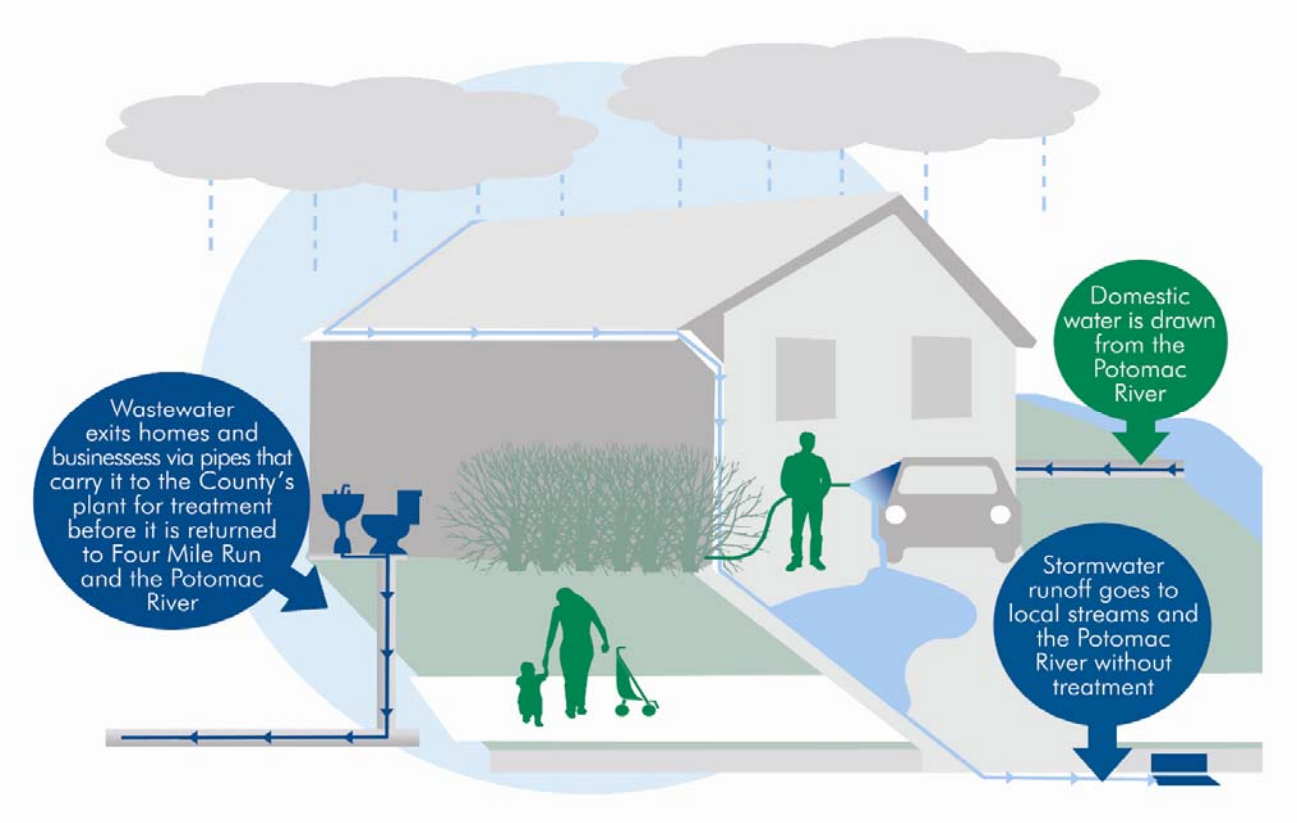
Waterworks

ARLINGTON
VIRGINIA

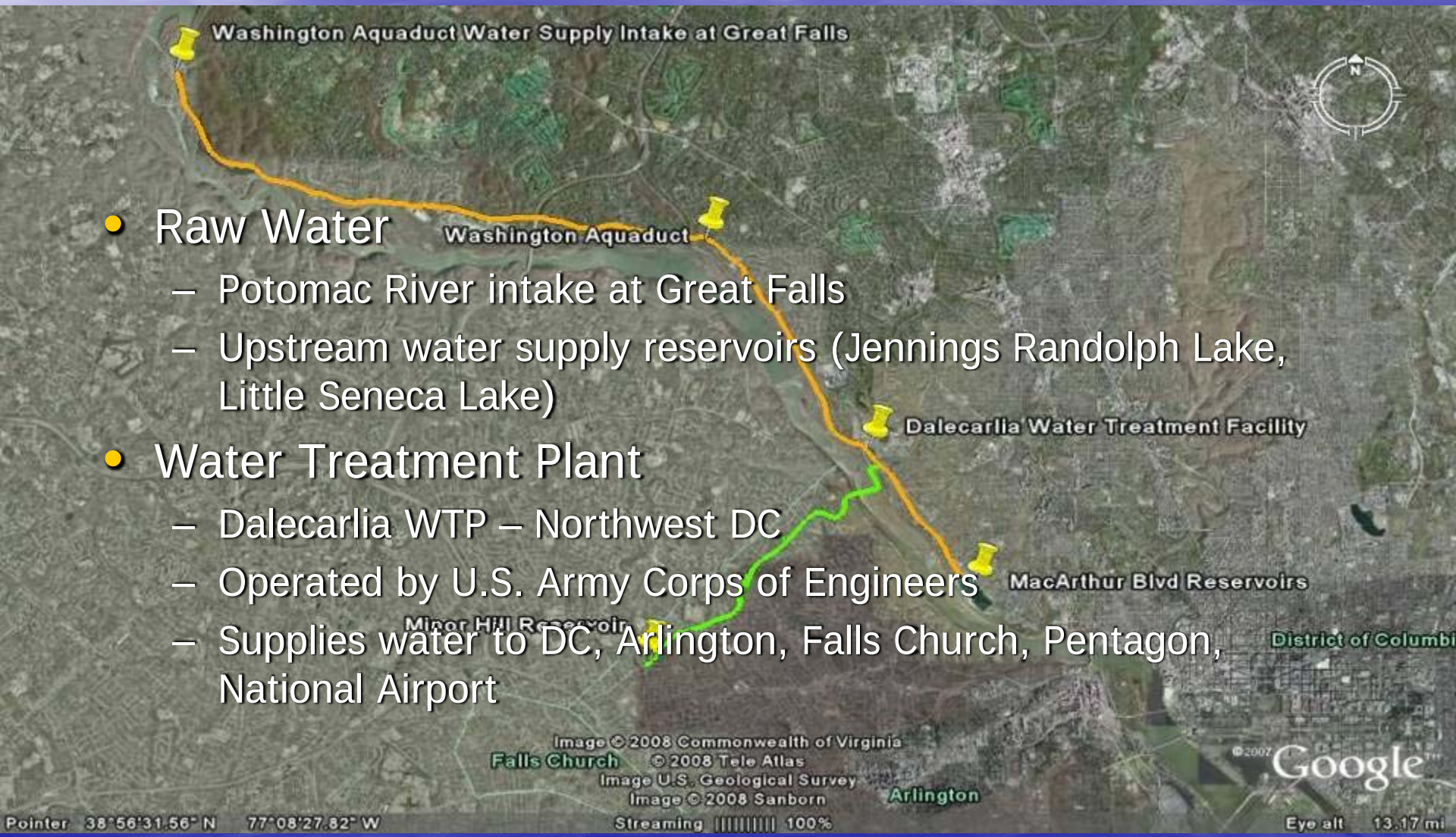
Presentation to the
Arlington County Civic Federation

January 6, 2009

Arlington's water cycle



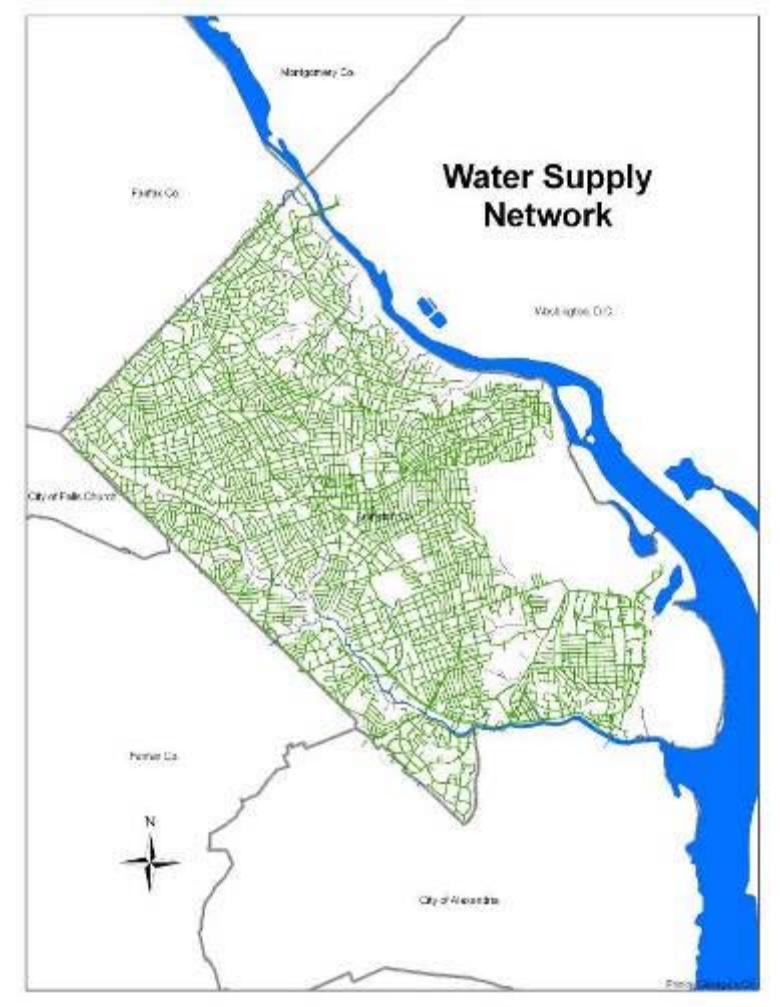
Water supply overview



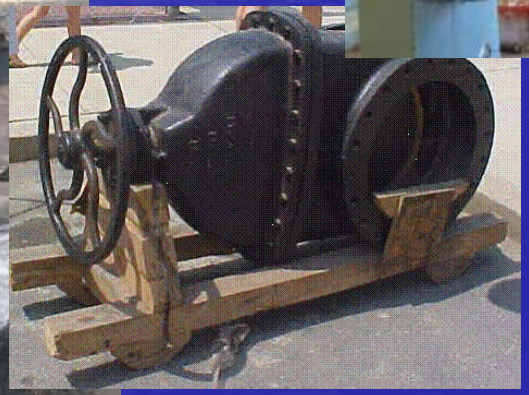
- Raw Water
  - Potomac River intake at Great Falls
  - Upstream water supply reservoirs (Jennings Randolph Lake, Little Seneca Lake)
- Water Treatment Plant
  - Dalecarlia WTP – Northwest DC
  - Operated by U.S. Army Corps of Engineers
  - Supplies water to DC, Arlington, Falls Church, Pentagon, National Airport

Water supply distribution

- 500 Miles of pipes
- 3,500 Hydrants
- 13,000 Valves
- 3 pumping stations
- 32 million gallons of storage



Water supply infrastructure

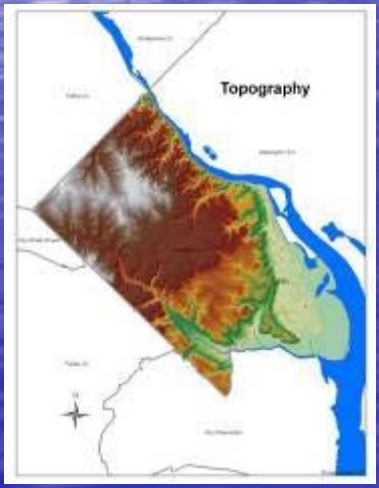


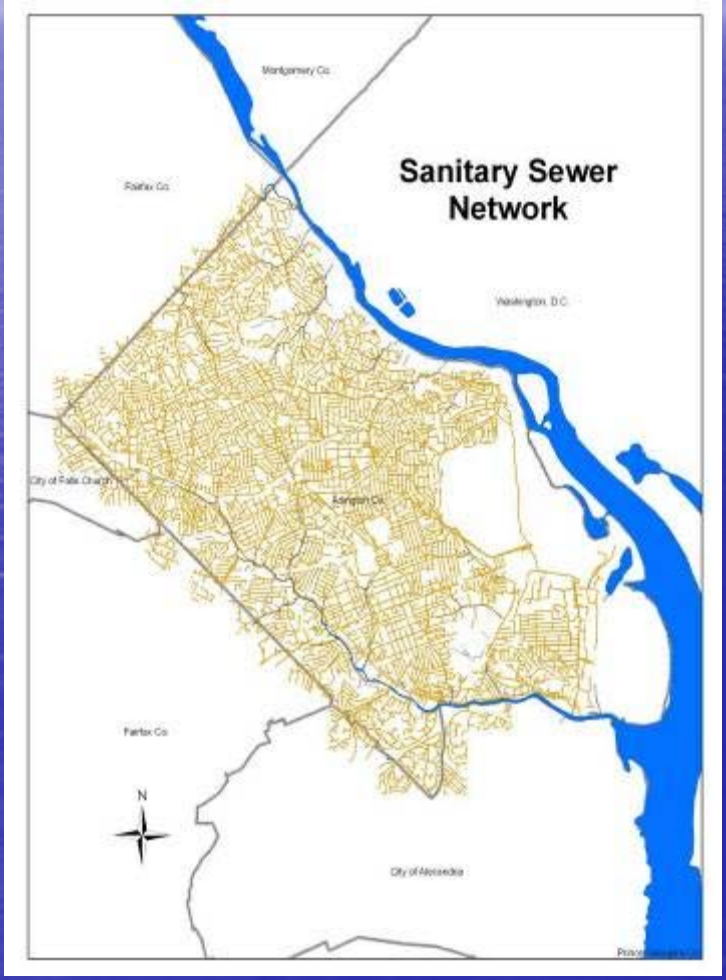
Maintaining a safe water supply

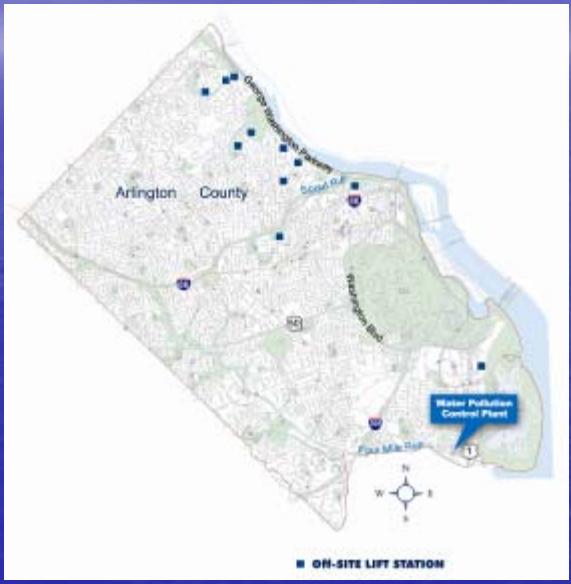
- Disinfection: Chloramines
  - Adequate residual levels in system
  - Reduce disinfection by products
- Tuberculation: Rusty Water
  - Corrosion byproducts in pipes
- Corrosion: Lead & Copper
  - Mitigation & preventive measures
- Biological contaminants:
  - E. coli, cryptosporidium, giardia, etc.
- Environmental contaminants:
  - Perchlorate, pharmaceuticals, endocrine disrupting chemicals, etc.

Wastewater collection

- 465 miles of sewer mains
- 13,000 manholes
- Most wastewater flows by gravity, except in areas served by 12 lift stations







Wastewater treatment technology

Then

Now

- Current upgrade & expansion
- Completion scheduled in 2011
- Cost estimate: $568 million

Equalization Tanks

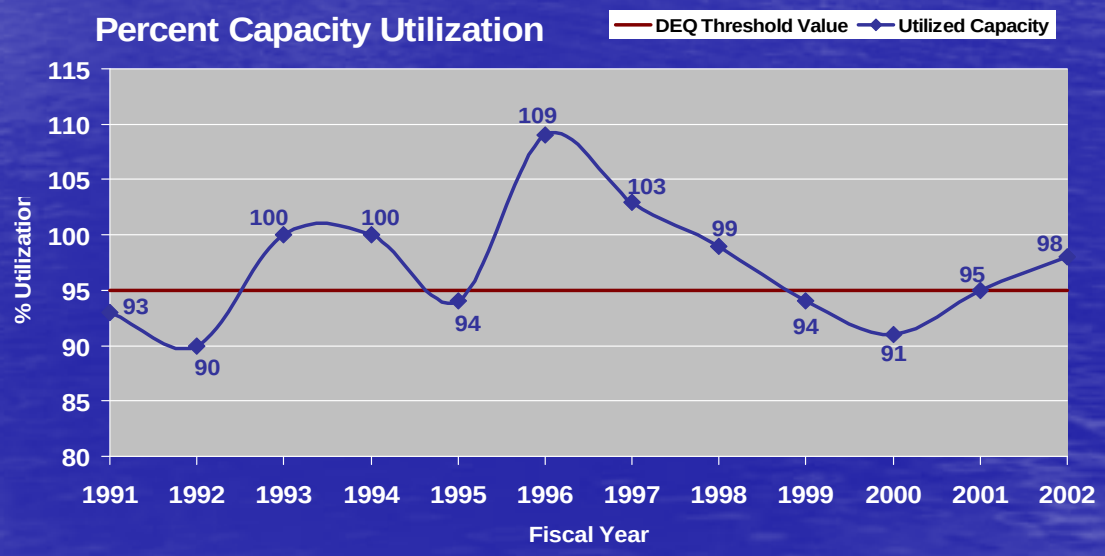
Secondary clarifiers

Filter Building

Aeration Tanks

Why expand and upgrade now?

- State regulatory requirements to ensure reliable wastewater treatment
- Age of facility
- Stringent nutrient controls to protect the Chesapeake Bay



30 mgd (million gallons per day) rated capacity

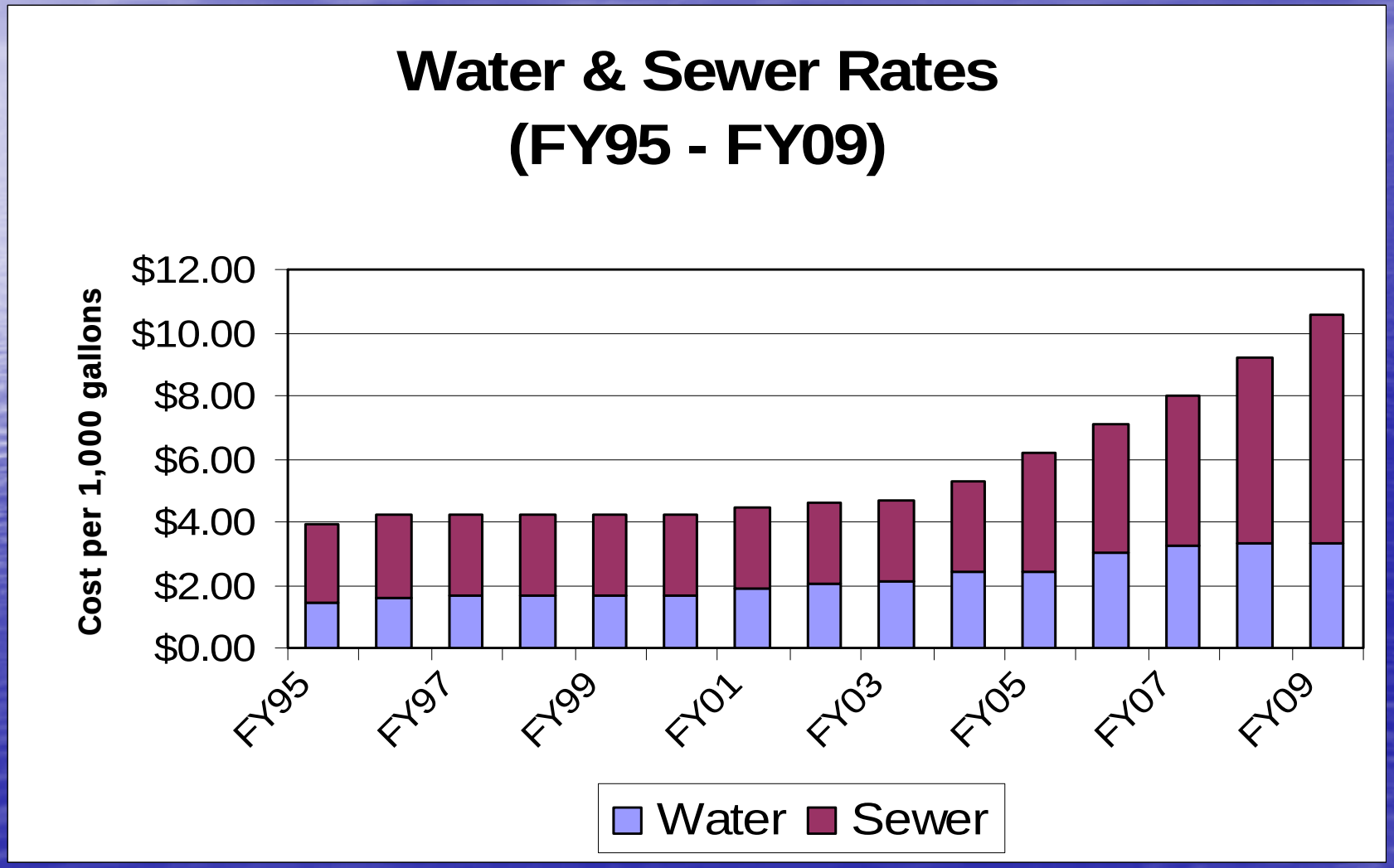
Clean water is more than just infrastructure







How expensive is clean water?



Regional water & sewer costs

Jurisdiction	FY 2008 Annual Cost	FY 2009 Annual Cost
Arlington County	**$644**	**$738**
City of Alexandria	$702	$723
Falls Church (Within City Limits)	$718	$718
Prince William County	$597	$656
District of Columbia	$571	$618
Pr. Georges & Montgomery Counties	$503	$546
Fairfax City (Residential)	$449	$478
Loudon County	$459	$470
Fairfax County	$394	$423

(based on estimated annual household consumption of 70,000 gallons)

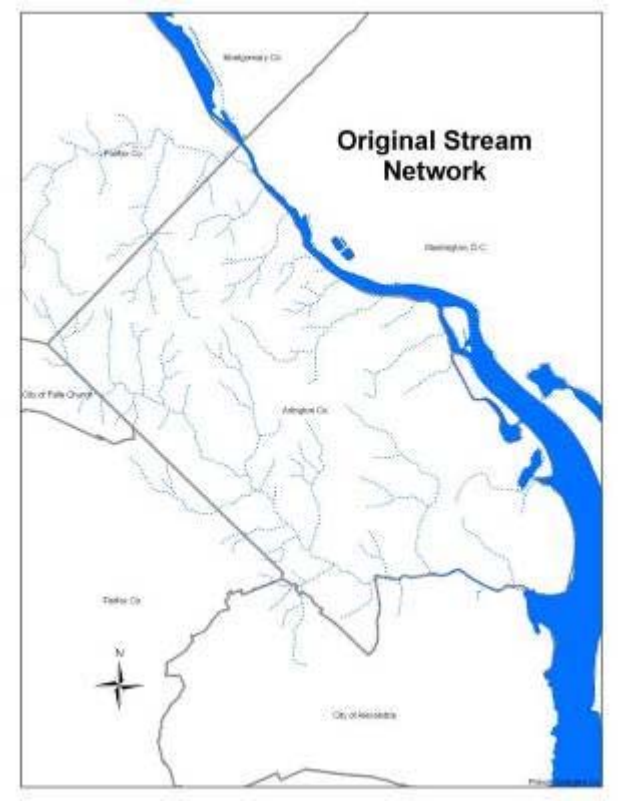
Wastewater treatment cost benchmarks

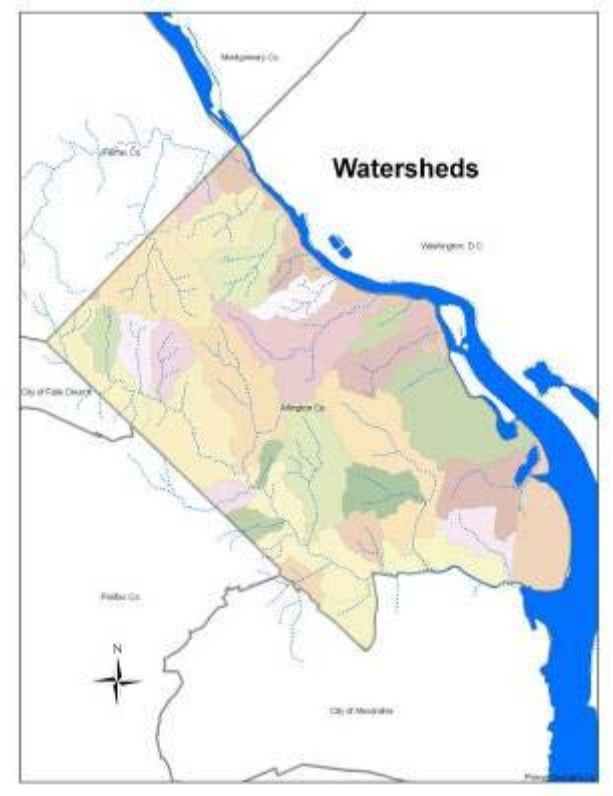
Average Annual Residential Charge (NACWA Index)

Summary Statistic	2004	2005	2006	2007	2008
Number of Wastewater Agencies	228	217	207	199	NA
Minimum	$30.50	$82.44	$33.00	$35.50	NA
Maximum	$612.00	$756.00	$756.00	$733.92	NA
Median	$249.43	$262.06	$281.00	$284.16	NA
Arlington County	$233.60	$270.00	$308.30	$330.00	$472.00

Stormwater management

- Over 50 miles of natural streams prior to settlement

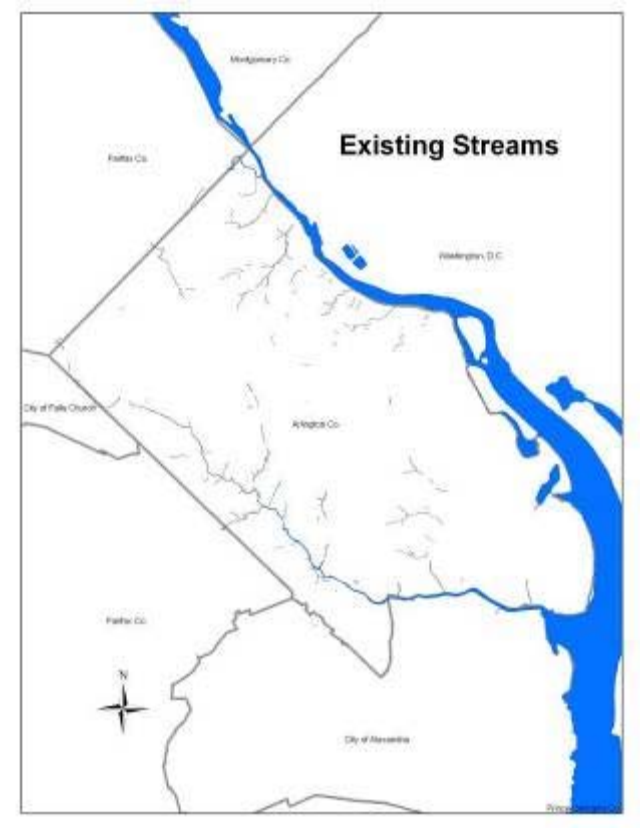




- About 60 percent of County drains to Four Mile Run

Stormwater management

- Only 26 miles of natural stream remain

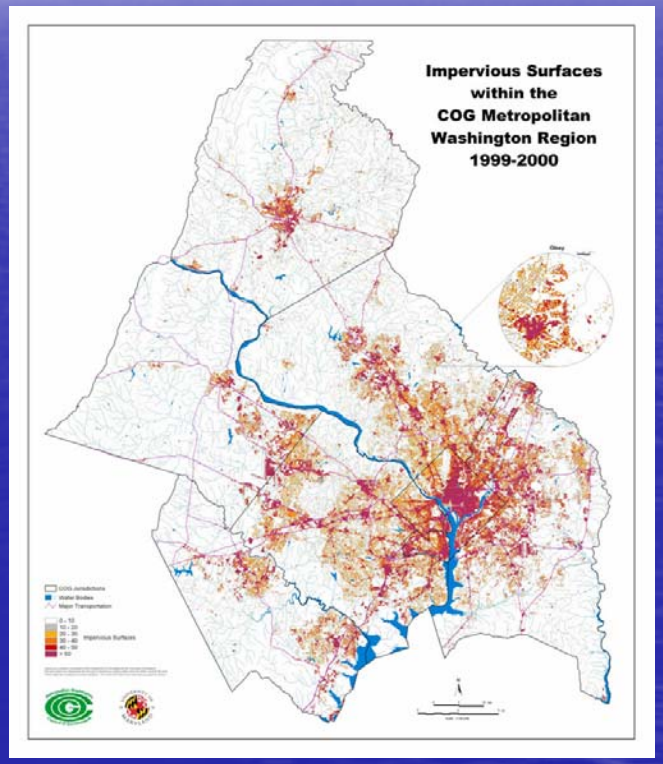


- 366 miles of storm sewers
- 10,000 catch basins

Stormwater management

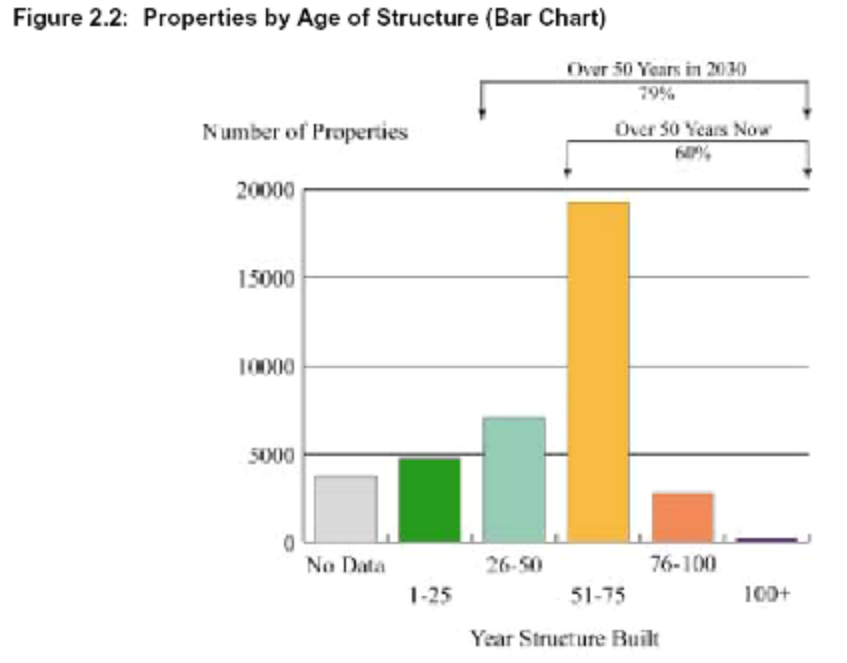
- *Flood protection*

Lower Four Mile Run after 1975 flood



Aging stormwater infrastructure

- Most of system built between 1940 – 1960
- Concrete pipe life expectancy (~ 50 - 75 yr)
- Approx. 11 miles of corrugated metal pipe (< 40 yr. life)
- <u>60 percent</u> of the County's 366 mile pipe network is already at or beyond its useful life.



Storm sewers do not age gracefully

Military Road at Donaldson Run (2001)

Emergency repair cost = $1.2 million

Columbia Pike near South George Mason Drive (2003)

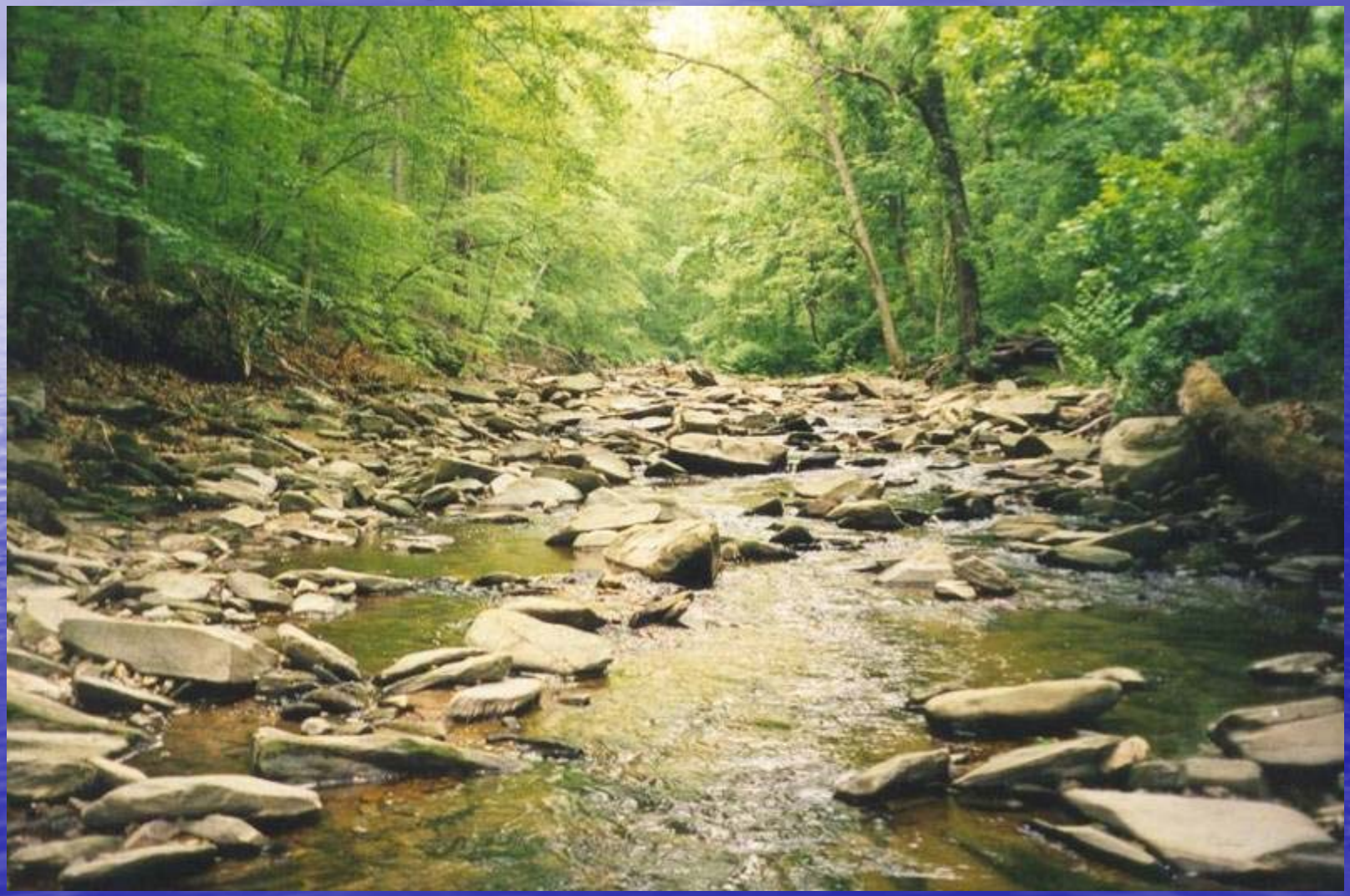
Emergency repair cost = $2.1 million

24th Street South (2006)

Emergency repair cost = $0.4 million

The regulatory challenge:

- to protect local streams…



Pimmit Run

...and create healthy, stable, restored streams...

Donaldson Run

…to help save the Chesapeake Bay.

Stormwater infrastructure deterioration

Litter and debris

Sanitary sewer leaks

Pollutants in urban stormwater

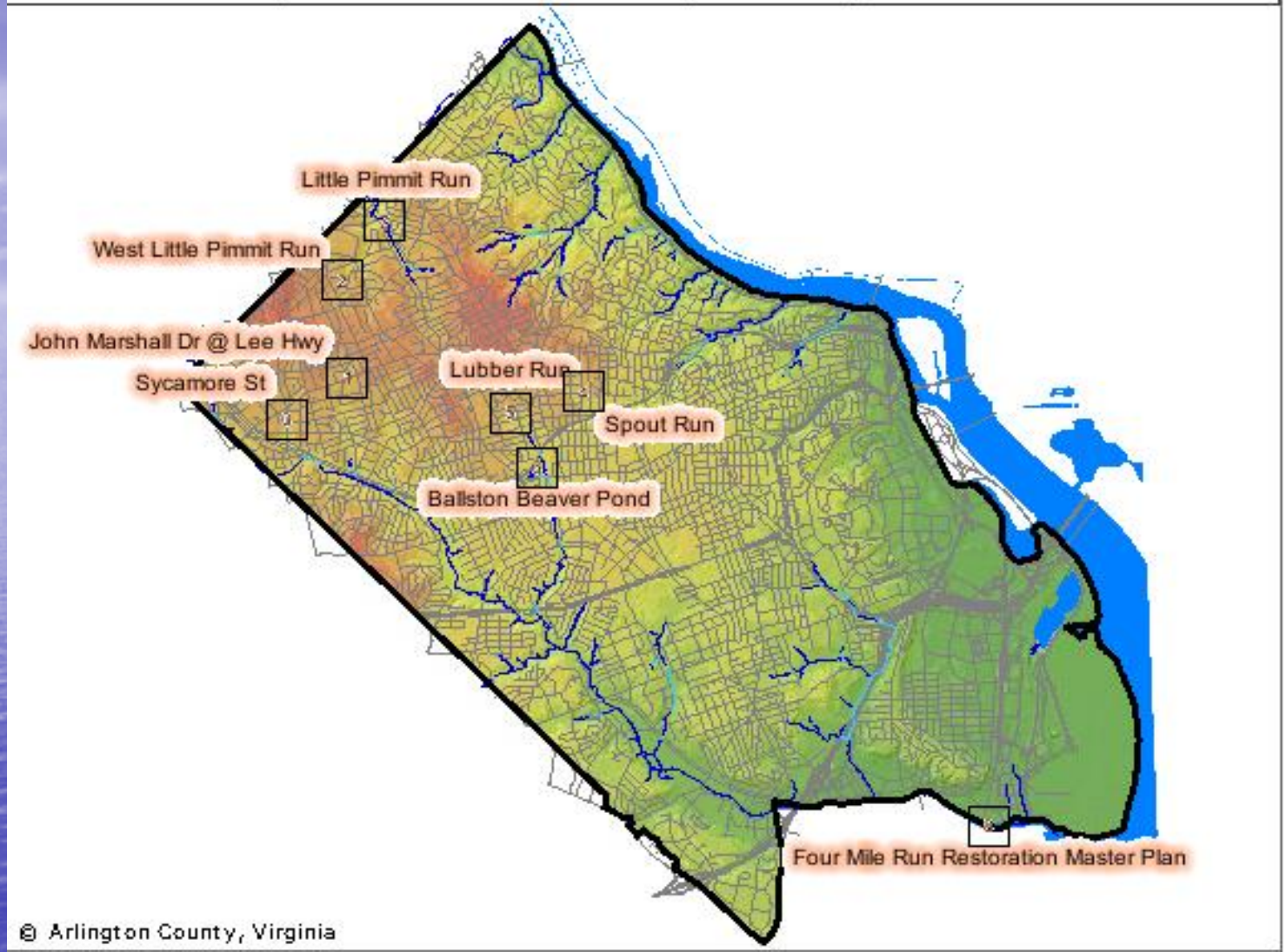
Hazardous material spills

Severe streambank erosion and habitat degradation

Stormwater funding

- County Board adopted a Sanitary District tax of $0.010 per $100 of assessed real property value dedicated to stormwater management.
  - *Arlington joins over 400 local governments that have adopted a dedicated funding source for stormwater management.*
  - *Typical household cost ~ $53 per year.*
  - *Operations funding available in FY 2009 ~ $3.1 million*
    - *4.0 FTEs approved in FY 2008 and 7.0 FTEs in FY 2009*
    - *supports engineering plan review, GIS stormwater data update, operations & maintenance, regulation & enforcement, and an update of the Stormwater Master Plan*
  - *Capital funding available in FY 2009 ~ $5.3 million*
    - *several critical stormwater capital projects*
    - *environmental and water quality improvement projects, stormwater infrastructure maintenance work, and contingency funding for emergencies*

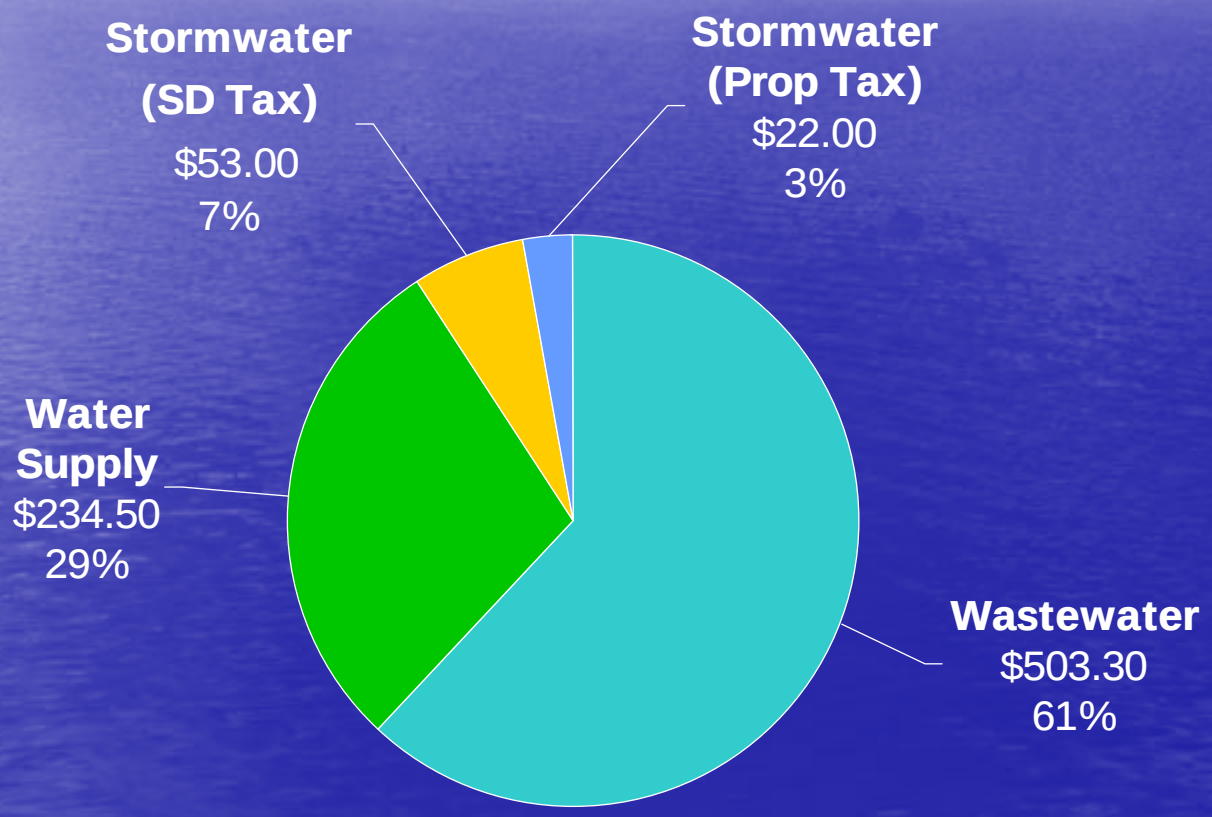
Proposed Stormwater Capital Projects



Selections

1 John Marshall Dr @ Lee Hwy
2 West Little Pimmit Run
3 Sycamore St
4 Spout Run
5 Lubber Run
6 Ballston Beaver Pond
7 Little Pimmit Run
8 Four Mile Run Restoration Master Plan

The cost of Arlington's waterworks



Typical Annual Residential Costs

Future challenges

- *New regulatory requirements*
  - Total Maximum Daily Load (TMDL) for Chesapeake Bay (nutrients), Potomac River (PCBs), and Four Mile Run (bacteria)
  - MS4 stormwater permit requirements
  - Stormwater management regulations
  - Endocrine disrupting chemicals
- *Climate change*
  - Could fundamentally alter the global water cycle

Questions

For additional information, contact
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or visit www.arlingtonva.us/des