Report on Water Demands

Delaware Water Supply Coordinating Council

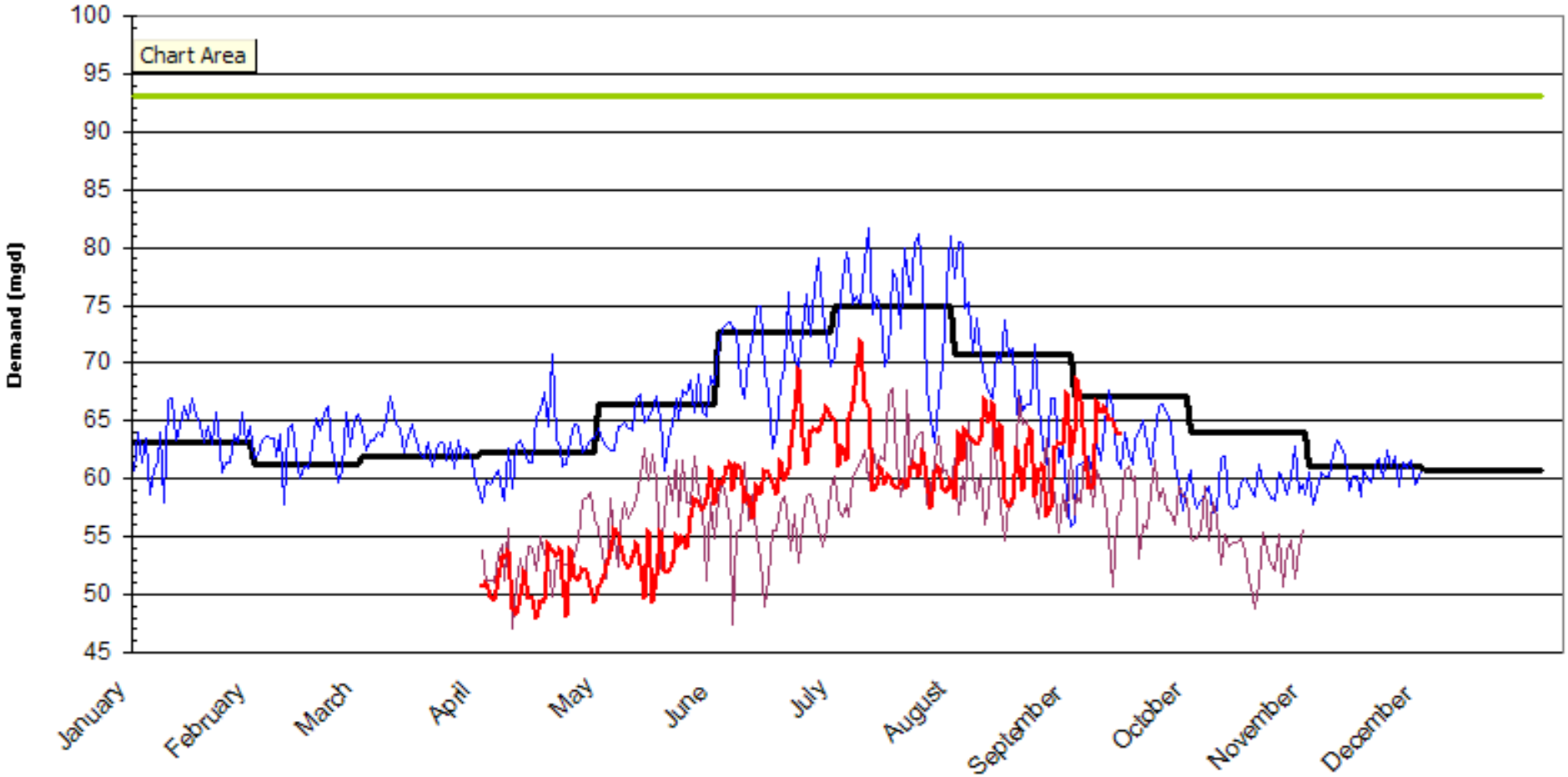
Dover, Del.

Sep 22, 2010

1	Water Production in Northern Castle County												
2	Sep-10												
3	Water Purveyor												
4													
5		2	3	4	5	6	7	8	9	10	11	12	13
6	City of Wilmington												
7													
8	* Brandywine Filter Plt.	4.8	4.2	4.2	1.2	0.8	4.2	4.4	4.4	4.4	4.4	4.4	4.4
9	* Porter Filter Plant	18.6	17.2	15.9	16.2	16.6	17.8	18.3	17.9	17.9	17.9	17.9	17.9
10													
11		**23.4**	**21.4**	**20.1**	**17.4**	**17.4**	**22.0**	**22.7**	**22.3**	**22.3**	**22.3**	**22.3**	**22.3**
12	Artesian Water Co.												
13													
14	* Wells (North)	17.32	16.83	15.93	15.53	17.50	17.92	16.49	16.39	16.39	16.39	16.39	16.39
15	ASR	0.98	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	* CWA (PA) Intercon.	2.54	2.53	2.51	2.46	2.53	2.51	2.42	2.44	2.44	2.44	2.44	2.44
17	* New Castle Intercon.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	* Wilmington Intercon.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19													
20		**20.8**	**20.3**	**18.4**	**18.0**	**20.0**	**20.4**	**18.9**	**18.8**	**18.8**	**18.8**	**18.8**	**18.8**
21	United Water Delaware												
22													
23	* White Clay Cr./Stanton	18.7	19.7	18.3	18.8	17.4	19.5	17.5	19.4	18.7	18.1	17.4	17.6
24	*ASR	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.7	0.8	0.8	0.7	0.7
25	- Hoopes Release												
26	Raw Chlorides(Stanton Plt)	58	46	53	47	52	48	54	46	56	53	56	55
27	.newport bridge												
28	.churchman's	400	370	425	400	443	425	355	617	693	750	812	857
29	.tcs	55	57	53	52	56	57	55	60	48	52	58	53
30	* Christina River WTP												
31	* CWA (PA) Intercon.	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2
32	* Artesian Intercon.												
33	* Wilmington Intercon.												
34													
35		**19.1**	**20.1**	**18.7**	**19.2**	**17.8**	**20.0**	**18.4**	**20.3**	**19.6**	**19.1**	**18.3**	**18.4**
36	City of Newark												

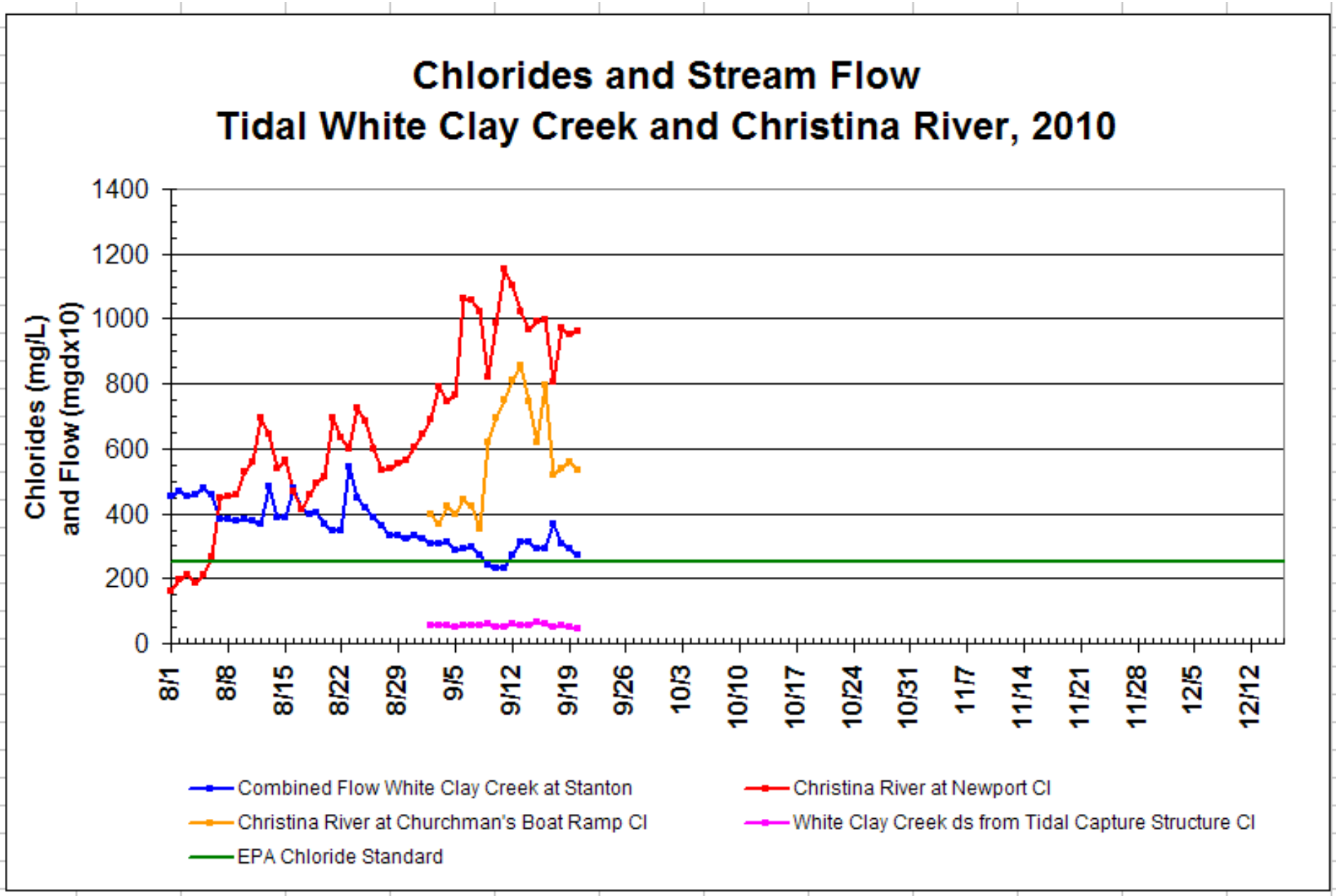
	A	C	D	E	F	G	H	I	J	K	L	M	N
1	**Water Production in Northern Castle County**												
2	**Sep-10**												
3	**Water Purveyor**												
4													
5		2	3	4	5	6	7	8	9	10	11	12	13
28	.churchman's	400	370	425	400	443	425	355	617	693	750	812	857
29	.tcs	55	57	53	52	56	57	55	60	48	52	58	53
30	* Christina River WTP												
31	* CWA (PA) Intercon.	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2
32	* Artesian Intercon.												
33	* Wilmington Intercon.												
34													
35		**19.1**	**20.1**	**18.7**	**19.2**	**17.8**	**20.0**	**18.4**	**20.3**	**19.6**	**19.1**	**18.3**	**18.4**
36	**City of Newark**												
37													
38	* White Clay Cr. WTP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	*Newark Reservoir	3.0	2.8	3.2	2.9	2.4	2.7	4.1	3.1	2.6	3.1	2.8	2.3
40	* Wells	1.7	1.7	1.2	1.2	1.2	1.2	1.1	1.2	1.2	1.2	1.2	1.4
41	* United Intercon.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
42	* Artesian Intercon.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43													
44		**4.7**	**4.5**	**4.4**	**4.1**	**3.6**	**3.9**	**5.2**	**4.3**	**3.8**	**4.3**	**4.0**	**3.7**
45	**New Castle Brd. of W & L**												
46													
47	* Wells	**0.6**	**0.6**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.5**	**0.6**	**0.5**	**0.6**
48													
49	Subtotal	68.7	66.9	62.1	59.2	59.4	66.9	65.7	66.3	65.0	65.0	63.9	63.8
50	- Del. Interconnections	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51													
52		**68.7**	**66.9**	**62.1**	**59.2**	**59.4**	**66.9**	**65.7**	**66.3**	**65.0**	**65.0**	**63.9**	**63.8**

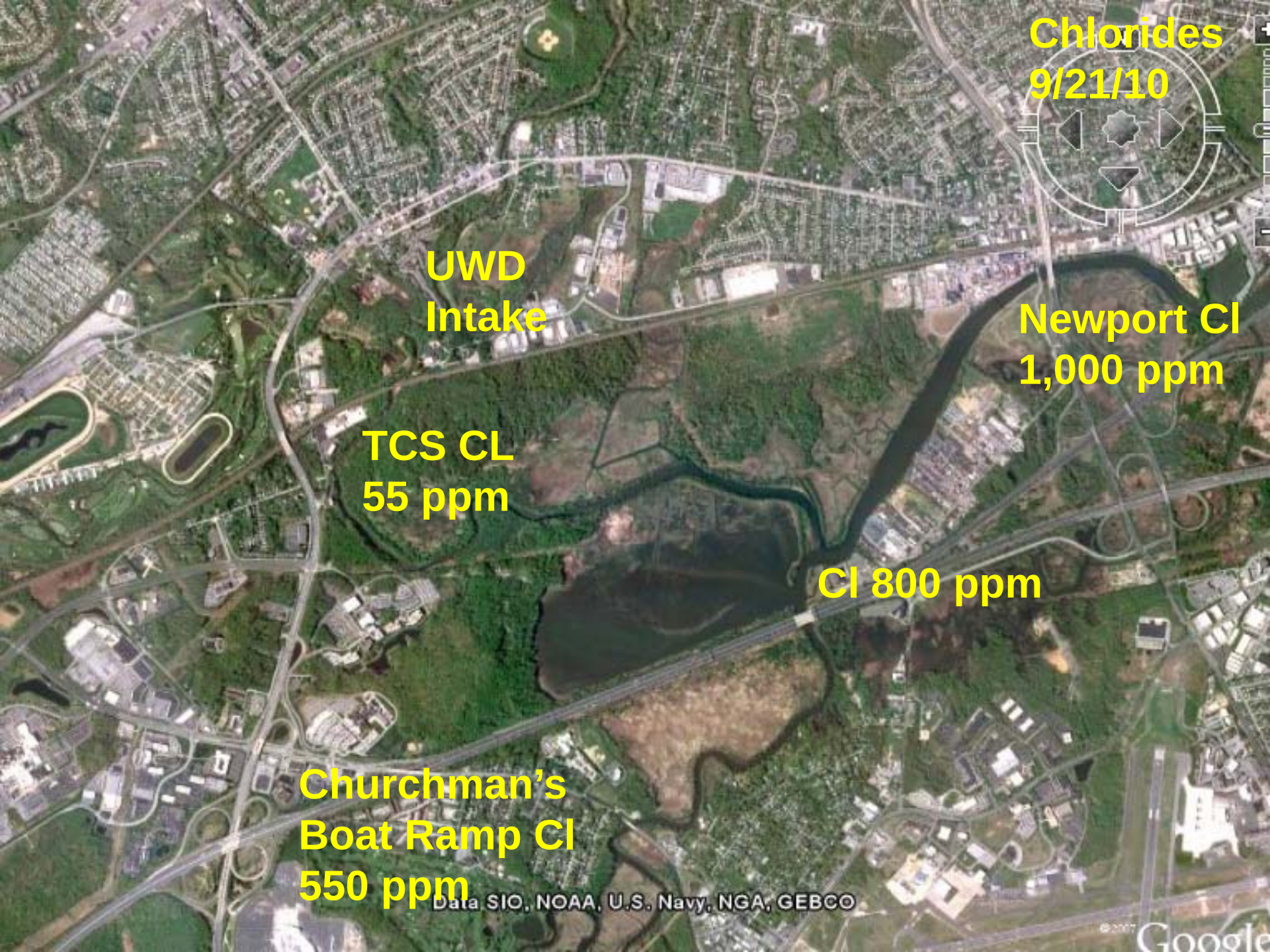
Public Water Demand: Northern New Castle County



Compiled by the University of Delaware Water Resources Agency using data from Artesian Water Co., City of Newark, New Castle Municipal Services Commission, United Water Delaware and City of Wilmington

Historic Peak 1997 | Monthly Mean | 2002 drought | 2009 | 2010


Chlorides and Stream Flow
Tidal White Clay Creek and Christina River, 2010
Chlorides (mg/L)
and Flow (mgdx10)
1400
1200
1000
800
600
400
200
0
8/1
8/8
8/15
8/22
8/29
9/5
9/12
9/19
9/26
10/3
10/10
10/17
10/24
10/31
11/7
11/14
11/21
11/28
12/5
12/12
Combined Flow White Clay Creek at Stanton
Christina River at Newport Cl
Christina River at Churchman's Boat Ramp Cl
White Clay Creek ds from Tidal Capture Structure Cl
EPA Chloride Standard

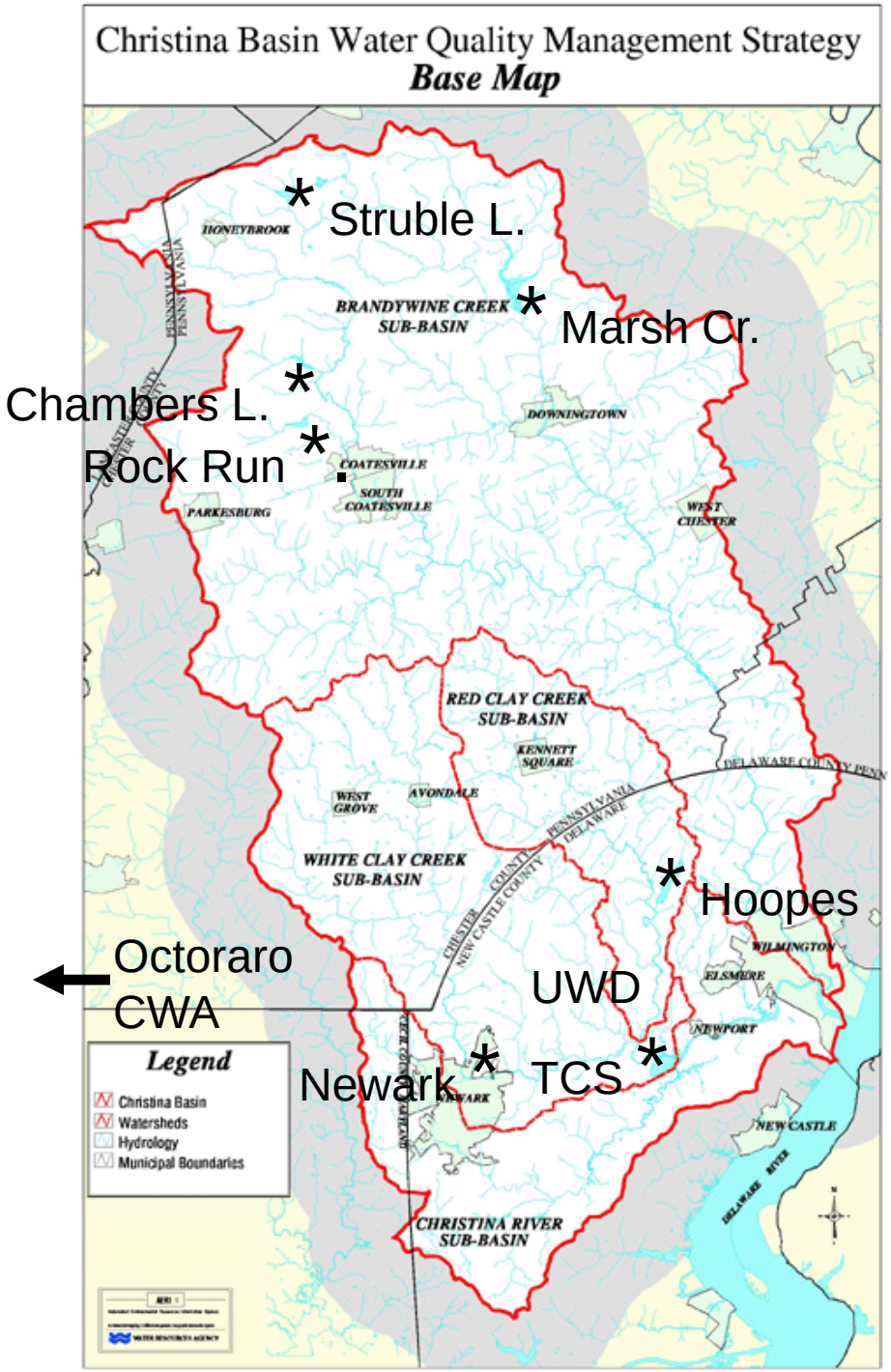

Chlorides
9/21/10
UWD
Intake
Newport Cl
1,000 ppm
TCS CL
55 ppm
Cl 800 ppm
Churchman's
Boat Ramp Cl
550 ppm
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Google

Newark Reservoir

* released 60 mg since Aug 29, 2010

Marsh Cr. Reservoir

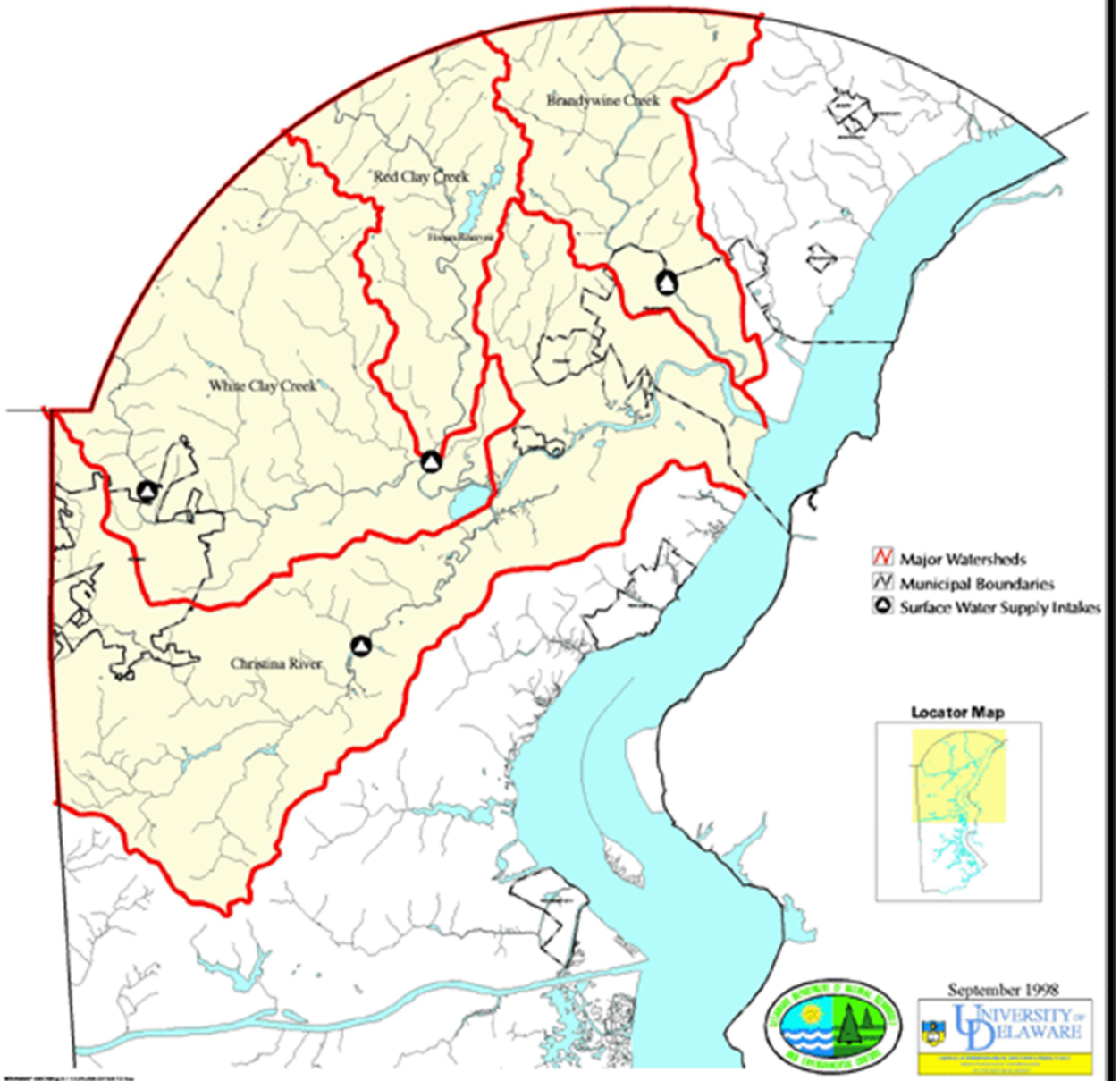
* released 234 mg since Jul 21, 2010
* at 94% of 4,000 mg capacity
* release 2.3 cfs on 9/21/10 or 2% of flow to Brandywine Cr. At Wilmington.

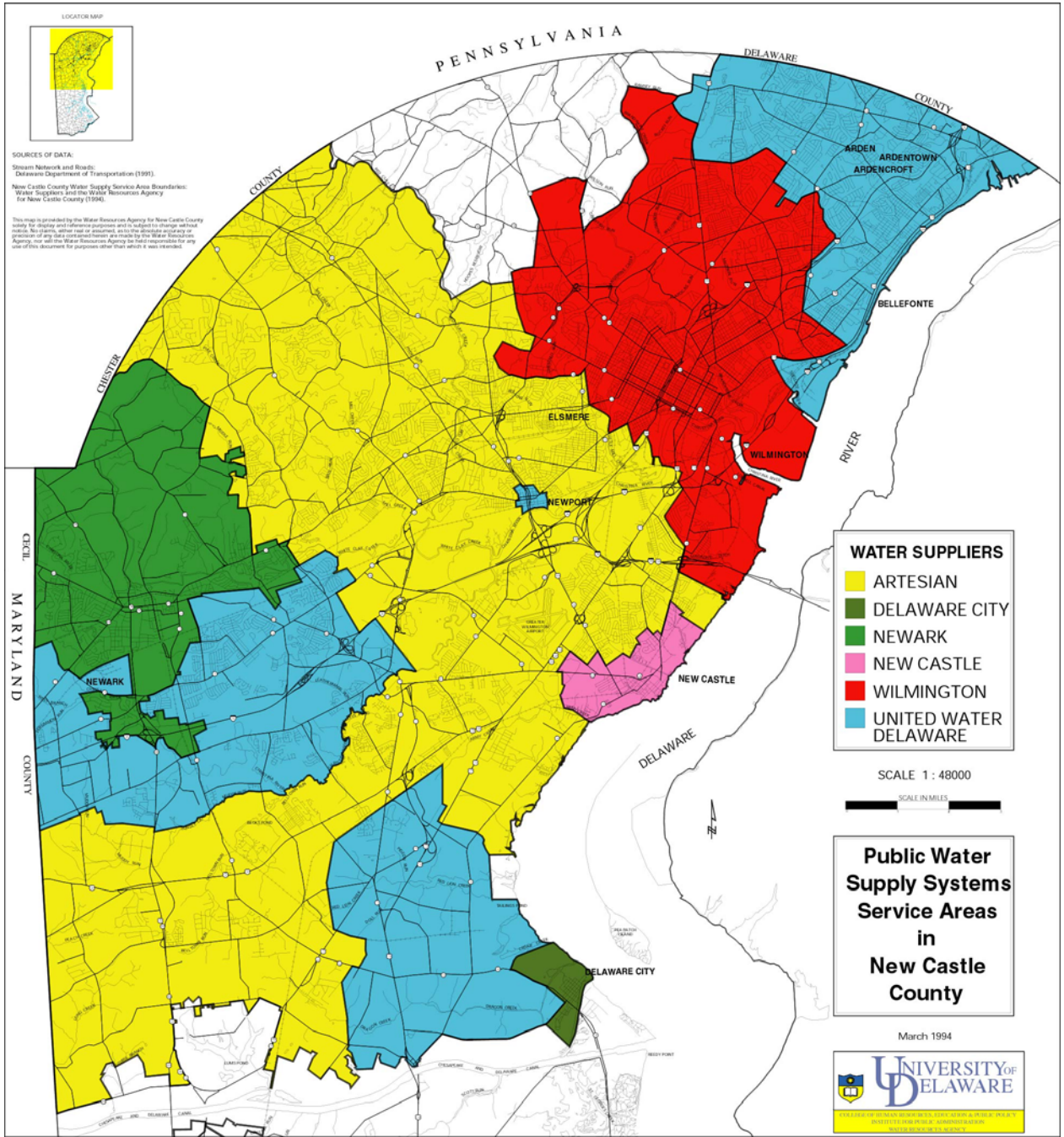

Christina Basin Water Quality Management Strategy
Base Map
Struble L.
Marsh Cr.
Chambers L.
Rock Run
Hoopes
Octoraro
CWA
UWD
Newark
TCS
HONEYBROOK
BRANDYWINE CREEK SUB-BASIN
DOWNINGTOWN
COATESVILLE
SOUTH COATESVILLE
PARKESBURG
WEST CHESTER
RED CLAY CREEK SUB-BASIN
KENNETT SQUARE
WEST GROVE
AVONDALE
WHITE CLAY CREEK SUB-BASIN
WILMINGTON
ELSMERE
NEWPORT
NEWARK
NEW CASTLE
CHRISTINA RIVER SUB-BASIN
DELAWARE RIVER
Legend
Christina Basin
Watersheds
Hydrology
Municipal Boundaries

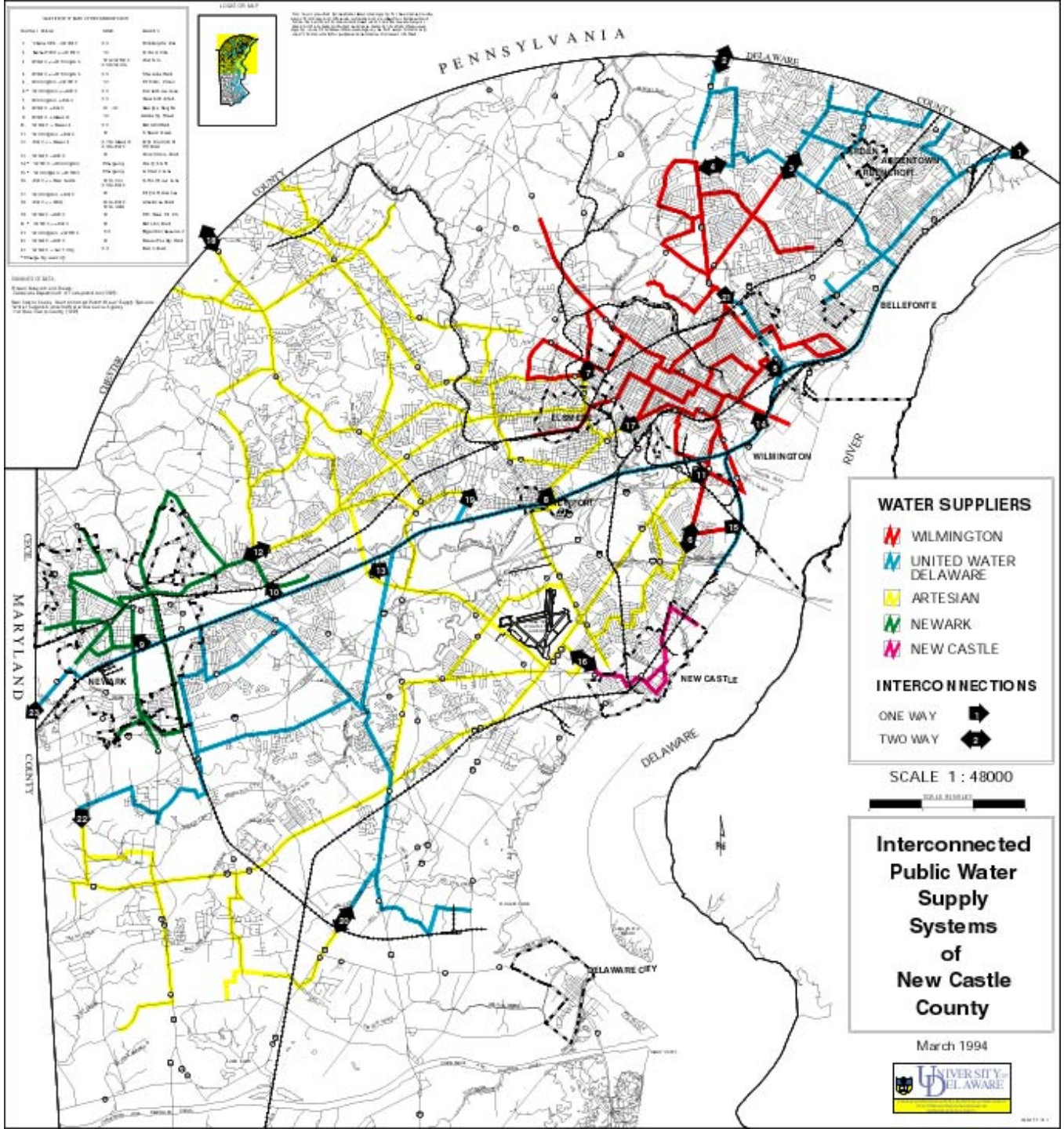
Reservoirs

Delaware Source Water Assessment and Protection Program

Figure 3-1. Public Surface Water Supplies




LOCATOR MAP
SOURCES OF DATA:
Stream Network and Roads:
Delaware Department of Transportation (1991).
New Castle County Water Supply Service Area Boundaries:
Water Suppliers and the Water Resources Agency
for New Castle County (1994).
This map is provided by the Water Resources Agency for New Castle County solely for display and reference purposes and is subject to change without notice. No claims, either real or assumed, as to the absolute accuracy or precision of any data contained herein are made by the Water Resources Agency, nor will the Water Resources Agency be held responsible for any use of this document for purposes other than which it was intended.
PENNSYLVANIA
DELAWARE
COUNTY
CHESTER
COUNTY
CECIL
MARYLAND
COUNTY
ARDEN
ARDENTOWN
ARDENCROFT
BELLEFONTE
ELSMERE
WILMINGTON
NEWPORT
NEW CASTLE
NEWARK
DELAWARE CITY
RIVER
DELAWARE
WATER SUPPLIERS
ARTESIAN
DELAWARE CITY
NEWARK
NEW CASTLE
WILMINGTON
UNITED WATER DELAWARE
SCALE 1 : 48000
SCALE IN MILES
Public Water Supply Systems Service Areas in New Castle County
March 1994
UNIVERSITY OF DELAWARE


PENNSYLVANIA
DELAWARE
COUNTY
CHESTER
COUNTY
CECIL
MARYLAND
COUNTY
ARDEN
ARDENTOWN
BELLEFONTE
ELSMERE
WILMINGTON
RIVER
NEWARK
NEW CASTLE
DELAWARE
DELAWARE CITY
WATER SUPPLIERS
WILMINGTON
UNITED WATER DELAWARE
ARTESIAN
NEWARK
NEW CASTLE
INTERCONNECTIONS
ONE WAY
TWO WAY
SCALE 1 : 48000
Interconnected Public Water Supply Systems of New Castle County
March 1994
UNIVERSITY OF DELAWARE

OUTCOME OF WSCC DROUGHT REVIEW SUBCOMITTEE MEETING SEPTEMBER 9, 2008

CONSENSUS: Language to be appended to the Drought Operating Plan

Whenever we are on any of the levels there shall be a status update by DGS at intervals no greater than four weeks, posted at the DGS website. Responsibility for providing technical guidance for a move up to or down from Watch is with WSCC. Responsibility for providing technical guidance for a move up to or down from Warning or Emergency is with GDAC. Any member of WSCC may request, for reasons to be stated, that the chair or designee calls a meeting of WSCC at his/her discretion.

Northern Delaware Drought Operating Plan							
% of Time Stream Exceeds Listed Flow	**80 %**	**85 %**	**90 %**	**95 %**	**98 %**	**99 %**	**Record**
					7Q10 flow	**1999 drought**	**2002 drought**
Section 1.01 I. Stream Flow	*mgd*	*mgd*	*mgd*	*mgd*	*mgd*	*mgd*	*mgd*
Brandywine Creek at Wilmington Intake	110	100	85	70	49	40	21
White Clay/Red Clay Creek at Stanton Intake	53	42	37	31	17	10	7
White Clay Creek at Newark Intake	20	19	16	13	7	5	3
Chlorides White Clay Creek at Stanton TCS	< 250	< 250	< 250	< 250	= 250	> 250	> 250
	ppm	*ppm*	*ppm*	*ppm*	*ppm*	*ppm*	*ppm*

*Northern Delaware Drought Advisory Guidelines**			
Advisories	**Drought Watch**	**Drought Warning**	**Drought Emergency**
Status	Potential	Imminent	Emergency
Demand Recommendations / Restrictions	Voluntary	Primarily Voluntary	Mandatory
Northern Del. Demand Conservation Goal	< 80 mgd	< 73 mgd	< 68 mgd
Indicators	**Drought Watch**	**Drought Warning**	**Drought Emergency**
DGS Water Conditions Index	4.0-5.0 (potential shortage)	3.0-3.99 (potential shortage)	<3.00 (shortage)
Precipitation: Running 12-month deficit			
New Castle County (Wilmington) Airport and Wilmington Porter Reservoir	6" to 8.99"	9" to 11.99"	>12.00"
Stream Flows: 30-day moving average			
Brandywine Creek at Wilmington	85 mgd (90% exceedance)	70 mgd (95 % exceedance)	48 mgd (98% to 99% exceedance)
White Clay Creek at Stanton (RCC+WCC)	42 mgd (85% exceedance)	37 mgd (90% exceedance)	31 mgd (95% exceedance)
White Clay Creek at Newark	19 mgd (85% exceedance)	16 mgd (90% exceedance)	13 mgd (95% exceedance)
Chlorides	Stream flows ≤ 37 mgd for 5 consecutive days on WCC at UWD Stanton Intake	Chlorides > 250 ppm for 3 consecutive days at the Christina River at Newport	Chlorides > 250 ppm for 3 consecutive days at the UWD Stanton Intake

Reservoir			
Stream Flows: 30-day moving average			
Brandywine Creek at Wilmington	85 mgd (90% exceedance)	70 mgd (95 % exceedance)	48 mgd (98% to 99% exceedance)
White Clay Creek at Stanton (RCC+WCC)	42 mgd (85% exceedance)	37 mgd (90% exceedance)	31 mgd (95% exceedance)
White Clay Creek at Newark	19 mgd (85% exceedance)	16 mgd (90% exceedance)	13 mgd (95% exceedance)
Chlorides	Stream flows ≤ 37 mgd for 5 consecutive days on WCC at UWD Stanton Intake	Chlorides > 250 ppm for 3 consecutive days at the Christina River at Newport	Chlorides > 250 ppm for 3 consecutive days at the UWD Stanton Intake
Ground-Water Levels			
Shallow DGS Well Db24-10	14 - 14.99 feet (75% exceedance)	15 - 15.99 feet (90% exceedance)	> 16 feet (96% exceedance)
Aquifer Storage and Recovery	Report remaining water volume (mg) to GDAC	Report remaining water volume (mg) to GDAC	Report remaining water volume (mg) to GDAC
Reservoir Levels			
Hoopes Reservoir (City of Wilmington)	- 5 feet (elev. 215 feet) (85% capacity)	- 7 feet (elev. 213 feet) (79% capacity)	- 9 feet (elev. 211 feet) (72% capacity)
Newark Reservoir	- 10 feet (70% capacity)	-17 feet (52% capacity)	- 27 feet (28% capacity)
CWA Conditions (Octoraro Reservoir)	Report water levels to GDAC	Report water levels to GDAC	Report water levels to GDAC
DRBC Conditions (NY City Reservoirs)	Drought Watch	Drought Warning	Drought

- These drought operating guidelines are not "triggers" for specific advisory levels. Rather, they are designed to provide guidance to the Governor's Drought Advisory Committee (GDAC) and the Delaware Water Supply Coordinating Council (WSCC). Final declaration of drought advisories rests with the Governor based upon input from the GDAC.

11th Report to the Governor and General Assembly
Estimates of Water Supply and Demand in Kent County and Sussex County through 2030

Chapter		Milestone
Executive Summary (UDWRA)	50%	9/22/10
1. Introduction (UDWRA)	90%	9/22/10
1.1. Purpose and Scope		
1.2. Role of Delaware Water WSCC		
2. Demographics/GIS Mapping (UDWRA)	90%	9/22/10
2.1. Land Use/Zoning		
2.2. Population		
2.3. Housing Units		
2.4. Comprehensive Plans		
2.5. Water supply service areas CPCN map		
2.6. Interconnected systems map		
3. Hydrogeology and Groundwater Availability (DGS)	%	date
4. Water Quality (UDWRA/DNREC/DGS/DPH)	90%	9/22/10
4.1. Existing water quality		
4.2. Source water protection		
5. Water Supply (DNREC)	50%	12/15/10
5.1. Allocated water users		
Public community wells, over 50,000 gpd		
Public non-community systems (Nontransient/transient)		
Irrigation wells (farms/golf courses/nurseries/wastewater reuse)		
Self supplied industry wells		
5.2. Domestic individual wells		
5.3. Public non-community systems (not allocated)		
6. Water Demands (UDWRA)	90%	9/22/10
6.1. Existing public water demands		
6.2. Existing domestic water demands		
6.3. Existing irrigation water demands		
6.4. Existing industry water demands		
7. Future Water Demands	90%	9/22/10
7.1. Future public water demands		
7.2. Future individual residential water demands		
7.3. Future irrigation water demands		
7.4. Future self supplied industry water demands		
7.5. Comparison of supply and demand		
8. Conclusions/Recommendations	0%	12/15/10
8.1. Conclusions		
8.2. Recommendations		