

SECOND REPORT TO THE GOVERNOR AND THE GENERAL ASSEMBLY

Regarding the Progress of the:

DELAWARE WATER SUPPLY COORDINATING COUNCIL

March 1, 2001

Prepared by the:

**University of Delaware, College of Human Services, Education, and Public Policy
Institute for Public Administration, Water Resources Agency**

Delaware Geological Survey

Delaware Department of Natural Resources and Environmental Control

(This report may be viewed on-line at www.ipa.udel.edu, www.udel.edu/dgs, or www.dnrec.state.de.us.)



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

OFFICE OF THE
SECRETARY

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March 6, 2001

The Honorable Ruth Ann Minner
Governor, State of Delaware
Legislative Hall
Dover, Delaware 19901

141st General Assembly
Legislative Hall
Dover, Delaware 19901

Dear Governor Minner and Members of the 141st General Assembly:

As Chairman of the Governor's Water Supply Coordinating Council, it is my pleasure to forward to you the second report of the Water Coordinator for northern New Castle County.

Established under Executive Order 74, issued by former Governor Carper, the Water Supply Coordinating Council and Water Coordinator for northern New Castle County are charged with working with public and private water providers to help ensure the timely implementation of critical water supply projects.

Legislation enacted by the General Assembly in 2000 (House Bill 549) extended the life of the Council and Coordinator until the end of 2003 to coincide with the scheduled completion date for identified water supply projects. The Coordinator's report outlines progress on this important effort. It is anticipated that these projects, when implemented, will provide sufficient water supply in the region to meet projected demand to the year 2020, even in time of drought.

I wish to note that the ground-water contamination problem that occurred at Artesian Water Company's Llangollen wellfield last November highlights the vulnerability of our water supplies. While the water being supplied to the public from that wellfield is being effectively

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treated, we should be ever mindful that our demand projections and supply projects did not take into account the loss of supplies due to contamination. This may lead the Council to re-evaluate the need for surface storage alternatives as a necessary contingency in the near term as well as a long range alternative as identified in the Governor's Water Supply Task Force report.

I hope you find the information in this report helpful, and should you have any questions please do not hesitate to contact my office.

Sincerely,

A handwritten signature in dark ink, appearing to read "Nicholas A. DiPasquale". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Nicholas A. DiPasquale
Secretary

pc: Water Supply Coordinating Council Members

**SECOND REPORT REGARDING THE PROGRESS OF THE
DELAWARE WATER SUPPLY COORDINATING COUNCIL
March 1, 2001**

Executive Summary

This is the second semiannual report from the Water Coordinator to the Governor and General Assembly summarizing the progress of the Water Supply Coordinating Council. This report covers the period from July 2000 through February 2001. The first report was issued on May 31, 2000.

General Progress - In northern New Castle County, healthy strides were made in the surface water area to develop additional storage where the design of a 300 million gallon (mg) Newark Reservoir is underway. The City of Wilmington has identified that an additional 500 mg of water are available from deeper levels in Hoopes Reservoir now to help meet regional drought needs.

In the ground-water sector, the Artesian Water Company developed new wells. The City of Newark solicited bids for the design of a new treatment plant at its South Wellfield. A semi-volatile compound was detected at the Llangollen Wellfield requiring Artesian to install a new carbon filter plant to bring the wells and Aquifer Storage and Recovery project back on line.

Legislation - In July 2000, Governor Carper signed two bills approved by the General Assembly to develop and manage drinking water supplies more efficiently in Delaware. HB 549 appointed a Water Coordinator and Water Supply Coordinating Council to secure new water supplies (17 mgd) by 2003 to meet peak demands during drought in northern New Castle County. SB 370 transferred the jurisdiction for award of water supply franchise areas (Certificates of Public Convenience and Necessity or CPCNs) from the DNREC to the Public Service Commission effective July 1, 2001.

Water Conditions - Because of consistent rains and cooler temperatures during the summer of 2000, water supplies increased and peak water demands were lower than normal. Water conditions in streams and aquifers were above normal and were notably wetter than during the 1999 drought.

Cumulative precipitation for the period October 2000 – February 2001 was 3.48" below normal in northern New Castle County at Wilmington. However, conditions improved during January and February as a result of above normal precipitation. Ground-water levels in water-table observation wells declined unseasonably from October through January. Water levels began to rise in late January and into February in response to recharge associated with above normal rain and snow during this two-month period. Water levels are in the normal range for this time of year. Water conditions will continue to be carefully monitored as we enter the summer low-flow period of 2001.

Water Suppliers

Artesian Water Company - AWC has implemented 1.1 mgd of its 2 mgd target for additional supply from new wells and 1.9 mgd of its 5 mgd target for Aquifer Storage and Recovery. AWC is planning to drill 2 new wells and employ ASR technology at three wellfields in the aquifers north of the C&D Canal. Artesian's effort to expand ASR at its Llangollen Wellfield was delayed for one year as a result of the unexpected discovery in fall 2000 of certain wells with higher than acceptable levels of bis (2-chloroethyl) ether (BCEE). Artesian installed a carbon filtration system at the Llangollen Wellfield to bring the 2 mgd wells back on line on December 28, 2000. With the new

carbon treatment, the ASR wells resumed injection in February 2001. About 115 million gallons (1.9 mgd over 60 days) is expected to be stored for ASR prior to the summer 2001 recovery period.

City of Newark - Newark acquired and annexed land for a new 300 mg reservoir and retained consulting engineers to design Delaware's first major water supply reservoir in close to 70 years. The City retained a consultant to prepare design plans for a new iron and manganese treatment plant at the South Wellfield - a project designed to increase drinking water supplies by 1.0 mgd. Newark also plans to construct a replacement well near Glasgow that would have a design yield of 0.4 mgd.

City of Wilmington - Wilmington has a reliable water supply and is self sufficient to meet peak demands in its system under current regulatory conditions of no minimum instream flow requirement for the Brandywine Creek. The City conducted a dam safety inspection and the Delaware Geological Survey completed a survey of Hoopes Reservoir which concluded that the water quality is good at all levels, therefore, an additional 500 mg of water is now available in the deeper pool to meet drought needs. The City developed a Hoopes Reservoir Operating Plan that makes water available from the top ten feet of storage to other water purveyors during drought.

New Castle Municipal Services Commission - New Castle has a reliable water supply with excess capacity to meet demand. New Castle has proposed to construct a new interconnection to transfer water to and from the Artesian Water Company.

United Water Delaware - UWD has signed a new treated water interconnection agreement with Wilmington and has indicated that it plans to sign an agreement by summer 2001 with Wilmington to acquire raw water releases from Hoopes Reservoir. UWD has developed a chloride-monitoring plan for the tidal White Clay Creek and Christina River which is designed to provide early warning and minimize the potential for salt water entering the Stanton intake. UWD is also conducting studies to evaluate the feasibility of a new reservoir at Bread and Cheese Island, and Aquifer Storage and Recovery of treated surface water from a river or stream.

Institutional/Management Options

Interconnected Water System - The five water purveyors have conducted hydraulic tests and modeling to increase the interconnected system capacity to move water when and where needed during drought or emergency. In 2000, there are 26 interconnections either in place or planned for, up from 1994 when 23 interconnections were in place

Conservation Water Rates - The DNREC contracted with the University of Delaware, Center for Energy and Environmental Policy to produce a State-wide Demand Side Water Plan focused on the potential for adopting conservation water rates to reduce peak water demands especially during droughts. The Artesian Water Company and the City of Newark have already adopted conservation water rates for their customers.

Northern New Castle County Ground-Water Study - The DNREC signed a contract for the US Army Corps of Engineers to conduct a modeling study to estimate the long-term availability of ground-water from the coastal plain aquifers for water supply purposes in northern New Castle County. The ground-water modeling area extends from Wilmington to Middletown and from New Jersey to Maryland. The ground-water study is scheduled to be completed in October 2001.

Introduction

In response to the drought of 1999, the Governor's Water Supply Task Force on December 2, 1999 endorsed a report (www.ipa.udel.edu) which recommended a series of options to secure additional water supplies in northern New Castle County. The report also recommended appointing a Water Coordinator and a Water Supply Coordinating Council consisting of public agencies, water purveyors, and the public to work cooperatively to implement the selected water supply options.

This is the second semiannual report to the Governor and the General Assembly regarding the progress of the Delaware Water Supply Coordinating Council. Gerald Kauffman (Water Coordinator) and Martin Wollaston (Senior Planner) of the Water Resources Agency at the University of Delaware - Institute for Public Administration; John Talley (Associate Director) of the Delaware Geological Survey; and Stewart Lovell (Manager of the Water Supply Section) of the Delaware DNREC authored this report on behalf of the WSCC. This report focuses mainly on water supply activities in northern New Castle County (Exhibit 1). The new water supply franchise area CPCN legislation (SB 370) has statewide implications for all three counties in Delaware.

Water Coordinator

HB 549, which appointed Delaware's first Water Coordinator, was passed by the General Assembly in June 2000 and signed by Governor Carper in July 2000. HB 549 appointed the Water Resources Agency at the University of Delaware - Institute for Public Administration as the State's Water Coordinator for a period that expires December 31, 2003, when the new water supplies identified in the Task Force report are scheduled to be completed. The responsibility of the Water Coordinator is to work cooperatively with the water purveyors to ensure that new water supplies are developed on schedule without slippage. The DGS and the DNREC were appointed as water advisory agencies.

The WRA, DGS, and DNREC met with the water purveyors at a series of coordination meetings on:

- January 8, 2001 – City of Wilmington
- December 18, 2000 – Artesian Water Company
- November 9, 2000 – City of Newark
- July 21, 2000 and January 8, 2001 – United Water Delaware

Water Supply Coordinating Council

HB 549 appointing the Water Supply Coordinating Council was passed by the Legislature in June 2000 and signed into law by Governor Carper in July 2000. The WSCC tenure extends until December 31, 2003. The following public and private entities were appointed to the Council:

Office of the Governor

Secretary of the Delaware Dept. of Natural Resources & Environmental Control (Chair)

Secretary of the Delaware Department of Public Safety

Secretary of the Delaware Department of Agriculture

Executive Director of the Public Service Commission

Director of the Delaware Emergency Management Agency

Director of the Delaware Geological Survey

Director of the Delaware Division of Public Health

Public Advocate
Executive Director of the Delaware River Basin Commission
New Castle County Executive
Artesian Water Company
City of Newark
City of Wilmington
New Castle Board of Water and Light (now Municipal Services Commission)
Tidewater Utilities, Inc.
United Water Delaware
New Castle County Chamber of Commerce
Delaware State Chamber of Commerce
Delaware Nursery and Landscape Association
Delaware Professional Grounds Management Society
Delaware State Golf Association
Delaware Nature Society
Coalition for Natural Stream Valleys
New Castle County Civic League

The Water Supply Coordinating Council met on the following dates:

- July 31, 2000, New Castle County Chamber of Commerce, Churchmans Crossing, DE
- October 4, 2000, Artesian Water Company, Churchmans Crossing, DE
- January 10, 2001, United Water Delaware, Stanton, DE

The charges to the Water Supply Coordinating Council are to:

- By 2003, encourage implementation of new water supplies (1,020 million gallons or 17 mgd over a 60-day drought) in northern New Castle County to meet peak demands during drought.
- Work cooperatively in a public-private effort between the government and the water purveyors to manage water supplies more efficiently in Delaware.

Water Conditions Update

Precipitation - Precipitation for the 2001 Water Year (October 1, 2000 – February 28, 2001) has been below normal and is 3.48 to 4.61 inches less than the long-term average. However, rain and snow produced normal to above normal precipitation during January and February 2001.

Ground-Water Levels – Water levels in water-table observation wells declined unseasonably during November through January indicating that ground-water discharge was exceeding recharge. The declining trend is attributed to below normal precipitation recorded during that period, especially in October when only 0.13 inches and 0.69 inches were recorded, respectively, at New Castle and Wilmington. More significant ground-water recharge occurred during January and February resulting in rising water levels (Exhibit 2). This trend may continue if precipitation remains normal to above normal. At this time ground-water levels are in the normal range.

Streamflows – Monthly mean streamflows on Brandywine Creek at Wilmington exhibited a rising trend and have been in the normal range since October. Streamflows were below normal on Red

Clay Creek, White Clay Creek, and the Christina River during October and November. However, streamflows have improved in these watercourses and are currently in the normal range.

Hoopes Reservoir – The reservoir is currently five feet below full with useable storage of 1.65 billion gallons. The City is presently releasing water from the reservoir to augment supplies during the cleaning of the Brandywine Mill Race. The reservoir will be at full capacity (1.8 bg) by May 1.

The Water Conditions Index (WCI) for New Castle County – The Delaware Geological Survey WCI for NCC has been in the normal range since October 1999 (Exhibit 3).

Chester County, Pennsylvania – Significant portions of the Brandywine, Red Clay, and White Clay Creek watersheds are located in Chester County, Pennsylvania. Thus, water conditions in Chester County have an impact on streamflows in northern Delaware. Chester County reported that cumulative precipitation for the period October 1999-January 2001 was 2.6 inches below normal (80% of average). Streamflows increased during the period and are in the normal range. Ground-water levels generally rose during February and most are in the normal range for this time of year.

Public Water Demand

This section summarizes the public water demands for the public water purveyors in northern New Castle County for the water supply summer of 2000, the period from June through September when streamflows and ground-water levels tend to decline and water demands usually rise.

Regional Summary - During the summer of 2000, water demands were below normal due to surplus precipitation and cool weather. The peak demand recorded during 2000 was 80.8 million gallons per day on July 13, 2000. By comparison, water purveyors recorded a peak water demand of 89 mgd on July 19 during the drought of 1999 and 93 mgd on July 18, 1997 which is the highest peak day on record (Exhibit 4). As an indicator of the relative wet weather, the DGS reported that 64 days had rain during summer 2000 compared to 34 days with rain during the summer of 1999.

Peak Demands - The water purveyors recorded the following peak demands during summer 2000:

<u>Water Purveyor</u>	<u>Peak Daily Demand (mgd)</u>	<u>Date (2000)</u>
Artesian Water Co.	24.4	July 13
City of Newark	6.5	August 29
City of Wilmington	32.4	July 13
New Castle MSC	0.5	July 13
United Water Delaware	24.6	August 22

The peak water transfer by the purveyors through interconnections was 4.0 mgd on July 13, 2000.

Future Supply/Demand Projections (2020)

The Governor's Water Supply Task Force compiled estimates of public water supply and demand in northern New Castle County for worst case drought conditions for the planning years 2000, 2010, and 2020. The estimate assumes a worst case historic drought scenario and that environmental standards for minimum instream flow (7Q10) are in effect along the Brandywine Creek and White Clay Creek. The supply and demand curves forecast a deficit of 17 million gallons per day (mgd) or 1,020 million gallons (mg) for a 60-day drought period by the year 2020:

Scenario <u>Year</u>	Supply <u>(mgd)</u>	Demand <u>(mgd)</u>	+/- <u>(mgd)</u>	Volume <u>(mg)</u>
2000	73	86	-13	-780
2010	73	88	-15	-900
2020	73	90	-17	-1,020

Future Water Supply Options

The Water Supply Coordinating Council is working to develop a series of water supply projects to close the 17-mgd (1,020-mg) gap between supply and demand for the year 2020 in northern New Castle County. The water purveyors have committed to the following "A" list options which have few environmental constraints, enjoy community support, and can be implemented by 2003:

"A" List. Future Water Supply Options – Committed to by Water Purveyors:

<u>Project</u>	<u>Amount Targeted 12/2/99 Report</u>	<u>In-Service by Summer 2001</u>
Newark Reservoir	200 mg (3 mgd)	On-line by 2003
Wilmington Hoopes Reservoir Deep Storage Plan	500 mg (8 mgd)	500 mg (8.0 mgd)
Artesian Water Co. New Wells North of the C&D Canal	120 mg (2 mgd)	66 mg (1.1 mgd)
Newark South Wellfield Iron Treatment Plant	60 mg (1 mgd)	On-line by 2002
<u>Artesian Water Co. Aquifer Storage and Recovery</u>	<u>300 mg (5 mgd)</u>	<u>115 mg (1.9 mgd)</u>
Total	1,180 mg (19 mgd)	681 mg (11.0 mgd)

Institutional and Management Options

The WSCC is working on the following options to manage water supplies more efficiently:

- Conduct tests to optimize and expand interconnections to convey water from suppliers with excess capacity to suppliers in need of water to meet peak demands (**Completed 2001**).
- Encourage water providers to adopt inclining block conservation rates or seasonal water conservation rates to reduce water demands (**In progress**).
- Work with the water purveyors to develop cooperative cost and capacity interconnection agreements (**Estimated completion spring 2001**).

- Advise the DNREC and provide technical input to the U.S. Army Corps of Engineers Ground-Water Availability Study for northern New Castle County **(In progress)**.
- Conduct a water quality survey for Hoopes Reservoir by the DGS **(Completed Dec. 2000)**.
- Develop a chloride-monitoring plan for the tidal White Clay Creek/Christina River to ensure withdrawal of fresh water at the UWD Stanton Intake during drought **(Completed 2000)**.

Progress and Activities

Exhibit 5 summarizes the schedule for the Water Supply Coordinating Council to achieve the “A” list water supply options. The members of the WSCC have made the following progress from July 2000 through February 2001:

Artesian Water Company

- In July 1999, AWC placed into service 0.4 mgd from a well located in Middle Run Crossing and has been granted an increased summer allocation of 0.7 mgd for its Old County Road Wellfield. The increased summer allocation at Old County Road allows for greater water availability during the targeted dry summer period, but without a change in the annual supply allocation for the wellfield. This change permits water withdrawals to better match seasonal customer demands without negatively impacting the aquifer.
- AWC plans to bring two new wells (0.8 mgd) on-line north of the C&D Canal at Artisans Village and Middle Run Crossing. AWC is seeking permits to place a new 0.4 mgd well (24 mg for 60 days) in service at Artisans Village by July 2001. AWC plans to construct a new well at Middle Run Crossing adding 0.4 mgd (24 mg for 60 days) to its supply by March 2002.
- AWC has completed several cycles of its Aquifer Storage and Recovery program at a maximum rate of 1.9 mgd (115 mg for 60 days). Artesian plans to implement ASR, basically a system of underground reservoirs, at the Delaware River and Route 40 (Fairwinds) Wellfields to augment existing ASR wells at Llangollen and Fairwinds.

In July and October 2000, New Castle County, USEPA, and the State Division of Public Health tested Artesian's Llangollen Wellfield for the presence of bis (2-chloroethyl) ether (BCEE). In November 2000, AWC shut down the Llangollen wellfield and associated ASR injection when low levels of BCEE were detected above the USEPA action level of 0.96 parts per billion (ppb). AWC then began plans to install a granular activated carbon treatment system to eliminate BCEE in water withdrawn from the well field.

On December 27, 2000 AWC announced that water quality tests of the Llangollen wells after treatment by the new activated carbon system confirmed the removal of BCEE from the water supply. These results were corroborated by samples taken by the Division of Public Health. AWC is now delivering carbon treated water to customers from the Llangollen Wellfield. In February 2001, AWC began pumping carbon treated water into the aquifer at the Llangollen ASR and expects to treat the water again as it is pumped out to the customers. The inflow and outflow water at the Llangollen ASR will be tested regularly for the presence of BCEE. AWC

expects 1.7 mgd to be available from the Llangollen ASR and 0.2 mgd from the Fairwinds ASR (1.9 mgd total or 115 mg for 60 days) to meet peak demands during the summer of 2001.

AWC plans to place ASR on-line by September 2002 at an additional wellfield along the Delaware River (1.7 mgd) and by September 2003 at the Fairwinds Wellfield along Route 40 (1.4 mgd).

City of Newark

- Newark is on schedule to build a 300 mg reservoir which would make the City nearly self-sufficient and be the first major water supply reservoir built in Delaware in almost 70 years. The reservoir will enable Newark to operate its White Clay Creek water treatment plant nearly year round providing up to 3 mgd of water for a 60-day drought period. In August 2000, Newark acquired 112 acres of land for the reservoir for \$ 7.95 million with the assistance of \$ 3.4 M in funding from the State Legislature. On October 24, 2000 City Council awarded to URS a \$729,000 contract to prepare design plans and specifications for reservoir construction. In October 2000, City Council also awarded a contract to Duffield Associates to design the reservoir pump station and pipeline. Permitting and design of the reservoir is scheduled for completion during the summer of 2001. Reservoir construction is scheduled to begin in the fall of 2001 with a planned operational date of June 2003.
- Newark Council scheduled a February 26, 2001 public hearing to propose a bond referendum that is needed to authorize the funding proposal for the reservoir and treatment plant projects. City Council voted unanimously to place the referendum before the voters on April 10, 2001.
- In September 2000, City Council awarded a contract to Whitman Requardt to design an iron and manganese removal plant at its South Wellfield. This project is expected to increase drinking water supplies from the South Wellfield by 1.0 mgd. The City is on schedule for this project with a planned completion date in June 2002.
- Newark continued discussions with the City of Wilmington to develop an interim agreement to release up to 3 mgd from Hoopes Reservoir. Releases from Hoopes would improve the reliability of Newark's White Clay Creek intake allowing Newark to withdraw water for 30 to 40 more days than presently possible during low flow conditions. The agreement would be contingent upon a test during the summer 2001 low-flow period to ensure the releases provide water of sufficient quantity and quality to Red Clay and White Clay creeks for withdrawal by United Water Delaware at its Stanton WTP. This would be an interim arrangement until the completion of the Newark Reservoir in 2003.

City of Wilmington

- During fall 2000, the City contracted with Metcalf and Eddy to conduct a dam safety inspection of Hoopes Reservoir. The dam inspection was conducted during November/December 2000 and a dam safety report is due to the City in February 2001. This report may serve as the basis for a possible future project which would evaluate the structural and hydraulic feasibility of raising the existing water level five feet to provide an additional 300 mg (5 mgd) of storage.

- The City of Wilmington completed an Operating Plan for Hoopes Reservoir in October 2000 which outlines the City's actions regarding the exportation of raw water to other purveyors based on the level of water in the reservoir. Between elevation 220 feet (full) and 210 feet (-10 feet), the City will release up to 3 to 5 mgd of raw water as requested by other utilities such as United Water Delaware and the City of Newark. Below elevation 210 the City may reserve the remaining contents of the reservoir for its internal use. These guidelines are predicated on the present regulatory climate whereby the DNREC has not imposed minimum instream flows along the mile-long stretch of the nontidal Brandywine Creek below the Wilmington intake.
- In July and November 2000, the Delaware Geological Survey conducted an investigation of water quality at various depths and transects in Hoopes Reservoir. The DGS concluded that concentrations of iron and manganese are below drinking water standards at all depths in the reservoir except at the very bottom below the lowest gate. Based on the water quality analyses and review of the operation of the lower gates, the City concluded that 1,800 mg of Hoopes Reservoir water can now be considered useable in the event of extreme drought, a volume 500 mg greater than thought previously available. This "A" list alternative is now considered complete and includes provisions to operate the lower gates or pump the deep water (500 mg or 8 mgd) out of the reservoir during an extreme drought.

New Castle Municipal Services Commission (formerly Board of Water and Light)

- With a supply of 1.7 mgd and a peak demand of 0.5 mgd, New Castle has excess capacity from its wells and can presently sell water to AWC through interconnections as needed. New Castle plans to construct a new 1.0 mg interconnection with the AWC at the Riveredge Industrial Park.
- New Castle is evaluating the feasibility of adopting conservation water rates that could potentially reduce demands during high demand periods.

United Water Delaware

- During the summer of 2000, UWD conducted preliminary environmental and wetland evaluations for a potential reservoir at Bread and Cheese Island. This project is in the conceptual stage and costs and schedules are under development at this time.
- UWD met with Wilmington to renegotiate its Hoopes Reservoir agreement to release water to the Red Clay Creek for use at United's Stanton Treatment Plant. The agreement would set forth the volume and cost (\$/1000 gallons) of raw water released from the reservoir to UWD. United intends to sign the agreement with Wilmington before the summer 2001 low flow period
- UWD has signed a new interconnection agreement with Wilmington to transfer up to 3 mgd (expandable to 10 mgd) of treated water into the United system as needed.
- UWD has implemented a chloride-monitoring plan at three stations along the tidal Christina River and White Clay Creek to provide early warning of elevated salt levels at the Stanton intake during drought. This plan is designed to optimize fresh water withdrawals from the creek and minimize salt levels in drinking water supplies during drought. Because of higher than normal stream flows last summer, UWD never had to initiate chloride monitoring.

- UWD retained CH2M Hill hydrogeological consultants to evaluate the feasibility of recharging treated surface water from a river or creek into Aquifer Storage and Recovery wells.

Interconnected System

- The five water purveyors conducted hydraulic tests and modeling to increase the northern New Castle County interconnected system capacity to move water during drought (Exhibit 6). As of February 2001, there are 26 interconnections in place or planned for, up from 1994 when 23 interconnections were in place (Exhibit 7). The water purveyors have made or are planning the following improvements to the interconnected system since 1994:
 - United Water Delaware <-> Wilmington at Chatham- 1.5 mgd to UWD, up from 1.0 mgd
 - United Water -> Newark at Academy St. - 3.0 mgd to Newark, up from 1.6 mgd
 - Wilmington <-> Artesian Water Co. at Heald St. - 1.3 mgd, up from 1.0 mgd
 - United Water <-> Artesian Water Co. at Churchmans Rd. - 2.0 mgd, up from 1.0 mgd
 - Artesian Water <-> New Castle BWL at School Ln. - 0.8 mgd to AWC, up from 0.5 mgd
 - Wilmington -> Artesian Water Co. at Maryland Ave. - 5.0 mgd, up from 3.0 mgd
 - Chester Water Authority -> Artesian at Limestone Rd. - 6.0 mgd, up from 4.0 mgd
 - United Water <-> Artesian Water Co. at 1st State Ind. Park - 2.0 mgd to UWD, 1.5 mgd to Artesian, up from 1.0 mgd
 - Wilmington -United Water Delaware from Hoopes Reservoir - 5 mgd raw water
 - Artesian Water Co. <-> New Castle BWL at Riveredge Ind. Park - 1.0 mgd new
 - Wilmington -> United Water at Wilson Road - 1.5 mgd new and proposed

Conservation Water Rates

- The DNREC signed an agreement with the University of Delaware Center for Energy and Environmental Policy to evaluate the potential for adopting conservation water rates to reduce peak water demands. This work is under the direction of the Water Conservation Oriented Rate (WCOR) Subcommittee and is scheduled for completion in May 2001.
- Artesian continues its conservation water rate structure that has been in place since 1992.
- Newark continues its seasonal conservation water rate structure in place since 1999.

Northern New Castle County Ground-Water Modeling Study

- The DNREC Division of Water Resources signed a contract on May 23, 2000 with the US Army Corps of Engineers to estimate the long-term safe yield of ground-water for water supply in northern New Castle County. The Corps of Engineers study will update earlier studies by the USGS and DGS which indicated ground-water availability from northern New Castle County in the coastal plain is 32 mgd. The capacity of wells allocated by DNREC in this area is 31 mgd. The ground-water modeling area is in the coastal plain extending from Wilmington to Middletown and from New Jersey across New Castle County into Maryland. The ground-water study is currently in the data collection phase and is scheduled for completion by October 2001.

Green Industry Guidelines

- The DNREC Division of Water Resources is working with the Green Industry to revise the rules for nonessential water use during drought as they pertain to the State's nurseries, golf courses, and landscaping firms.

Transfer of CPCN to Public Service Commission

- In July 2000, Governor Carper signed SB 370 passed by the General Assembly which transfers the jurisdiction for issuing water supply franchise areas (Certificates of Public Convenience and Necessity or CPCNs) from DNREC to the PSC effective July 1, 2001. Under the law the PSC is responsible for promulgating regulations to implement the new CPCN process. All public utilities will be required to obtain a CPCN from the PSC before expanding water service. The bill sets minimum standards for granting CPCNs requiring water utilities to demonstrate adequate pressure and capacity to meet peak demands during drought. The PSC will have discretion to deny CPCN applications when the water utility is unable to provide safe and reliable water service. On November 30, 2000, the PSC held a workshop to receive comment on the draft water supply CPCN regulations which are now under public review.

Summary

The water purveyors on the Water Supply Coordinating Council are working deliberately to develop additional water supplies in northern New Castle County. The Newark Reservoir is under design as scheduled and the City of Wilmington has determined that water is available from deep storage in Hoopes Reservoir. The City of Newark and Artesian Water Company are improving their groundwater supplies. Artesian installed a carbon filtration plant at the Llangollen Wellfield when a semivolatile chemical was discovered in the water supply.

Stream flows are normal mainly due to a wet summer 2000. Deficit precipitation from October through December 2000 resulted in declining ground-water levels. However, the rains and snows in January and February 2001 are recharging the aquifers. Vigilant monitoring of water conditions is advised through spring 2001 entering this summer's low flow period.

The water purveyors have improved the capacity and reliability of the northern New Castle County interconnected system. Based on the work to date, the members of the Water Supply Coordinating Council are more prepared to face the next drought, whenever that may occur.

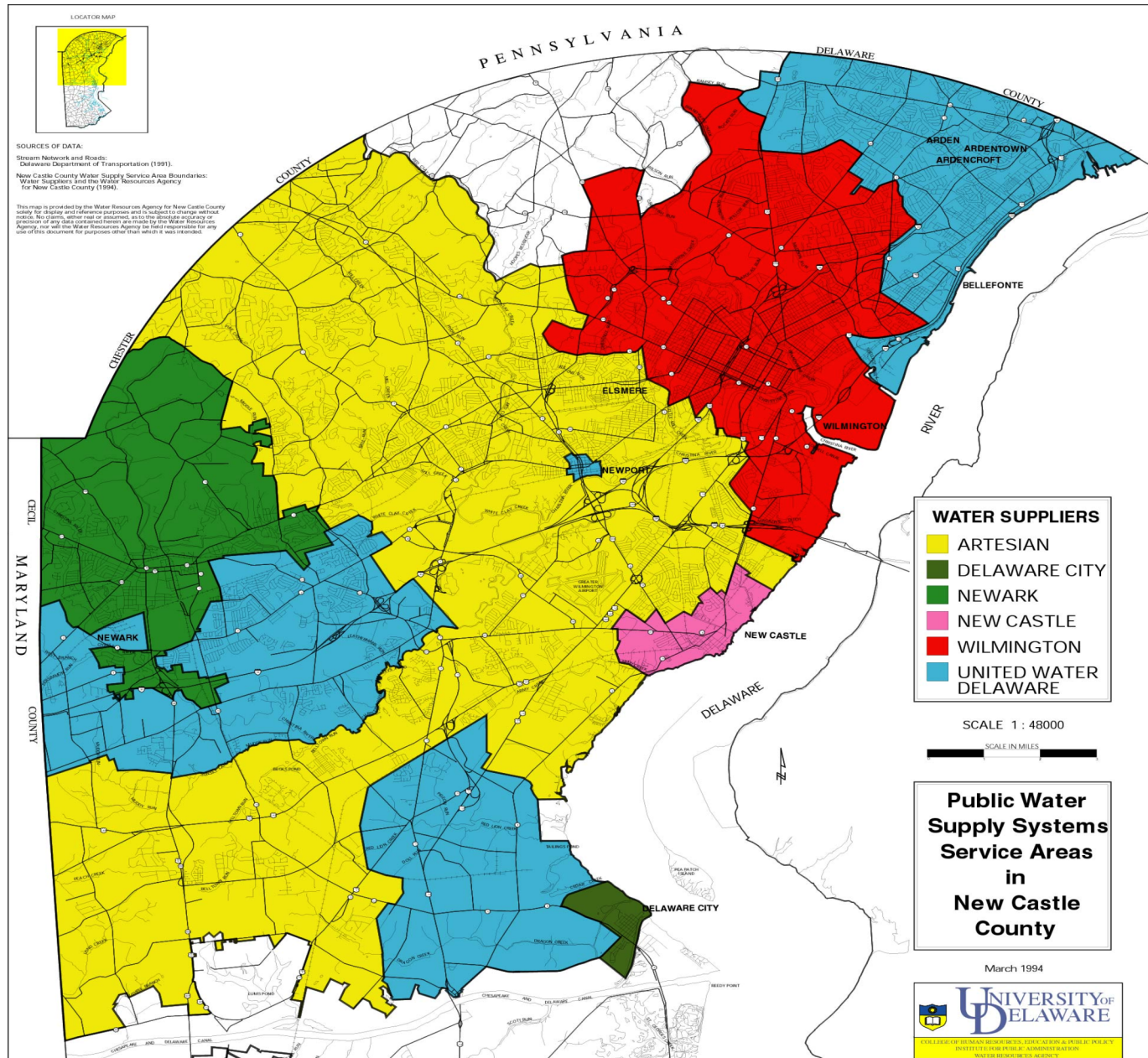
The following chart summarizes the updated status of the "A" list alternatives designed to meet the projected 17 mgd (1,020 mg) deficit forecast for northern New Castle County in 2020:

<u>Alternative</u>	<u>Targeted Capacity</u>	<u>Capacity in Service (6/01)</u>	<u>Status of Completion</u>
Newark Reservoir	200 mg (3 mgd)	-0-	In design, completion 2003 300 mg reservoir planned.
Wilmington Hoopes Reservoir -Deep Storage	500 mg (8 mgd)	500 mg (8.0 mgd)	Complete - deep storage now available 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-	In design completion 2002
Artesian Water Co.	300 mg (5 mgd)	115 mg (1.9 mgd)	Carbon treatment installed at Llangollen wells to filter BCEE. Next addition of ASR anticipated for 2002.
Total	1,180 mg (19 mgd)	681 mg (11.0 mgd)	

The projected deficit for year 2020 is 1020 million gallons and 581 mg have been developed since 1999. At least 439 mg of new storage are needed to meet peak demands during drought in northern New Castle County.

The Water Coordinator plans to submit the next report regarding the progress of the Water Supply Coordinating Council to the Governor and General Assembly by June 2001.

Exhibit 1. Public Water Supply System Service Areas in Northern New Castle County



**Delaware Geological Survey
Well Db24-10
Ogletown**

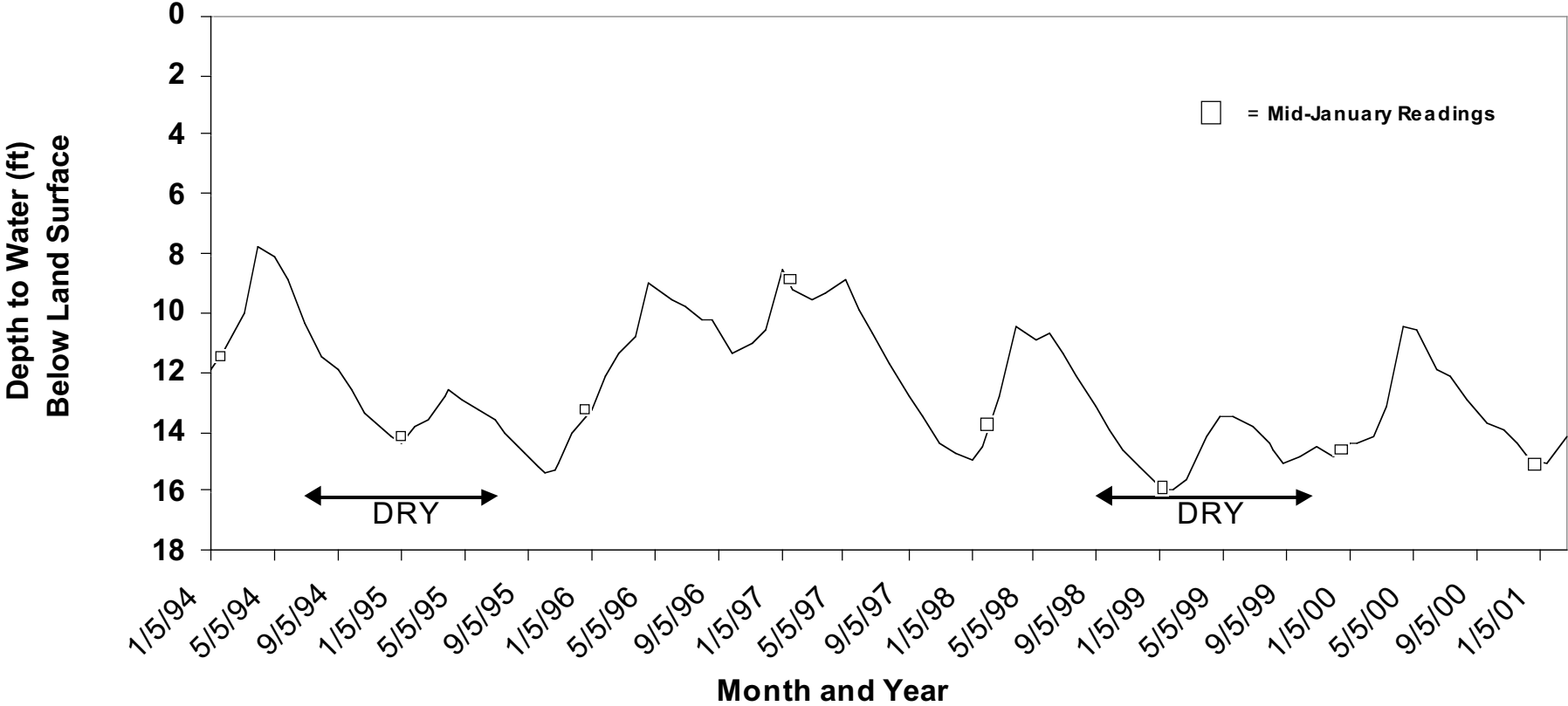


Exhibit 3. Delaware Geological Survey Water Conditions Index for New Castle County

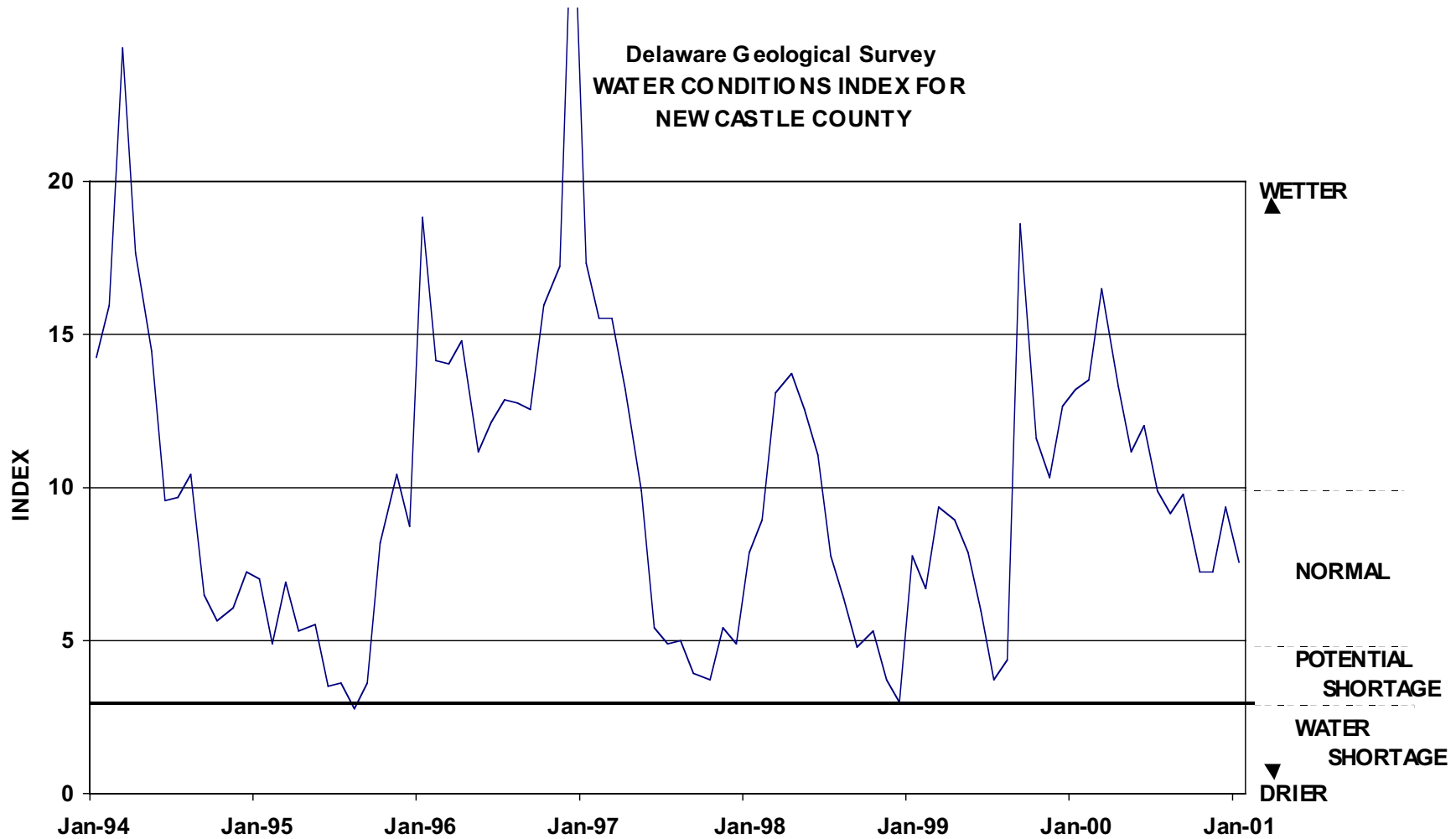


Exhibit 4. Public Water Demand in Northern New Castle County (July 1999 and 2000)

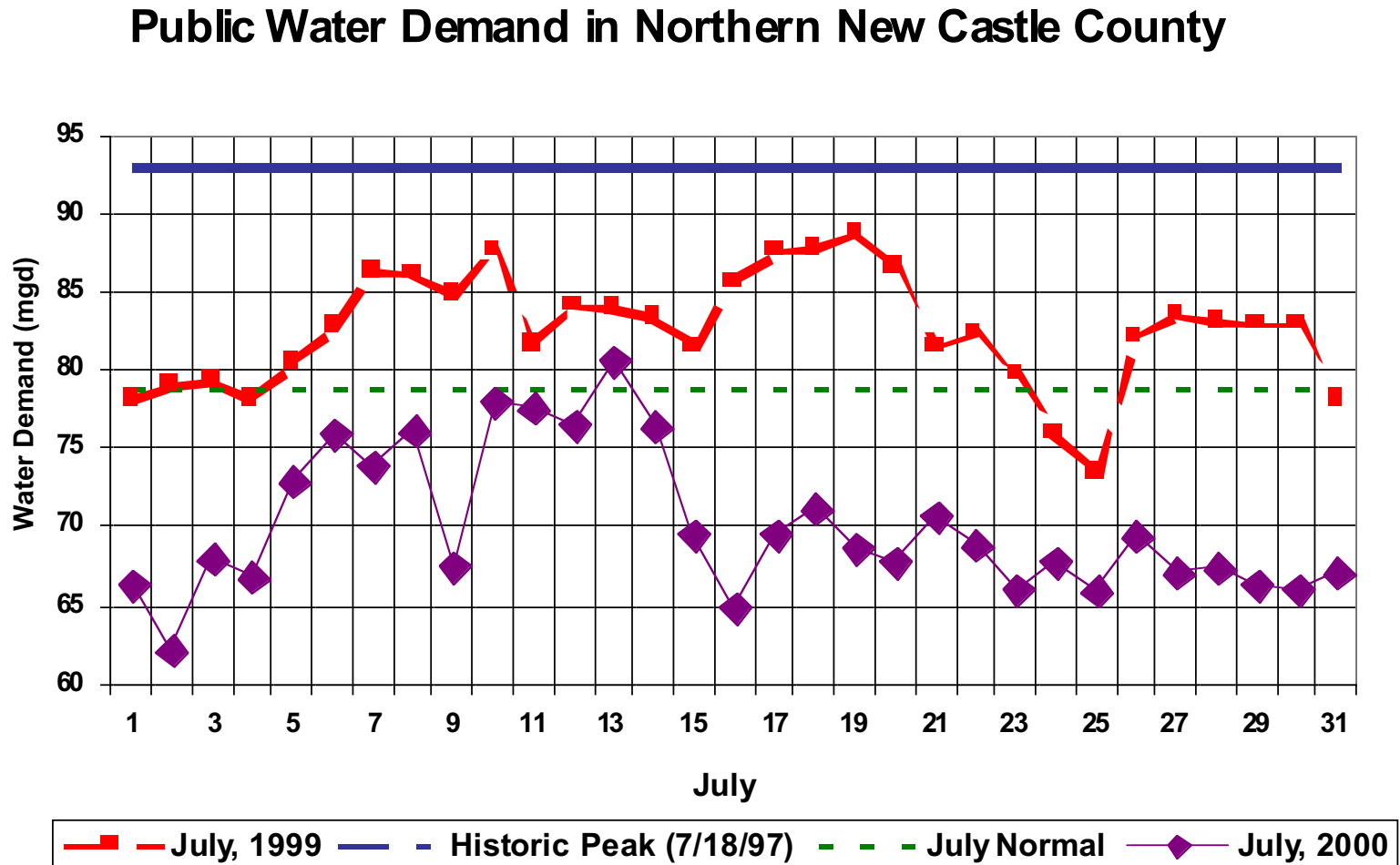


Exhibit 6. Interconnected Public Water Supply Systems in Northern New Castle County

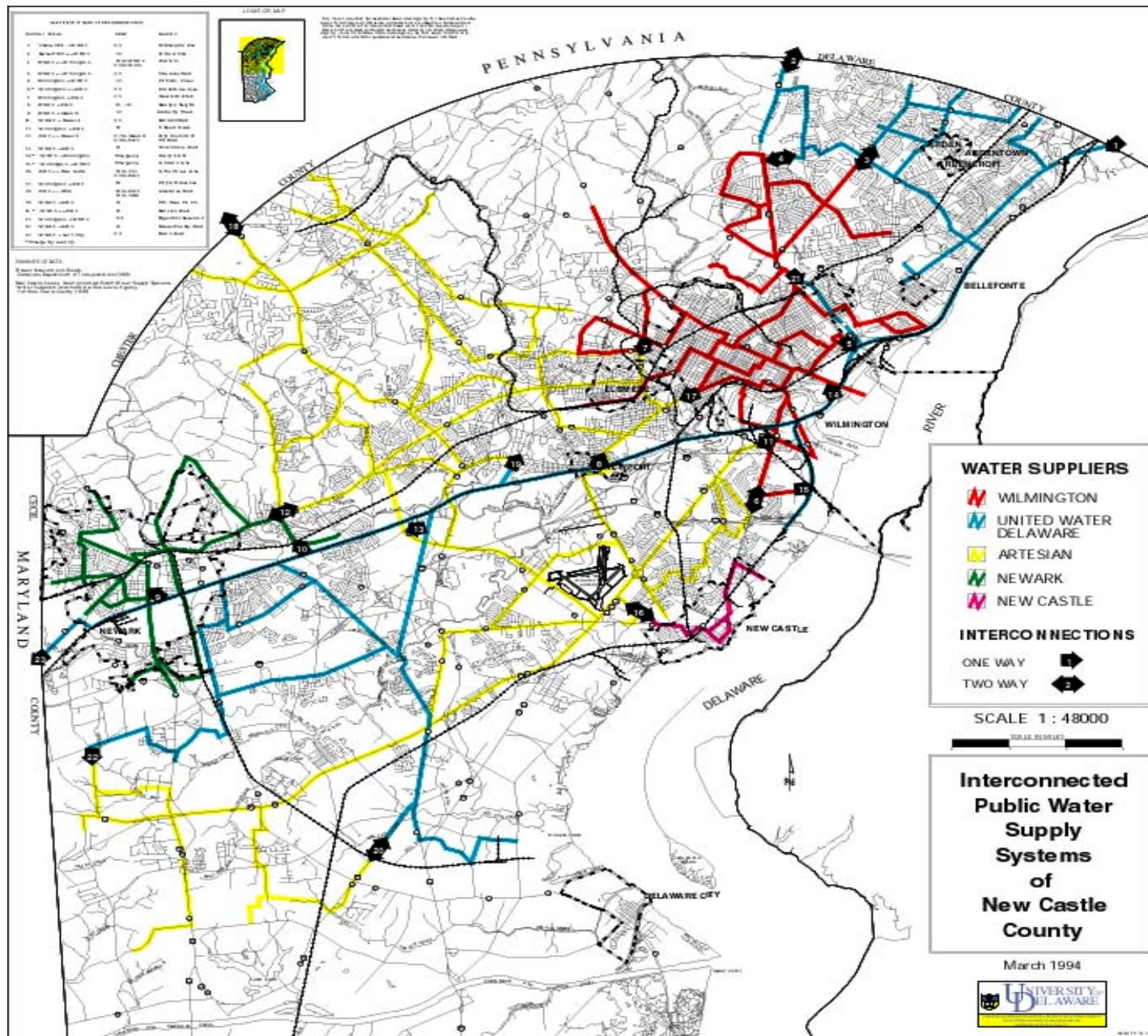


Exhibit 7. List of Water Supply Interconnections in Northern New Castle County

Number	Parties	Capacity (MGD)	Location
		2001	2001
1.	Chester Water Authority -> United Water	0.3	Philadelphia Pke/Post Road
2.	Bethel WP <-> United Water	1.5	Concord Pike
3.	United Water <-> Wilmington	1.5 to United	Chatham
		0.5 to Wlm.	
4.	United Water <-> Wilmington	0.5 to Wlm.	Silverside Road
		to UWD (Emergency)	
5.	Wilmington -> United Water	0.25	35th/Gov. Printz
6.	Wilmington <-> Artesian Water Company	0.5	Moorehouse Lane
7.	Wilmington -> Artesian Water Company	0.7	Cleveland & Taft
8.	United Water <-> Artesian Water Company	3.0	Newport Heights
9.	United Water -> Newark	3.0	Academy Street
10.	United Water -> Newark	1.4	Red Mill Road
11.	Wilmington <-> Artesian Water Company	1.3	S. Heald Street
12.	Artesian Water Company <-> Newark	0.7 to Newark	Polly Drummond Hill Rd.
		0.4 to AWC	
13.	United Water <-> Artesian Water Company	2.0	Churchmans Road
14.*	United Water -> Wilmington	Emergency	Cherry Island
15.	Wilmington -> United Water	0.5	Lambson Lane
16.	Artesian Water Company <-> New Castle BWL	1.0 to NC BWL	School Lane
		0.8 to AWC	
17.	Wilmington -> Artesian Water Company	5.0	Maryland Avenue
18.	Artesian Water Company <-> Chester Water Authority	6.0 to AWC	Limestone Road
		1.0 to CWA	
19.	United Water <-> Artesian Water Company	2.0 to AWC	First State Industrial Park
		1.5 to UWD	
20.*	United Water <-> Artesian Water Company	Emergency	Red Lion Road
21.	Wilmington <-> United Water	1.0 to UWD	Christiana Ave.
		0.5 to Wlm.	
22.	United Water <-> Artesian Water Company	0.5 to AWC	Pleasant Valley Road
		1.0 to UWD	
23.	United Water -> Cecil County	0.4	Ekton Road
24.	Wilmington -> United Water Delaware (raw water)	5.0	Hoopes Reservoir to Red Clay Cr
25.	Artesian Water Co. <-> New Castle BWL	1.0	Riveredge Industrial Park
			(under construction)
26.	Wilmington <-> United Water	1.5	Wilson Rd (proposed)
	*Emergency Use Only		
			Modified since 1994

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