



# Water Conservation and Energy Efficiency as Pollution Prevention

## The View from a Drinking Water Utility

### Cultural Change & Cost Savings

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**“When the well’s dry, we know  
the worth of water.”**

Benjamin Franklin

*Poor Richard’s Almanac, 1746*





# *Overview*

## *Department of Waterworks*

# Department of Waterworks

- **Owns** and manages Indianapolis Water.
- Bi-partisan seven-member Board of Directors oversees department policy, finances, capital projects, and the Management Agreement with the contract operator.
- Department currently has five employees.
- System is **operated** by Veolia Water Indianapolis, LLC comprised of approximately 350 employees.

# Waterworks System - Overview

- Indianapolis Water serves nearly 1 million people in 8 counties.
- 83% of customers and 89% of revenues are within Marion County.
- Service is also provided to portions of Hamilton, Boone, Hendricks, Morgan, Shelby and Hancock Counties
- 77% of the supply is from surface water sources.
- The source of supply is supplemented with ground water wells. Currently, there are 68 groundwater wells.
- The current average daily production rate of finished water is 140 million gallons per day.
- A peak average day production rate was recorded on June 13, 2007 (dry summer) and 228 million gallons was treated and pumped.
- Total rated capacity of the treatment system is 260 MGD.
- Largest Municipal Water Utility in the State of Indiana: 10 treatment facilities  
29 storage tanks, 31 pump stations; 4,300 miles of pipe;  
32,000 valves; 36,500 hydrants.



# Strategic Plan – Needs

- Regulatory Compliance
  - Next phase of the Safe Drinking Water Act regulations require monitoring and treatment process modifications to all surface water treatment plants by April 2012
- Future Growth of Community and Surrounding Areas
- Aging Infrastructure
- Technology Enhancements
- Safety & Security Concerns (Homeland Security)
- To meet these needs, it's estimated that \$600 million will be required over the next 15 years
- Over \$111 million in capital work is planned for 2011-2012

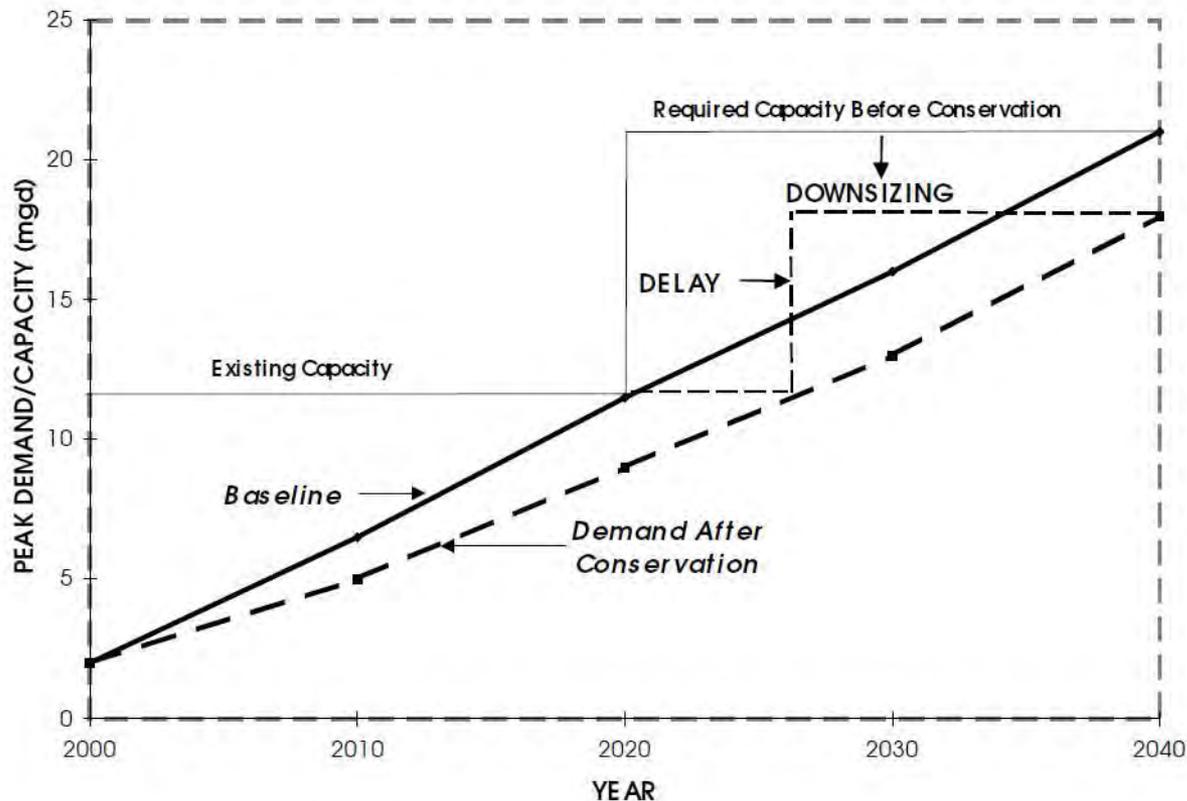


# Strategic Plan – Needs

- *Problem: How to meet the system needs?*
  - Option A: Increase capacity and treatment methods with new systems at existing facilities.
  - Option B: Increase capacity and treatment with new treatment plants to meet demand
  - Option C: Seek out water conservation measures to maximize current system capacity.
- *Solution: A combination of all three, with an emphasis on Option C.*

# Strategic Plan – Needs

## Example of Conservation Impacts on Capacity Improvements

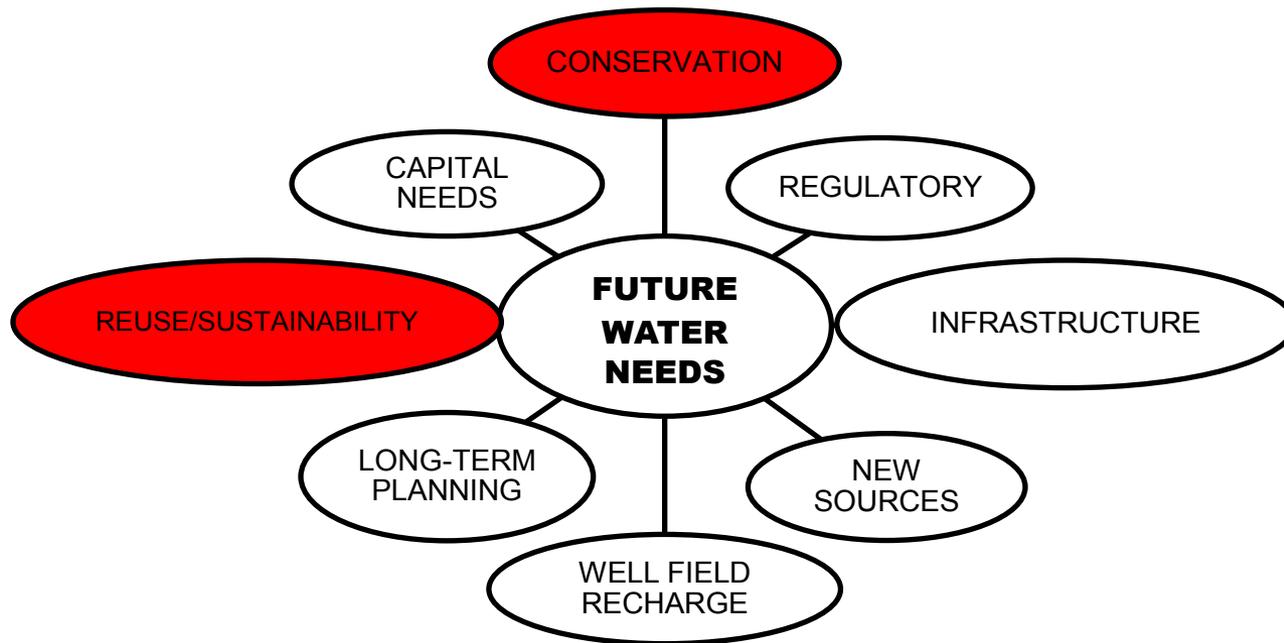


# Strategic Plan – Goals

- Employ Innovative Strategies To Meet the Future Water Needs of the Region (10-50 year horizon)
- Maintain Quality of Life while Supporting Proper Infrastructure Investments
- Encourage Proper Use but Discourage Waste
- Practically Maintain the Financial Stability of Utility

# How to Plan for Future Water Needs

## Components of Strategic Planning



**Additional 50 million gallons per day needed in the year 2025**

# Conservation Measures Broad Perspective

- Water Conservation Ordinance (G.O. 15-2009)
  - Passed by Indianapolis City-County Council and other jurisdictions where DOW supplies water
  - Based on issued warnings and emergency declarations due to severe conditions
    - Low surface water flow conditions
    - Severely limited sources of supply
    - Other extreme water shortage issues



# Conservation Measures Broad Perspective

- Board of Waterworks Resolution No. 8, 2008 for Wise Water Use Policy
  - Recommends customers voluntarily employ efficient water use practices during normal conditions
  - Employs Water Use Advisories which focus on notifications to customers about high water usage and recommendations on temporary limitations



# Conservation Measures Broad Perspective

## ■ Irrigation Technology

- Average day demand during dry summers can increase by as much as 60 million gallons per day to meet irrigation loading.
- DOW is drafting lawn irrigation standards and specifications for approval by the Indiana Utility Regulatory Commission



# Conservation Measures Broad Perspective

## ■ Irrigation Technology Standards

- Includes weather-based smart controllers which utilize current climatological data as a basis for scheduling irrigation.
- Requires professionally certified individuals to design, inspect, and install irrigation systems.
- Avoids wasteful overspray (sprinkling the pavement), which can result in discharges into storm and combined sewer systems and reduces pollution runoff.

# Conservation Measures Broad Perspective

- Board of Waterworks Resolution No. 45, 2009 for High Performance Green Building Standards
  - Affects newly constructed utility buildings
  - Designs qualified for Silver LEED-rating and/or two (2) Globes under the Green Globe rating system
  - Opportunities to increase energy efficiency, cost effectiveness, and sets an example for resource conservation



# Conservation Measures Broad Perspective

- Building Fixtures – Plumbing Retrofit Program
  - Developing a pilot program with Delta Faucet Company to partner on improved plumbing fixtures
  - Installing improved fixtures in DOW facilities
  - Improves water use efficiency, reduces water production energy requirements



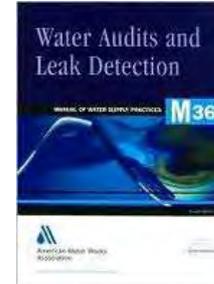
# Conservation Measures Broad Perspective

- Beneficial Re-use of Groundwater
  - Studying the possibility of beneficial reuse of ground water from various sources that can reduce flows into existing Indianapolis combined sewers.
  - Potential of re-using 3-5 MGD that is currently discharged into downtown storm and combined sewers from dewatering wells and sump pumps.



# Conservation Measures Broad Perspective

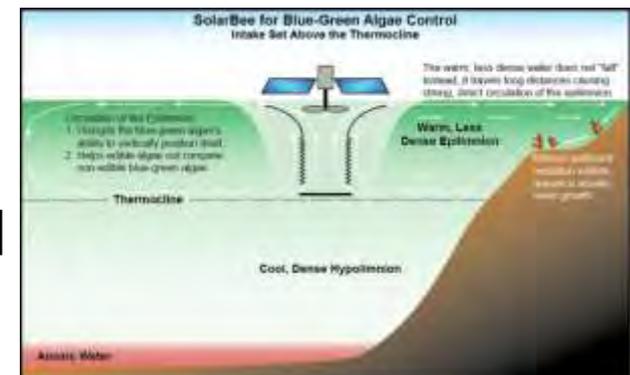
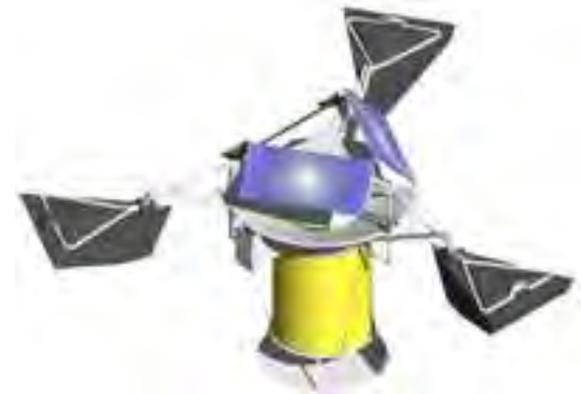
- Improve Leak Detection through Technological Advancements
  - Use new AWWA water audit methodology to track and fix leaks
  - Reduce losses within the water system
  - Measure Indianapolis with benchmarking utility standards nationwide, worldwide



# Conservation Targeted Achievements

## ■ Sustainability Practices

- Conduct energy reviews and audits
- Use specialized equipment to optimize power consumption
- Examine alternative energy sources
- Increase the use of solar powered equipment such as “SolarBee” mixing units



# Conservation Targeted Achievements

- Installation of Variable Frequency Drives (VFD's) on high-service pumping equipment
  - Reduce inefficient power peaks, stabilize electrical loadings, reduce overall “carbon footprint”, eliminate water hammer
- Update construction standards to improve water pipe sterilization guidelines to reduce flushing water needed for new construction

# Conservation Targeted Achievements

- Use improved storage tank cleaning methods – for example, employ robotic cleaning equipment to avoid wasting and draining water storage tanks for maintenance activities



- On-Site Solids Residuals Treatment

- Use of filter presses to treat water treatment facility solids to reduce discharges to city sewer system



# Conservation Future

- Community Water Outreach
  - Rain Barrels
  - Rain Gardens
  - Community Watershed Alliances

Use Water Wisely!

Reduce your water usage by up to 40% using one of these water conservation products...

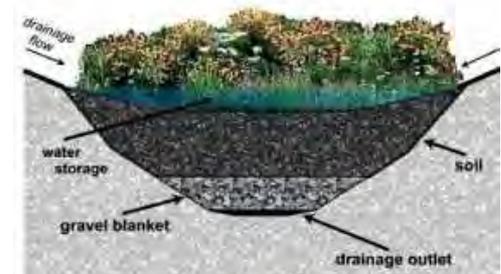
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- “Holistic” Approach to Watershed Management

Cross-section of typical rain garden



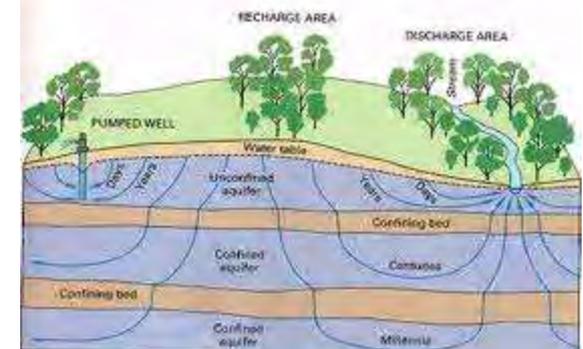
# Conservation Future

- Improved use of “gray” water solutions
  - Reuse/recycle water for non-potable use
    - Irrigation of landscaping
    - Boiler makeup water
    - Industrial process water
    - Steam/chiller system water



# Conservation Future

- Aquifer Recharge
  - Use wastewater treatment plant effluent that currently discharges into White River to recharge confined water treatment plant aquifers
  - Can provide 200+MGD of additional water influence



# Summary

- Water System Goals and Needs Drive More Efficient Water Usage Policies
- Current Conservation Successes are Providing Customers with Diverse Alternatives
- Future Conservation Measures will Improve Options and Further Reduce Water Pollution Impacts

# Questions?

