

PALMDALE RECYCLED WATER AUTHORITY

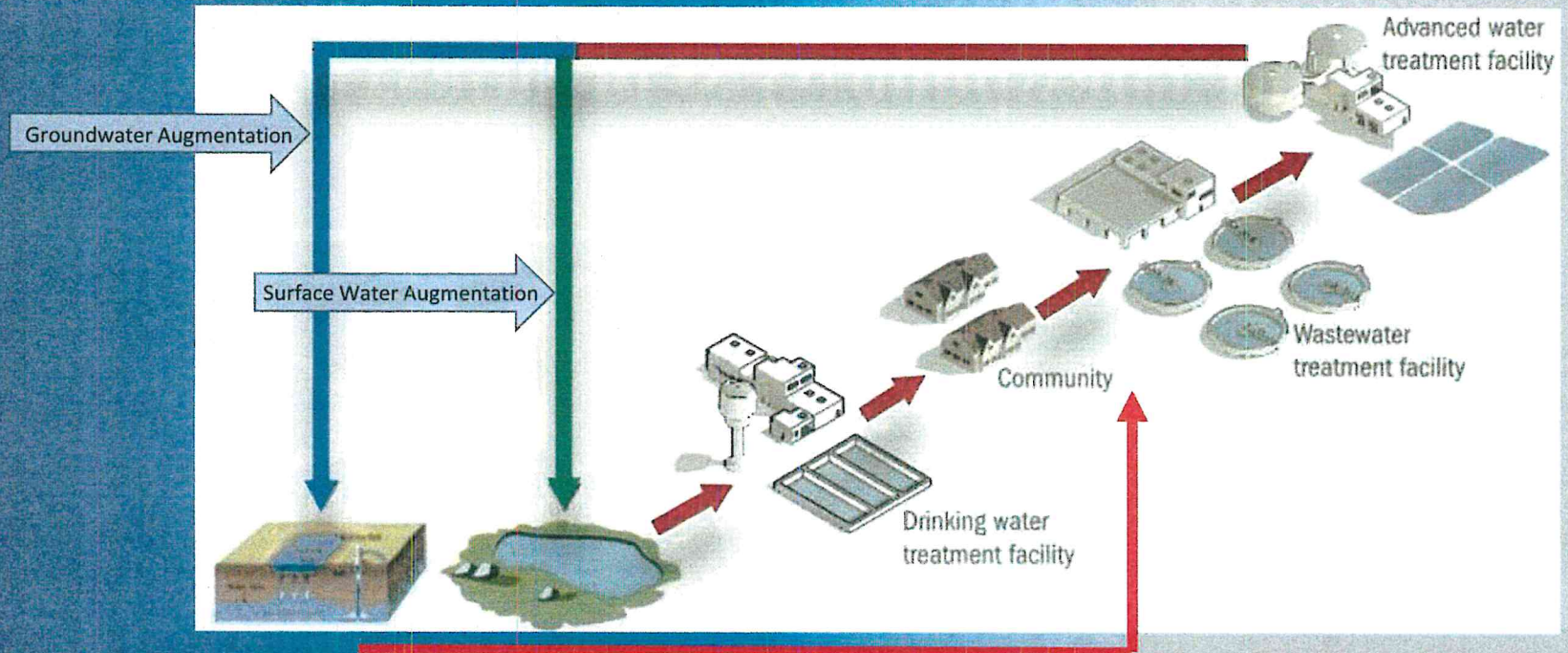


Advanced Water Treatment & Groundwater Injection
Scott Rogers, P.E. PWD Engineering Manager

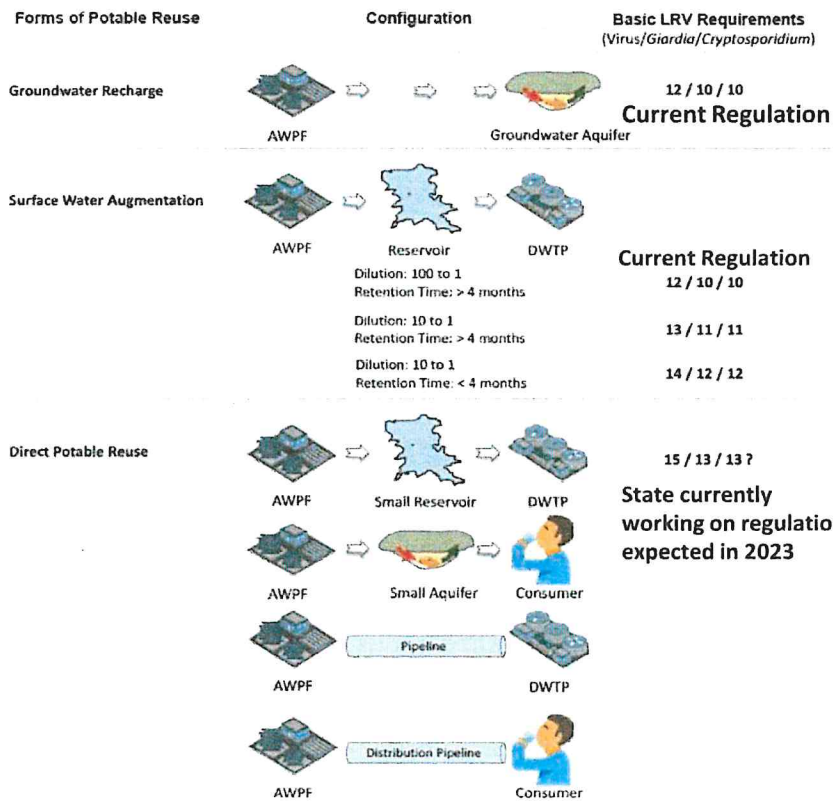
June 21, 2021

38300 Sierra Highway, Suite C, Palmdale, CA 93550

Advanced Water Treatment & Groundwater Injection



Tertiary Water Use Options



LRV – Log Removal Value

Below are several options approved or in the process of being approved for utilizing tertiary water.

Indirect

- Groundwater Recharge
 - Replenishment
 - Injection
- Surface Water Augmentation

Direct

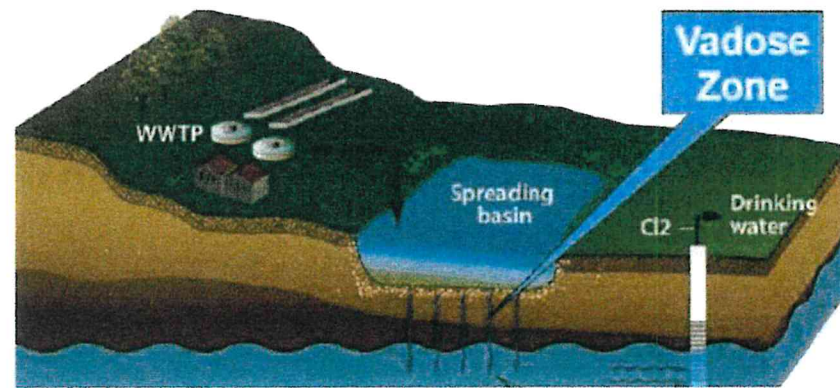
- Raw Water Augmentation
- Treated Water Augmentation

Tertiary Water Use Options for Palmdale

The beneficial use of tertiary water from the Palmdale Water Reclamation Plant is important to the future water supply for Palmdale and fully utilizing the 5,325 acre-feet annually helps address it.

- Water Augmentation (Advanced Treatment & Injection)
- Irrigation (purple pipe system)
- Recharge (blend with imported water and spread in basins)

Indirect Treatment Options



Recharge (Surface Spreading)



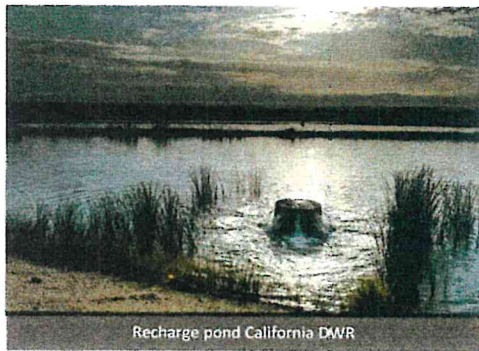
a) Indirect potable reuse using groundwater replenishment via surface spreading.

Injection (Subsurface Injection)



b) Indirect potable reuse using groundwater replenishment via subsurface injection.

Regulatory Requirements



Recharge pond California DWR



Recycled Water Irrigation at Camp Pendleton

Recharge

- Blend 80% Imported Water with 20% Tertiary Water

Irrigation

- Public Notice
- Infrastructure
- Plumbing Surveys

Groundwater Augmentation

- Treated to very high quality
- Travel time between point of injection to point of withdrawal

What is Groundwater Augmentation?



Tertiary water must be highly treated



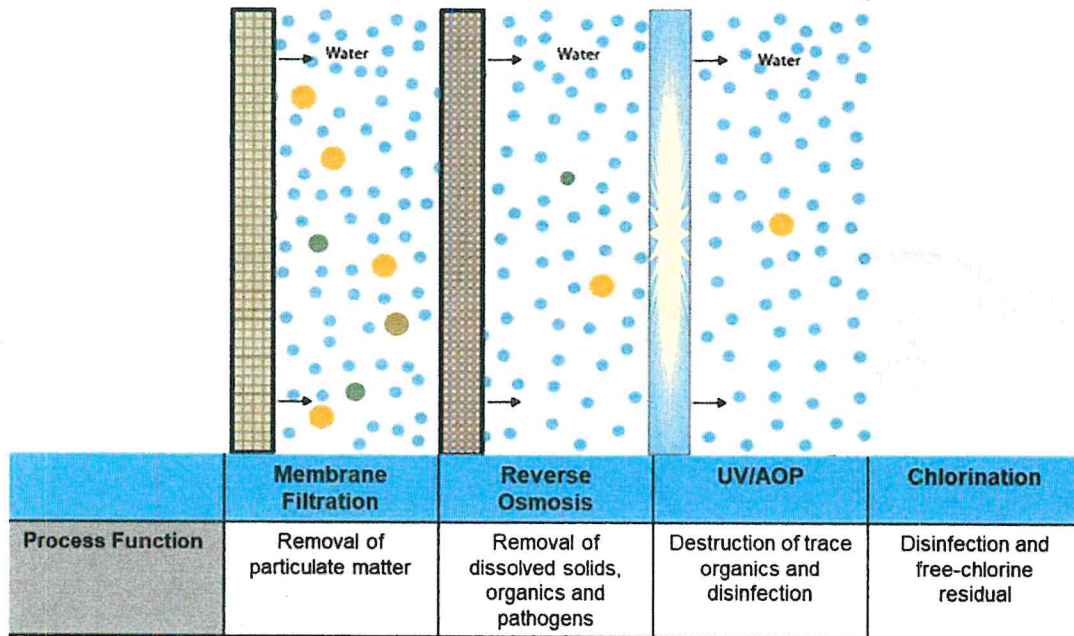
Direct injection of water into the groundwater



Currently being done in California

Orange County Water District
Water Replenishment District of Southern California
Monterey One Water
West Basin Municipal Water District

Advanced Treatment Capability



Pathogen Log Removal					FAT Total
Virus	0	1.5	6	5	12.5
Giardia	4	1.5	6	0	11.5
Cryptosporidium	4	1.5	6	0	11.5

Function of Unit Processes in Full Advanced Treatment (FAT) Train

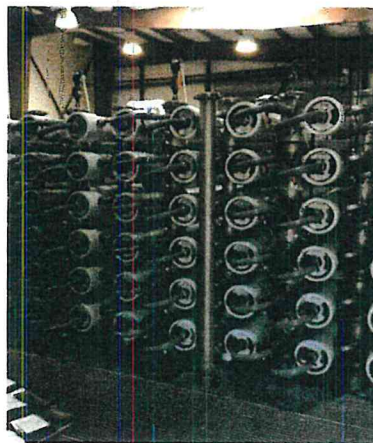
Unit Process	Function
Membrane Filtration	Removal of particulate matter and pathogens
Reverse Osmosis	Removal of dissolved solids, organics and pathogens
Ultraviolet / Advanced Oxidation Process	Destruction of trace organics (e.g. pharmaceuticals and personal care products) and disinfection
Chlorination	To maintain a free chlorine residual in the conveyance pipelines for disinfection

Proposed Advanced Treatment Train

Below are examples of the proposed treatment systems for the Advanced Treatment Train for the Groundwater Augmentation Program.



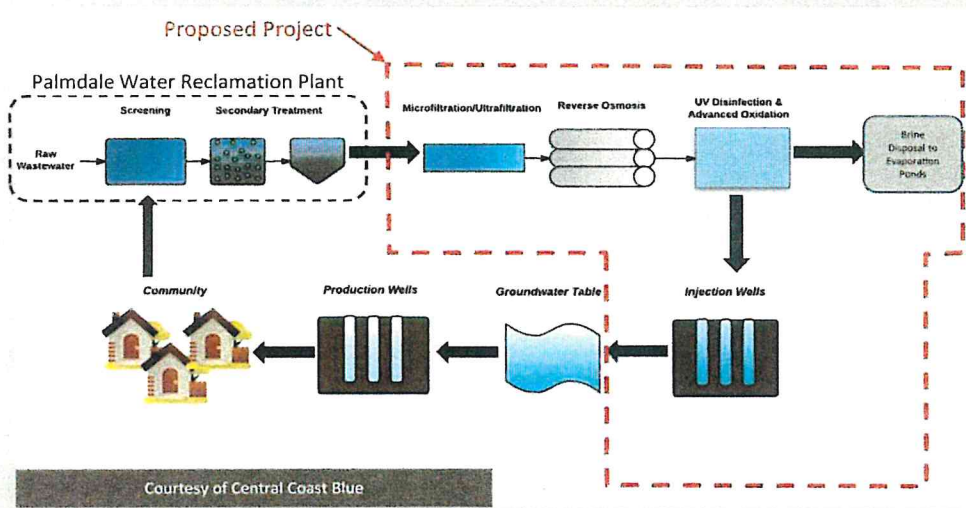
Membrane Filtration System



Reverse Osmosis System



Ultraviolet Light and Advanced Oxidation Process



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PRWA

THANK YOU