



Washington Suburban Sanitary Commission

Challenges and the Short & Long-Term Strategies for Use of Non-Potable Water

Montgomery County

Water Quality Advisory Committee

September 12, 2011



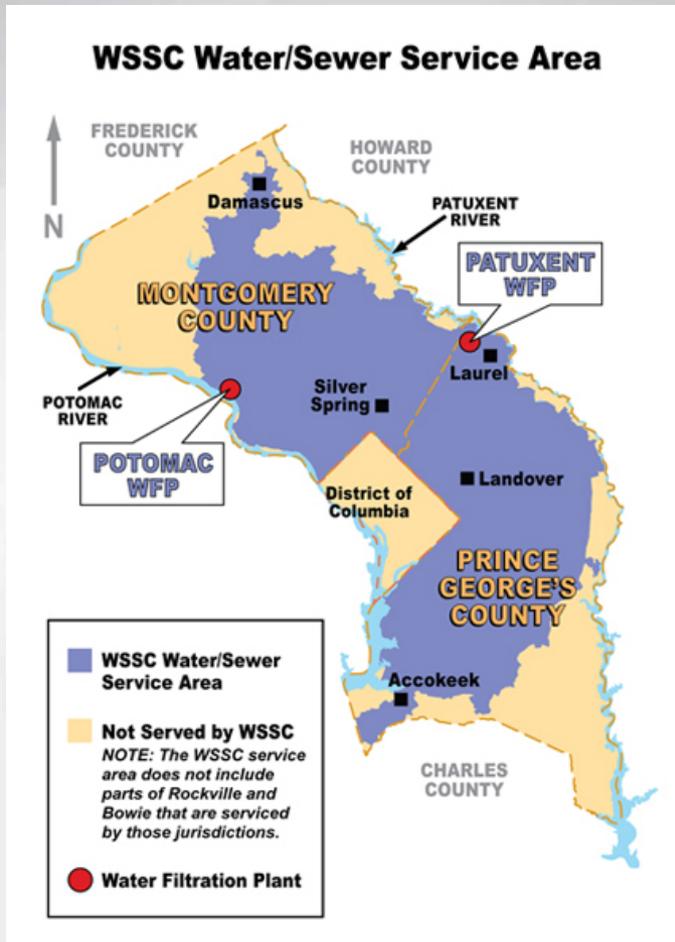
Objectives of the Presentation

- Communicate WSSC's concerns
- Promote the concept of “beginning with the end in mind”- consistent water quality standards for intended end use
- Present WSSC's short and long term strategies

Outline

1. Background about WSSC
2. Non-potable Water Sources
3. Non-potable Water Uses
4. WSSC's Authority
5. Concerns
 - a. Health Concerns
 - b. Legal Concerns
 - c. Technical Concerns
 - d. Financial Implications
 - e. Perceptions (Green Initiatives)
6. Logical Process for Safe Use of Non-potable water
7. WSSC's Short Term Strategy for Approval Process
8. Next Steps – WSSC's Long Term Strategy

Background about WSSC



- Established on May 1, 1918
- Bi-county water/sewer agency
- 3 reservoirs – 14 billion gallons
- 2 water filtration plants – the Patuxent (56 MGD) Potomac (285 MGD)
- 7 wastewater treatment plants - capacity to handle 74.1 MGD
- Blue Plains- cost sharing
- 5,500 miles of water main
5,400 miles of sewer mains

WSSC's Mission

*We are entrusted by our community to provide **safe and reliable** water, life's most precious resource, and return clean water to our environment, all in an ethically and financially responsible manner.*

Potable Vs Non-Potable

- **Potable Water - meets or exceeds drinking water standards** (for today's purpose, we are only talking about potable water provided by WSSC)
- **Non-potable water - does not meet drinking water standards** (then what standards should it meet?)

Non-Potable Water Sources

- Reclaimed Water
Class IV effluent of a regulated municipal waste water treatment facility distributed for various non-potable uses, regulated by MDE.
- Harvested Rainwater
Water collected from rooftops, parking lots and other impervious surfaces.
- Graywater
Wastewater generated from baths, showers, washing machines, and sinks, excluding toilets and kitchen.
- Groundwater
Underground water (typically from shallow depths) near building foundations.
- A/C Condensate
Water collected from air conditioning condensate

Other sources: e.g., laboratory RO system reject; eyewash stations recirculation water

Non-Potable Water Uses

- Irrigation
- Flushing toilets and urinals
- Washing animals
- Washing buses
- Boiler make-up water
- Other uses, to be explored

WSSC's Authority

WSSC has two roles related to Non-potable Water:

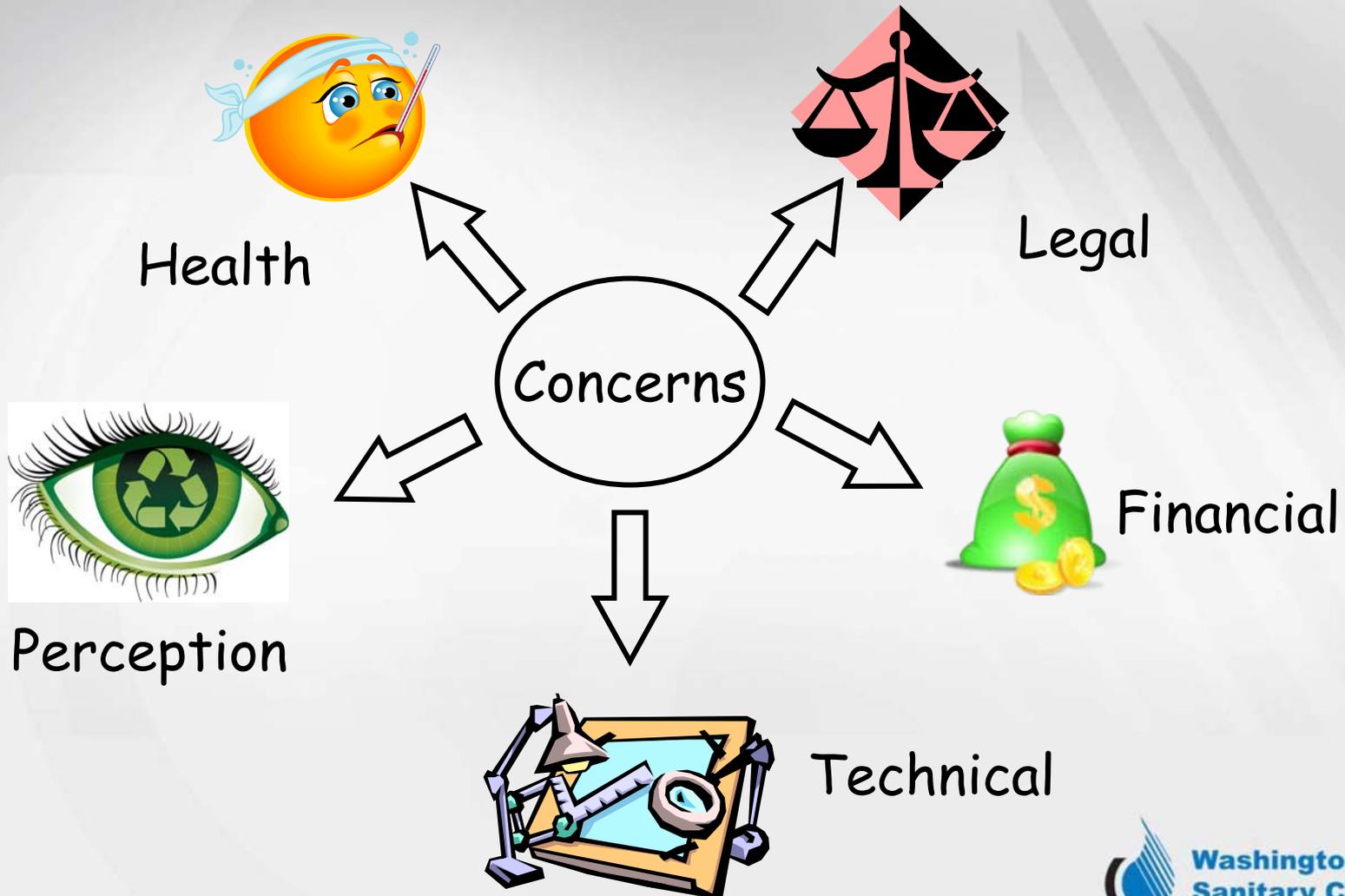
I) Water Purveyor

II) Plumbing Code Authority

WSSC's Authority Cont.

- WSSC is **not** responsible for safety and reliability of non-potable water.
- Other agencies (e.g., MDE; local Health Departments; Local Environmental Protection Departments) need to take this responsibility.
- In Montgomery County, DEP is leading the County's efforts.

Concerns: Non-Potable Water Use



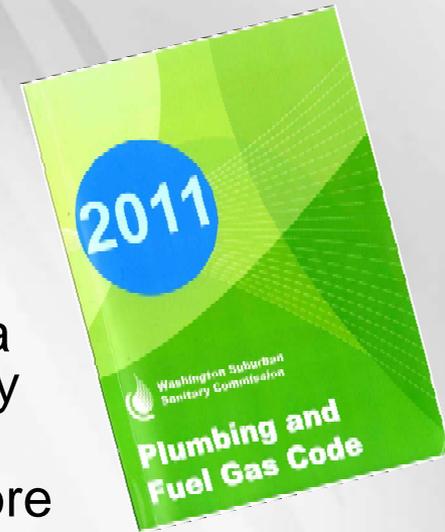
Health Concerns

Varying health risks may arise from accidental ingestion, inhalation or dermal contact with non-potable water.

- Groundwater may be contaminated
- Local rainwater data indicates a low pH
- Rooftops and patios are subjected to bird/animal waste and decomposing carcasses may be unsafe
- Rainwater stored in cisterns or recycled graywater- if untreated, may contain bacteria, viruses or other contaminants

Legal Concerns

- Section 602.2- IPC: “**potable water** shall be provided to all plumbing fixtures”
- Section 804.1.12: “no person shall discharge or cause the discharge of **any storm water**, surface water, ground water, roof runoff or subsurface drainage.”
- Section 608.6.1- IPC: “**cross connections** between a private water supply and a potable public water supply are prohibited.”
- Section 608.8 – IPC: “in all buildings where two or more water distribution systems are installed, each system shall be **labeled** as either potable and non-potable
- Minimum/acceptable **water quality standard** not defined



Technical Concerns

- Make-up potable water is used in all non-potable water use cases
- WSSC's most important responsibility is to protect water supply from cross connections between potable and non-potable water



Technical Concerns

Sewer Metering



- Non-potable water needs to be metered for calculation of sewer charges
- Graywater systems **do not** require a sewer meter because the original source passed through the domestic meter.
- Multi-source re-use water that includes a graywater creates complicated sewer metering.
- Metering backwash from treatment process may be a challenge.

Financial Implications

- The non-potable water projects, **if** designed and maintained properly, maybe costly compared to WSSC water
- Storm water management costs may offset this high cost
- There may be minor revenue loss for WSSC due to less use of potable water

Perceptions: “Green” Image

Implications of Approval

- WSSC’s approval may suggest system is safe (at the start and forever), even if it may not be
- Approvals can set a precedent for future requests
- If we go forward, at risk, and no negative issues arise, WSSC could be seen as being innovative.



Perceptions: “Green” Image

Implications of Disapproval

- Public perception; that we are protecting revenue vs. the environment.



MD “Green” Trends

Current Trends in Maryland (MDE **Purple Pipe** Initiatives)

Class I and II Effluent – MDE has “guidelines” for irrigation in areas with restricted public access

Class III Effluent – MDE has “guidelines” for Agricultural Applications of Non-Food Crops and Golf Course Irrigation

Class IV Effluent – MDE is working on guidelines for *any land application or commercial building toilet flushing and mechanical supply.*

Purple Pipe – standard color being adopted for pipe transporting reclaimed water (class IV effluent).

Class IV Water Quality

Parameter	Draft- MDE Standard
BOD ₅ (monthly avg.)	10 mg/L
Turbidity (daily avg.)	2 NTU and < 5 NTU <small>all times</small>
E.Coli (monthly mean)	1.1 MPN per 100 ml
Fecal Coliform (monthly mean)	2.2 MPN per 100 ml
pH	6.5-8.5
Total N (monthly avg.)	10 mg/L
Total Residual Chlorine	0.5-4 mg/L anytime

MDE Limitations- Use of Class IV

- A water use permit must be obtained
- Reuse shall not cause nuisance
- All reuse force mains and indoor plumbing should be purple
- Reuse is only approved for non-residential buildings
- Residential buildings with at least 10 units, managed by a company may also use class IV water

Non-Potable Water Projects in WSSD

- Many years ago, two M.C. schools inquired about rainwater for flushing toilets. Due to budget constraints, the system was never constructed
- In the past two years, WSSC has been contacted on behalf of NIH; Walter Reed; and Bethesda Naval Hospital regarding non-potable projects
- Currently, WSSC is looking at a few projects in both Counties with various applications for use of non-potable water
- One M.C. project has received approval and another is in final review process

One Example- an Existing Project in This Area

- T.C. Williams High School in Alexandria, Va. has been registered through the US Green Building Council's LEED Rating System
- The project includes a below grade 450,000 Gallon cistern to collect rainwater from the building's roof
- Rainwater is disinfected by Chlorine and stored in a smaller tank for toilet flushing and irrigation
- Treated water is monitored and sampling is routinely conducted to ensure system operation

Use of Non-potable Water: Typical Approach

- Start with source of the non-potable water
- Pick and choose various treatment options
- Try to convince authorities that their system is safe
- No clear chain of oversight authority, maintenance, monitoring and reporting requirements.

Systematic Approach Non-Potable Water Use

- Define the intended water use (end in mind)
- ***Establish water quality standards for that use***
- Identify source of water's initial quality/quantity
- Design water treatment to meet standards
- Define O&M requirements
- Establish qualifications to perform O&M
- Establish sampling, recordkeeping and reporting requirements
- Develop contingency plans in case of system failure

WSSC's Short-term Approval Process

- A waiver may be submitted to the WSSC's Chief Engineer
- **Prior** to submitting the waiver, applicant **must contact** appropriate state/county agencies to get an approved plan. Plan should include:
 - Approved source of non-potable water and meet MDE requirements for appropriation of surface or groundwater uses
 - Approved water quality standards that will be used for the intended use of non-potable water
 - Water quality data on raw non-potable water as well as a treatment design, certified by a P.E. to reliably meet applicable water quality standards
 - Approved operation and maintenance requirements, including operator certification requirements
 - Details of approved roles and responsibilities for recordkeeping and reporting requirements

WSSC's Additional Requirements

- Sewer metering plan for non-potable water and verification that it meets "typical" domestic sewage, and it is free of toxic matters
- Disposal plan for wastewater generated from the water treatment process to meet WSSC's Prohibited Discharge Conditions and sewer charge calculations for the processing of wastewater
- Supplemental water supply and backflow protection plan
- Marking and labeling for non-potable water systems
- Other relevant information, as requested by the WSSC or others

WSSC's Position



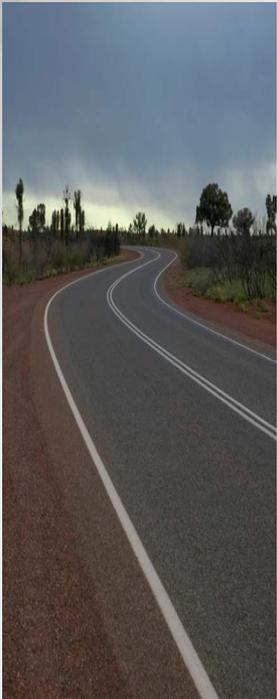
- Yes – Safe Systems: central management, treatment approved and monitored by responsible agencies



- No – Unsafe, un-supervised systems
- No – Residential

WSSC's Long-Term Plans

- Pilot projects
 - EMOC Facility in Montgomery County- Rainwater
 - City of Takoma Park, Graywater and Rainwater
 - University of Maryland and Possibly Hampton Inn project in Prince Georges County
- Participate in work groups and collaborate with others to learn about the success and failure points
- Develop new code – eliminate the waiver process



Summary

The WSSC is in support of **safe non-potable water systems** to meet water conservation goals.

At the same time, we remain committed to ensuring the safety of the ***public potable water system***.