

Expert Panel for CECs in Recycled Water

Costa Mesa, California
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Mark Millan



- Councilmember & Former Mayor

- Founder & Principal

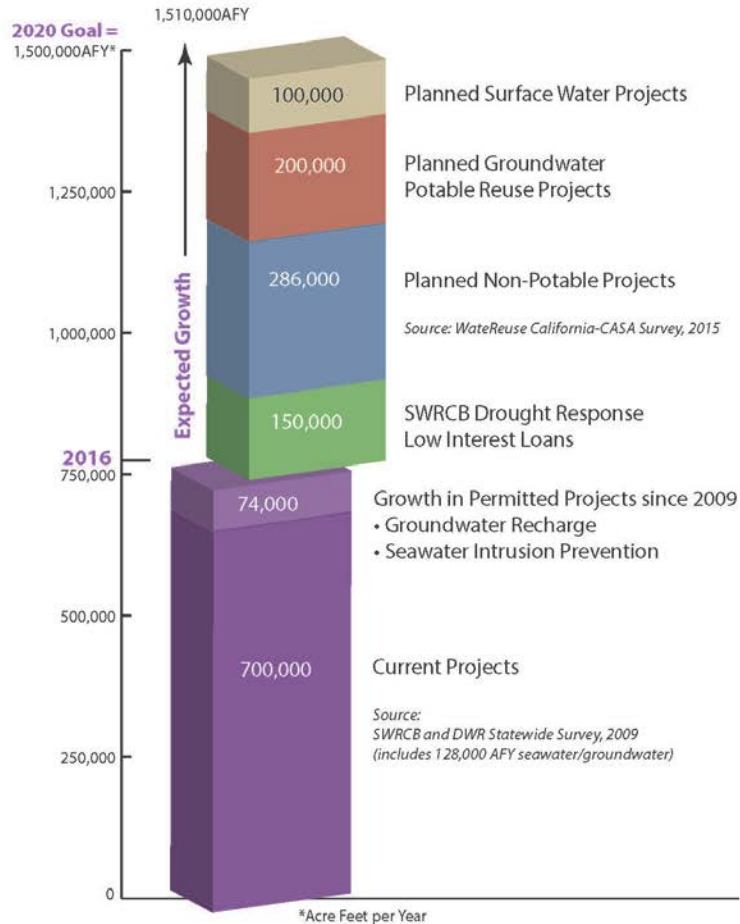


Water Recycling Policy

- Wherever feasible, water recycling should be practiced in urban, industrial and agricultural sectors. This includes increasing the use of recycled water over 2002 levels by at least one million acre-feet/year (afy) by 2020 and by at least two million afy by 2030.
- Potable water should include as much use of reclaimed water and water conservation by 2030 as possible.
- Increased recycling, reuse and other re nements in water management practices should be included in all water supply programs.



Pathway to Meeting California's Recycled Water Goal



Two Items for Consideration

- 1) Occupational exposure resulting from food crop irrigation
- 2) Degradation of groundwater (that is subsequently consumed as potable water)
 - Characterizing risk to the public
 - Specifically CECs

WRF-09-07: Risk Assessment Study of PPCPs in Recycled Water to Support Public Review



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Compounds of Interest

PPCP	Type of Substance	Common usage
Ibuprofen	Over the counter (OTC) pharmaceutical	Non-steroidal anti-inflammatory
Acetaminophen	OTC pharmaceutical	Analgesic
17-beta estradiol	Prescription pharmaceutical	Synthetic and naturally occurring hormone
Fluoxetine	Prescription pharmaceutical	Antidepressant
Caffeine	Ingredient in food and drink	Stimulant
Triclosan	Personal care product	Antimicrobial
Sulfamethoxazole	Prescription pharmaceutical	Antibiotic
<i>N,N</i> -Diethyl- <i>meta</i> -toluamide (DEET)	Personal care product	Insect repellent
Perfluorooctanesulfonic acid (PFOS)	Organic compound formerly used in common products	Fluorosurfactant
Bisphenol A	Organic compound used in common products	Various uses, primarily plastics manufacturing

Non-Potable Exposure Scenarios

- Children at play
- Urban Landscapers
- Golfers










Agricultural workers



From WRF 09-07

WRF 09-07 Key Findings

- The presence of PPCPs in recycled water is not likely to result in adverse health effects for non-potable uses of recycled water.
- Results of the risk assessment indicate that risks from exposures to PPCPs resulting from non-potable uses of recycled water are many times less than risks from those same chemicals through common daily exposures to PPCPs.

(1) Pharmaceuticals & Personal Care Products - PPCP	(2) How Used/Where Found	(3) Acceptable (safe) vs. Actual Concentrations ug/l	(4) Relative Exposure at Actual Concentrations
Ibuprofen 	Over the counter (OTC) non-steroidal anti-inflammatory pain reliever (NSAID)	Acceptable = 1,700 Actual = 0.5	Our agricultural worker could work in the fields for 28,000 years before being exposed to the equivalent of one Advil tablet
17-beta estradiol 	Prescription hormone replacement	Acceptable = 0.18 Actual = 0.0084	After 16,000 years the agricultural worker would be exposed to the equivalent of one dose of this hormone as it is typically prescribed
Fluoxetine 	Prescription antidepressant	Acceptable = 320 Actual = 0.031	After 83,000 years in the fields the worker will have been exposed to the fluoxetine equivalent of one Prozac tablet
Sulfa-methoxazole 	Antibiotic commonly used to treat urinary tract infections or sinusitis	Acceptable = 38,000 Actual = 1.4	After 220,000 years at work, the worker will have been exposed to the equivalent of one prescription dose of this antibiotic
PFOS 	Man-made fluorosurfactant formerly found in Scotchgard, numerous stain repellents, textiles, paper, and leather; in wax, polishes, paints, varnishes, and cleaning products for general use; in metal surfaces, and carpets	Acceptable = 310 Actual = 0.09	The agricultural worker can toil in the fields for five years before he/she reaches the same exposure to PFOS it is estimated he/she receives in one day from other environmental factors
Bisphenol A 	Commonly called BPA; an organic compound known to be estrogenic; used to make polycarbonate plastic (water bottles) and epoxy resins, along with other applications	Acceptable = 2,000 Actual = 0.29	After 7.1 years at work, the agricultural worker will be exposed to the equivalent dose of BPA it is estimated he/she ingests from food in just one day
DEET 	N,N-diethyl-meta-toluamide (DEET) is the active ingredient in	Acceptable = 17,000 Actual = 1.5	After working in the fields for 85 million years, the agricultural worker will be exposed to the

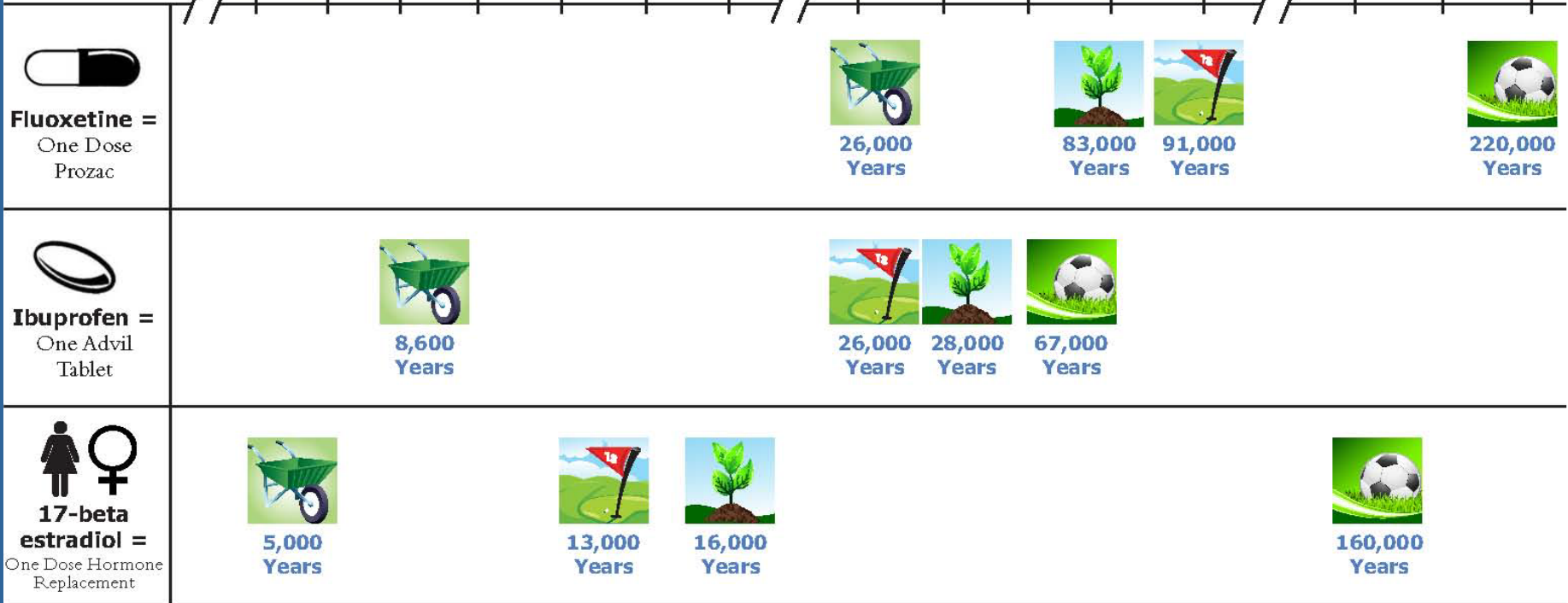
WHAT'S THE RISK?

A Comparison of Exposure to PPCPs from Recycled Water vs. Conventional Uses

This chart compares typical exposures to three Pharmaceuticals and Personal Care Products (PPCPs) — antidepressant, ibuprofen, hormone — with exposure to the same chemicals in recycled water under four different scenarios in which a person may come into contact with the water. For each scenario — child at play, agricultural worker, landscaper, and golfer — the chart shows how many years one could participate in that activity before reaching a single daily dose of the chemical from typical exposures.

Number of years of exposure to recycled water to equal conventional dose.

0 // 4,000 6,000 8,000 10,000 12,000 14,000 16,000 // 20,000 40,000 60,000 80,000 100,000 // 150,000 200,000 250,000



KEY: Four common scenarios where people may come into contact with recycled water.



Child at Play



Ag Worker



Landscaper



Golfer

2nd item: How do we talk about CECs?

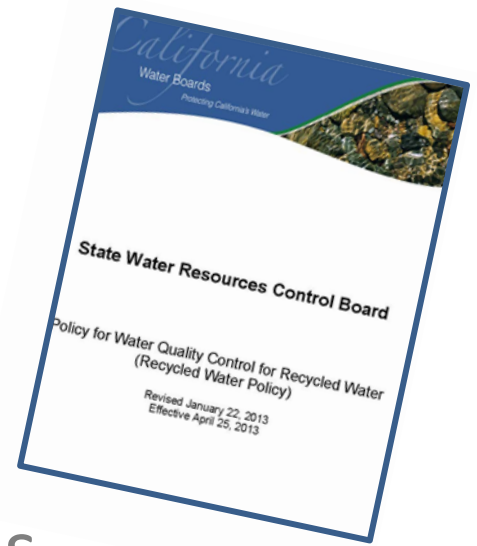
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Need for Improved Communication

- Due to the scientific nature of risk assessment process and outcomes, raw results may not be fully appreciated by the general public.
- Findings should be portrayed in terms that are understandable and meaningful for a nontechnical audience.
- An agency staff may not have the time or skill set necessary to provide critical and accurate messaging.

Roles of the State Water Board, Regional Water Boards, CDPH & DWR



- 5. ...the State Water Board recognizes that CDWR and the CPUC **have important roles to play in encouraging the use of recycled water.**
- 5d: CDWR is charged with reviewing...
...and **planning for the potential for future uses of recycled water.**

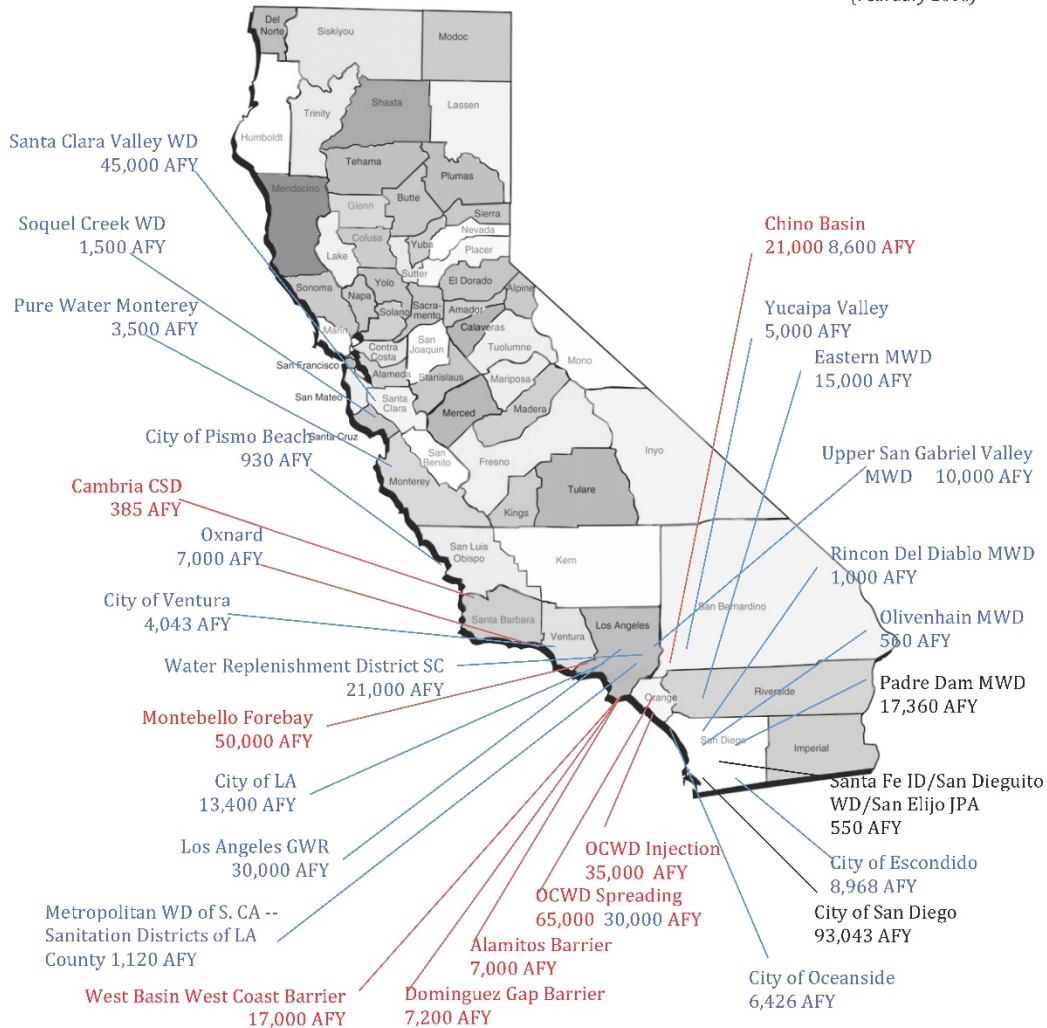
Fulfilling Policy Objectives

- Although you are challenged with these tasks
 - Such as identifying surrogates and why they are an efficient method for monitoring. Who explains this to the public in away they can fully comprehend?
- Public trust of Government is low and since Flint it is even lower.
- If every city or utility has to tell this story - it will not have the integrity nor the consistency that the state would have for describing the process that you have so thoughtfully under taken to protect public health.

Potable Use Projects

Red = Permitted groundwater—202,585 AFY
 Blue = Planned groundwater -- 215,447 AFY
 Black = Planned surface water augmentation—110, 910 AFY

(February 2016)



Make a Policy Recommendation to include Communications to the Public

- Characterizing your findings on CECs to the public in a way they can understand
- “Just because we see it doesn’t mean its harmful”
- Treatment trains and operational protocols ensure the delivery of safe drinking water sources
- Explain the relative risks from recycled water uses compared with other exposures to PPCPs

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