Washington Aqueduct: 150+ Years of Water Supply Planning

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Washington Aqueduct
US Army Corps of Engineers
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The Washington Aqueduct: Little Known Facts

2-Time "Longest Bridge in the World" Record Holder

Once Had its Own Police Force and Jail Cells

The Washington Aqueduct, Capitol Dome, and Arlington Cemetery Share a Common Engineer

Pilot Tested Direct Potable Reuse in the early 1980’s
The Washington Aqueduct - Service Area and Major Facilities

- Washington Aqueduct
- Great Falls Dam and Intakes
- MacArthur Boulevard Raw Water Conduit
- Cabin John Reservoir
- Siphon Glen Echo
- Little Falls Raw Water Pumping Station
- Dalecarlia Reservoir and Water Treatment Plant
- McMillan Reservoir and Water Treatment Plant
- Georgetown Reservoir
- City Tunnel
- Capitol
- Chain Bridge
- Falls Church
- Arlington County
- Fairfax County
- Alexandria
- Reagan National Airport
- Potomac River

Service Area Legend:
- DC Water
- Arlington County
- Fairfax Water

Scale: 0 to 5 miles
A Brief History of Water Supply
The Birth of Washington’s Water System
Managing Supply as a Region
Meeting the Challenges of Tomorrow
The Birth of Washington’s Water System
The Growth of Our Nation’s Capital: 1800-1850

1800

1850

Early Schemes: Skinner’s Grand Basin (1830)

- I. K. Sinner proposed a 200 ft x 600 ft x 5 ft deep basin (C&O Canal water)
Early Schemes:
LTC Hughes Recommends Rock Creek (1851)

“...Would supply 8 MGD, a sufficient amount to supply the city for the next 50 years.”

1900: ~55 MGD
The Meigs Study and the Creation of the Washington Aqueduct (1852-1853)

• 1851: Fire at Library of Congress nearly consumes wooden dome
• Considered Great Falls, Little Falls, and Rock Creek

“Let our Aqueduct be worthy of the Nation”

Initial Gravity System construction – 1853-1863

Conduit Size:
7 ft (36 MGD) or 9 ft (68 MGD)?
Managing Supply as a Region
The Postwar Construction Boom

Dalecarlia Pump Station: 480 MGD

Little Falls Pump Station: 525 MGD

Assumes Sufficient Water Quantity and Quality

The Estuary: A Pumping Station and a Pilot Plant

- The Estuary Pump Station at Chain Bridge (1979-1985)
  - A little salt, a little sewage

"The water here flows back and forth with the tide, over the extensive flats between Georgetown and the Long Bridge, collecting and retaining the sewage of the cities; and, as these cities increase in size, the water will become less and less fit for domestic use."

- Montgomery Meigs, 1853
Rivers and Harbors Act of 1899

- Gives USACE permitting authority in navigable waters
Cooperative Management of Potomac in Washington Metro Area (WMA)

USACE: 16 dams proposed

1963

Low Flow Allocation Agreement (LFAA)

1978

Co-operative agreements signed to avoid LFAA

1982

1970s
Research on cooperative reservoir management

1981
Jennings Randolph Reservoir Completed

2015
24% Population increase by 2040
Meeting the Challenges of Tomorrow
Drivers of Potential Projects

- Climate Change
- Environmental / Water Quality
- Population Growth

New Water Resources Infrastructure?
A Promising Alternative: Travilah Quarry

Figure 5 One Tunnel and One Pumping Station Alternative – Profile
Montgomery Meigs at the Aqueduct’s Groundbreaking

“...this great work is destined I trust for the next 1,000 years to pour its healthful waters in to the capital of our union.”