

# Recycled Water in Denver

DENVER WATER



RECYCLED  
The Right Water

WATER SYSTEM  
The Right Use





## Overview

- **Introduction to Water Reuse**
- **Denver Water's System**
- **Challenges & Opportunities**
- **Future Plans**

# Introduction to Water Reuse

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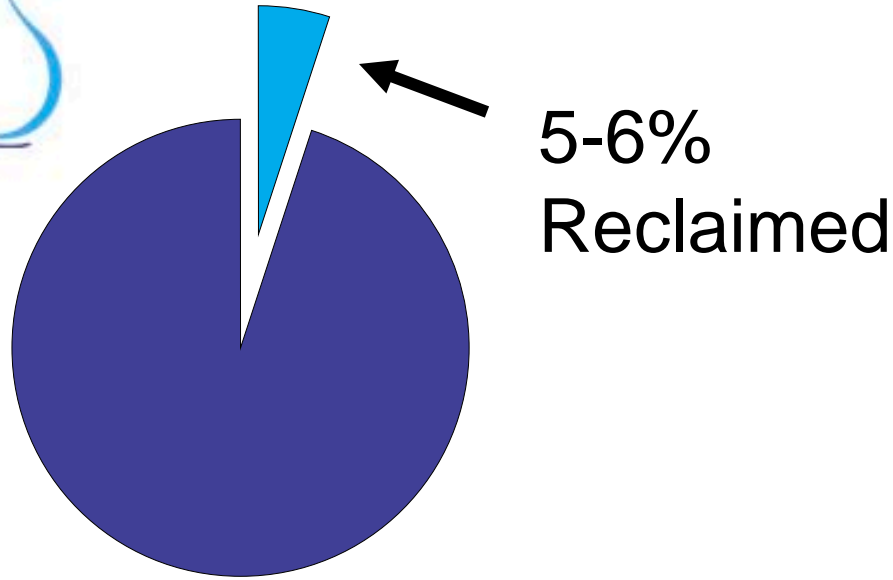


## Why Recycle Water?

- **Enables sustainable growth**
- **Lower rates for customers**
- **Availability during drought**
- **Lessens load on drinking water system**
- **Delays requirement for developing new drinking water supplies**
- **Water law issues**
- **Right water for the right use**



# Potential for Water Reuse

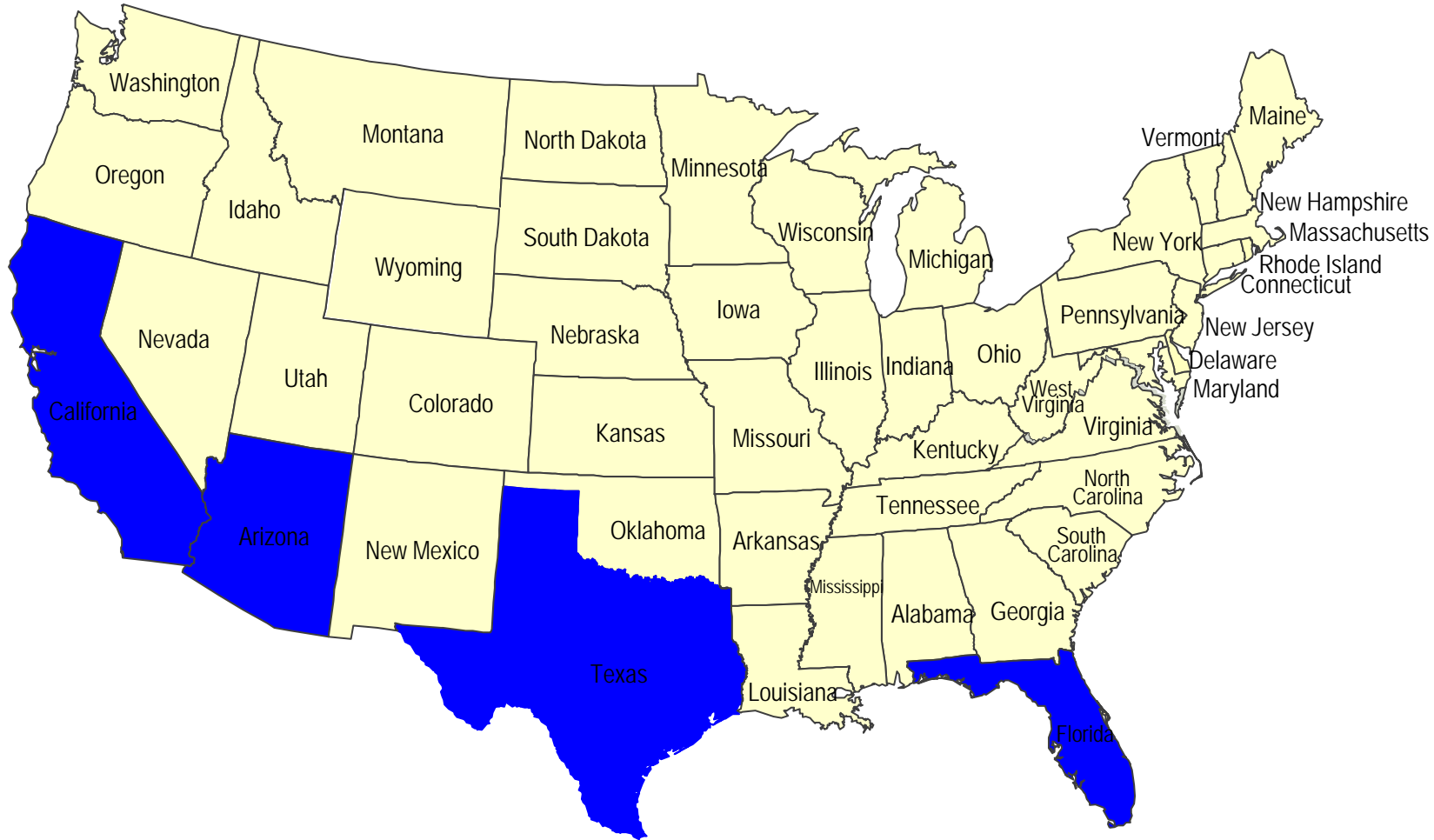


- **1 ac-ft serves 2.5 single-family homes**
- **Implementation costs: \$2k-\$100k/ac-ft**

**35 billion gallons per day wastewater effluent in the U.S.**



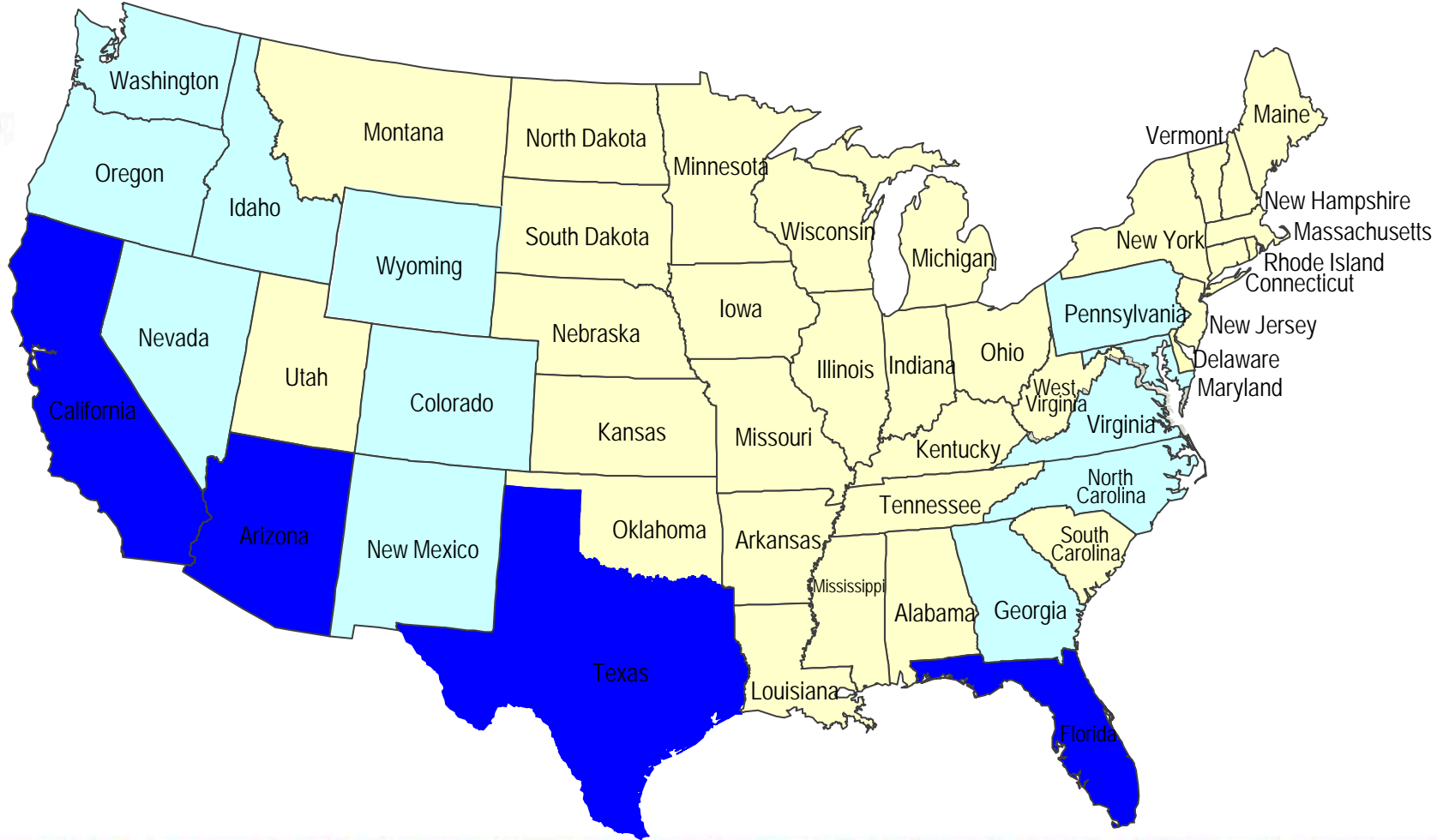
# Most water reuse in the U.S. occurs here...



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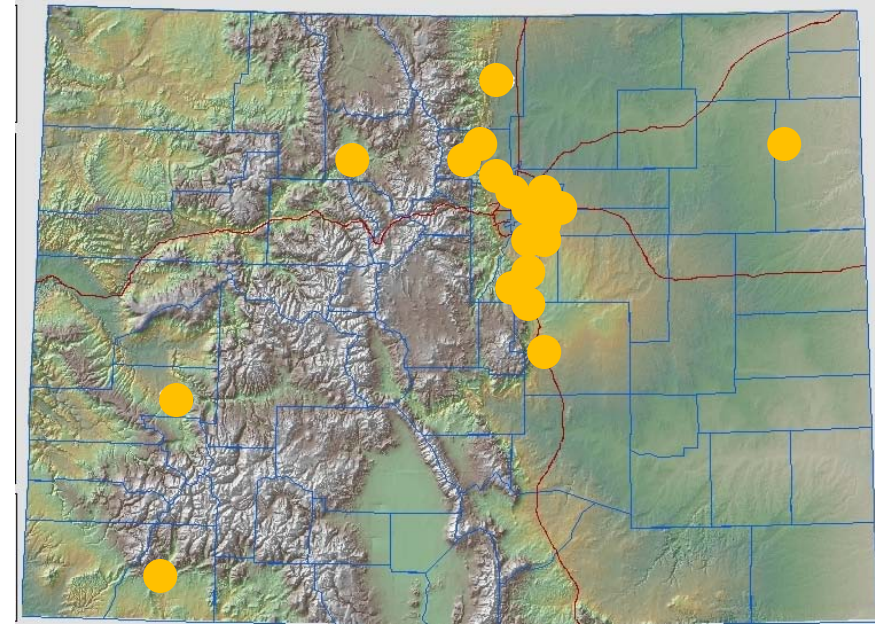
# ...growing in other states



US Office Locations for WRA Members



February 7, 2011



## Nationally

- > 100 years for crop irrigation
- > 70 years for landscape irrigation
- > 40 years for drinking water augmentation

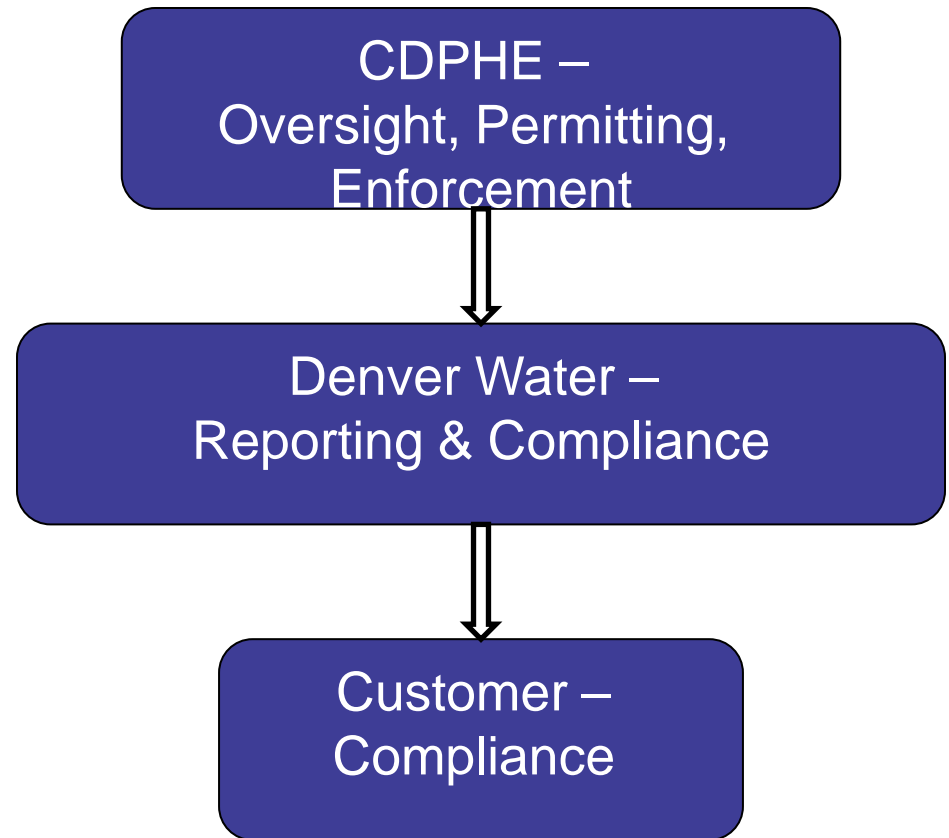
## Locally

- Nearly two dozen communities
- Half a century in Colorado Springs & Aurora
- 7 years in Denver



# Regulations

- **No federal regulations**
- **28 states have regulations**
- **Colorado – Regulation 84**



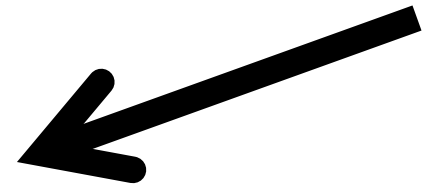


## Types of Reuse

Direct  
Potable

Indirect  
Potable

Non-  
Potable



# Denver Water's System

DENVER WATER



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The Right Water

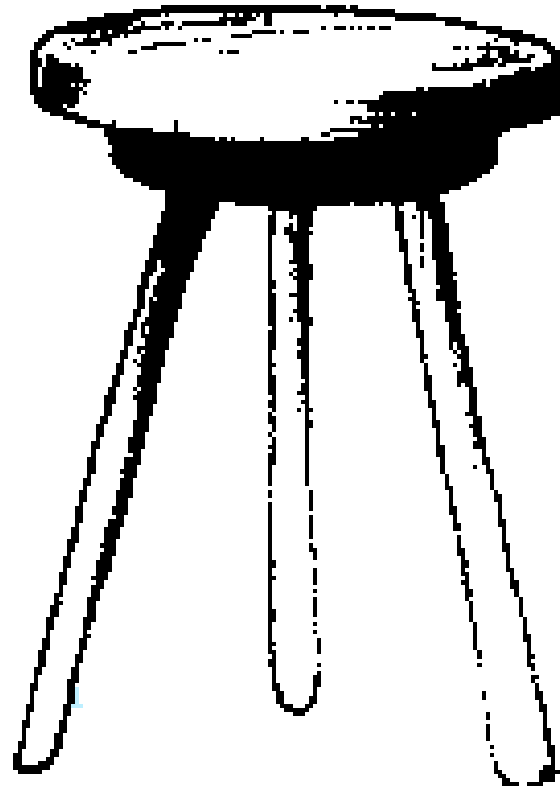
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# Denver's Water Supply Strategy



**Conservation**

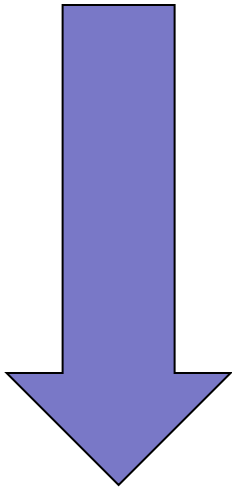
**Recycling**

**New Supply**

DENVER WATER  RECYCLED WATER SYSTEM



**Blue  
River  
Decree**



**1955**

**Successive  
Use Project**



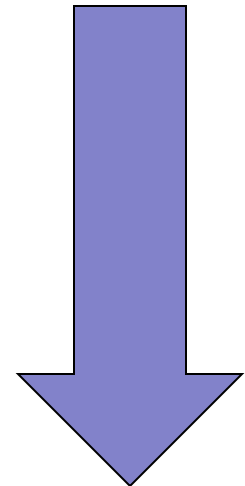
**1960 1970**

**Potable Reuse  
Demonstration  
Project**



**1980 1990**

**Recycling  
Plant  
Commissioned**

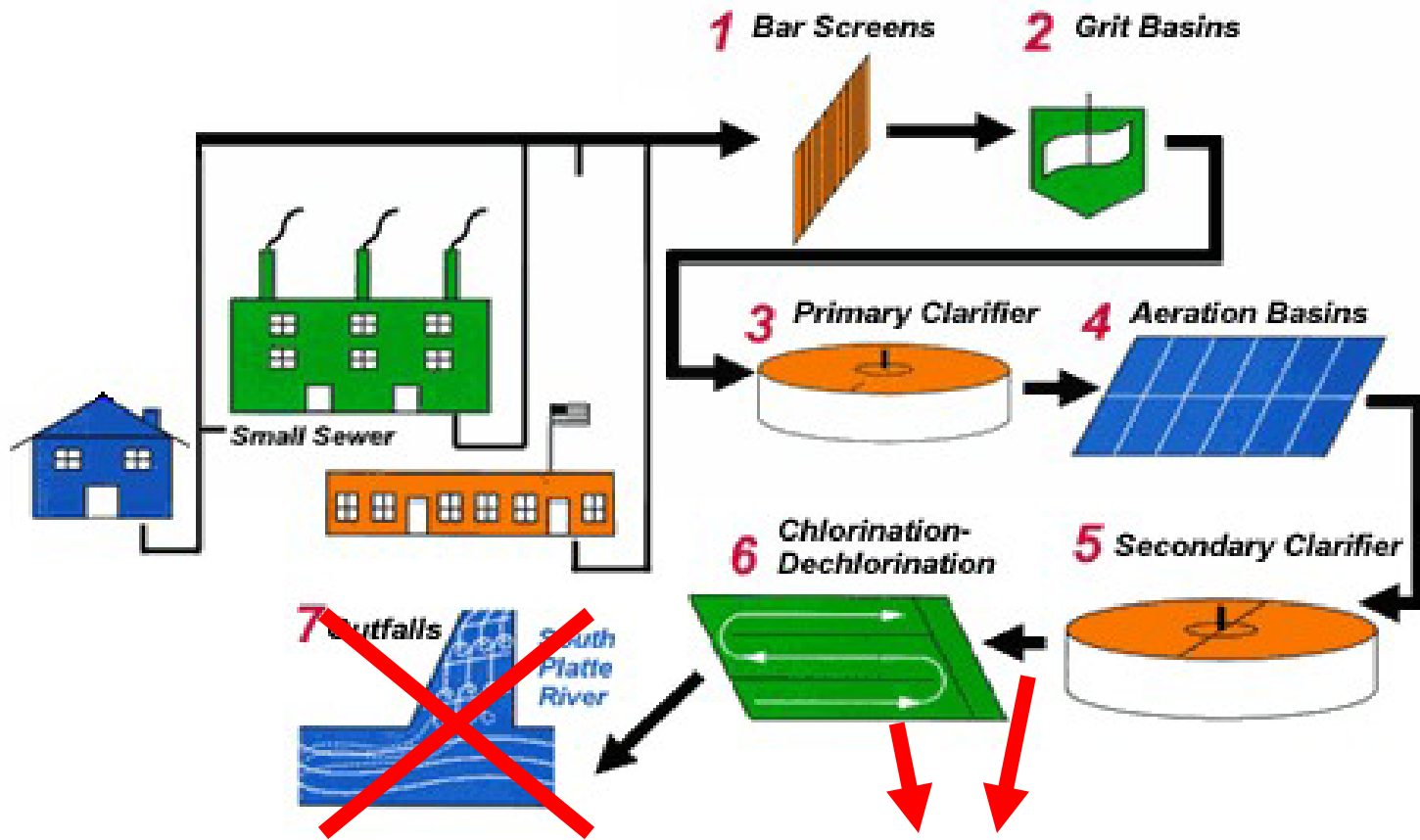


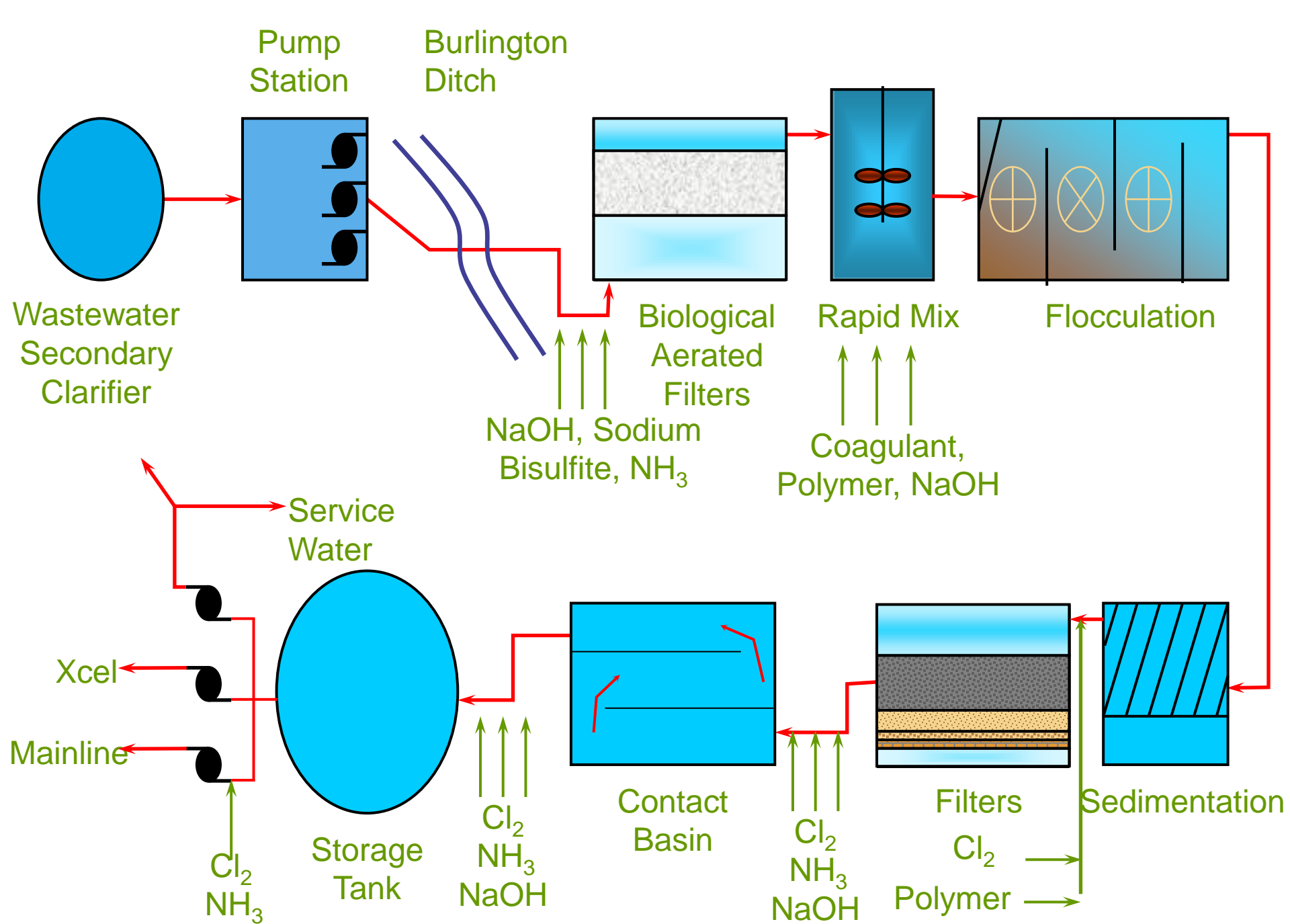
**2004**

**DENVER WATER  RECYCLED WATER SYSTEM**



# Wastewater Treatment Process







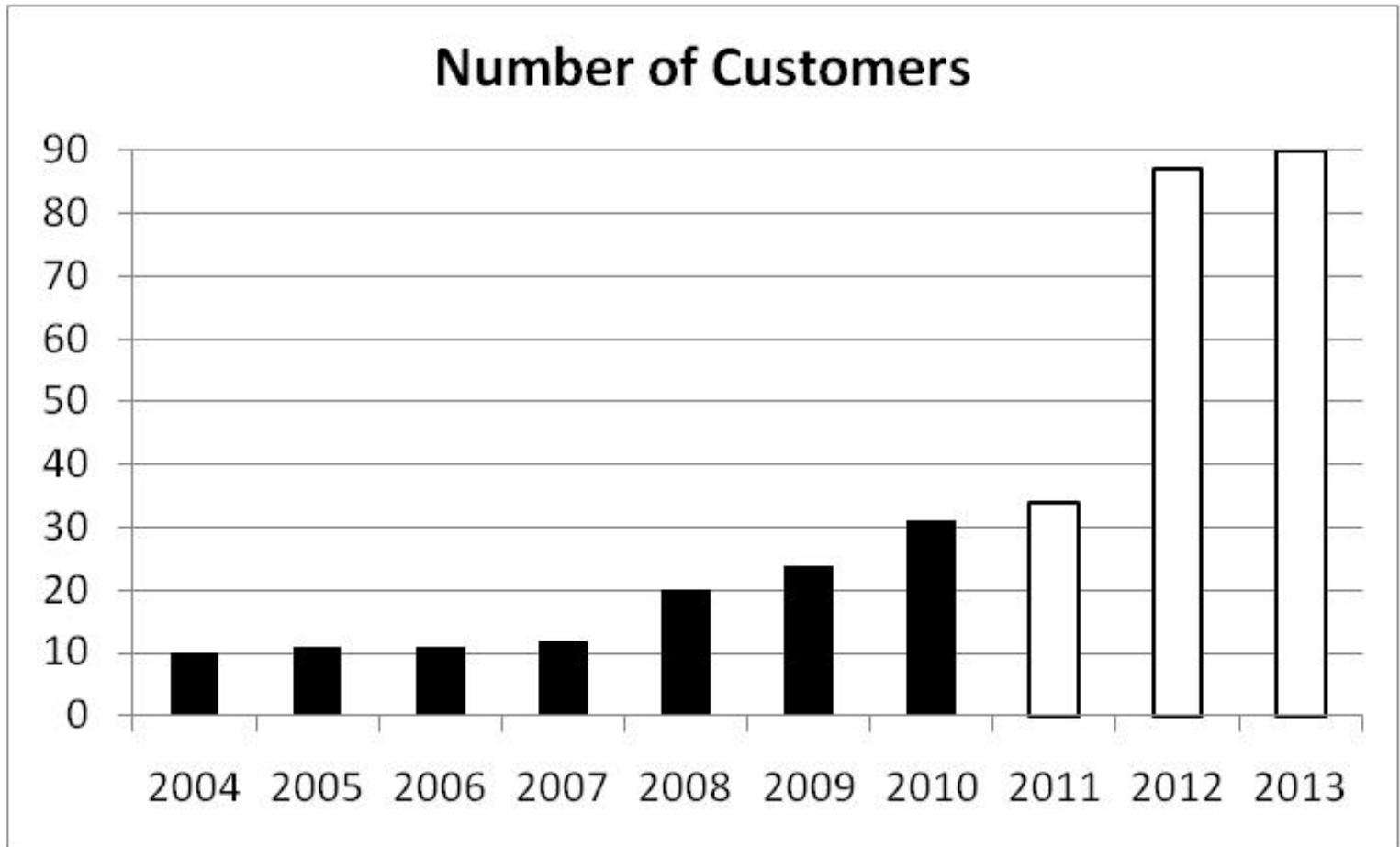




# Current System

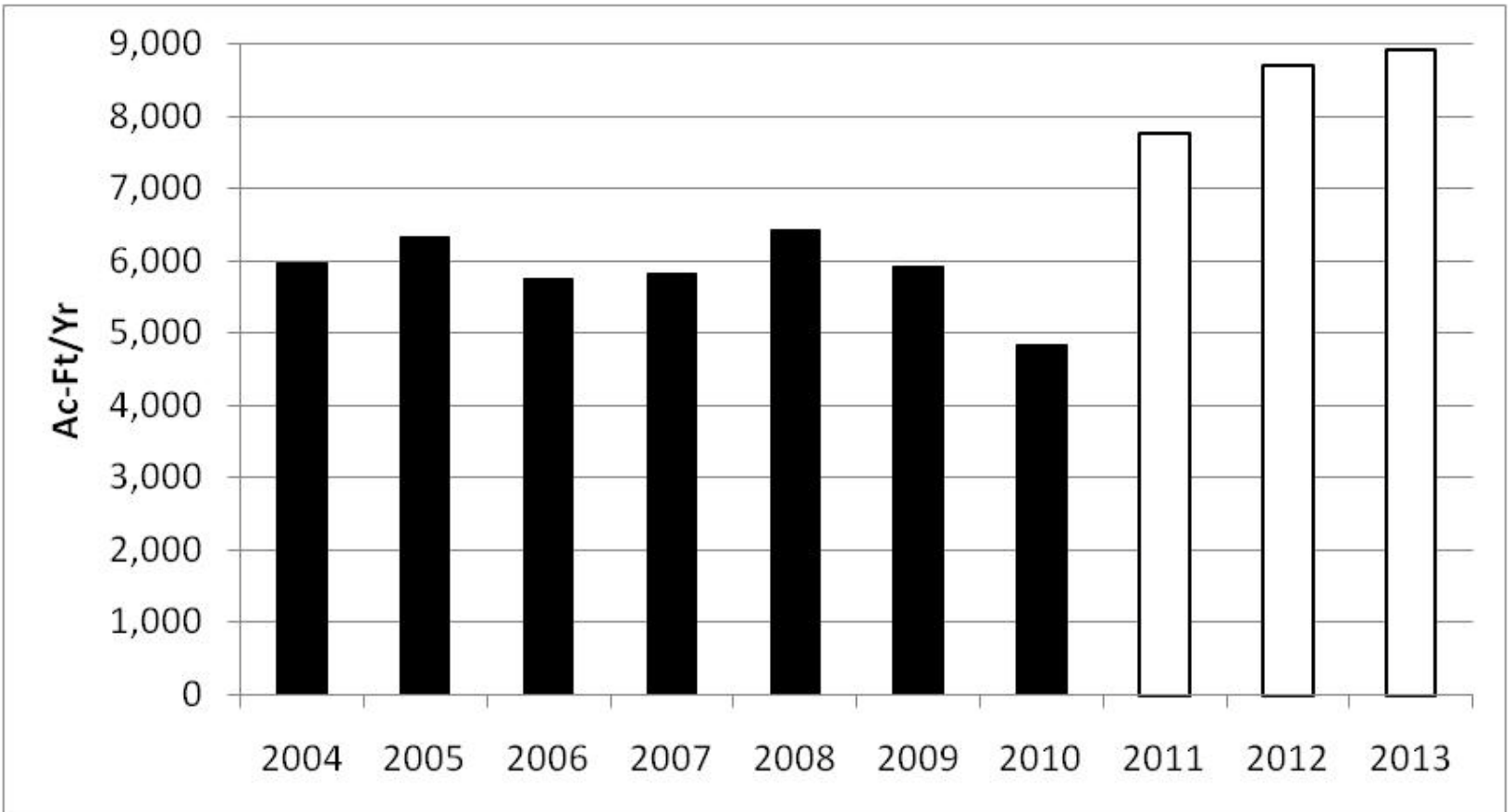


# Number of Customers





# Consumption



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# Challenges & Opportunities

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- **Construction in developed areas**
- **Pumped vs. gravity**
- **Separate wastewater entity**
- **Water quality**
- **Water rights**
- **Irrigator-heavy customer base**
- **Cost**
- **Balance with overall capital program**
- **Policies**
- **Landscape concerns**
- **Public/customer perception**

# Future Plans

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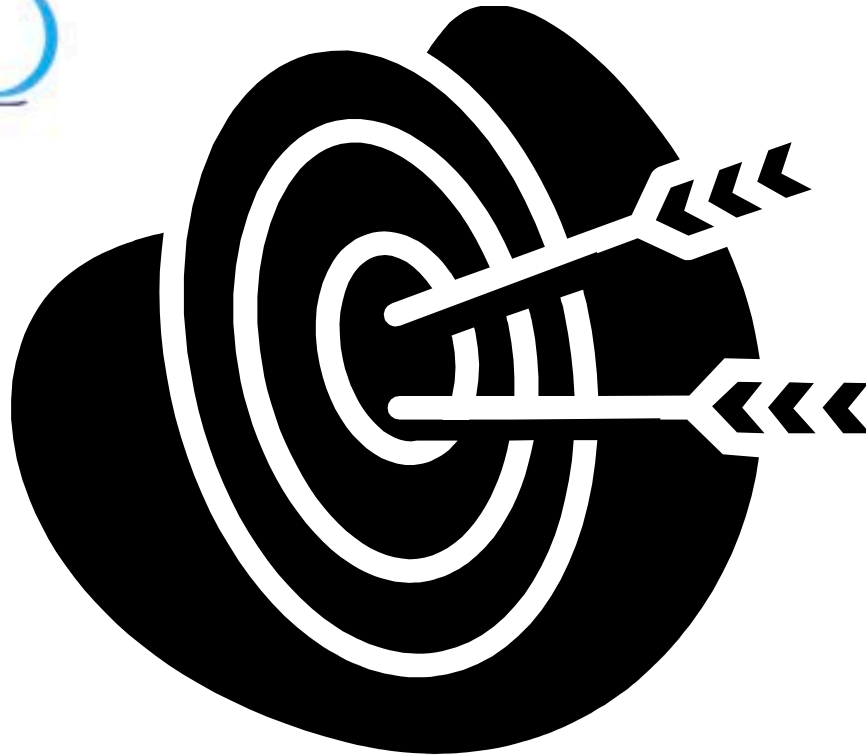
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**17,500 ac-ft/yr**

**Over next decade**

**DENVER WATER & RECYCLED WATER SYSTEM**



# Customer Types

Type of Customer	How Many
Golf Courses	6
Misc. Industrial/Processing	~ 50
Parks	~ 70
School Grounds	~40
HOAs	~ 30



# System at Build-Out

DENVER WATER  RECYCLED WATER SYSTEM



## Benefits of Water Reuse

- **Lessens load on drinking water system**
- **Delays requirement for developing new drinking water supplies**
- **Dependable source of supply**
- **Reliable, consistent quality**
- **Required for sustainable growth**
- **Lower cost alternative**
- **Satisfy water rights requirements**
- **Right water for the right use**



**Questions?**

**DENVER WATER  RECYCLED WATER SYSTEM**