

# The Growing Global Importance of Recycled Water

League of Women Voters of the Bay Area  
Bay Area League Day  
Oakland, California

January 29, 2011

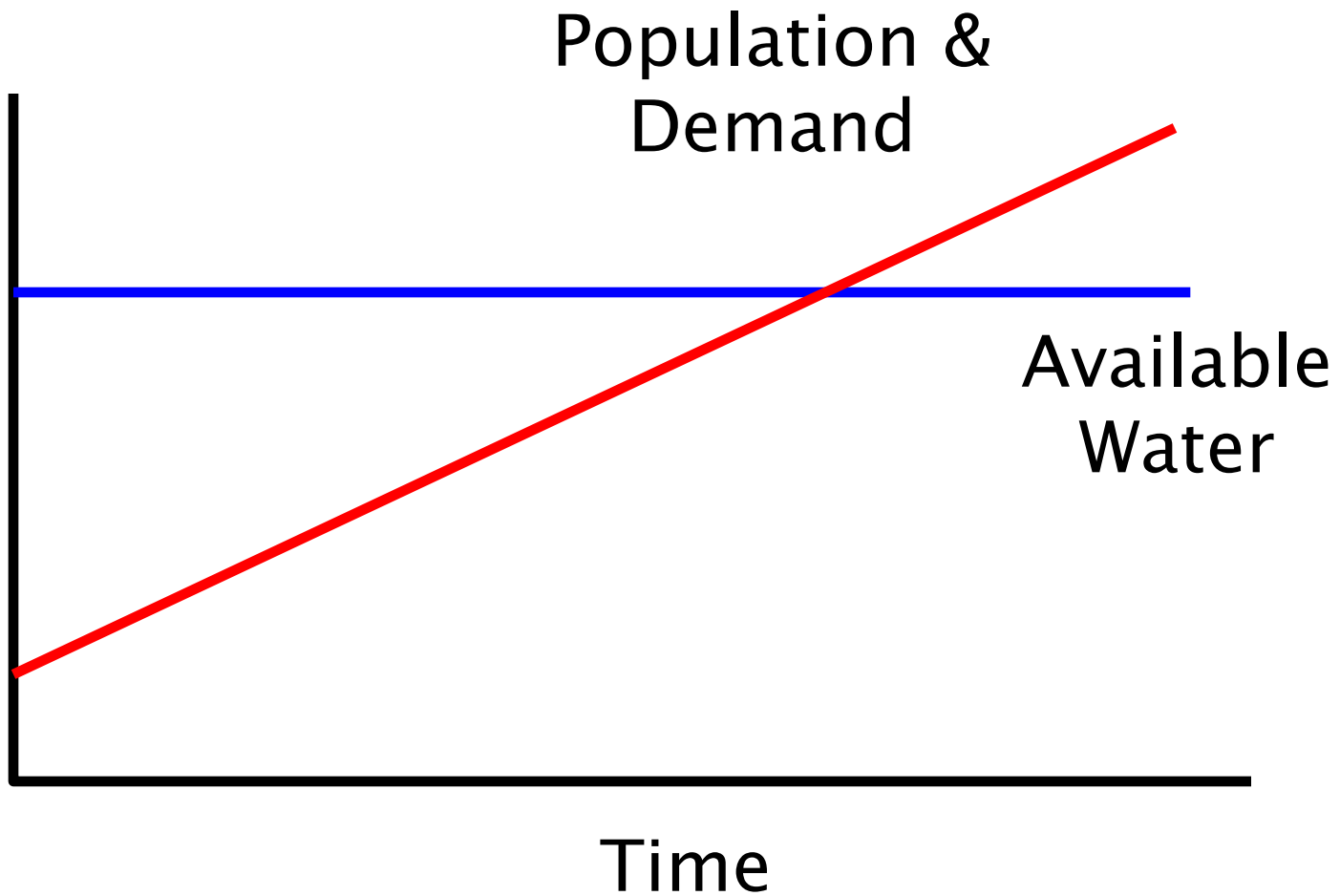


# Presentation Overview



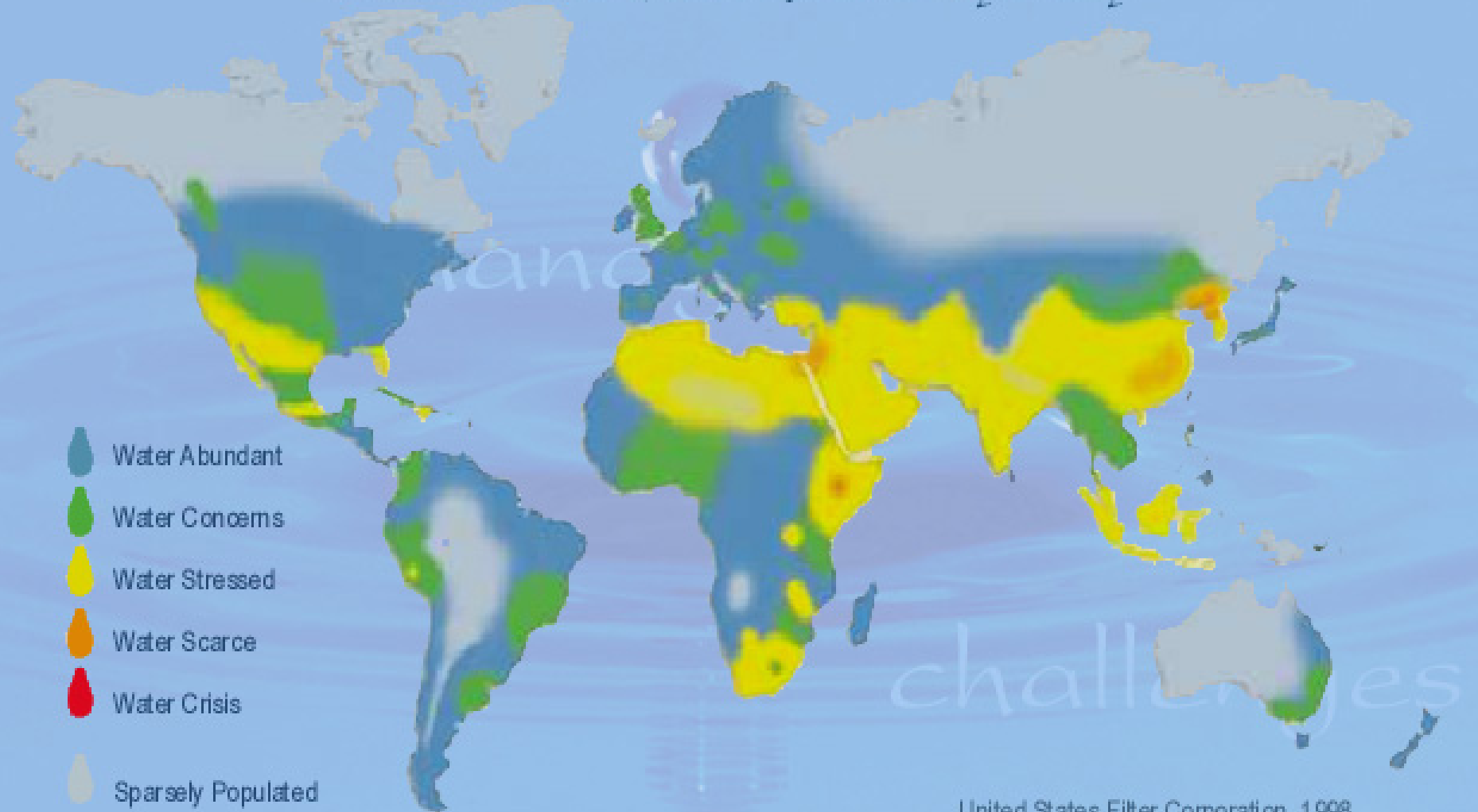
- International water recycling
- Water recycling in the United States
- Major recycled water producers in California
- EBMUD water recycling
- Concluding remarks

# Supply vs. Demand



# Water Areas of Water Stress in 2000

Worldwide Fresh Water Availability Today



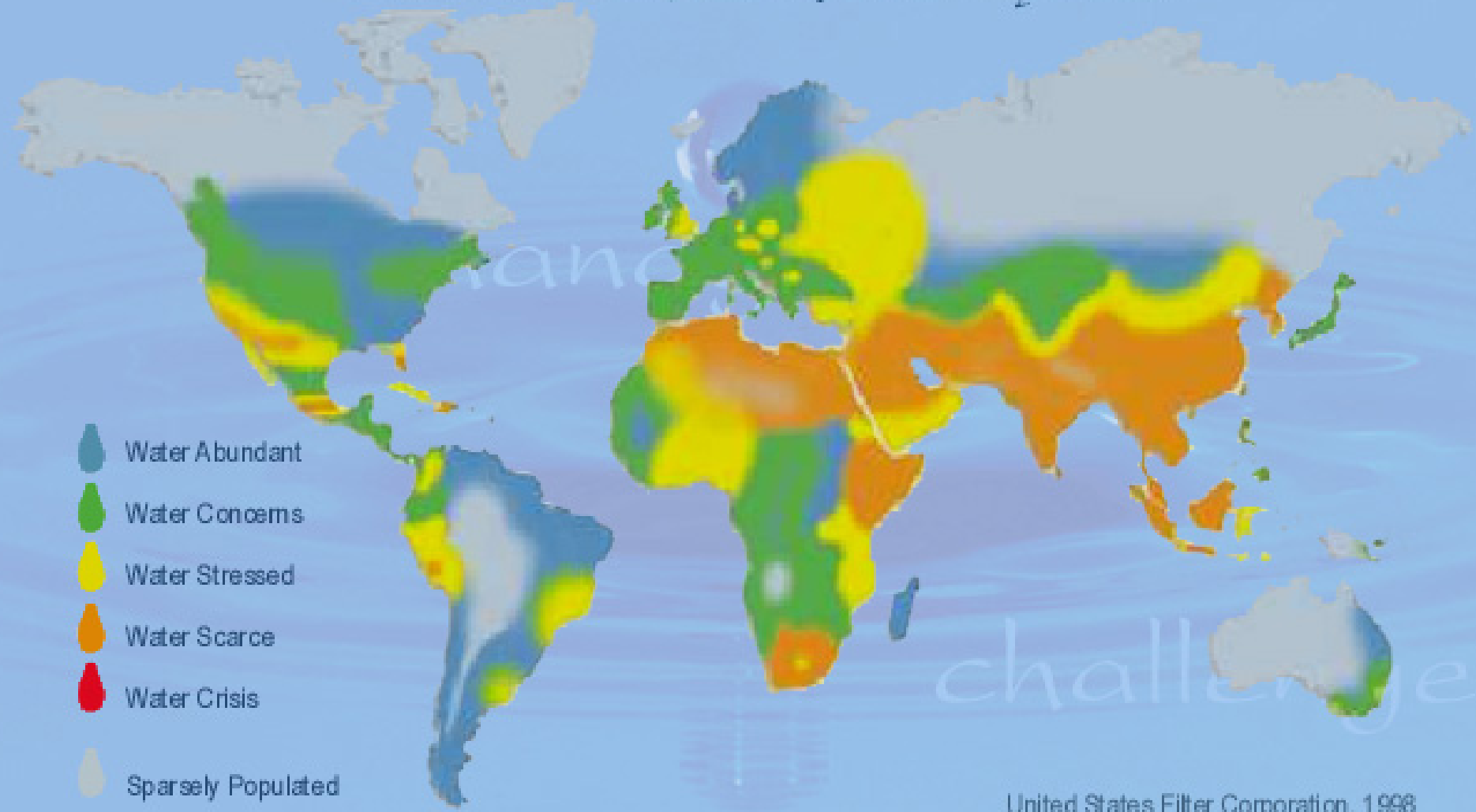
United States Filter Corporation, 1998

Department of the Interior  
Bureau of Reclamation  
Science and Technology Program



# Areas of Water Stress in 2020

Worldwide Fresh Water Availability in 2020



- Water Abundant
- Water Concerns
- Water Stressed
- Water Scarce
- Water Crisis
- Sparsely Populated

United States Filter Corporation, 1998

Department of the Interior  
Bureau of Reclamation  
Science and Technology Program



# Australia



# Singapore



## NEWater Supply



Kranji NEWater Factory (9 mgd)  
Launched in Feb 2003  
Supply to Woodlands  
Wafer Fab Park,  
Senoko & Yishun



Seletar NEWater Factory (5 mgd)  
Launched in Jun 2004  
Supply to Ang Mo Kio  
Industrial Park &  
Serangoon



Kranji

Seletar



Ulu Pandan



Ulu Pandan NEWater Factory  
(Initial capacity 25 mgd)  
To be commissioned by end 2006  
Supply to Central & Western  
parts of Singapore

Bedok

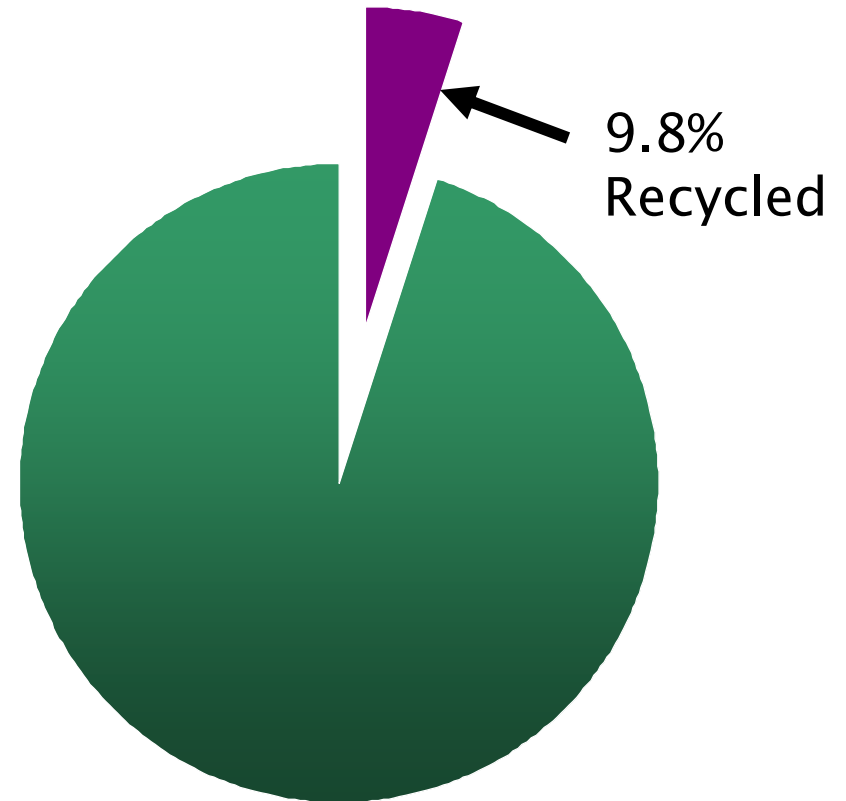


Bedok NEWater Factory (6 mgd)  
Launched in Feb 2003  
Supply to Tampines/Pasir Ris  
Wafer Fab Park, Bedok,  
Chai Chee & Loyang

# Potential for Water Recycling



Approximately 9.8% of municipal wastewater effluent in the U.S.A. is currently recycled



Municipal effluent in the U.S. = about 35 billion gallons/day

# 90% of Water Reuse Occurs in Four States



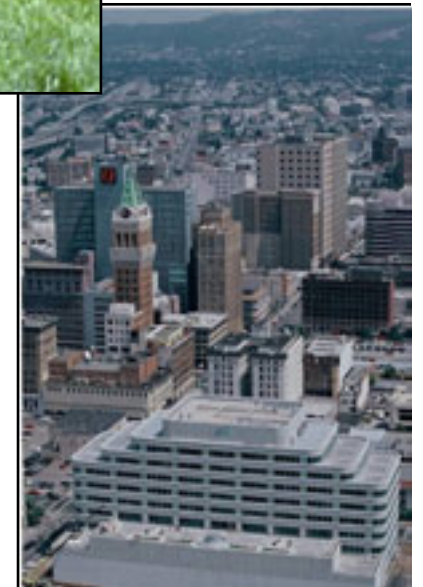
# However, Water Reuse is Growing in Other States



# Typical Recycled Water Uses



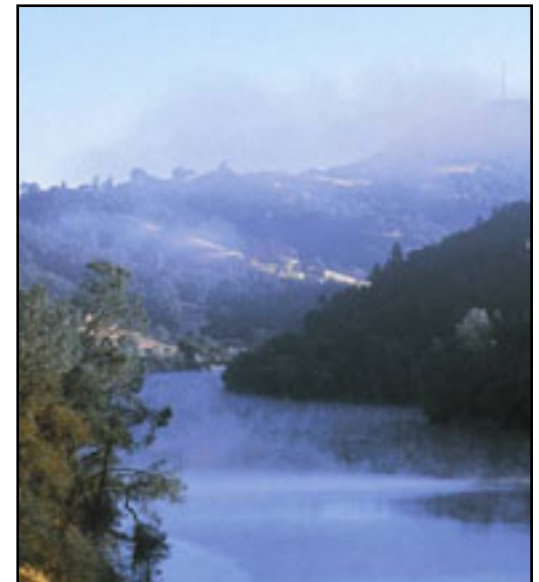
- Landscape irrigation
- Agricultural irrigation
- Industrial and commercial
- Non-potable urban uses (toilet flushing in high-rise offices)
- Environmental uses
- Groundwater recharge
- Potable water supply augmentation



# Benefits of Recycled Water



- Local, dependable water supply
- Sustainable supply
- Drought-resistant or drought-proof
- Reduces wastewater discharges to surface waters
- Reduces need for imported water supplies
- Benefits the environment



# California & Recycled Water



- Early municipal use: San Francisco's Golden Gate Park in 1912 and parks in Pomona starting in 1929
- Major recycled water producers in California:
  - Irvine Ranch Water District (~23 million gallons/day [mgd])
  - Orange County Groundwater Replenishment System (70 mgd > 85 mgd by 2011)
  - Delta Diablo Sanitation District's Recycled Water Facility (13 mgd)
  - South Bay Water Recycling (15 mgd in summer months)
  - Santa Rosa Subregional Wastewater Disposal System (11 mgd)

# Why EBMUD Recycles Water



EBMUD's Pardee Reservoir on March 25, 1977  
with 47,000 acre-feet in storage  
(maximum capacity = 198,000 acre feet)

# EBMUD's Commitment to Recycled Water



## Water Supply Management Program (WSMP)

- Goal set in 1993 for water recycling by **2020**:  
**14 mgd**, saving enough of EBMUD's drinking water to supply the indoor and outdoor needs of approximately **90,000** people per day
- Goal set in 2009 for water recycling by **2040**:  
**20 mgd**, saving enough of EBMUD's drinking water to supply the indoor and outdoor needs of approximately **129,000** people per day

# EBMUD Recycled Water Projects



# EBMUD's Recycled Water Program: *Existing Users*



- EBMUD Wastewater Treatment Plant
- Richmond Country Club
- Chuck Corica Golf Complex
- Harbor Bay Parkway
- Chevron Richmond Refinery:  
Cooling towers (NRWRP) + boiler  
makeup water (RARE Water Project)
- San Ramon Valley RWP (Phase 1)
- East Bayshore RWP (Phase 1A)



**Chuck Corica Golf Complex**



**RARE Water Project/Chevron**

# EBMUD's Recycled Water Program: *Under Construction*



- San Ramon Valley Recycled Water Project  
(Phases 2 – 4)



# EBMUD's Recycled Water Program: *Proposed Projects*



## WSMP 2040: Identified possible future projects

- Expansions of existing projects
- New projects, e.g., ConocoPhillips Refinery; Pleasant Hill area sites in partnership with Central Contra Costa Sanitary District
- Possible satellite treatment plants



# Concluding Remarks



- Opportunities for water recycling are numerous as population and demand for water increase
- Water recycling is growing in the U.S.A. and other regions of the world
- Planners: Make sure recycled water is on your radar screen
- Public support of recycled water is essential to its increased use!

# Contact Information



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RECYCLED  
■ WATER ■  
PROGRAM