

Draft recommendations from the Science Advisory Panel for constituents of emerging concern (CECs) in recycled water

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Research Project (SCCWRP)**

Presentation to the State Water Resources Control Board

April 20, 2010



RECYCLED WATER POLICY

- Draft report to be submitted in response to Policy, sec 10b
- (2) “Panel shall review the scientific literature....and submit a report describing the *current state of knowledge regarding the risks of emerging constituents* to public health and the environment”
- (3) “Each report should include *recommendations* that the State should take to improve our understanding of emerging constituents....and to protect public health and the environment”

RELEASE OF THE DRAFT REPORT

- ***“Monitoring Strategies for Chemicals of Emerging Concern in Recycled Water”*** (draft for public comment)
 - 9 Chapters
 - 13 Appendices
 - 99 References
 - 180 pages
- **Released to public on 4/16/10**

THIS REPORT DELIVERS FOUR PRODUCTS

- **#1: Decision making framework**
 - A tool to prioritize CECs now and into the future
- **#2: Application to recycled water projects state-wide**
 - Preliminary CEC monitoring list (“what” to monitor)
- **#3: Monitoring recommendations and interpretation**
 - How, where and when to monitor; and how to respond to results
- **#4: Future recommended activities**
 - Research, support tools and audits to improve & refine the process

#1: DECISION MAKING FRAMEWORK

- **Step 1: measure CEC concentration in recycled water**
 - Many utilities provide data through voluntary/investigative monitoring
- **Step 2: determine allowable concentration that is protective of human health**
- **Step 3: marry Steps 1 and 2 (measured / allowable)**
 - If ratio is < 1 , no concern
 - If ratio is ≥ 1 , add to candidate list
- **Step 4: screen candidate CECs for availability of reliable methods**

#2: APPLICATION OF FRAMEWORK – STARTING POINTS

- **Panel provided two sets of recommendations**
 - groundwater recharge (indirect potable reuse or IPR)
 - Title 22 landscape irrigation (non-potable)
- **Populated CEC “universe” using national and CA data**
 - EPA’s “CCL3” process
 - Actual CEC monitoring data from several CA utilities
- **Employed conservative assumptions to maximize number of candidate CECs**
 - Assumed maximum amount CEC intake from recycled water

#2: APPLICATION OF FRAMEWORK – CEC LIST FOR GROUNDWATER RECHARGE

Constituent	Chemical Class	Analytical Method	Method Detection Limit (ng/L)
17- β estradiol	Natural hormone	•LC-MS/MS	•<1.0
Caffeine	Food product	•GC-MS	•<350
Triclosan	Personal care product	•LC-MS/MS	•<350

#2: APPLICATION OF FRAMEWORK – SELECTING INDICATORS

- **Indicators are substitutes for a large group of (or difficult to measure) CECs**
- **Several possible indicators were identified**
 - candidates depend of level of water treatment
 - e.g. carbamazepine (pharmaceutical)
- **Panel to finalize selection of indicators in final report**

#2: APPLICATION OF FRAMEWORK – CEC LIST FOR LANDSCAPE IRRIGATION (TITLE 22)

- No CECs identified based on health risk**
- Human consumption (incidental) of recycled water in this scenario is very low**
- Indicator compounds are best way to assess Title 22 recycled water quality**

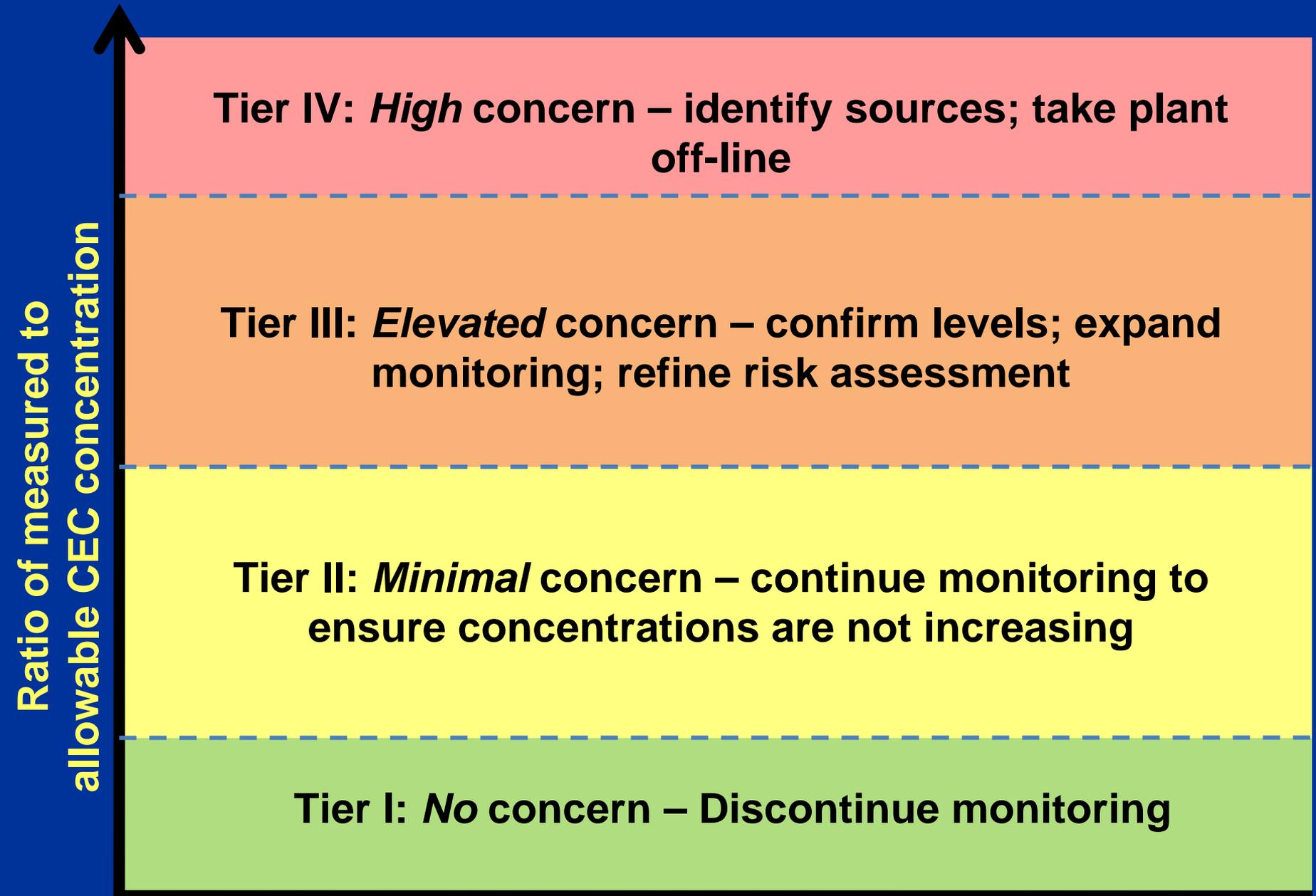
#3: MONITORING INTERPRETATION GUIDANCE

- **Panel provided recommendations for State-wide monitoring program**
 - *What* to monitor (chemical list)
 - *How* to monitor (i.e. which methods can we trust?)
 - *When* to monitor (how frequent is enough?)
 - *Where* to monitor
- **Panel provided guidance on interpreting the monitoring data**
 - Multiple tiered approach

#3: MONITORING RECOMMENDATIONS – DATA COLLECTION

- **Panel recommended that all permitted recycled water facilities should perform monitoring**
 - Distinguish between plant start-up & mature operations
 - Sample recycled water before it hits the ground (“point of compliance”)
- **Sampling & instrumental methods that can do the job**
 - GC-MS; LC-MS
 - Incorporation of isotope labeled standards
- **And the need for rigorous QA/QC**
 - Adequate detection or reporting limits
 - Precision and accuracy
 - Participation in round-robin exercises

#3: INTERPRETATION OF MONITORING RESULTS



#4: RECOMMENDED FUTURE ACTIVITIES

- ***Technical studies to bolster the science***
 - Improve our methods for targeted chemicals and screening purposes
 - Develop a process to predict CEC levels
 - Refine our drinking water benchmarks, prioritizing those CECs with increasing occurrence
- ***Programmatic support to manage the process***
 - Develop a process to manage data & apply framework
 - Implement periodic health surveillance activities in areas impacted by water reuse
 - Perform independent audit of Panel's initial recommendations
 - Revisit monitoring recommendations every 3-5 years

SCHEDULE

- **Meeting #1: September 2009**
 - Background presentations & perspectives of interested parties
- **Meetings #2 & #3: Jan, Feb 2010**
 - Address charge questions
- **Draft report released 4/16/10**
- **Meeting #4: May 20-21**
 - Written comments requested by May 15
 - Public comments session on May 21, 9a-noon
- **Final report due June 4, 2010**
- **SWB hearing to adopt recommendations Nov 2010**

PANEL EXPERTS

- **Dr. Paul Anderson**

- Human Health Toxicologist
- AMEC

- **Dr. Nancy Denslow**

- Biochemist
- University of Florida

- **Dr. Jörg Drewes (Chair)**

- Civil Engineer
- Colorado School of Mines

- **Dr. Adam Olivieri**

- Risk Assessor
- EOA Incorporated

- **Dr. Daniel Schlenk**

- Environmental Toxicologist
- UC Riverside

- **Dr. Shane Snyder**

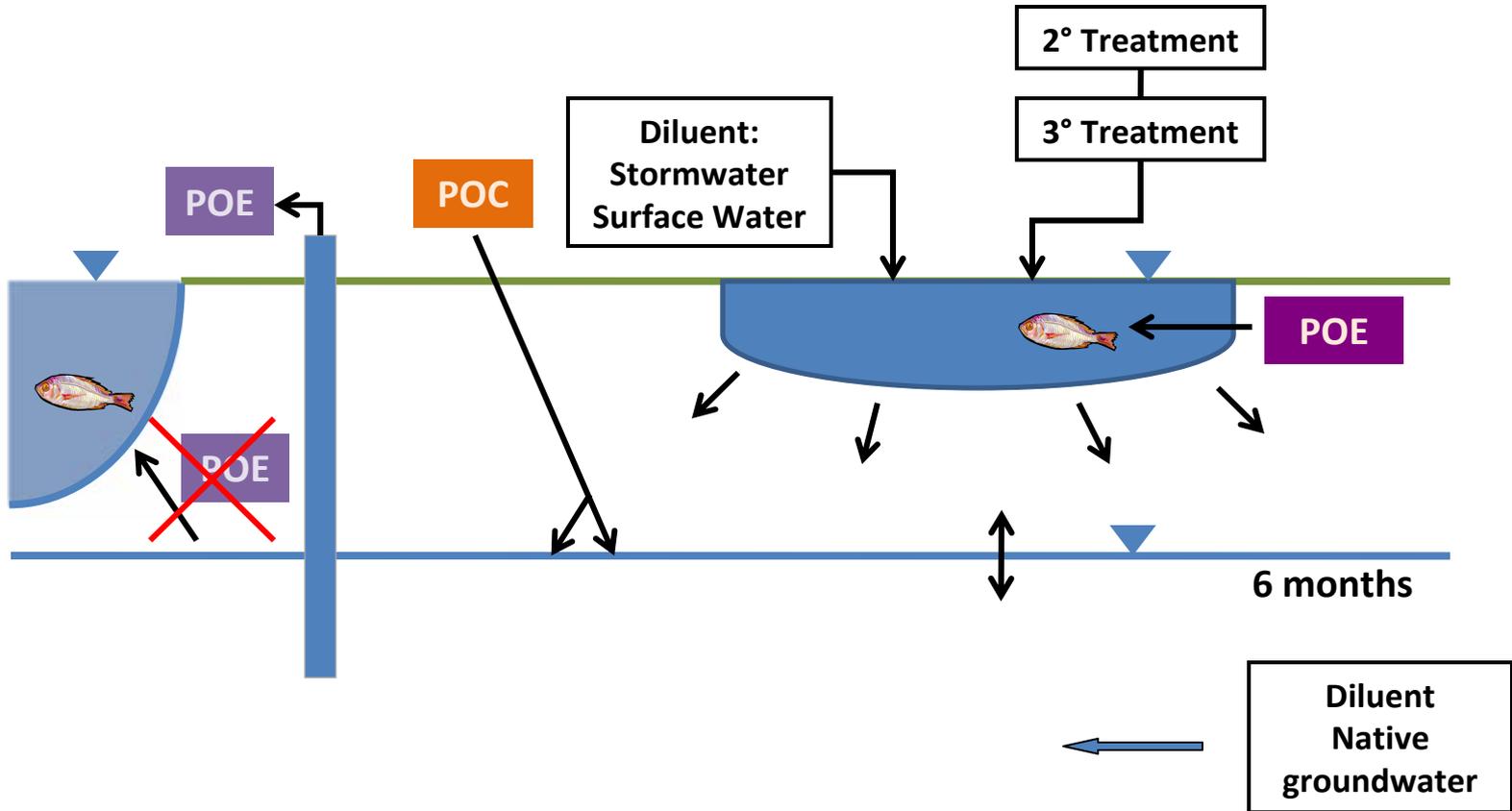
- Analytical Chemist
- Total Environmental Solutions, Inc

STAKEHOLDER ADVISORS

- **Danielle Blacet** (Assoc. CA Water Agencies)
- **Jim Colston** (Tri-TAC)
- **Mark Gold** (Heal the Bay)
- **Jeff Mosher** (National Water Research Institute)
- **Rick Moss** (State Water Board)
- **Toby Roy** (San Diego County Water Authority)
- **Linda Sheehan** (CA Coastkeeper Alliance)
- **Dave Smith** (WaterReuse Association)

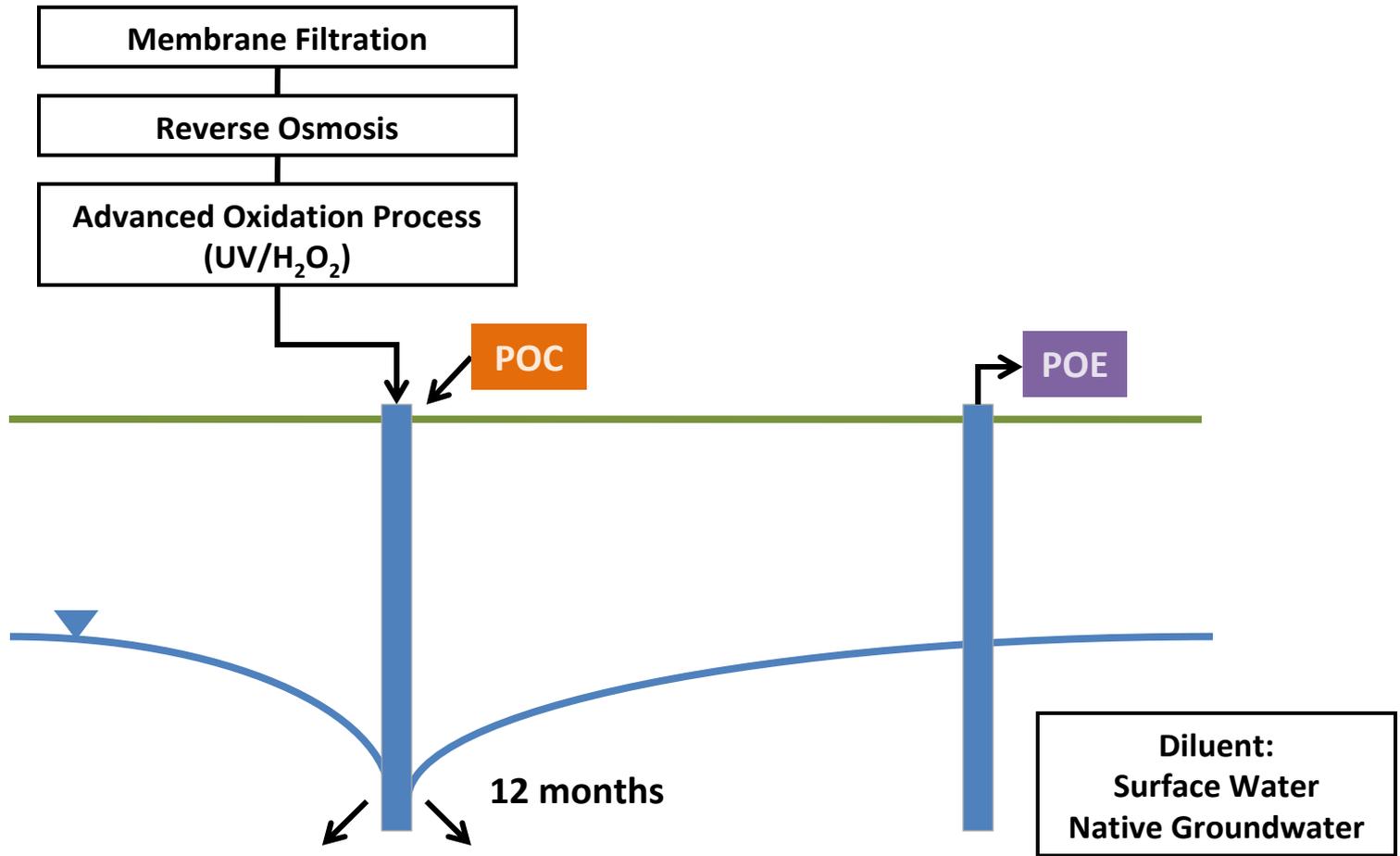
Surface Spreading

Recycled Water Contribution < 50%

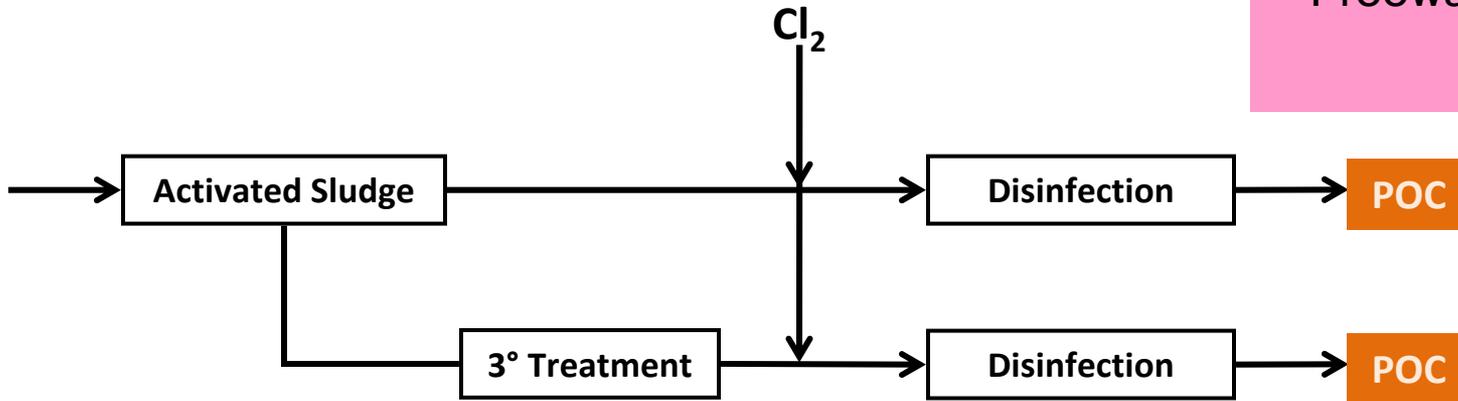


Subsurface Injection

Recycled Water Contribution > 50%



Title 22



POE Restricted access:
Landscape
Freeway/golf course

POE Unrestricted access:
1. Residential
2. Golf course
3. Urban landscape

STATE RECYCLED WATER POLICY

- **What are the appropriate constituents to be monitored, including analytical methods and MDLs?**
- **What is the known toxicological information for the above constituents?**
- **Would the above lists change based on level of treatment and use? If so, how?**
- **What are possible indicators that represent a suite of CECs?**
- **What levels of CECs should trigger enhanced monitoring of CECs in recycled water, groundwater and/or surface waters?**