	7.4	7.6	7.9	7.4	7.6	8.0	7.2	7.5	7.5	7.3	7.3
13	7.8	7.4	7.5	8.1	7.4	7.7	7.8	7.2	7.4	7.5	7.3	7.4
14	7.7	7.4	7.5	8.1	7.4	7.7	7.5	7.0	7.2	7.5	7.3	7.4
15	8.0	7.3	7.6	8.2	7.4	7.7	7.5	7.1	7.3	7.4	7.3	7.3
16	8.1	7.4	7.7	8.3	7.4	7.7	7.8	7.1	7.4	7.4	6.8	7.1
17	7.8	7.4	7.6	8.3	7.4	7.7	7.9	7.2	7.4	---	---	---
18	7.9	7.5	7.7	8.4	7.4	7.7	7.9	7.2	7.4	---	---	---
19	8.0	7.4	7.6	8.3	7.3	7.7	7.9	7.2	7.4	---	---	---
20	7.9	7.5	7.6	7.5	7.2	7.3	7.5	7.2	7.3	---	---	---
21	7.8	7.5	7.6	8.2	7.3	7.6	7.6	7.2	7.4	---	---	---
22	7.9	7.5	7.7	8.1	7.4	7.7	7.5	7.2	7.3	7.5	7.5	7.5
23	8.0	7.4	7.6	8.3	7.4	7.7	7.4	7.1	7.2	7.6	7.5	7.5
24	8.0	7.4	7.6	8.2	7.4	7.7	7.4	7.1	7.2	7.5	7.4	7.5
25	8.1	7.4	7.7	8.4	7.4	7.7	7.3	7.1	7.2	---	---	---
26	8.1	7.4	7.7	8.4	7.3	7.7	---	---	---	---	---	---
27	7.9	7.4	7.6	8.4	7.4	7.7	---	---	---	---	---	---
28	7.7	7.3	7.5	8.4	7.3	7.8	7.5	7.2	7.3	7.4	7.3	7.3
29	7.9	7.3	7.5	8.1	7.4	7.6	7.5	7.2	7.3	7.4	7.3	7.3
30	7.9	7.4	7.6	8.2	7.3	7.6	7.5	7.2	7.3	7.3	7.2	7.3
31	---	---	---	8.3	7.3	7.7	7.5	7.3	7.4	---	---	---
MONTH	8.1	7.3	7.6	8.4	7.2	7.6	8.6	7.0	7.4	7.6	6.8	7.3

CHRISTINA RIVER BASIN

01480870 EAST BRANCH BRANDYWINE CREEK BELOW DOWNINGTOWN, PA--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	21.0	17.0	19.5	12.5	9.5	11.0	---	---	---	---	---	---
2	18.0	14.5	16.0	12.5	10.0	11.5	---	---	---	---	---	---
3	16.0	13.5	15.0	11.5	9.5	10.0	---	---	---	---	---	---
4	15.0	14.0	14.5	11.5	8.5	9.5	---	---	---	---	---	---
5	16.5	14.0	15.0	10.0	7.0	8.5	---	---	---	---	---	---
6	16.5	14.0	15.5	9.5	7.0	8.0	---	---	---	---	---	---
7	17.0	15.5	16.0	10.0	7.5	9.0	---	---	---	---	---	---
8	17.5	16.5	17.0	11.0	9.0	10.0	---	---	---	---	---	---
9	17.0	16.5	17.0	11.5	9.5	10.5	---	---	---	---	---	---
10	18.5	16.5	17.5	11.0	8.5	9.5	---	---	---	---	---	---
11	19.0	16.5	17.5	13.5	11.0	12.0	---	---	---	---	---	---
12	17.0	16.0	16.5	11.0	9.0	10.0	---	---	---	---	---	---
13	18.0	16.5	17.0	10.5	8.0	9.0	---	---	---	---	---	---
14	18.0	15.5	17.0	11.0	8.0	9.5	---	---	---	---	---	---
15	16.0	13.5	15.0	11.5	9.0	10.0	---	---	---	---	---	---
16	16.0	12.5	14.0	10.5	8.0	9.5	---	---	---	---	---	---
17	15.5	12.5	14.0	12.0	10.0	11.0	---	---	---	---	---	---
18	17.0	13.5	15.0	11.5	9.0	10.0	---	---	---	---	---	---
19	18.0	15.5	16.5	10.5	7.5	9.0	---	---	---	---	---	---
20	16.5	13.5	15.0	12.0	10.0	11.0	---	---	---	---	---	---
21	15.0	13.0	14.0	11.0	9.0	10.0	---	---	---	---	---	---
22	13.0	11.5	12.5	10.0	8.0	9.0	---	---	---	---	---	---
23	13.5	10.0	11.5	9.5	6.5	8.0	---	---	---	---	---	---
24	14.5	10.5	12.5	11.0	9.0	9.5	---	---	---	---	---	---
25	14.5	11.0	12.5	9.5	7.5	8.5	---	---	---	---	---	---
26	15.0	11.5	13.5	10.0	8.0	9.0	---	---	---	---	---	---
27	15.0	13.5	14.0	10.0	8.0	9.0	---	---	---	---	---	---
28	15.0	13.0	14.0	9.5	6.5	8.0	---	---	---	---	---	---
29	15.0	12.0	13.5	10.0	7.5	9.0	---	---	---	---	---	---
30	13.5	10.5	12.0	11.0	8.5	10.0	---	---	---	---	---	---
31	13.0	9.5	11.0	---	---	---	---	---	---	---	---	---
MONTH	21.0	9.5	14.9	13.5	6.5	9.6	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	---	---	---	6.0	4.5	5.5	11.5	10.0	10.5	18.0	12.0	15.0
2	---	---	---	7.0	3.5	5.5	13.5	10.5	12.0	18.0	12.5	15.0
3	---	---	---	9.5	5.0	7.0	14.5	11.0	13.0	14.5	13.5	13.5
4	---	---	---	---	---	---	---	---	---	16.0	13.0	14.5
5	---	---	---	---	---	---	---	---	---	20.5	14.5	17.0
6	---	---	---	6.0	4.5	5.5	14.5	9.5	12.0	17.5	16.0	16.5
7	---	---	---	6.0	3.0	4.5	15.5	10.5	13.0	16.0	15.0	15.5
8	---	---	---	5.5	1.0	3.0	17.0	11.5	14.5	18.5	15.0	16.5
9	---	---	---	4.0	2.0	3.0	15.5	10.5	13.0	18.5	15.0	17.0
10	---	---	---	7.0	3.0	5.0	13.0	9.0	11.0	20.0	14.5	17.0
11	---	---	---	7.0	3.0	4.5	12.0	9.0	9.5	---	---	---
12	---	---	---	5.5	3.0	4.5	11.5	8.5	10.0	21.0	15.0	18.0
13	---	---	---	7.5	3.0	5.0	13.0	8.5	10.5	18.5	15.0	16.5
14	---	---	---	6.0	2.0	4.5	13.5	9.0	11.5	18.5	13.5	15.5
15	---	---	---	---	---	---	12.0	9.5	11.0	18.0	13.5	15.5
16	---	---	---	---	---	---	11.5	10.5	11.0	17.0	13.0	15.0
17	---	---	---	9.0	4.0	7.0	12.0	9.5	11.0	18.5	13.5	15.5
18	---	---	---	11.0	7.0	9.0	12.5	9.5	11.0	20.5	15.0	17.5
19	---	---	---	10.0	7.0	8.5	12.0	8.5	10.5	18.5	17.0	17.5
20	---	---	---	10.5	6.0	8.5	11.0	9.5	10.0	20.0	15.0	17.0
21	---	---	---	8.5	6.5	7.0	11.5	8.5	10.0	20.0	14.5	17.0
22	---	---	---	---	---	---	15.0	10.0	12.5	20.0	15.5	18.0
23	---	---	---	8.0	4.5	6.5	14.5	12.0	13.0	18.5	17.0	17.5
24	4.5	1.0	3.0	9.0	7.0	8.0	14.5	9.5	12.0	17.0	16.0	16.5
25	5.0	2.0	3.5	10.0	6.5	8.0	15.0	9.5	12.0	17.5	13.5	15.5
26	6.5	2.5	4.5	10.0	6.0	8.0	16.0	10.0	13.0	17.0	13.5	15.5
27	6.0	3.0	4.5	9.0	6.0	7.5	16.5	11.5	14.0	18.0	14.5	16.5
28	6.5	5.0	5.5	9.0	7.5	8.5	15.5	12.0	13.5	20.5	14.5	17.0
29	---	---	---	12.5	7.5	10.0	18.0	11.5	14.5	22.0	16.0	19.0
30	---	---	---	12.5	8.0	10.5	18.0	12.0	15.0	23.0	17.5	20.0
31	---	---	---	13.5	8.0	11.0	---	---	---	22.5	18.5	20.5
MONTH	6.5	1.0	4.2	13.5	1.0	6.8	18.0	8.5	11.9	23.0	12.0	16.6

CHRISTINA RIVER BASIN

01480870 EAST BRANCH BRANDYWINE CREEK BELOW DOWNINGTOWN, PA--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	23.0	18.5	21.0	23.5	21.5	22.5	29.0	24.5	26.5	21.5	18.0	19.5
2	24.5	20.0	22.0	25.5	22.5	23.5	27.5	22.5	25.0	22.0	18.0	20.0
3	23.0	20.5	21.5	26.5	22.5	24.0	26.5	21.5	23.5	23.0	18.0	20.0
4	23.0	18.5	20.5	28.5	23.5	25.5	26.5	21.0	23.5	22.0	20.0	21.0
5	22.5	17.5	19.5	30.5	24.5	27.0	25.0	21.5	23.0	23.0	21.0	22.0
6	23.5	17.5	20.0	31.0	25.0	27.5	26.0	20.0	22.5	23.5	21.0	22.0
7	25.5	19.0	22.0	29.5	25.0	27.0	26.0	20.5	23.0	24.0	22.0	23.0
8	27.5	21.5	24.0	27.5	22.0	24.5	24.5	23.0	23.5	25.5	22.0	23.5
9	27.0	21.0	23.5	27.5	21.0	24.0	25.5	21.0	23.0	24.5	22.0	23.0
10	23.5	20.0	21.5	25.0	23.0	24.0	24.0	19.0	21.5	22.5	21.0	22.0
11	24.0	18.0	20.5	26.0	20.0	22.5	25.0	20.0	22.5	23.0	19.0	20.5
12	21.0	17.5	19.5	22.0	19.5	21.0	25.5	21.0	23.0	22.5	18.0	20.0
13	21.5	20.0	20.5	25.0	19.5	21.5	26.0	22.5	24.0	22.5	18.0	20.0
14	23.0	20.0	21.5	23.0	20.0	21.5	26.5	23.5	24.5	22.0	19.0	20.0
15	25.0	20.5	22.5	25.5	18.5	21.5	24.0	22.5	23.5	20.5	19.5	20.0
16	23.0	19.0	21.0	27.0	21.0	23.5	26.0	22.0	23.5	21.0	17.5	19.0
17	21.0	19.0	19.5	28.5	22.0	25.0	27.0	22.0	24.0	---	---	---
18	21.5	17.5	19.5	28.5	22.5	25.0	26.0	22.5	24.0	---	---	---
19	22.0	17.0	19.5	28.0	23.0	25.5	25.0	21.0	22.5	---	---	---
20	20.0	18.0	19.0	25.5	23.0	24.0	22.5	20.5	21.5	---	---	---
21	19.0	17.5	18.5	25.5	21.5	23.5	20.5	19.5	20.0	---	---	---
22	23.5	17.0	20.0	25.5	22.5	24.0	22.0	18.5	20.0	15.0	13.5	14.5
23	24.5	18.5	21.0	28.0	23.0	25.0	24.5	18.0	20.5	15.5	12.5	14.0
24	25.0	19.0	21.5	26.0	23.0	24.5	23.5	20.0	21.5	15.5	13.0	14.0
25	23.5	19.5	21.5	28.5	23.0	25.5	23.5	19.5	21.5	---	---	---
26	26.0	20.5	23.0	27.5	22.5	25.0	---	---	---	---	---	---
27	26.5	22.0	24.0	28.0	22.5	25.0	---	---	---	---	---	---
28	25.0	23.0	24.0	28.0	22.5	25.0	25.0	20.5	22.5	18.0	16.0	17.0
29	27.0	23.0	24.5	27.0	22.0	24.5	25.5	21.0	22.5	19.0	17.0	18.0
30	24.5	22.5	23.0	27.0	22.0	24.5	21.5	19.0	19.5	18.5	16.5	17.5
31	---	---	---	28.5	23.0	25.5	21.0	18.0	19.0	---	---	---
MONTH	27.5	17.0	21.3	31.0	18.5	24.3	29.0	18.0	22.6	25.5	12.5	19.6

OXYGEN, DISSOLVED (MG/L), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	10.7	6.9	8.4	13.4	8.8	10.5	---	---	---	---	---	---
2	11.4	7.5	9.1	13.6	8.7	10.5	---	---	---	---	---	---
3	12.3	8.4	10.0	13.7	9.0	10.7	---	---	---	---	---	---
4	9.9	8.8	9.2	13.6	9.2	10.8	---	---	---	---	---	---
5	11.8	8.8	9.9	14.3	9.6	11.3	---	---	---	---	---	---
6	11.7	8.6	9.7	14.3	9.8	11.3	---	---	---	---	---	---
7	11.7	8.4	9.6	14.7	9.2	11.3	---	---	---	---	---	---
8	9.1	7.3	8.5	14.3	9.0	10.6	---	---	---	---	---	---
9	9.1	8.4	8.9	15.3	8.9	11.1	---	---	---	---	---	---
10	10.3	8.9	10.1	12.7	9.0	10.3	---	---	---	---	---	---
11	10.4	9.7	10.1	12.6	8.3	9.5	---	---	---	---	---	---
12	10.1	7.9	9.7	13.5	8.5	10.5	---	---	---	---	---	---
13	9.8	9.3	9.6	13.6	9.4	10.9	---	---	---	---	---	---
14	9.6	8.4	9.2	14.3	9.2	10.9	---	---	---	---	---	---
15	11.0	8.4	9.5	14.2	8.9	10.7	---	---	---	---	---	---
16	11.4	9.1	10.0	14.7	8.9	11.0	---	---	---	---	---	---
17	11.9	9.1	10.2	14.5	8.8	10.7	---	---	---	---	---	---
18	11.9	8.4	9.9	14.1	8.8	10.6	---	---	---	---	---	---
19	11.3	7.9	9.2	14.8	8.6	10.9	---	---	---	---	---	---
20	11.9	8.0	9.4	12.6	7.9	9.6	---	---	---	---	---	---
21	12.5	8.6	10.0	13.4	7.9	9.9	---	---	---	---	---	---
22	12.5	9.1	10.5	13.5	8.4	10.1	---	---	---	---	---	---
23	12.9	9.6	10.7	12.8	7.9	9.8	---	---	---	---	---	---
24	12.9	9.1	10.5	11.7	7.5	8.8	---	---	---	---	---	---
25	12.8	8.8	10.2	11.3	7.2	8.7	---	---	---	---	---	---
26	13.4	8.5	10.2	---	---	---	---	---	---	---	---	---
27	12.1	8.4	9.8	---	---	---	---	---	---	---	---	---
28	11.7	8.2	9.5	---	---	---	---	---	---	---	---	---
29	12.1	8.1	9.5	---	---	---	---	---	---	---	---	---
30	12.5	8.6	10.0	---	---	---	---	---	---	---	---	---
31	12.8	8.9	10.2	---	---	---	---	---	---	---	---	---
MONTH	13.4	6.9	9.7	15.3	7.2	10.4	---	---	---	---	---	---

