

Making the Right Choices

Shifting to Renewable Supplies

Presented to:

Water Resources Research Center

2007 Water Conference

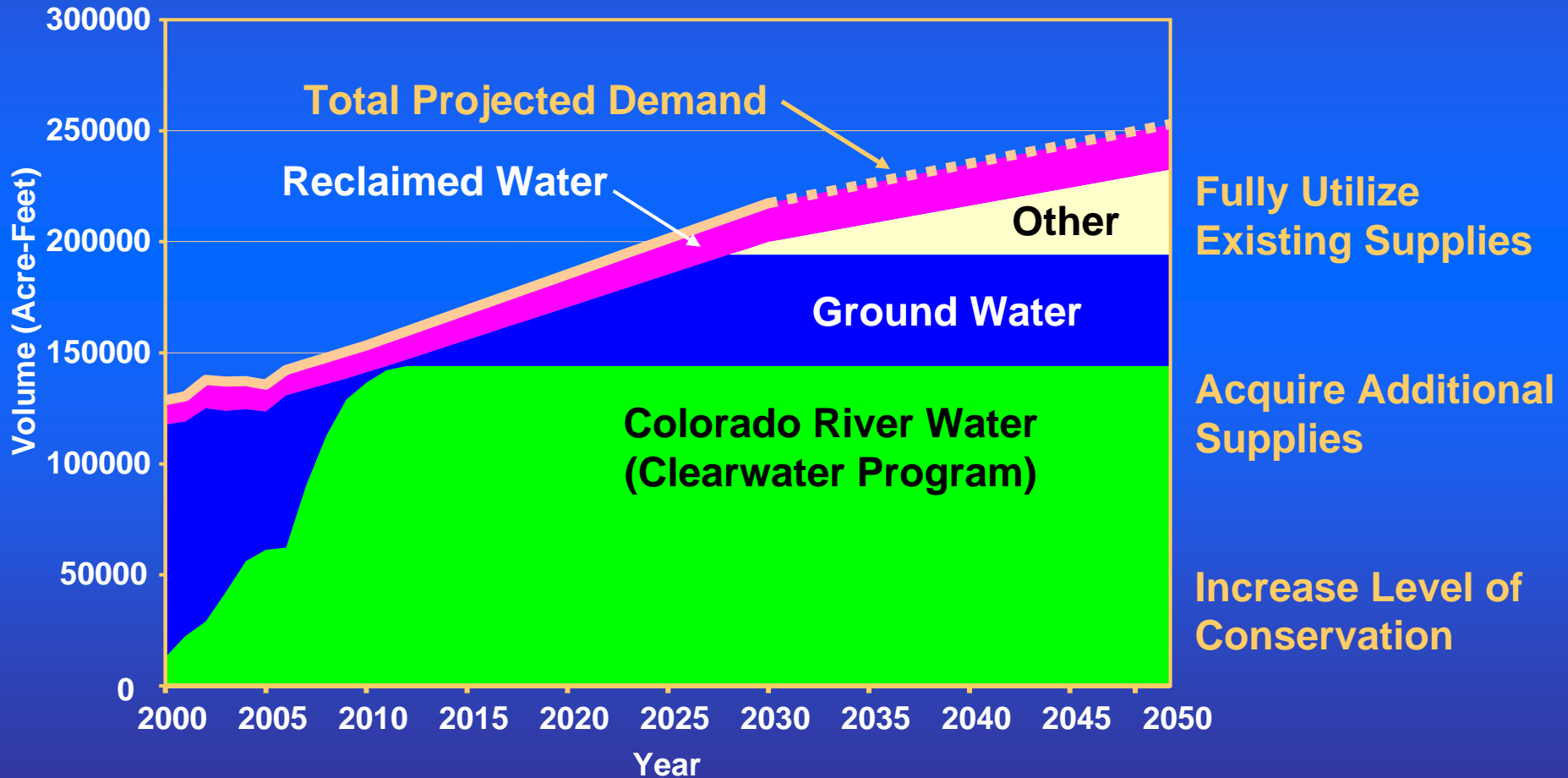
June 5, 2007

David V. Modeer

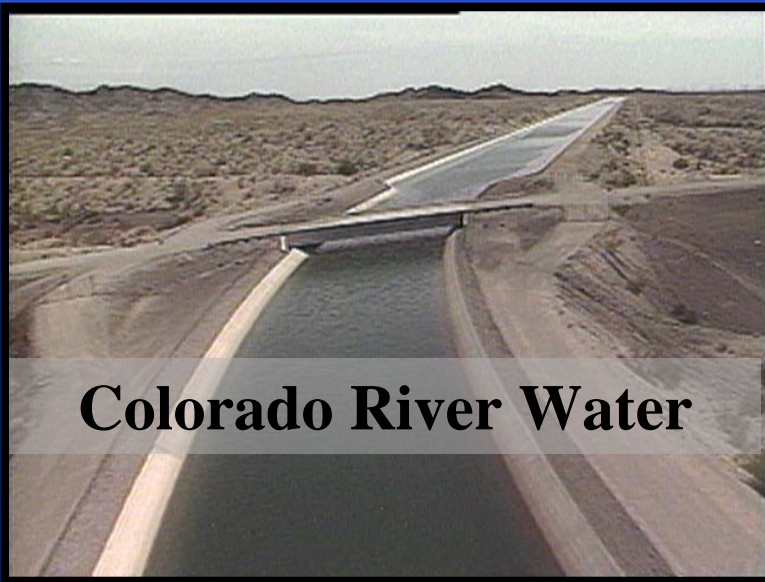
Director – Tucson Water



Projected Demand and Resources 2000-2050



The Need to Shift to Renewable Water Supplies



Colorado River Water



Renewable Groundwater



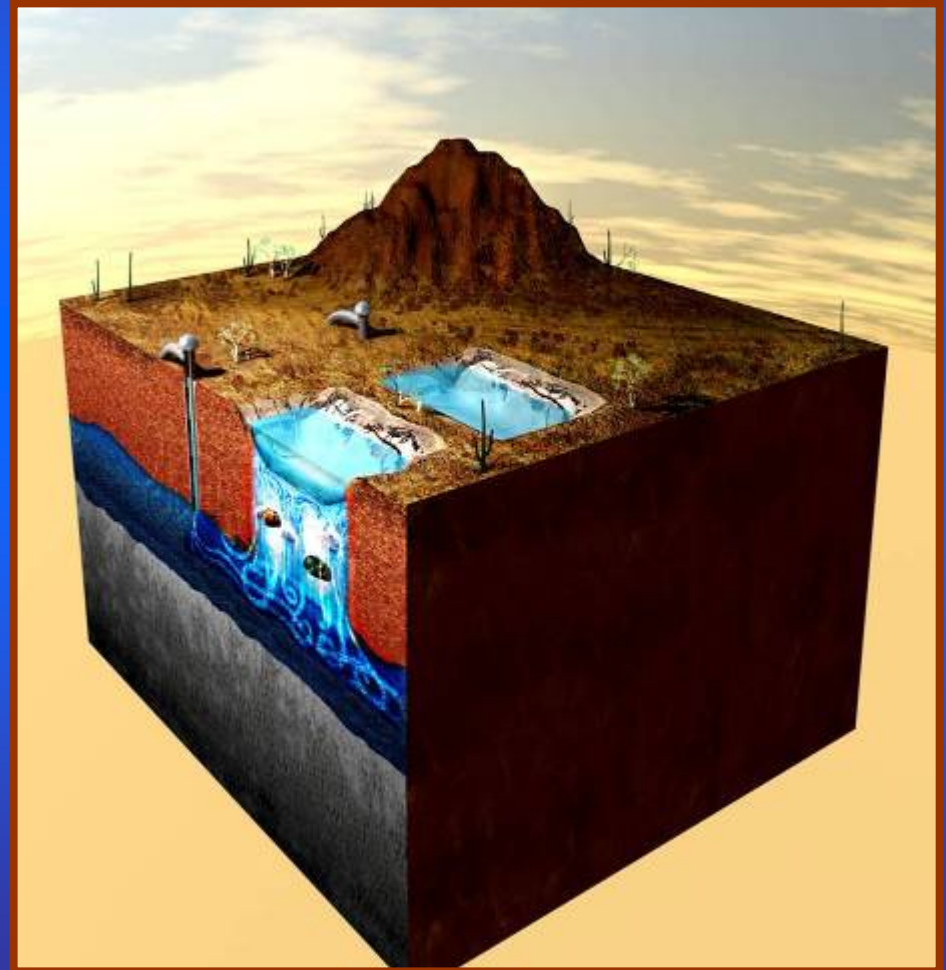
Wastewater Effluent

Clearwater Program



Central Arizona Project

Recharge and Recovery



Benefits of CAP Recharge

Problems with Direct Treatment:

Operational problems with introduction of CAP
Recharge instrumental in regaining public trust

Water Quality:

Bacteria and organics removal
Chlorine disinfection v. other methods

Flexibility:

Buffers changes in CAP water quality
Water banking with wet-water recovery

Reliability:

Drought Resistance

TDS Levels are Rising



Colorado River Water
Recharged to Date
340,000 Acre-Feet

Recovered Blend
TDS Rising 5%/year

Mineral level to
reach 450 in 2011
and keep rising

Asking Customers the question: *“Is that OK?”*

A Key Community Decision

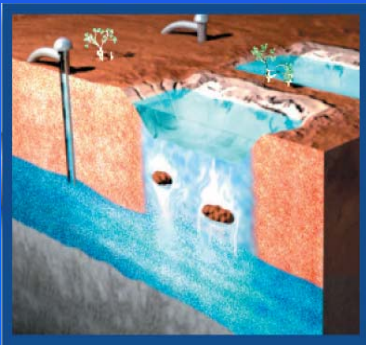


**Mineral Levels in
the Clearwater
Blend**

Reduce minerals or allow natural increase?

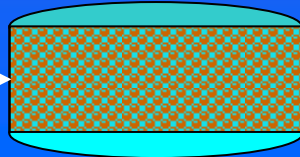
Due Diligence Research on Treatment Technologies

Recharge & Recovery

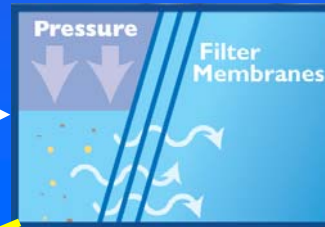


Ion Exchange
(Barium Removal)

30%



Reverse Osmosis
(Mineral Removal)



Potable Water

Blend

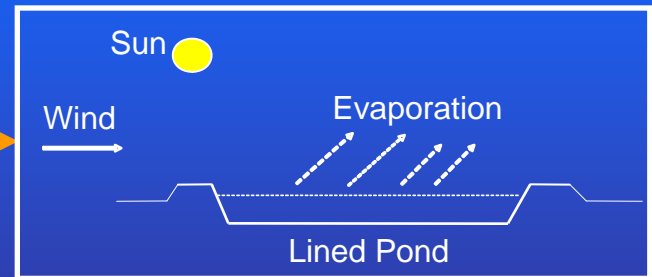
Concentrate

Potable Water



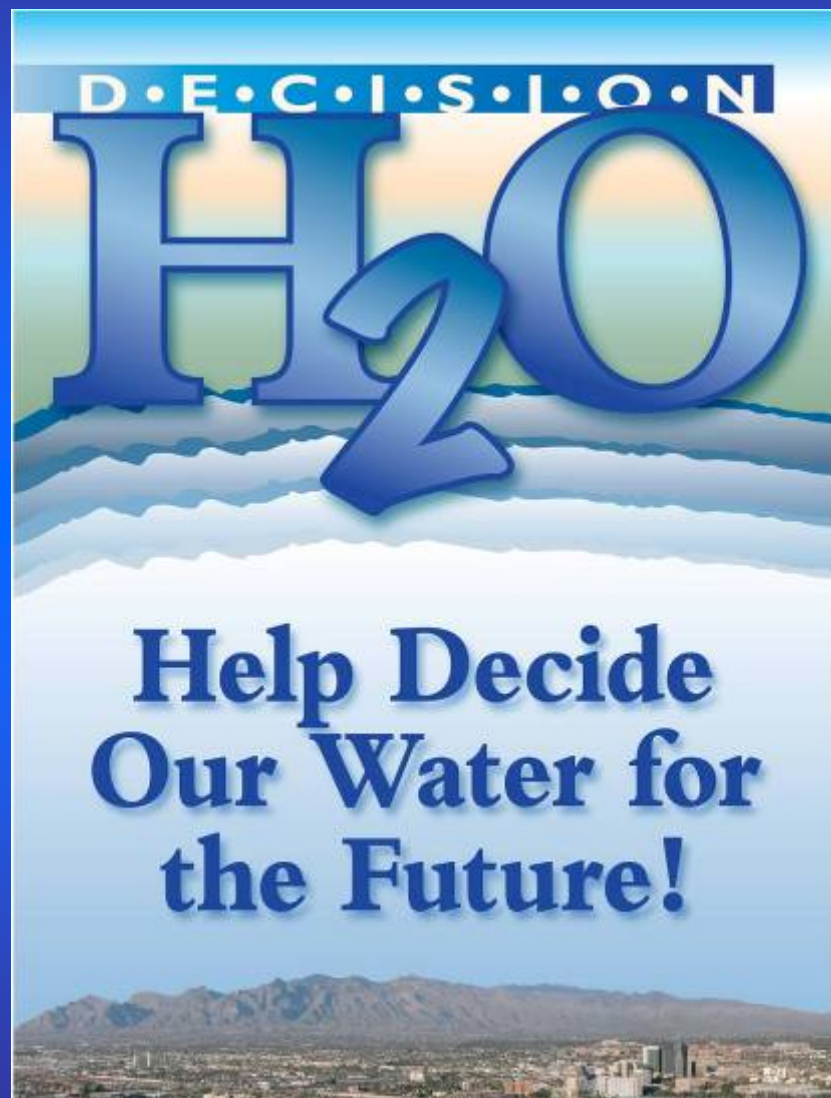
VSEP®
(Enhanced Water Recovery)

Mineral Brine



Evaporation Ponds
(Mineral Collection/Disposal)

The Decision H2O Program



Campaign Objectives

- Educate about need for Colorado River Water
- Inform about rising TDS levels and impacts of mineral control
- Provide opportunities to taste and learn
- Gather consumer preferences

Determining Customer Preferences

Consumer testing carried out at three different levels:



Flavor Profile Analysis



Consumer Panels

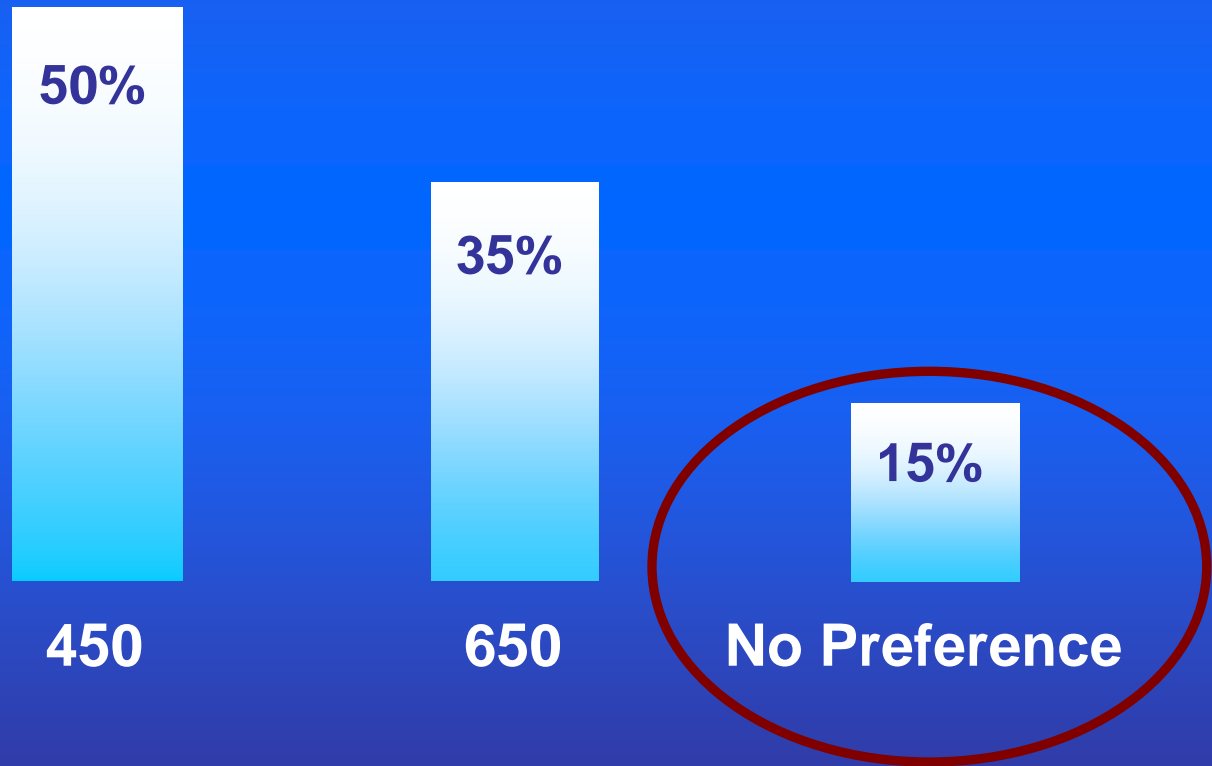


Mall and Traveling Kiosks



Decision H2O Campaign Results

High Interest in Mineral Issues, but...



Total Customer Responses - 14,000



Next Steps

Further evaluation of :

- **Customer response data**
 - Do income levels affect the mineral control decision?
 - Where should the 15% “No Preference” be placed?
- **Treatment technology and Cost**
 - Bench scale testing
 - Literature and industry experience with alternate technologies
- **Sustainability issues**
 - Energy usage/Carbon footprint
 - Water loss of mineral control vs home softening

A Renewable Water Resource Wastewater Effluent



Approximately 50%
of all water used in
our homes becomes
effluent



Wastewater Treatment Plant and Sweetwater Wetlands

Today, 30% of Our Effluent Becomes Reclaimed Water for Irrigation

Current customers:

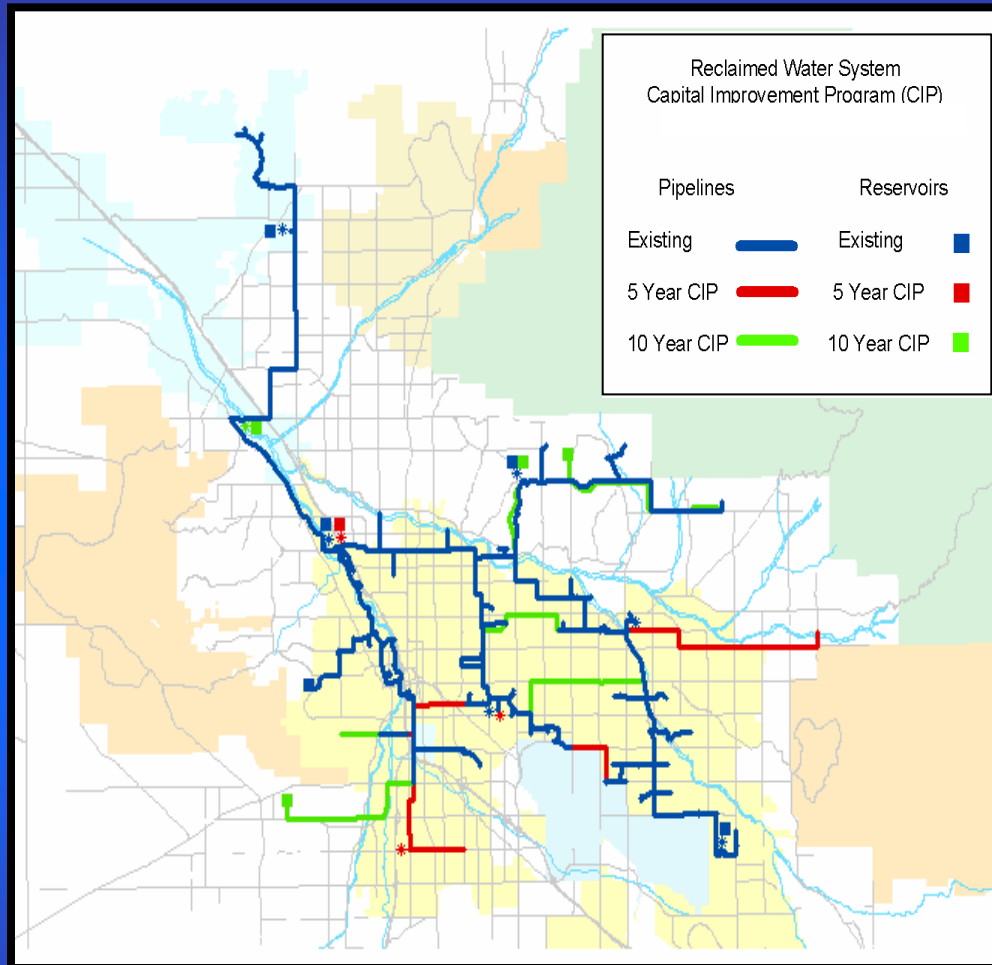
- 19 golf courses
- 30 parks
- 40 schools
- 600+ residential & commercial facilities



Supply grows with population



Expanding the Reclaimed Water System



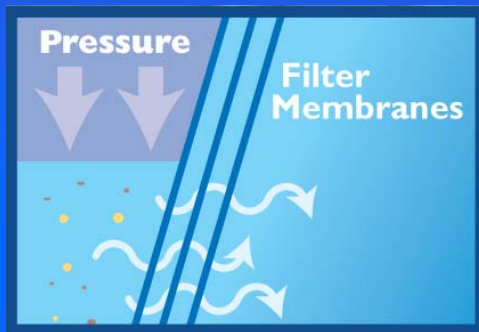
Expensive

**Rapidly
reaching point
of diminishing
returns**

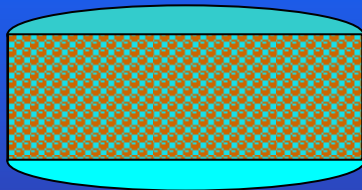
**Reduces other
reuse
opportunities**

Research on Effluent Reuse Treatment Technologies

Reverse Osmosis or other membrane filtration



+



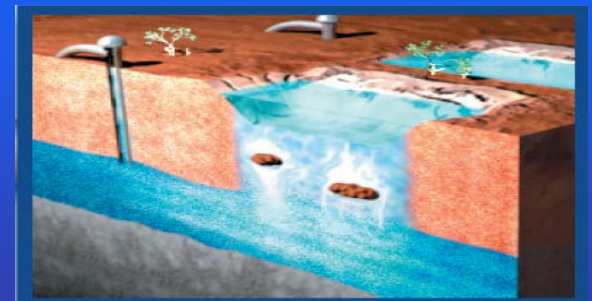
Enhanced Filtration or other treatment for emerging contaminants

To be used for...

Recharge Only For Long-Term Storage



OR



Recharge and Recovery as Blend for Potable Use

Making the Right Choices

Solutions Require Collaborative Partnerships

- Water Providers
- Community Leaders and Citizens
- State and Federal Agencies
 - ADWR
 - ADEQ
 - CAWCD
 - BOR

Our Goals

Reliability

Sustainability

Collaborative Decision
Making

Appropriate
Investments

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Questions?



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