

Potable Reuse in California: Lessons Learned and the Path Forward

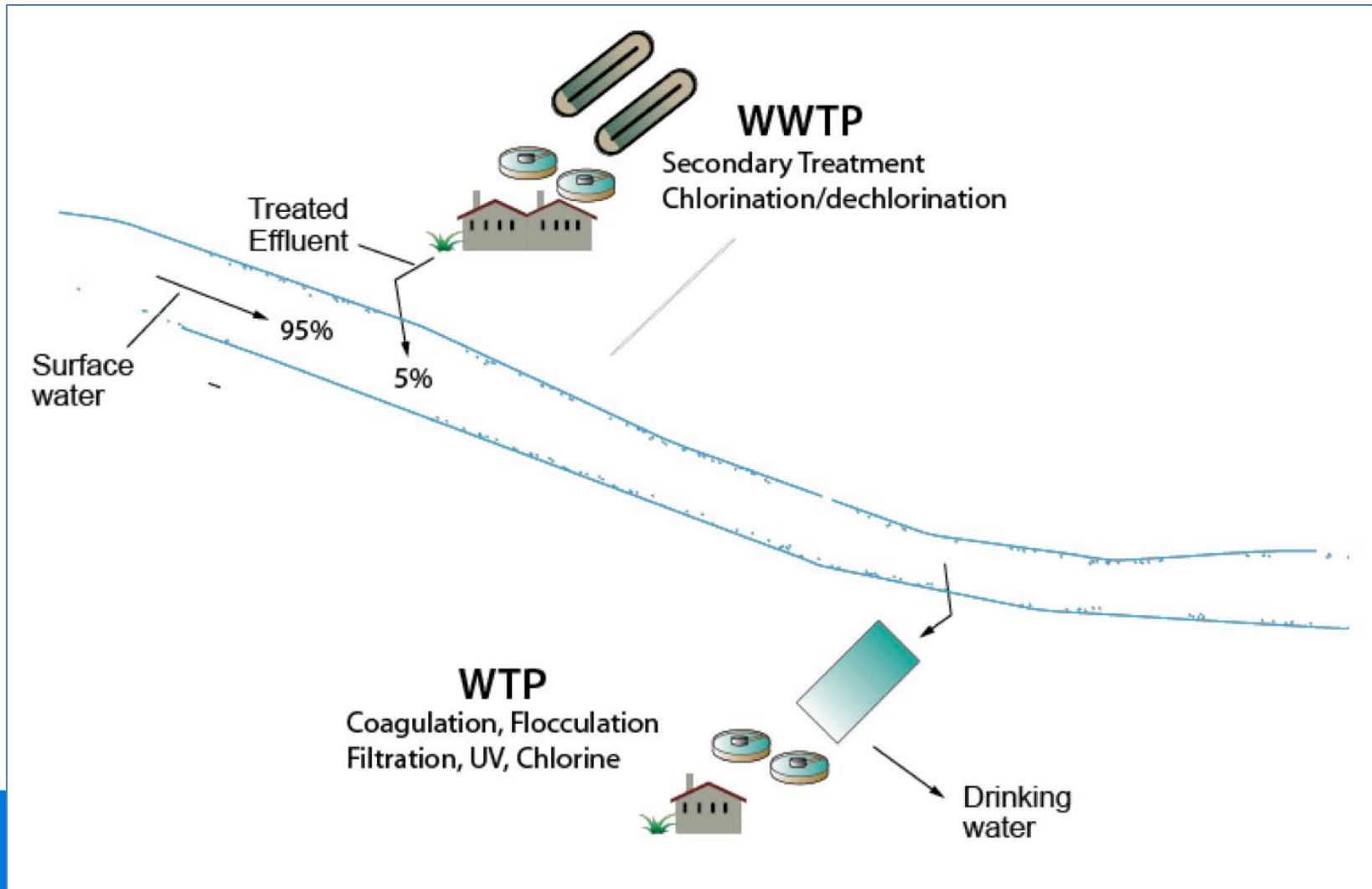
Shane Trussell, Ph.D., P.E., BCEE

San Diego Water Board Meeting

Mission Viejo, CA

February 11, 2015

De facto Potable Reuse



Indirect Potable Reuse (IPR)



Source Control



WWTP



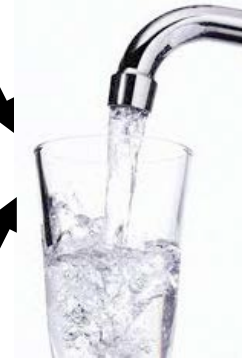
Advanced Water Treatment



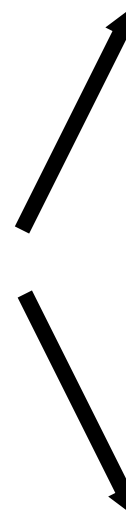
Aquifer Injection / Spreading



Surface Water Augmentation



WTP / Distribution



Direct Potable Reuse (DPR)

Existing surface water supply



Raw (or Source) Water Augmentation



WTP / Distribution



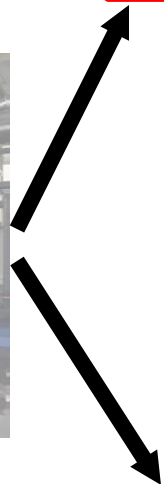
Source Control



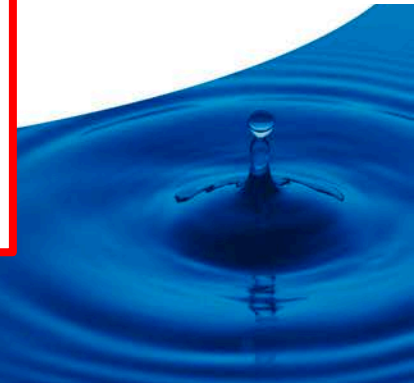
WWTP



Advanced Water Treatment



Flange-to-flange

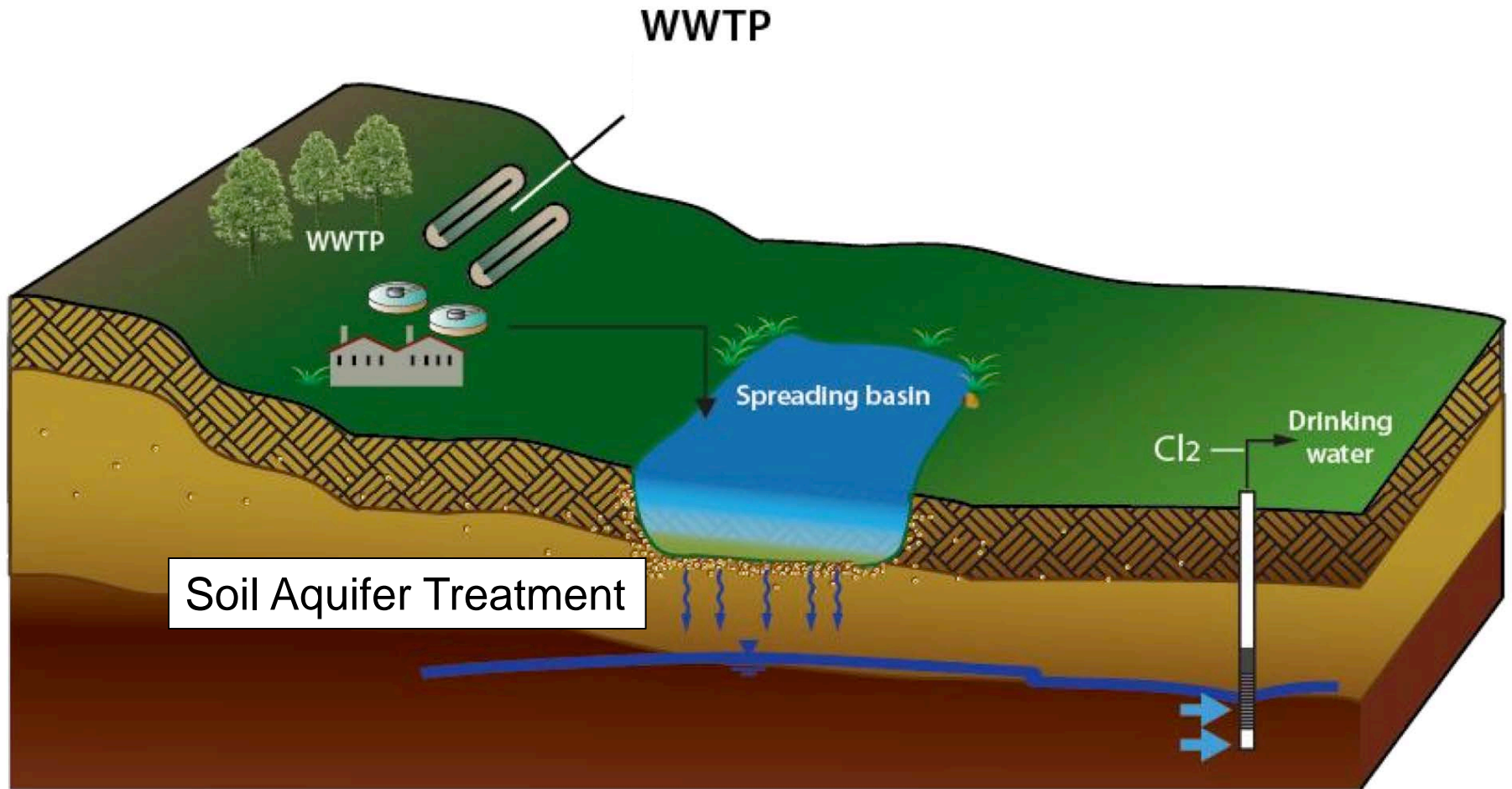


Current CA Potable Reuse Projects

- All are **IPR projects** doing **groundwater recharge**
- 7 existing projects



Groundwater Recharge: Surface Spreading



Biological Treatment

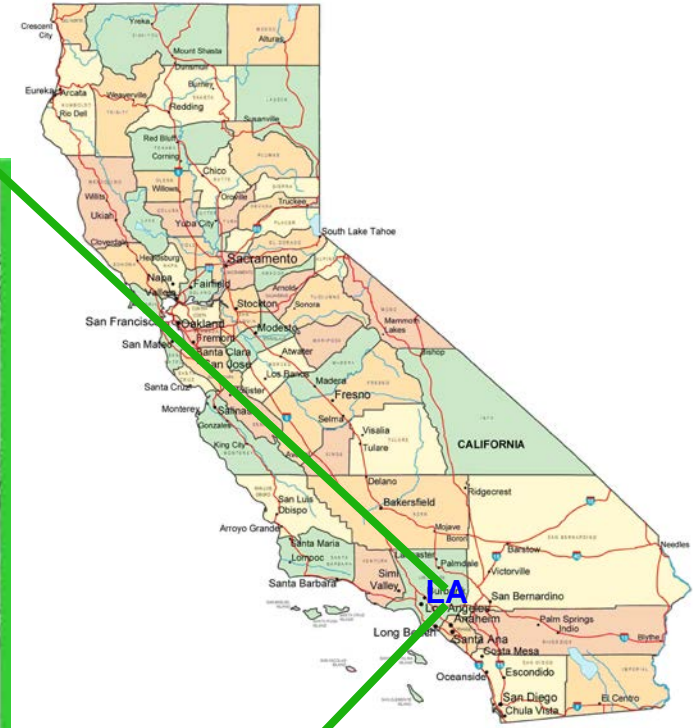
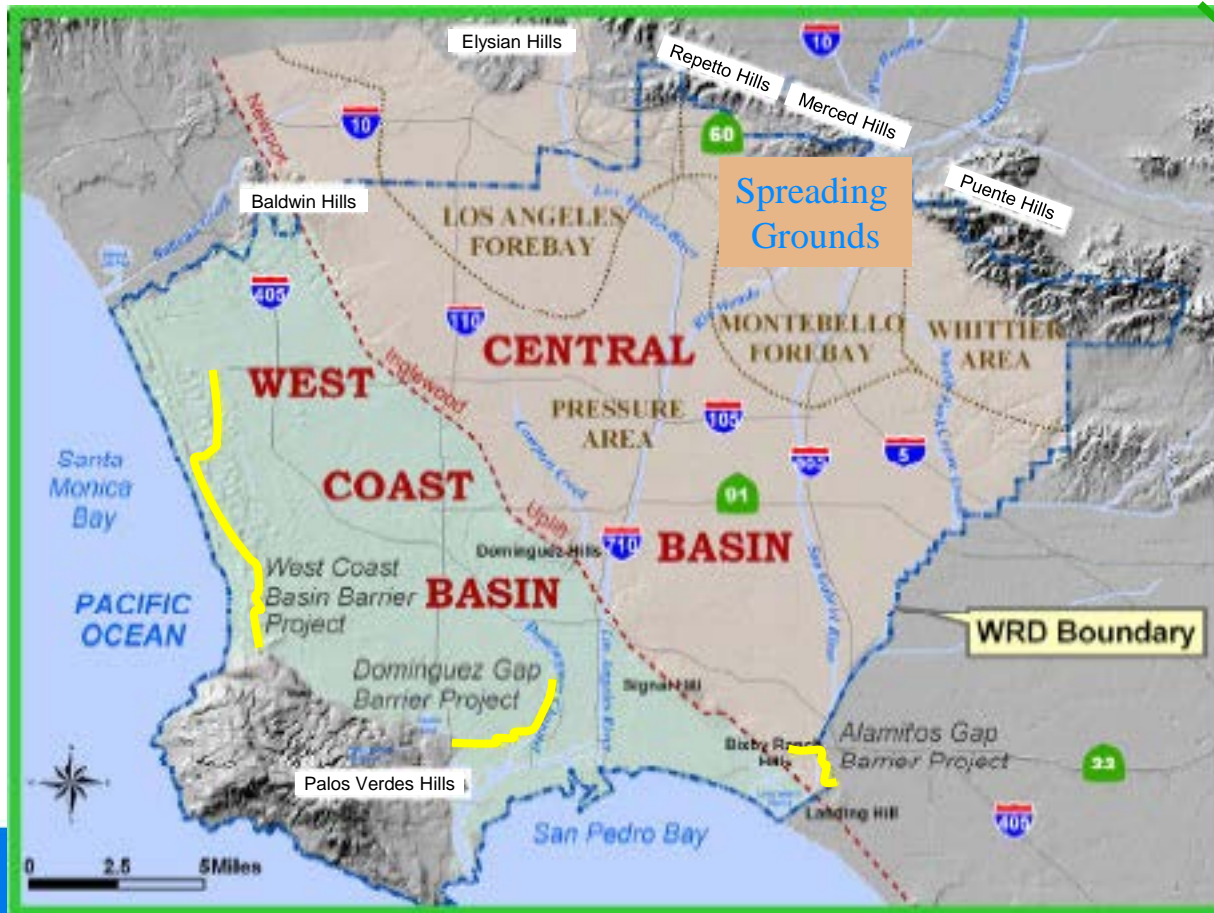
Granular Media Filtration

Disinfection

Soil Aquifer Treatment

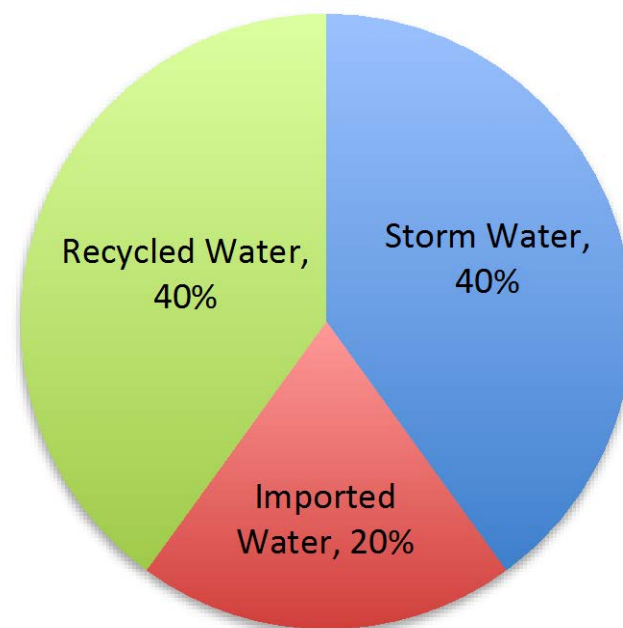


Montebello Forebay

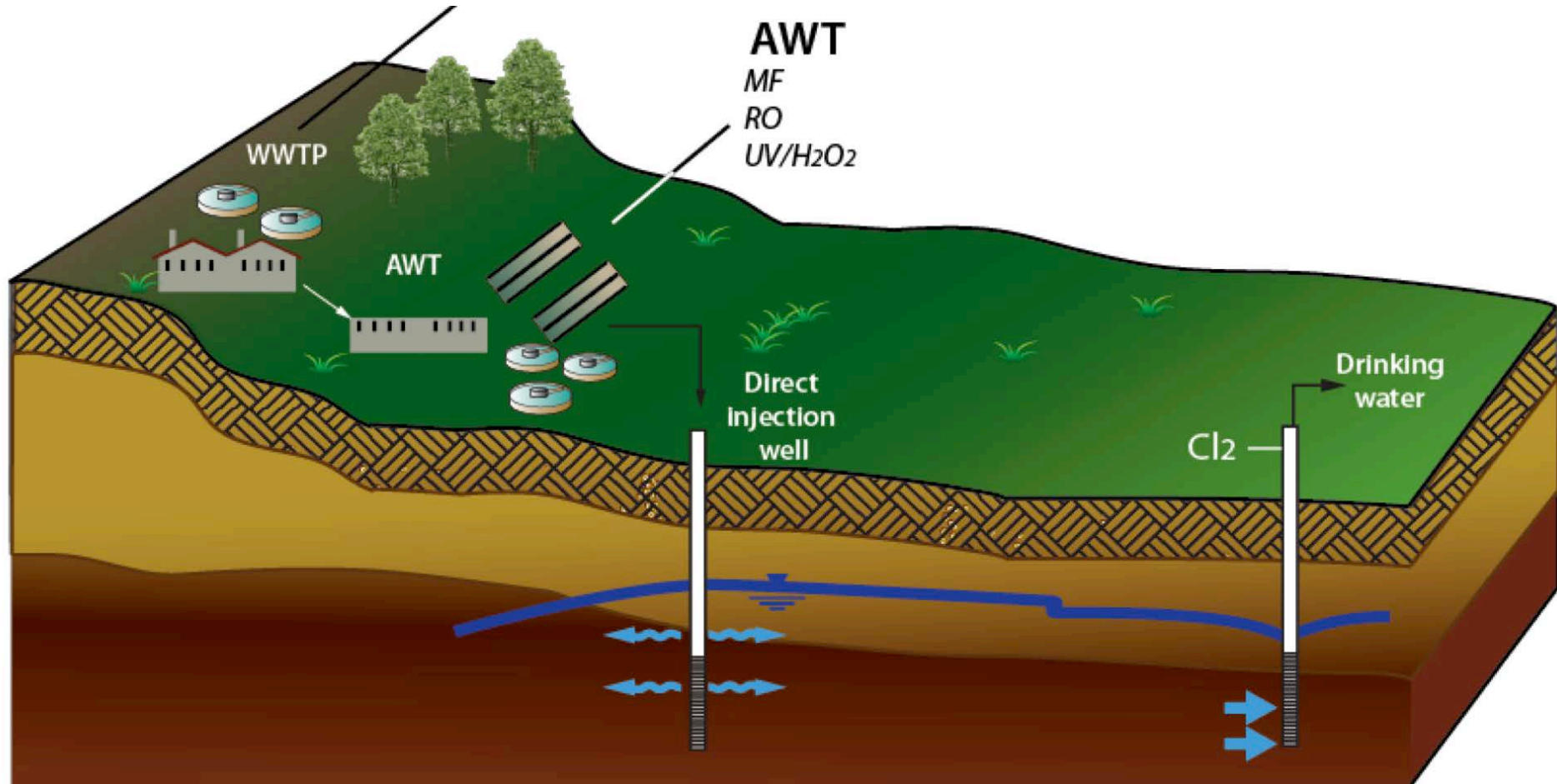


Montebello Forebay

- Operating since 1962
- Surface spreading
 - 560 acres
 - ~44 MGD
- Extensive testing
 - Epidemiology
 - Trace organics
- Expansion now underway



Groundwater Recharge: Subsurface Injection



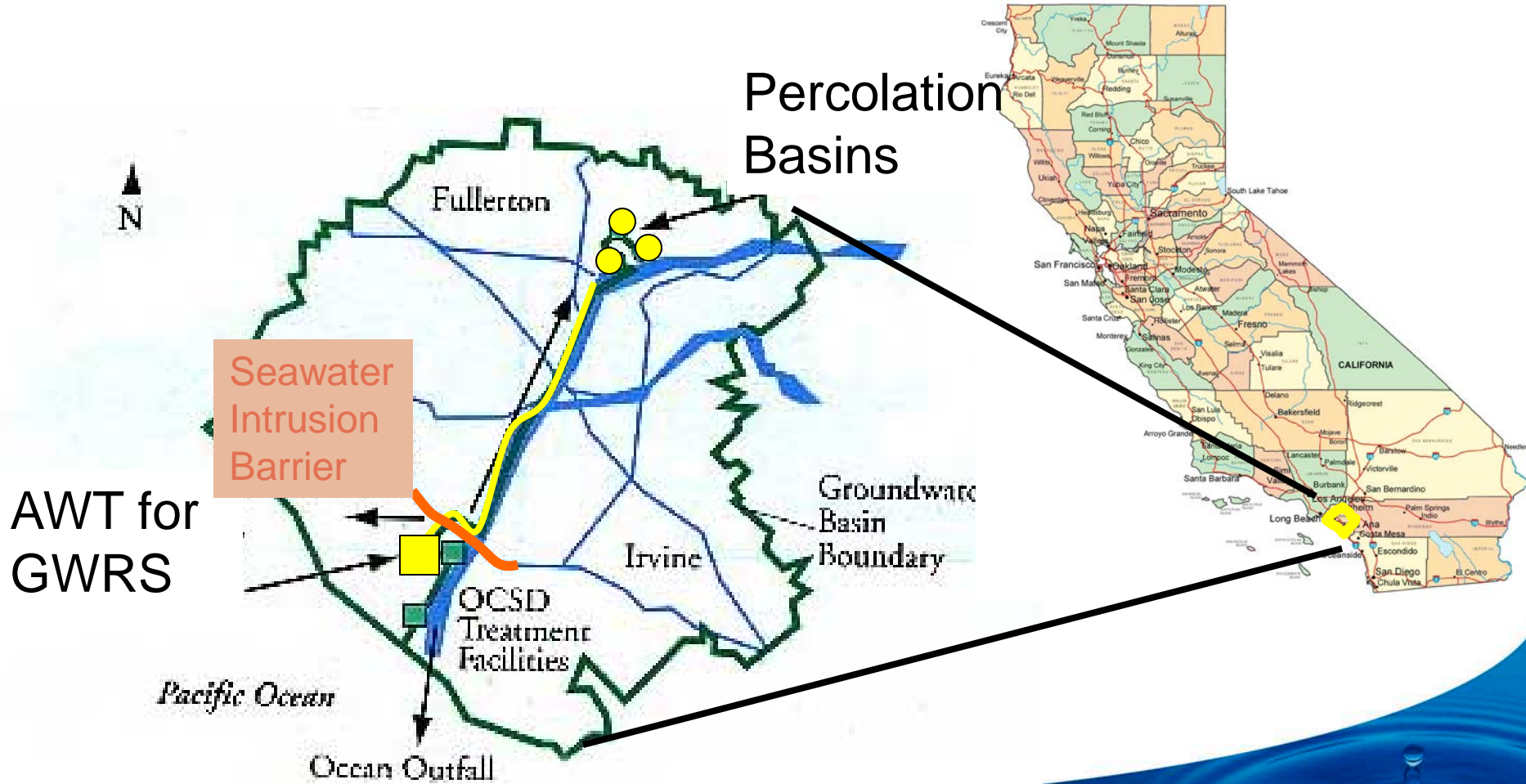


GROUNDWATER REPLENISHMENT SYSTEM

Ground Water Replenishment
System

Orange Co., CA

GWRS



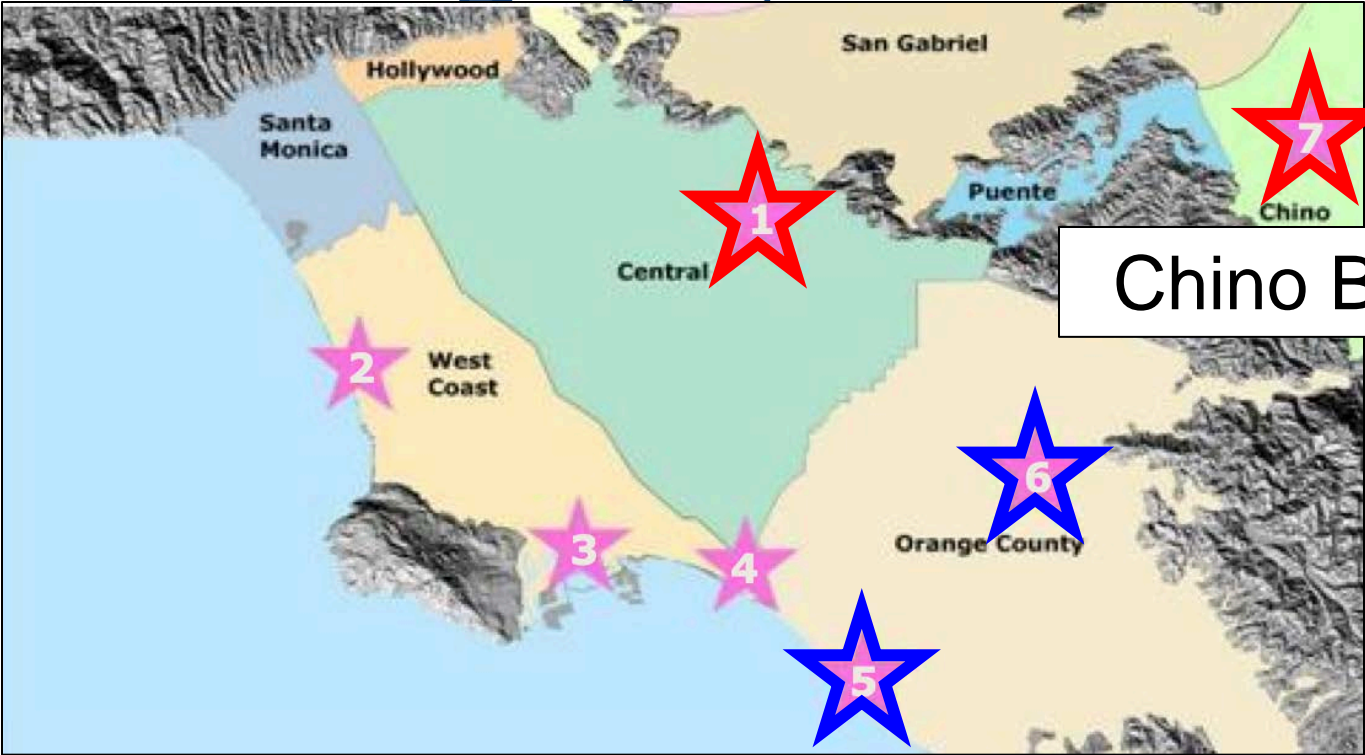
Orange County GWRS

- Preceded by Water Factory 21 (1978-2005)
- GWRS started operations in 2008
- Presently 70 mgd; undergoing a 30 mgd expansion
- Two recharge projects: direct injection and surface spreading

Other Groundwater Recharge



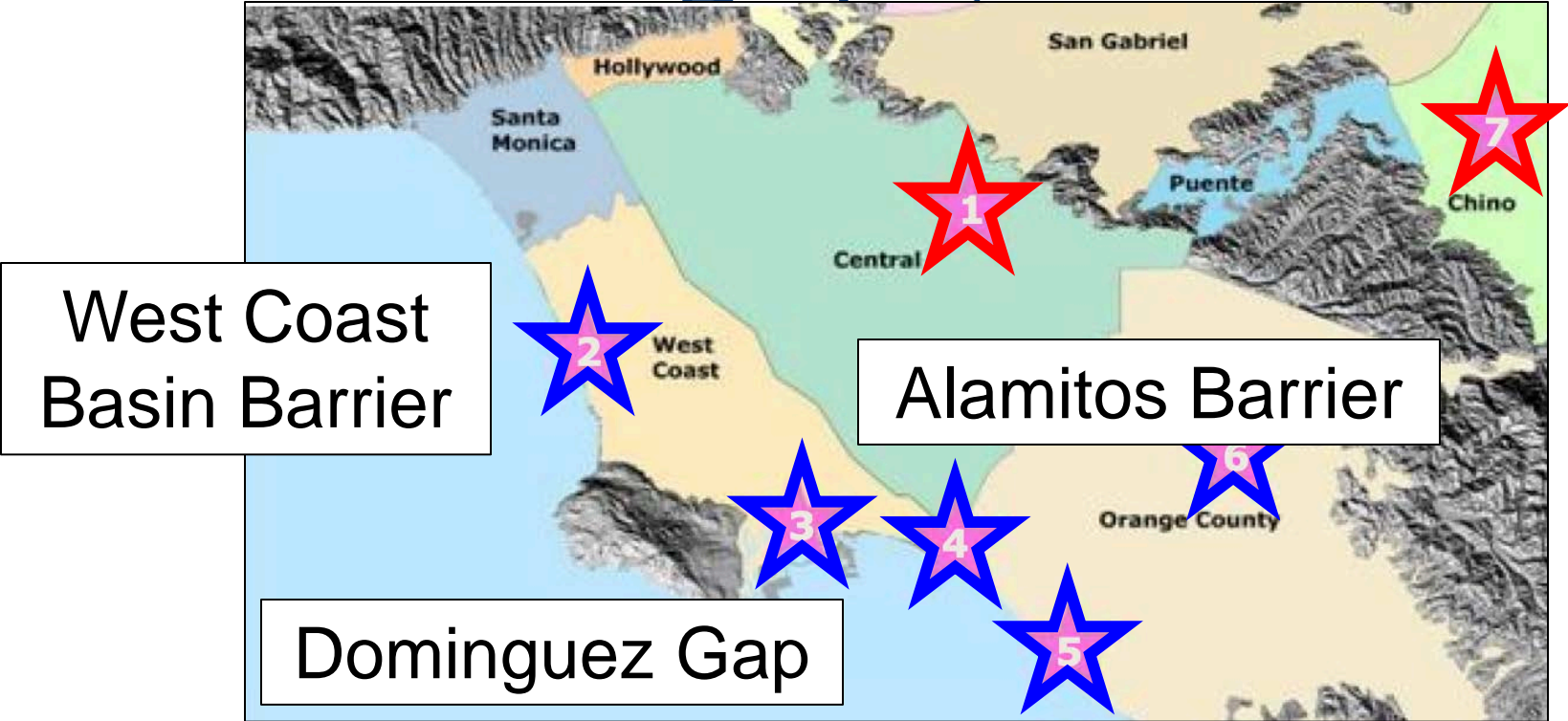
Other Groundwater Recharge



Chino Basin

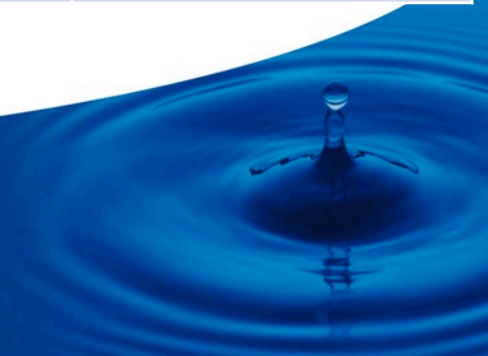


Other Groundwater Recharge



California IPR Overview

Facility	Technology	Production (MGD)	Production (AF/year)
Montebello Forebay	Spreading	44.6	50,000
Groundwater Replenishment System	Spreading / Injection	100	112,000
West Coast Basin Barrier	Injection	22.6	25,315
Chino Basin	Spreading	18.7	21,000
Alamitos Barrier	Injection	8	8,970
Dominguez Gap Barrier	Injection	5	5,600
Totals		~200	~220,000

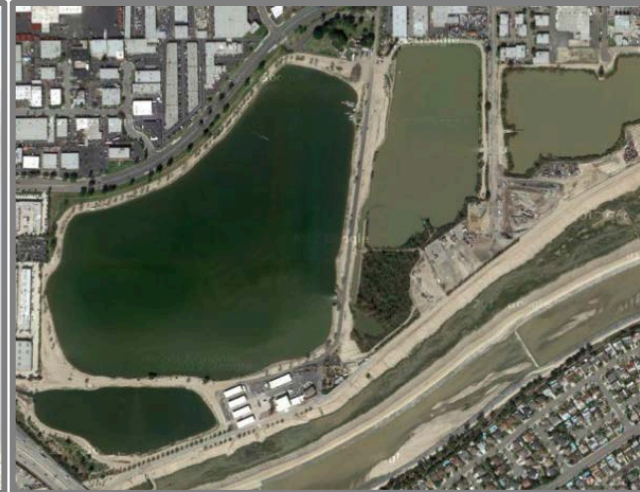


Future of Potable Reuse

- Senate Bill 918 was an important milestone
- Established deadlines for regulations
- Requires DDW to inform legislature on feasibility of DPR (end 2016)
- California State Expert Panel
 - Evaluate research and state of science
 - Provide technical guidance on regulations
- WaterReuse California/Research Foundation DPR Initiative has raised >\$6M



Role of environmental buffer in URB

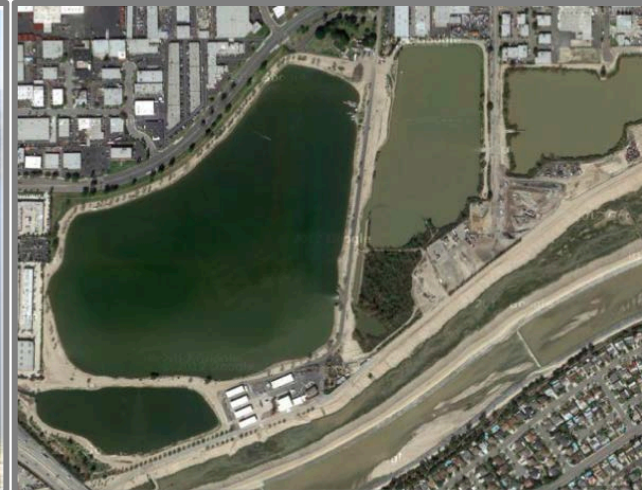


- Contaminant removal
- Dilution / blending

- Storage capacity
- Time to detect & respond to failures



Role of environmental buffer in URB



- Contaminant removal
- Dilution / blending
- Storage capacity
- Time to detect & respond to failures

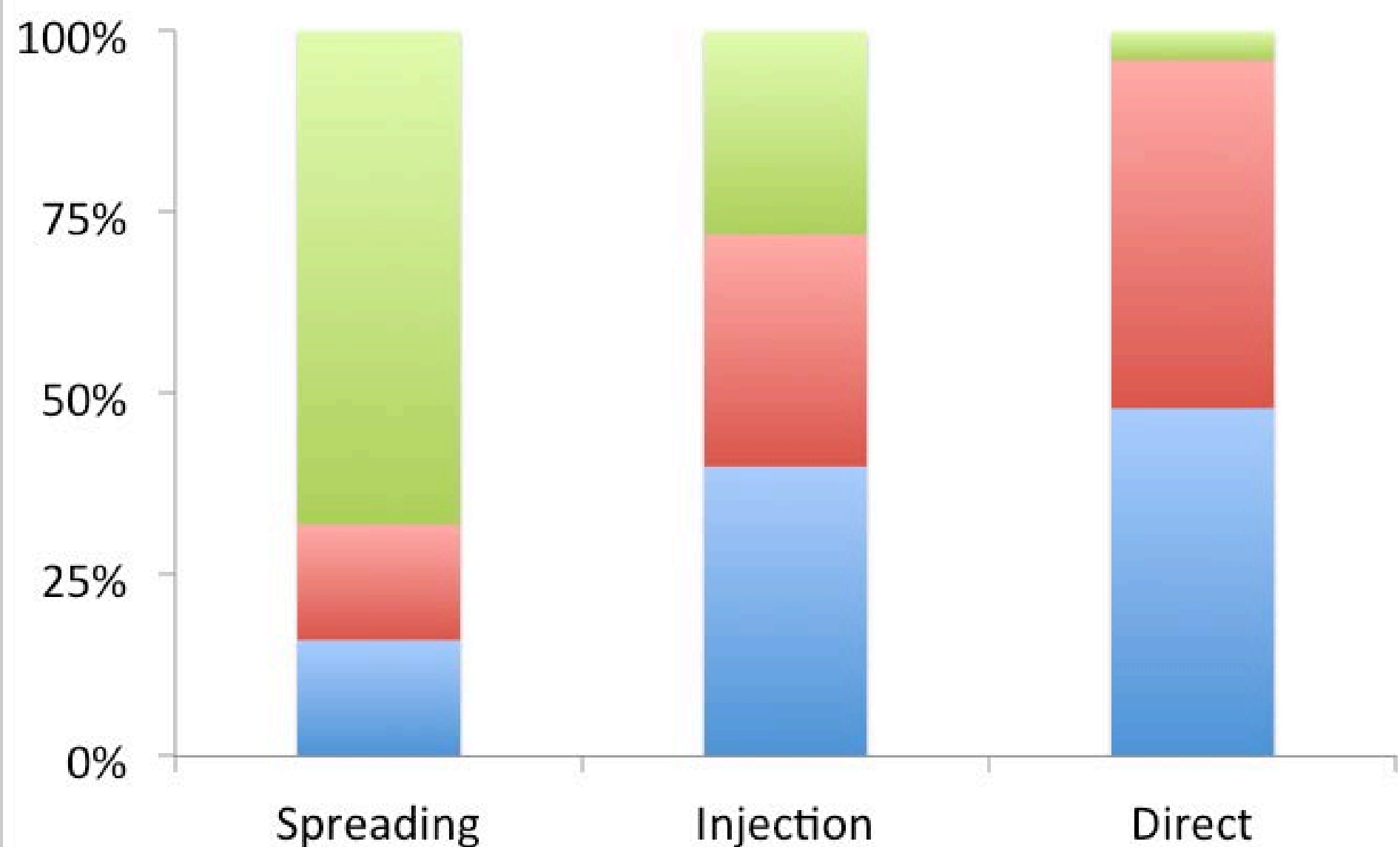
How do maintain these protections without an environmental buffer?

What are the key issues?



The Transition to DPR from Groundwater

Treatment Monitoring Retention Time



WRRF 14-12 Demonstrating Redundancy and Monitoring to Achieve Reliable Potable Reuse



1 MGD Demonstration Scale Project for DPR

Project Goal

Leverage industry experience and recent DPR research to demonstrate that we can safely implement potable reuse without an environmental buffer

NWRI Expert Panel Meeting



Conclusions

- Potable reuse can be done safely and has been for the past 50+ years in California
- Multiple solutions must be pursued
 - Non-potable reuse
 - Indirect potable reuse
 - Direct potable reuse
- Need to ensure public health protection
- Public acceptance is critical



Thank you for your attention

