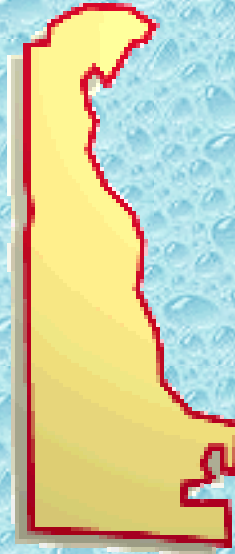


15 April 2002

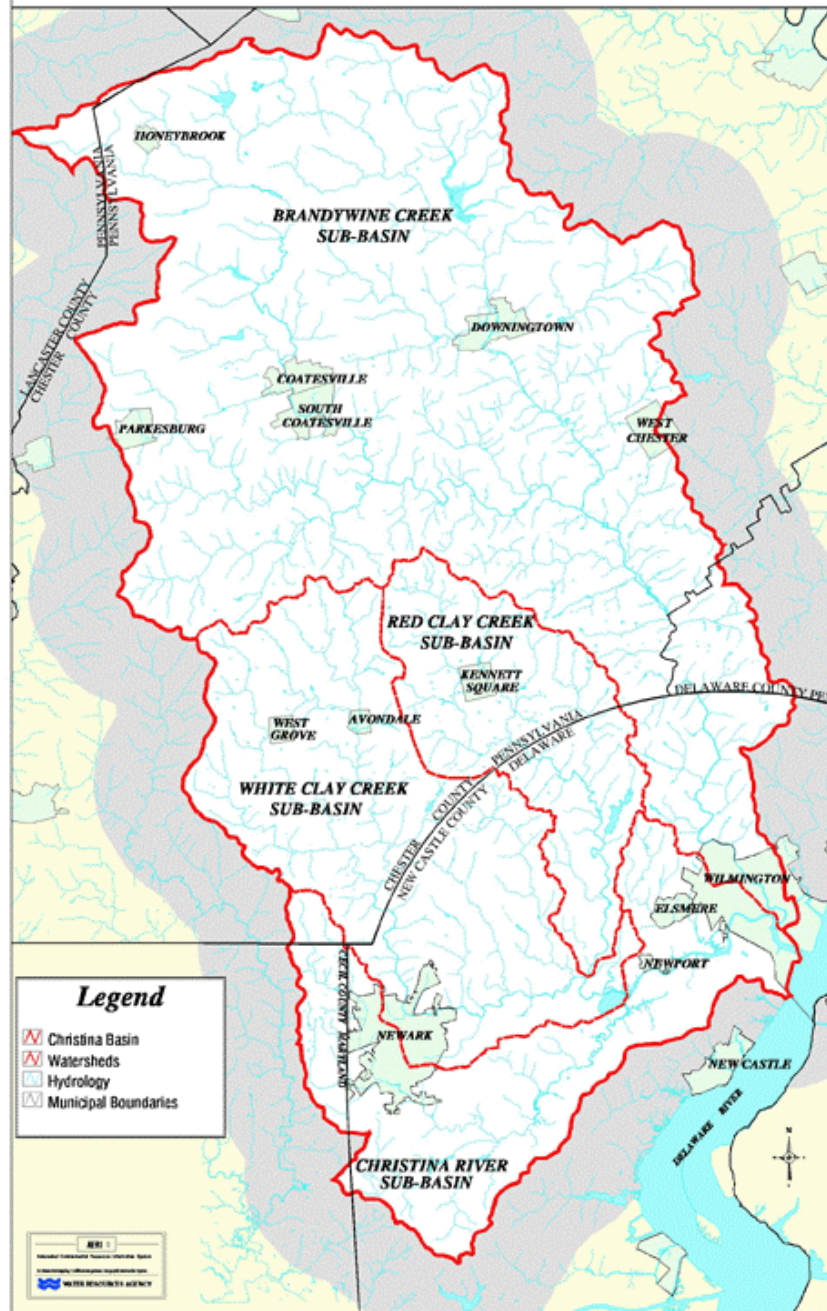


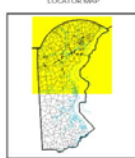
**Christina Basin  
Drought Management Committee**



# Christina Basin Water Quality Management Strategy

## Base Map

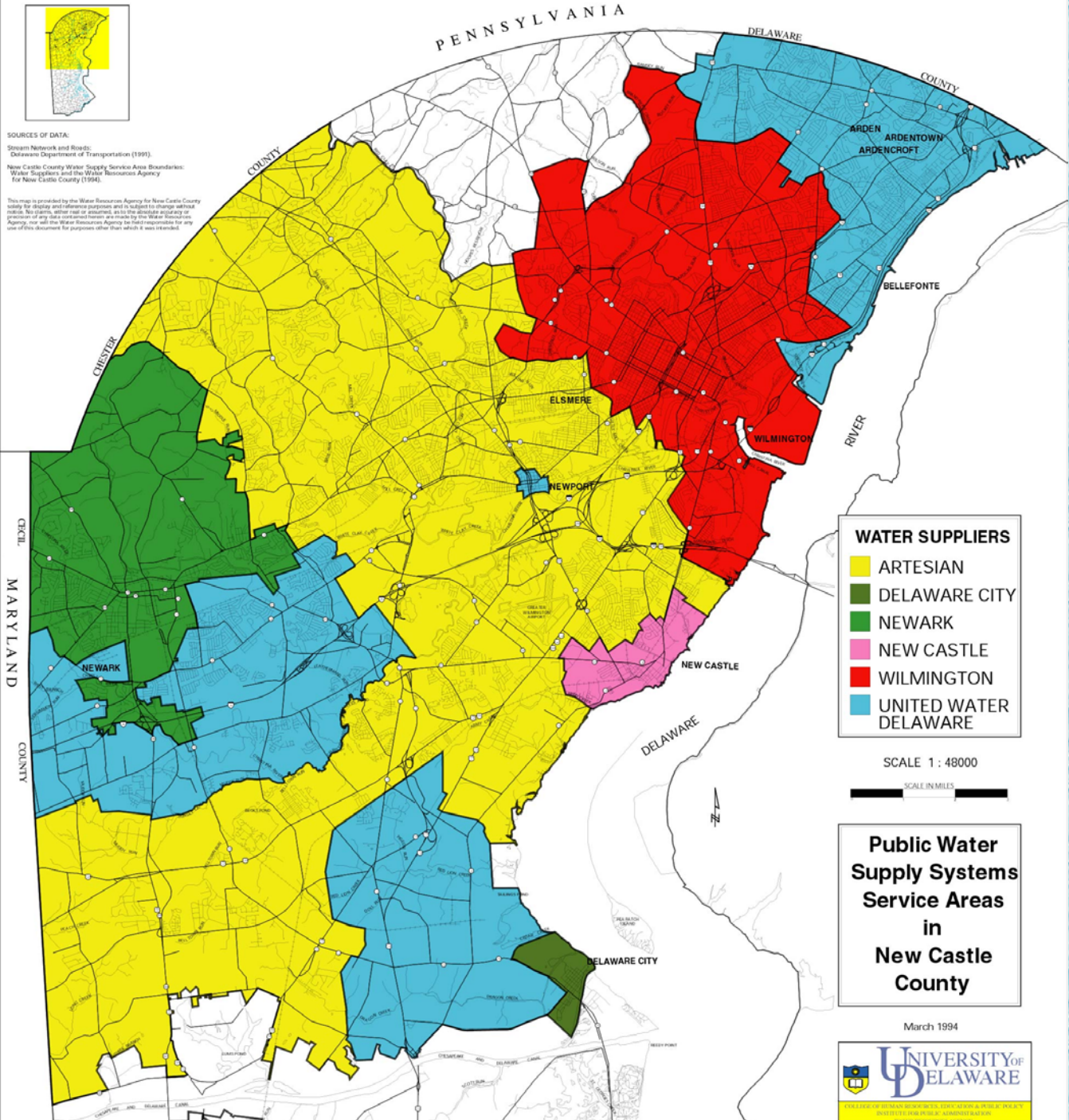




**SOURCES OF DATA:**

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 potential, are to be construed as a warranty or provision of any data contained herein are made by the Water Resources Agency. No liability will be assumed by the Water Resources Agency for any use of this document for purposes other than that which it was intended.



**WATER SUPPLIERS**

- ARTESIAN
- DELAWARE CITY
- NEWARK
- NEW CASTLE
- WILMINGTON
- UNITED WATER DELAWARE

SCALE 1 : 48000



**Public Water  
 Supply Systems  
 Service Areas  
 in  
 New Castle  
 County**

March 1994



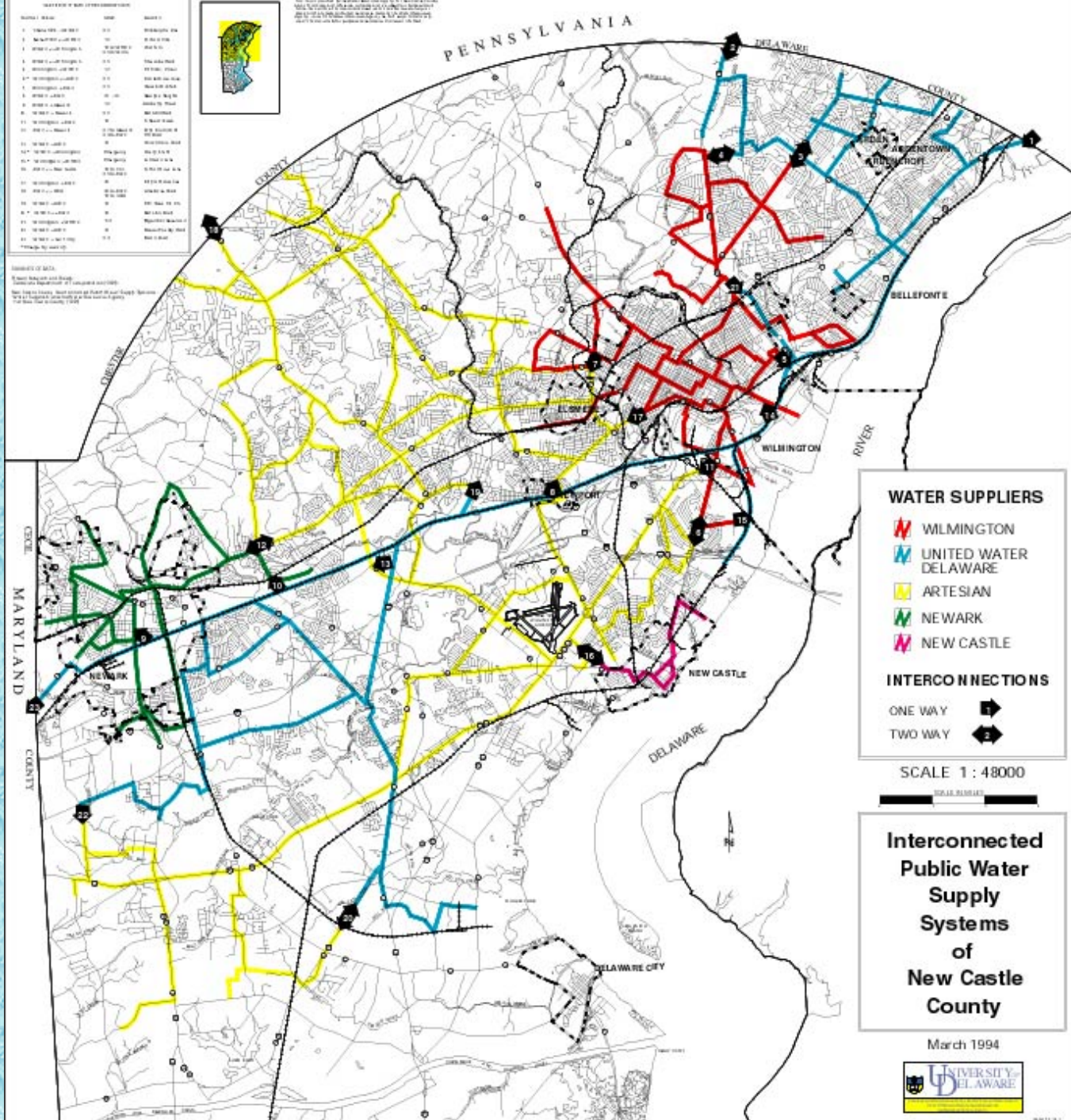
LEGEND OF MAP

LEGEND OF MAP

WATER SUPPLIER	SYMBOL	WATER SUPPLIER	SYMBOL
1. WILMINGTON	Red line	10. DELAWARE CITY	Black line
2. UNITED WATER DELAWARE	Blue line	11. NEWARK	Green line
3. ARTESIAN	Yellow line	12. NEW CASTLE	Pink line
4. NEWARK	Green line	13. DELAWARE COUNTY	Black line
5. NEW CASTLE	Pink line	14. MARYLAND	Black line
6. DELAWARE COUNTY	Black line	15. INTERCONNECTIONS	Black line
7. MARYLAND	Black line	16. ONE WAY	Black arrow
8. DELAWARE COUNTY	Black line	17. TWO WAY	Black arrow
9. DELAWARE COUNTY	Black line		



NOT TO SCALE



**WATER SUPPLIERS**

- WILMINGTON
- UNITED WATER DELAWARE
- ARTESIAN
- NEWARK
- NEW CASTLE

**INTERCONNECTIONS**

- ONE WAY
- TWO WAY

SCALE 1 : 48000



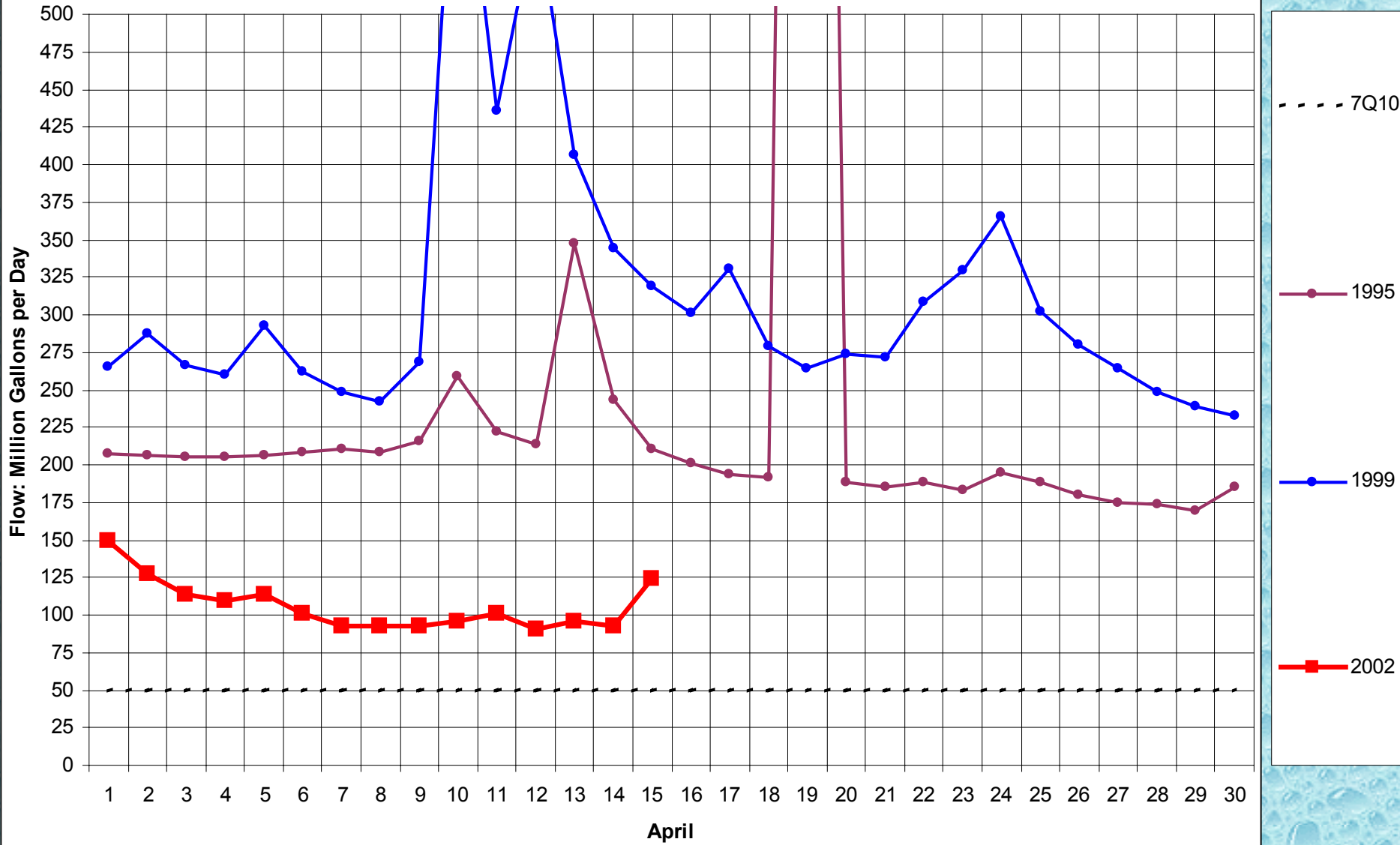
**Interconnected Public Water Supply Systems of New Castle County**

March 1994



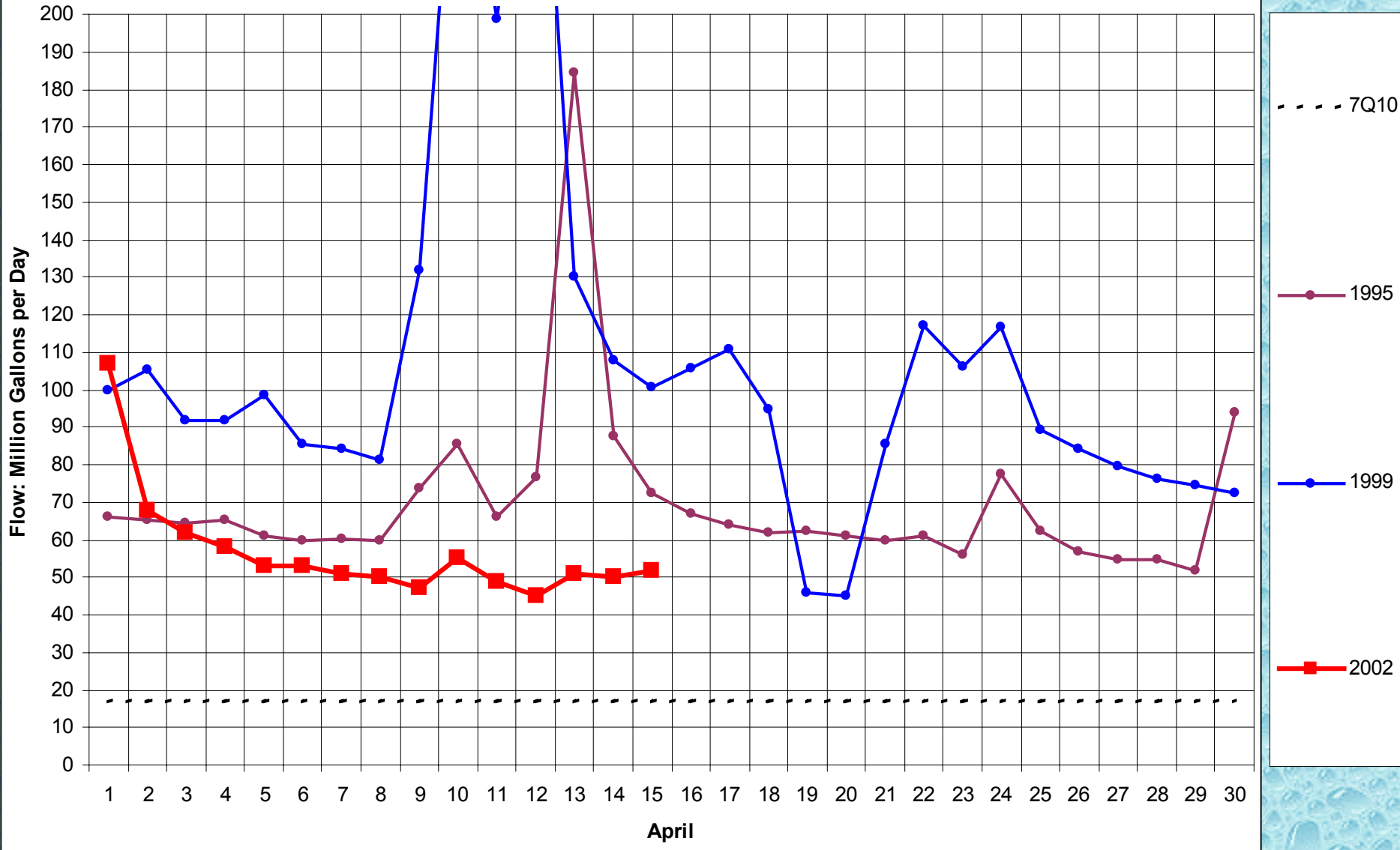
# Brandywine Creek Streamflow Data, April 2002

\*The 7Q10 is the minimum flow necessary to protect fishery and habitat that is likely to occur for 7 consecutive days, once every 10 years



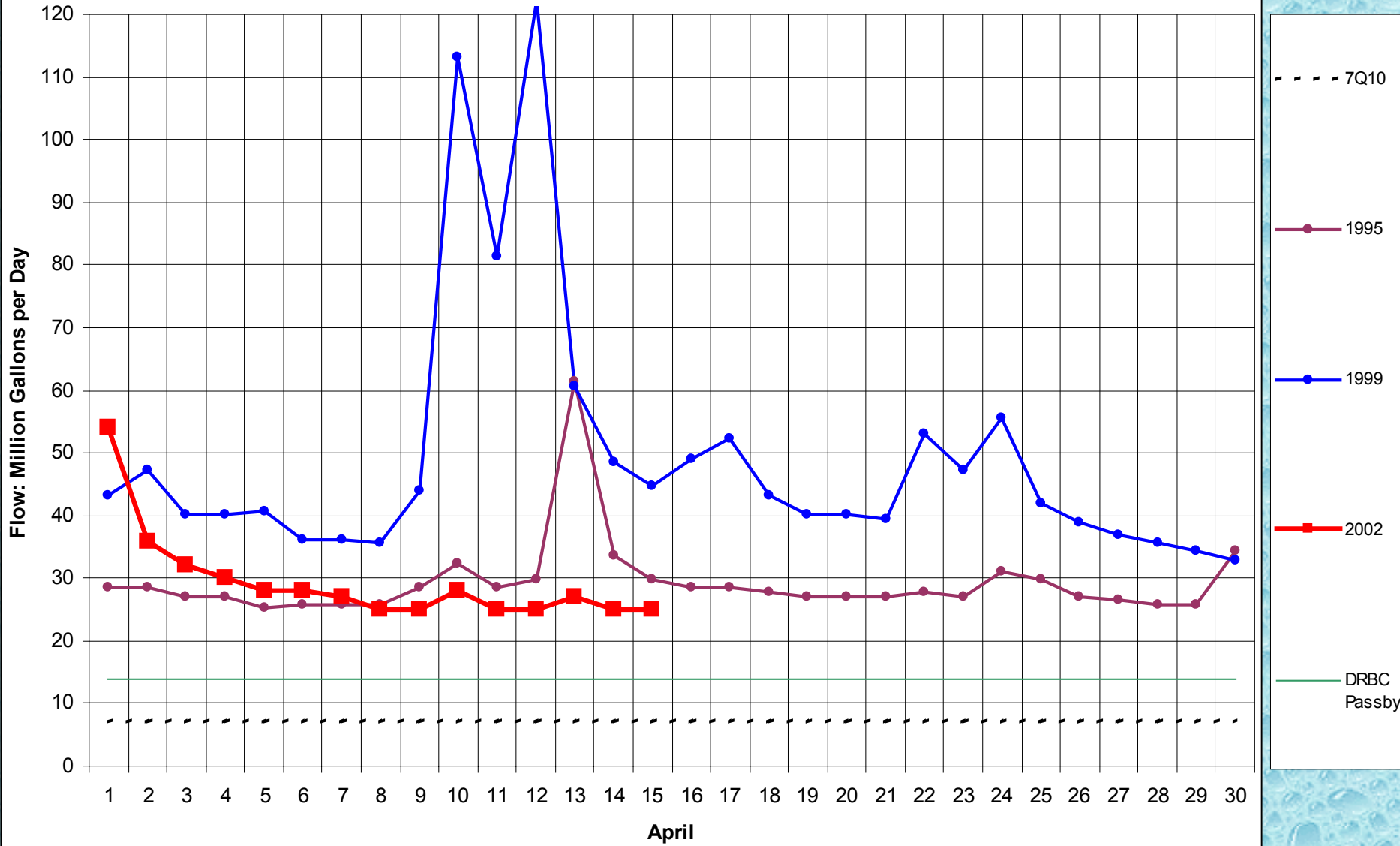
# White Clay Creek at Stanton Streamflow Data, April 2002

\*The 7Q10 is the minimum flow necessary to protect fishery and habitat that is likely to occur for 7 consecutive days, once every 10 years

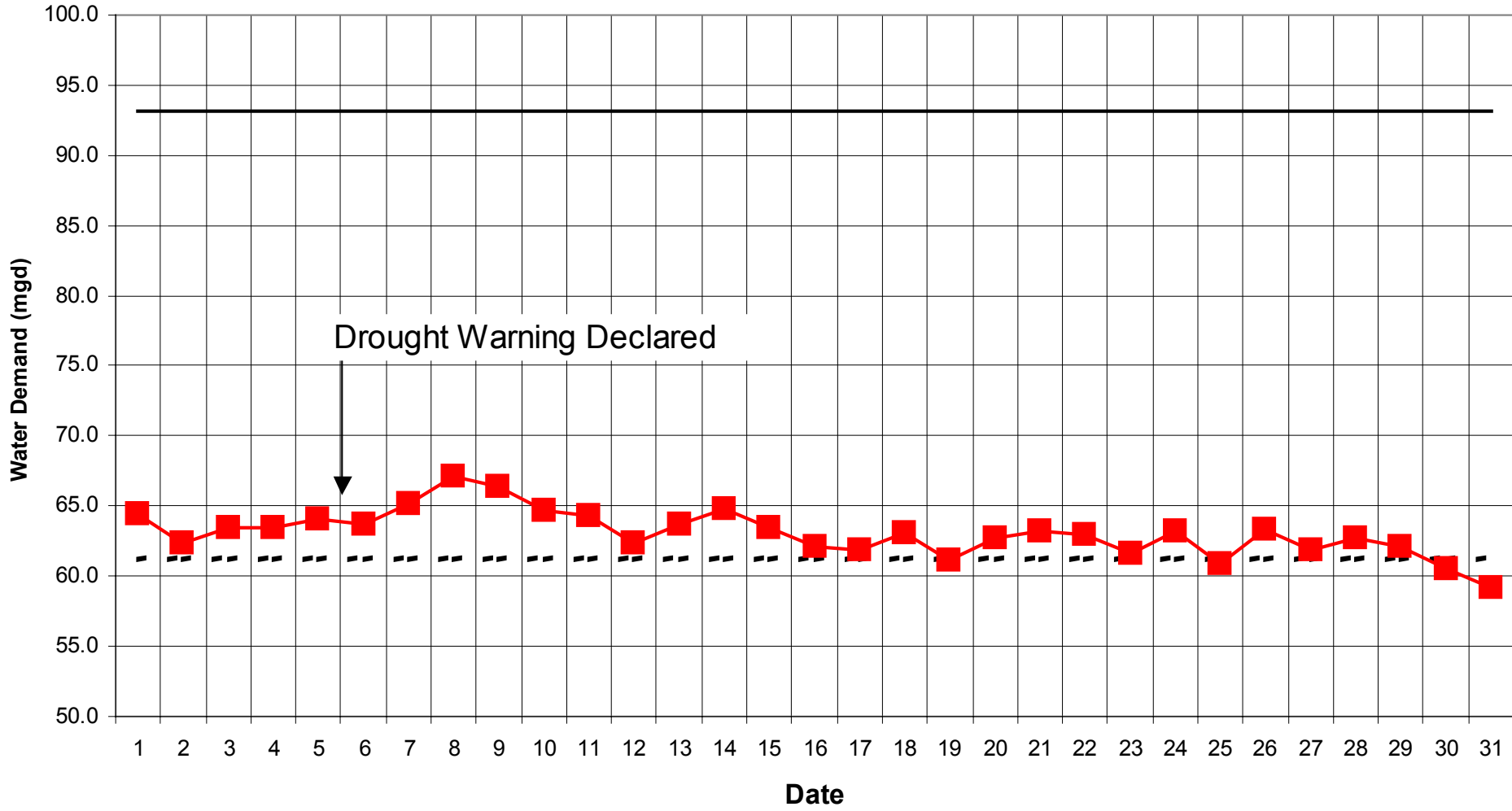


# White Clay Creek at Newark Streamflow Data, April 2002

\*The 7Q10 is the minimum flow necessary to protect fishery and habitat that is likely to occur for 7 consecutive days, once every 10 years



# Public Water Demand: New Castle County, March 2002



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

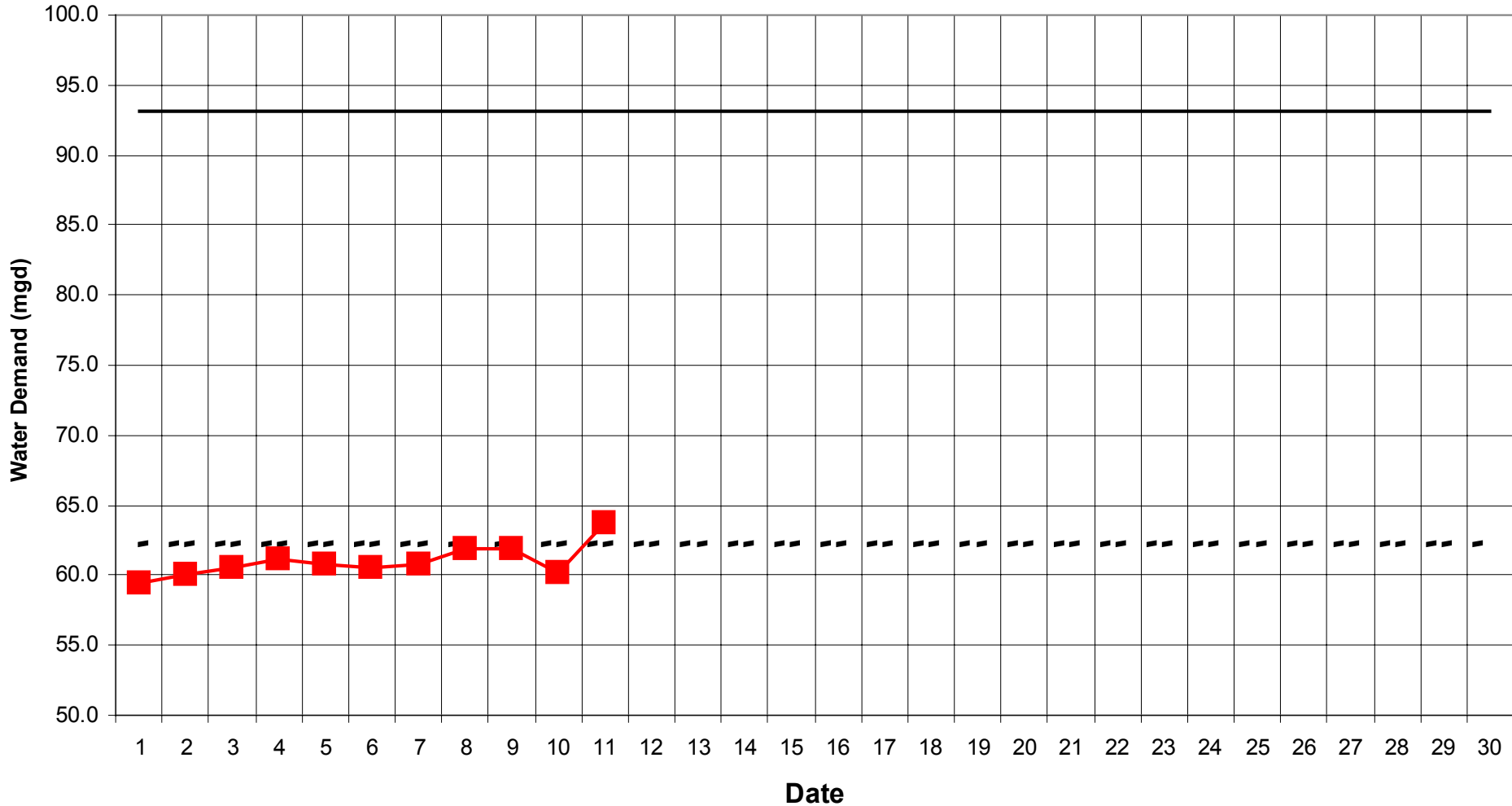
- - - March Normal

———— Peak (7/18/97)

—■— 2002



# Public Water Demand: New Castle County, April 2002



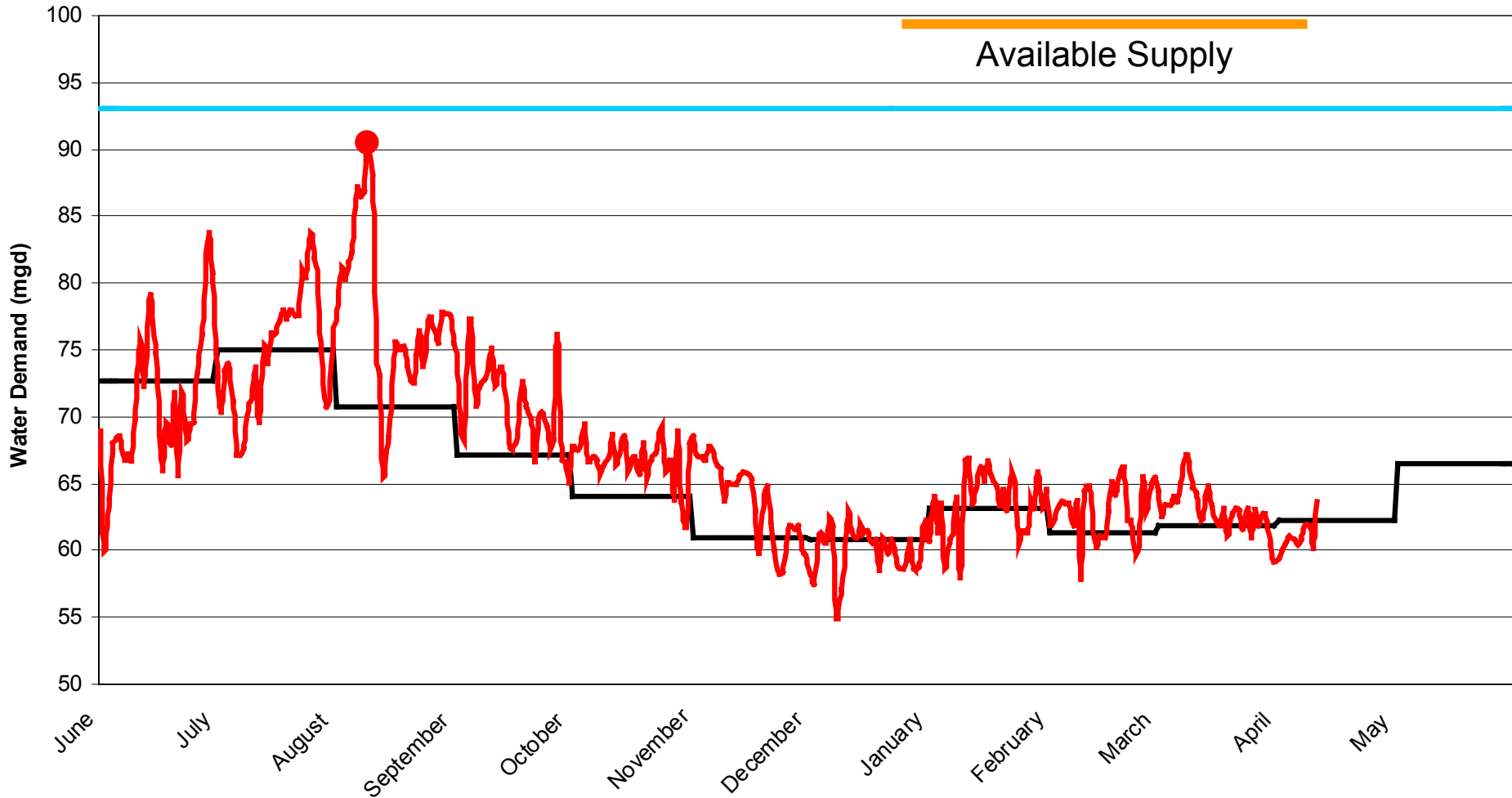
Compiled by the University of Delaware, Institute for Public Administration, Water Resources Agency, using data from: Artesian Water Co., City of Newark, City of Wilmington, New Castle Municipal Services Commission, and United Water Delaware

- - - April Normal

— Peak (7/18/97)

—■— 2002

# Public Water Demand: New Castle County, June 2001 - April 2002



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

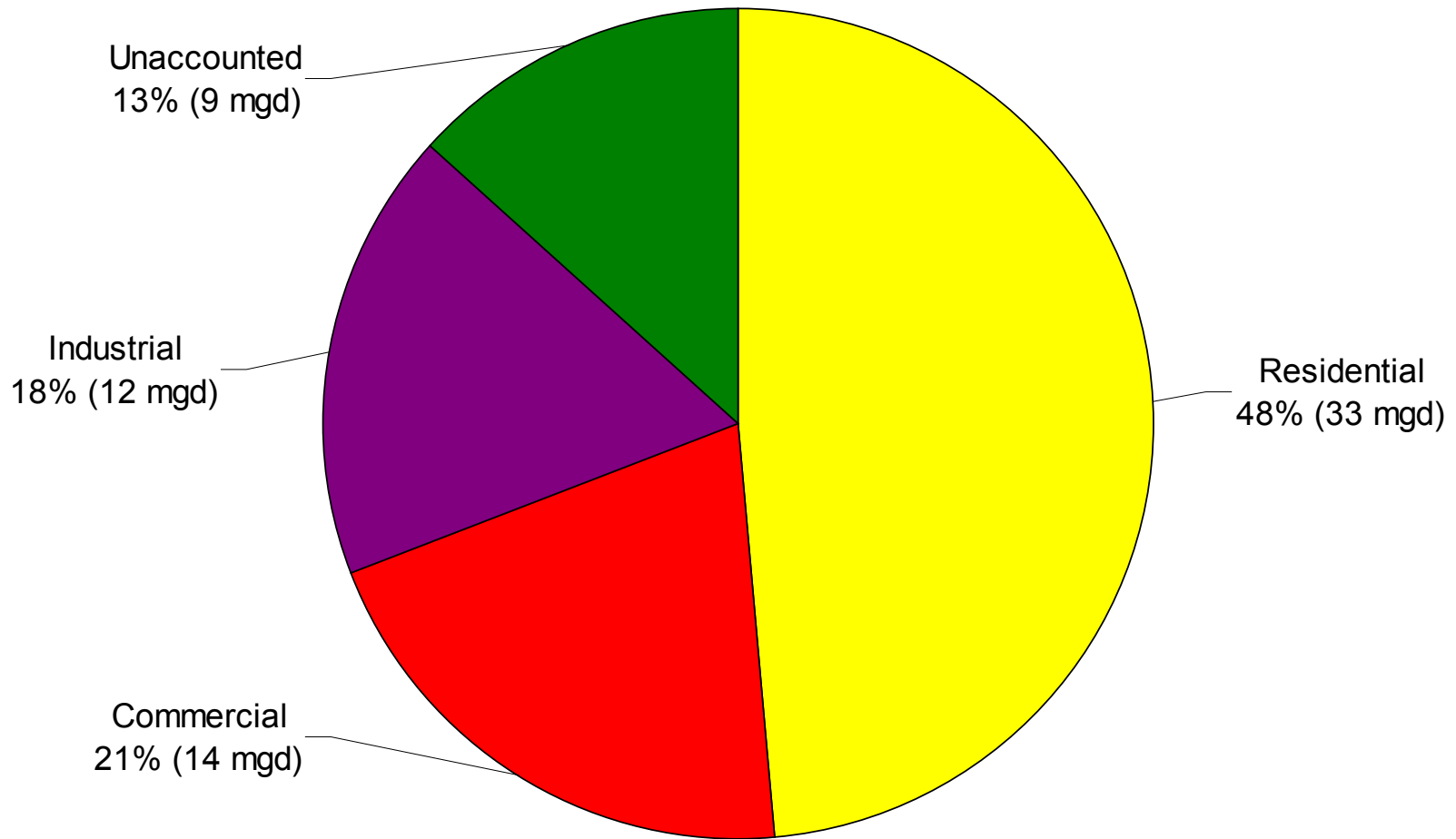
— Monthly Average

— Daily Value

— Historic Peak (7/18/97)

● 2001 Peak (8/9/01)

# Public Water Demand in Northern Delaware



# Water Demand

- Public water demand in New Castle County varies from **60 mgd** normally to **90 mgd** peak.
- The 1.5 peaking factor is due almost entirely to outdoor water use.
- Most people use around **100 gallons** of water per day . We need about **10 gallons** per day to live.

# Conserving Inside

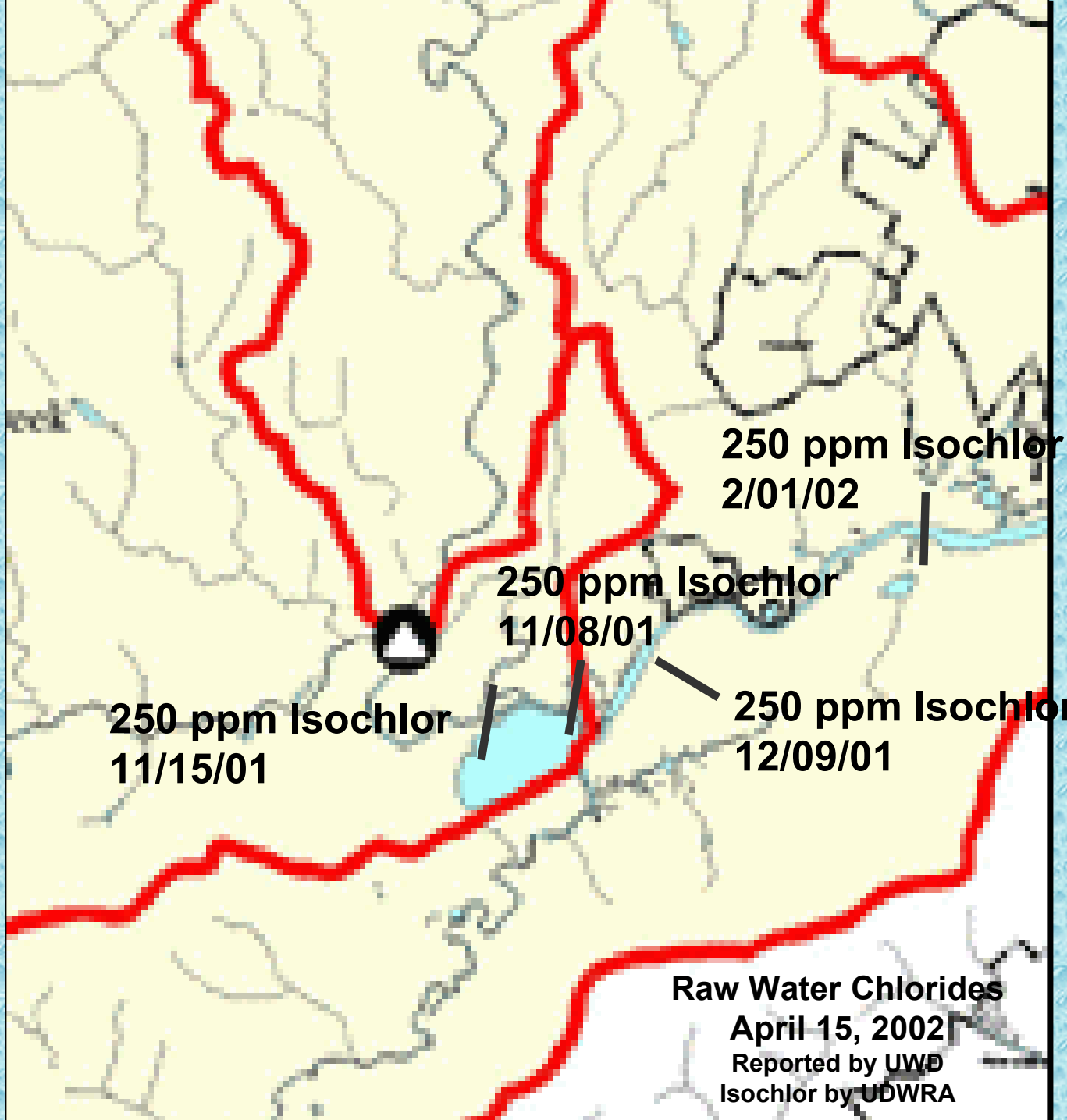
- Shorter showers
  - save **50 gallons** every 10 minutes
- Don't flush trash down the toilet
  - save **5 gallons** per flush
- Full loads in the dishwasher
  - save **12 gallons** per load
- Full loads in the laundry
  - save **40 gallons** per load
- Fix leaks in your plumbing
  - Save **100 gallons** per day



# Conserving Outside

- Water the lawn less frequently
  - Save **600 gallons** in a few hours
- Water plants in the morning
  - Save **300 gallons**
- Wash your car on the grass
  - Save **100 gallons**
- Use a broom to sweep sidewalks
  - Save **50 gallons** in 10 minutes





**Raw Water Chlorides**  
**April 15, 2002**  
Reported by UWD  
Isochlor by UDWRA

# Supply/Demand Curve (mgd)

## Year 2020

<u>Scenario</u>	<u>Supply</u>	<u>Demand</u>	<u>+/-</u>	<u>Vol (mg)</u>
1. No 7Q10	93	90	+3	180*
2.7Q10 Wc	85	90	-5	-300*
3.7Q10 B&W	73	90	-17	-1020*

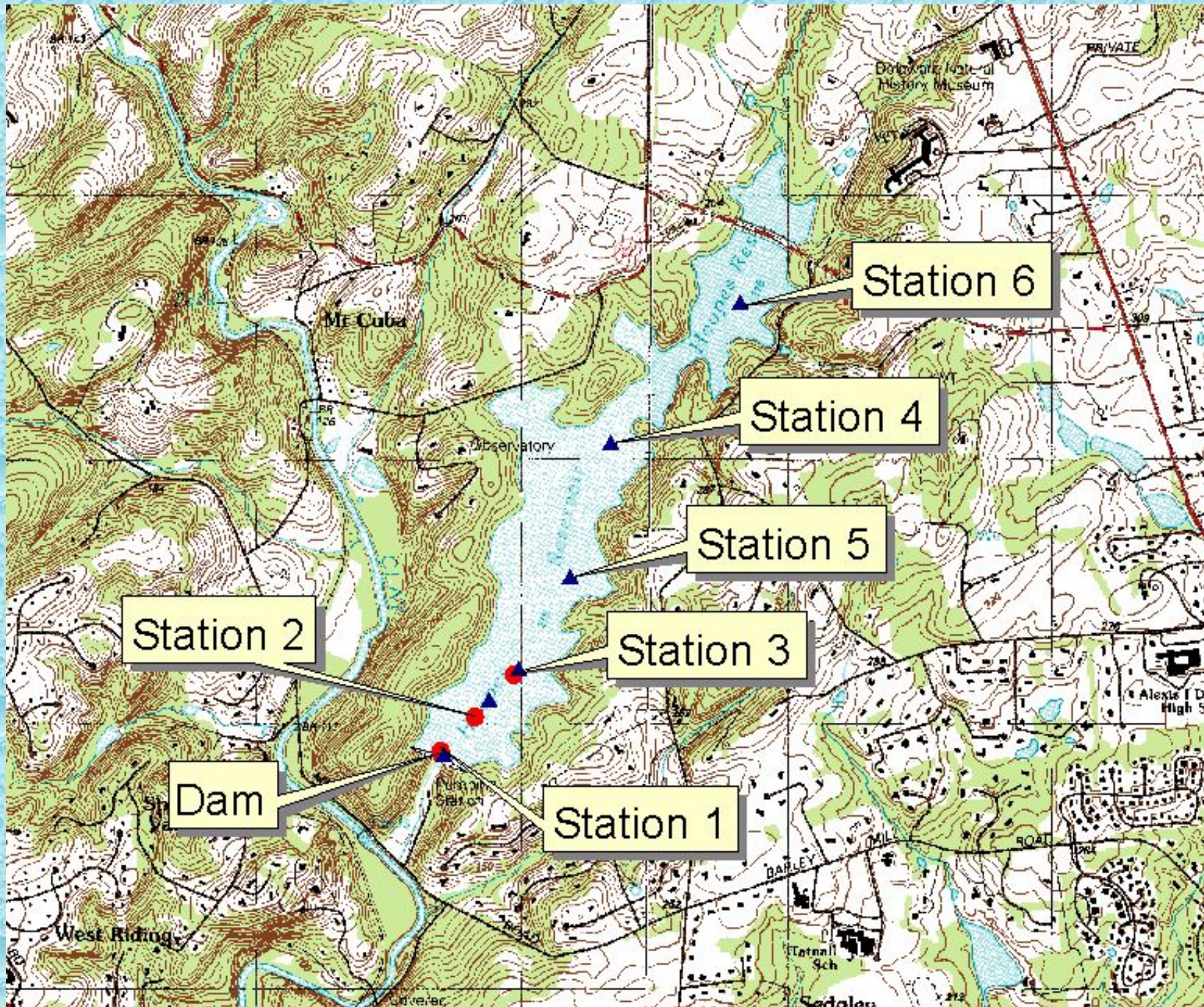
\* Volume required assuming a 60-day drought period



# “A-List” Alternatives

<b>Alternative</b>	<b>Targeted Capacity</b>	<b>Capacity in Service (2/02)</b>	<b>Status of Completion</b>
Newark Reservoir	200 mg (3 mgd)	--0--	Bids received, completion 2003 317 mg reservoir planned.
Wilmington Hoopes	500 mg (8 mgd)	500 mg (8.3 mgd)	Complete – operating plan provides top wedge for drought
Artesian Water Co. New Wells North C&D Canal	120 mg (2 mgd)	66 mg (1.1 mgd)	0.8 mgd wells planned completion 2002
Newark South Wellfield Iron Treatment Plant	60 mg (1 mgd)	--0--	construction underway, completion 2002
Artesian Water Co.	300 mg (5 mgd)	130 mg (2.2 mgd)	Next addition of ASR anticipated for 2002
<b>Total 2020 Deficit</b>	<b>1,180 mg (19 mgd) 1,020 mg (17 mgd)</b>	<b>696 mg (11.6 mgd)</b>	





Station 2

Dam

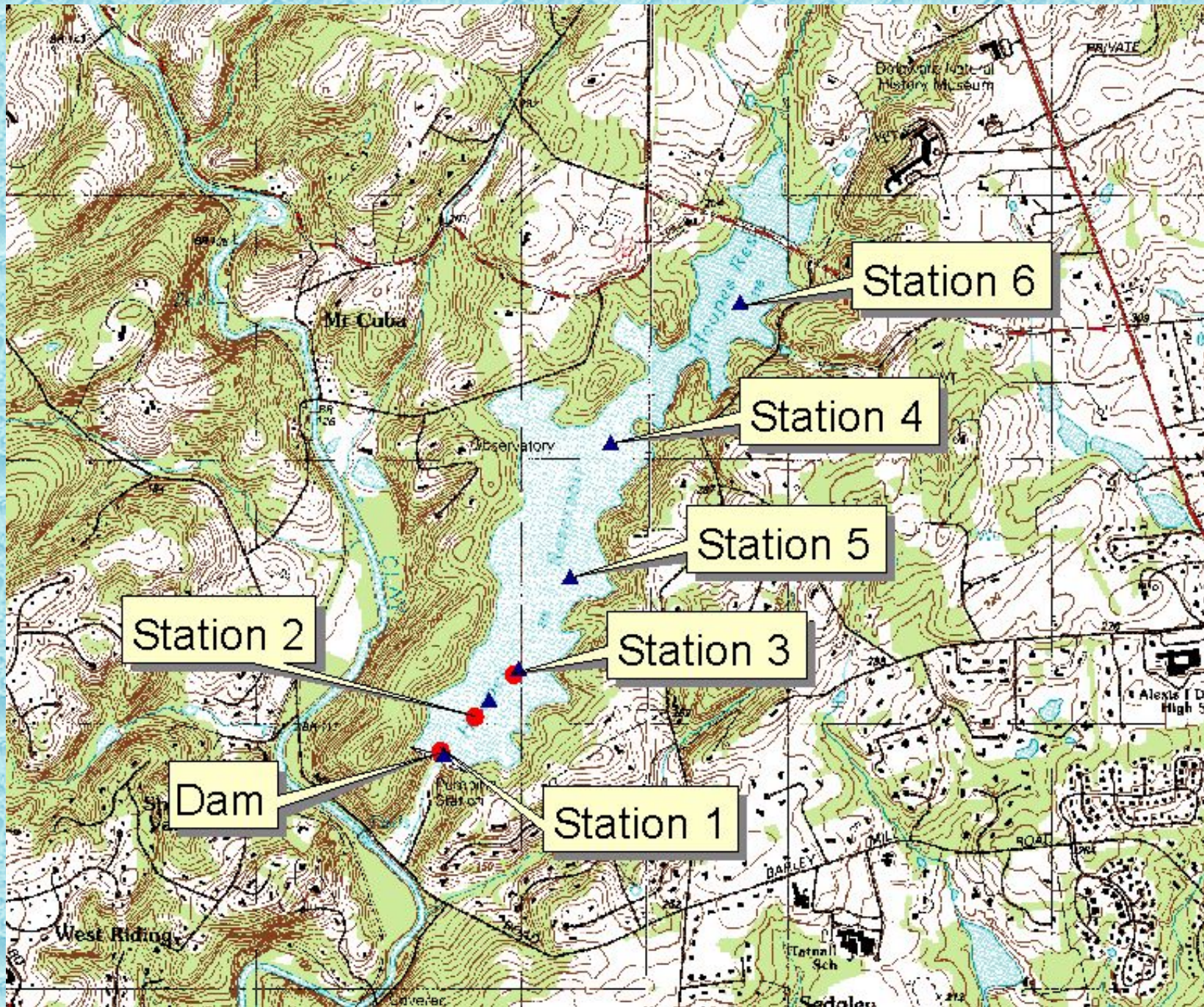
Station 1

Station 3

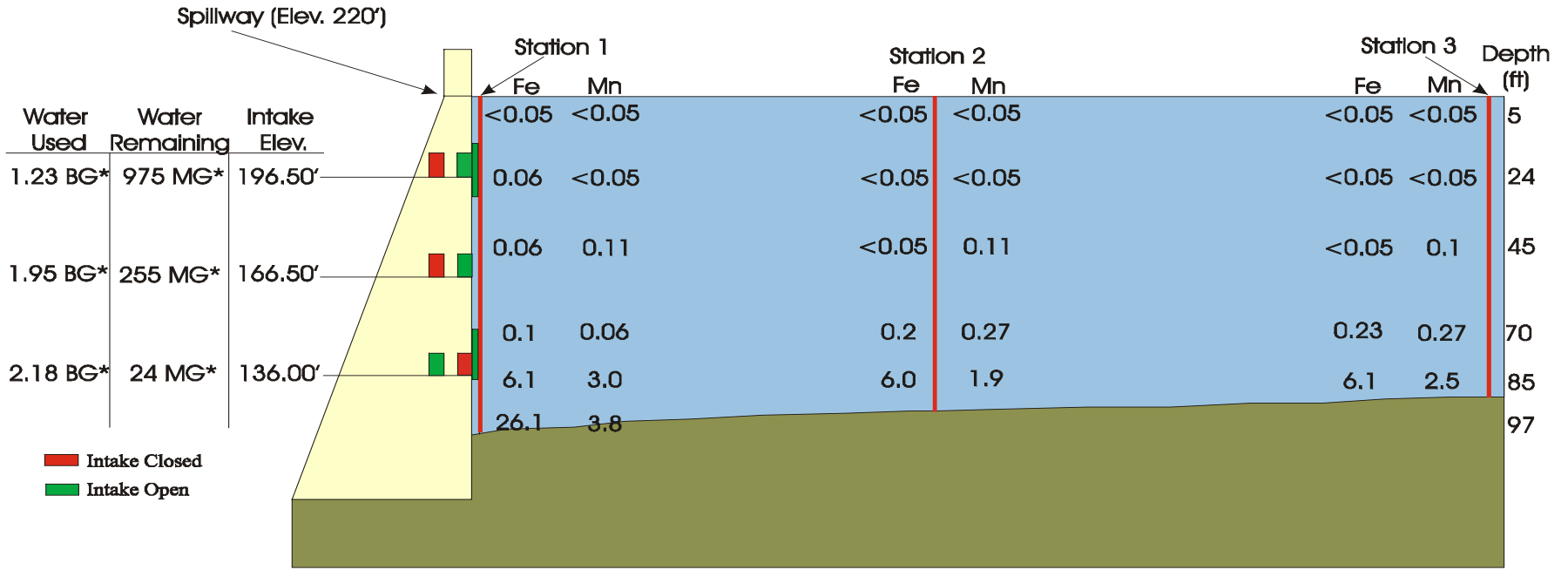
Station 5

Station 4

Station 6



**Delaware Geological Survey**  
**Edgar M. Hoopes Reservoir**  
**Water - Quality Data**  
**July 25, 2000**



\* Figures were calculated using Hoopes operating curve.



**ARTESIAN AQUIFER  
STORAGE & RECOVERY**  
*3 to 5 mgd*

NEW CASTLE

BROAD DIKE CANAL

ARMY CREEK

LIGHT  
LIGHT  
PEA PATCH ISLAND DIKE  
LIGHT  
LIGHT



# White Clay Creek at Stanton Streamflow v. Raw Chlorides

