



Regulation and California's Tightening  
Drinking Water Standards:  
Where do we Draw the Line?

**Friday, October 16, 2015**

9 am – 10 am

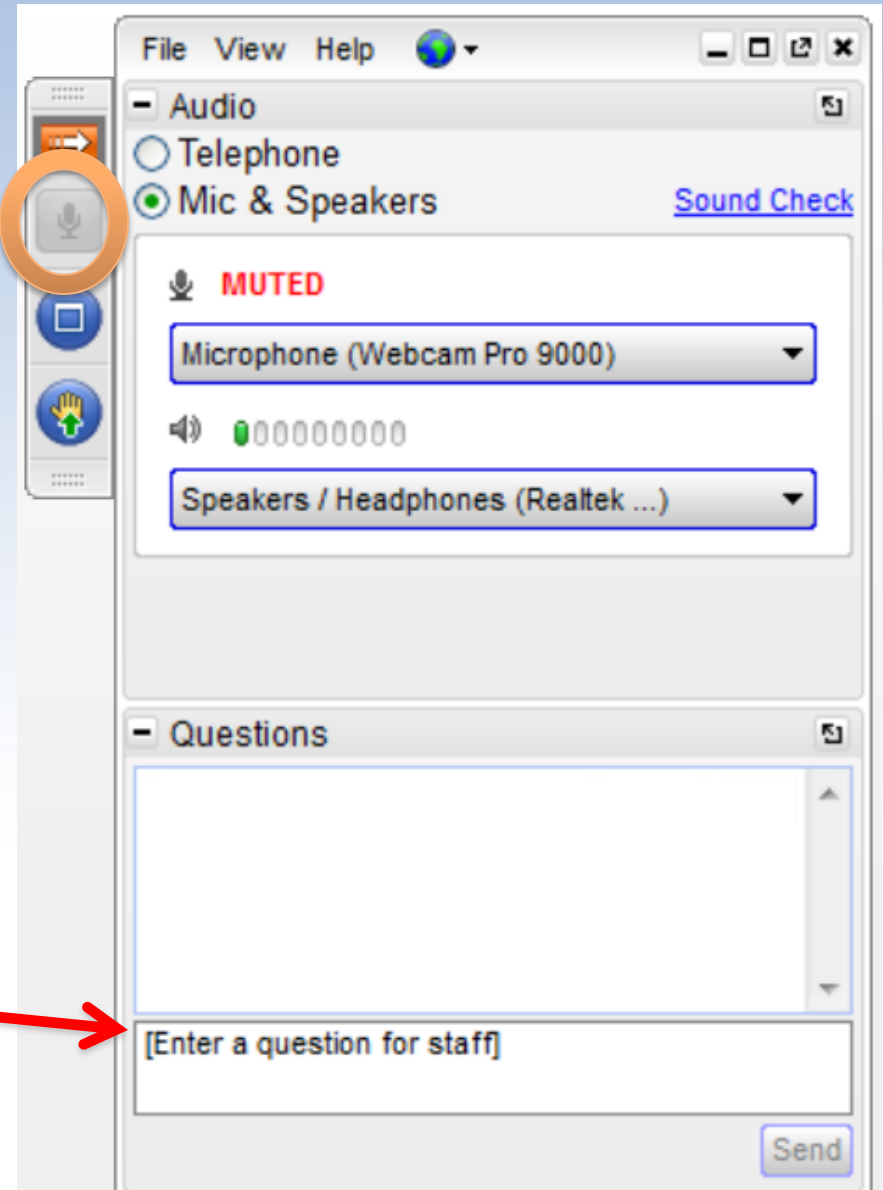
Technical difficulties? Call **(855) 352-9002**

# Housekeeping

We want to hear from you!

Join the discussion:  
**Mute and Unmute Yourself**

If you have a question for the panelists or staff (including technical difficulties), please enter it via the **Q&A Panel**.  
You can enter questions throughout the presentations.



# Recording and Slides

## Completed Webinars

Click on each webinar title for recordings, presentations, speaker bios, and additional resources.

### **Webinar 3—Leading Approaches in Solid Waste Management Regulation**

**August 21, 2015 9-10 am**

What would it mean to move solid waste out of the water cycle and back into the carbon cycle? This webinar will explore emerging thinking and approaches to solid waste management for water supply and quality outcomes while protecting public health. Associated regulatory frameworks will be presented and discussed.

### **Webinar 2—Regulating Rainwater and Stormwater Capture for Multiple Public Health Outcomes**

**July 17, 2015, 9-10 am**

Survey leading approaches to rainwater and stormwater capture and use and investigate the regulatory challenges inherent in endeavoring to support water-savvy approaches while protecting public health.

### **Webinar 1—California's Water Crisis: Leadership Opportunities for Environmental Health**

**June 19, 2015, 9-10 am**

This webinar kicks off our environmental health track with an introduction to new paradigms in water management and explores the question of how environmental health leaders can best respond in the face of rapid environmental and political change on water issues.

<http://phasocal.org/water-initiative/webinar-series-environmental-health/>



# Agenda

- Welcome & Introductions – Katy Mamen
- California’s Tightening Drinking Water Standards: Where Do We Draw the Line?
  - Eric Miguenlino
  - Edgar Dymally
  - Adán Ortega
- Discussion & Q&A – All, Moderated by Katy Mamen
- Key Takeaways and Closing – Katy Mamen

# Today's Speakers:



**Eric Miguelino**  
Research Scientist  
Division of Drinking Water  
State Water Resources  
Control Board



**Edgar Dymally**  
Senior Environmental  
Specialist  
Metropolitan Water District



**Adán Ortega**  
Executive Director  
California Association of  
Mutual Water Companies



# **Regulations and California's Tightening Drinking Water Standards: Where Do We Draw the line?**

**Edgar G. Dymally**

**Metropolitan Water District  
of Southern California**

**Friday, October 14, 2015  
9:00 – 10:00 a.m.**



# CHROMIUM VI

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- ✘ The Department is mandated by State law to set a Chrome-6 MCL.
- ✘ On July 1, 2014 the Hexavalent Chromium MCL became effective.
- ✘ Website has been updated with a memo from Dave Mazzera and our drinking water-related regulation book has been updated and posted.
- ✘ MCL = 0.010 mg/l or 10 ug/l (notice the significant figures for rounding purposes)

# CHROMIUM VI

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- ✘ Applies to Community and NTNC systems only.
- ✘ PWS have 6 months to take an initial Chromium VI sample, by January 1, 2015.
- ✘ Grandfathering data for groundwater sources only that is less than 2 years old is allowed if monitored by an ELAP certified lab using proper laboratory analysis.
- ✘ Analytical methods – 218.6 or 218.7.



# Chromium 6 Background

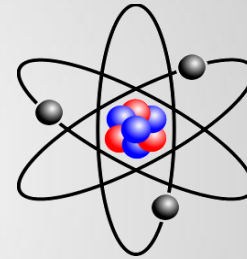
- Chromium is an inorganic chemical used in industrial manufacturing and cooling tower treatment for corrosion control.
- Chromium can enter drinking water sources through discharges from industrial, leaching from hazardous waste sites, and erosion of natural deposits.
- Chromium 6 is known to cause cancer in humans when inhaled. There is limited evidence on cancer and chromium 6 through ingestion

# Chromium 6 Regulatory Activities

- Chromium is currently regulated in drinking water as total chromium which assumes a mixture of chromium 3 (approx. 93 %) and chromium 6 (approx. 7%).
- State Senate Bill 351 requires the California Dept. Health Services to adopt a Chromium 6 standard by January 1, 2004 and OEHHA to adopt Chromium 6 PHG in early 2003.

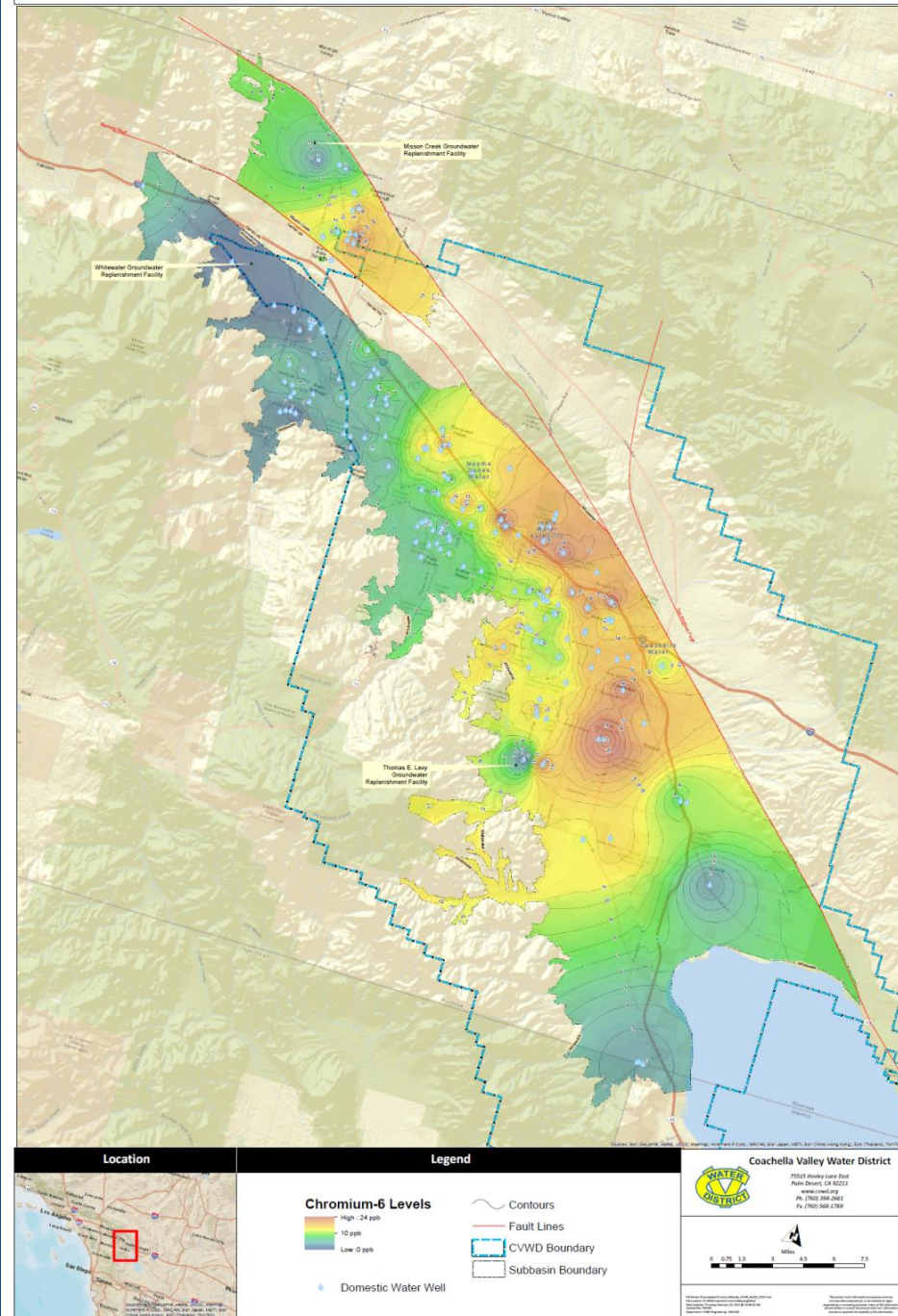
# Chromium (Cr) Background

- Chromic oxide – 9<sup>th</sup> most abundant compound in earth's crust
- Chromium-3 (Cr3) or chromium-6 (Cr6) in water
  - Mostly Cr6 in groundwater
  - Need Cr3 to produce insulin
- Cr6 Sources in Water
  - Erosion of natural sediments
  - Isolated industrial sources
- Cr6 Health Concerns
  - Carcinogen when inhaled at work
  - Listed as possible carcinogen when ingested (rodent studies)



# Coachella Valley Cr6 Occurrence

- Natural in groundwater
  - Ultra-mafic sediments
- Levels from <1 to 22 parts per billion (ppb)
- Above 10 ppb in about 100 domestic wells valley-wide
- 30 of CVWD's 100 wells (150 square mile service area)
- Cr6 below reportable levels in Colorado River water used for aquifer replenishment

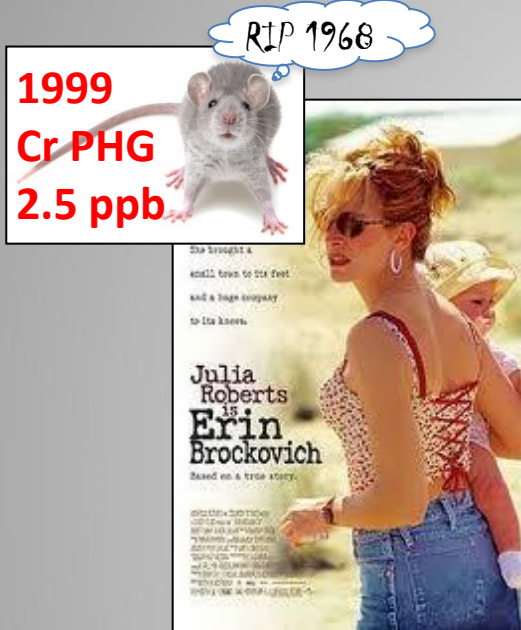




# California's Path to Regulate Cr6

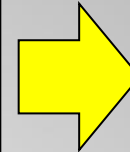
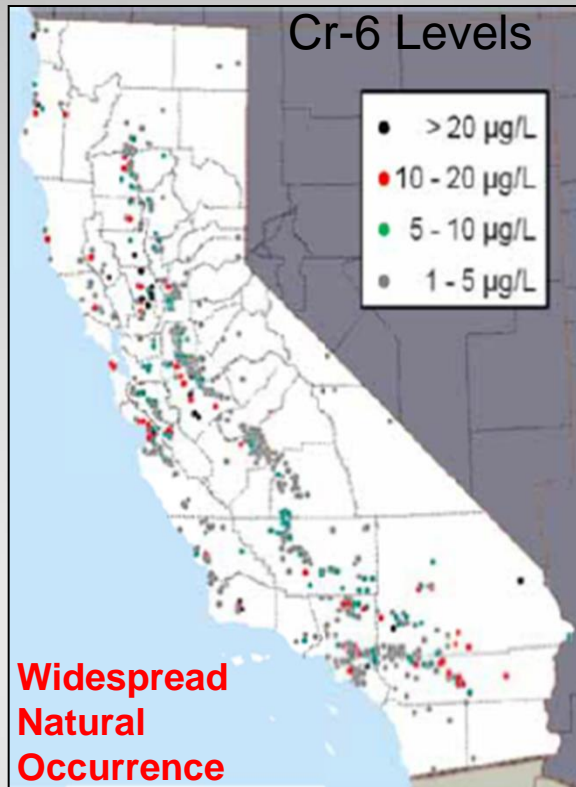
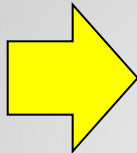
**1999**  
**Cr PHG**  
**2.5 ppb**

RIP 1968



The brought a small town to its feet and a huge company to its knees.

Julia Roberts in **Erin Brockovich**  
Based on a true story.

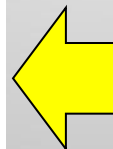


**2010**  
**Cr6**  
**PHG**  
**0.020**  
**ppb**

RIP 2008



April 15, 2014  
Court Order Cr6  
MCL is set at  
0.010 mg/L  
(10 ppb)



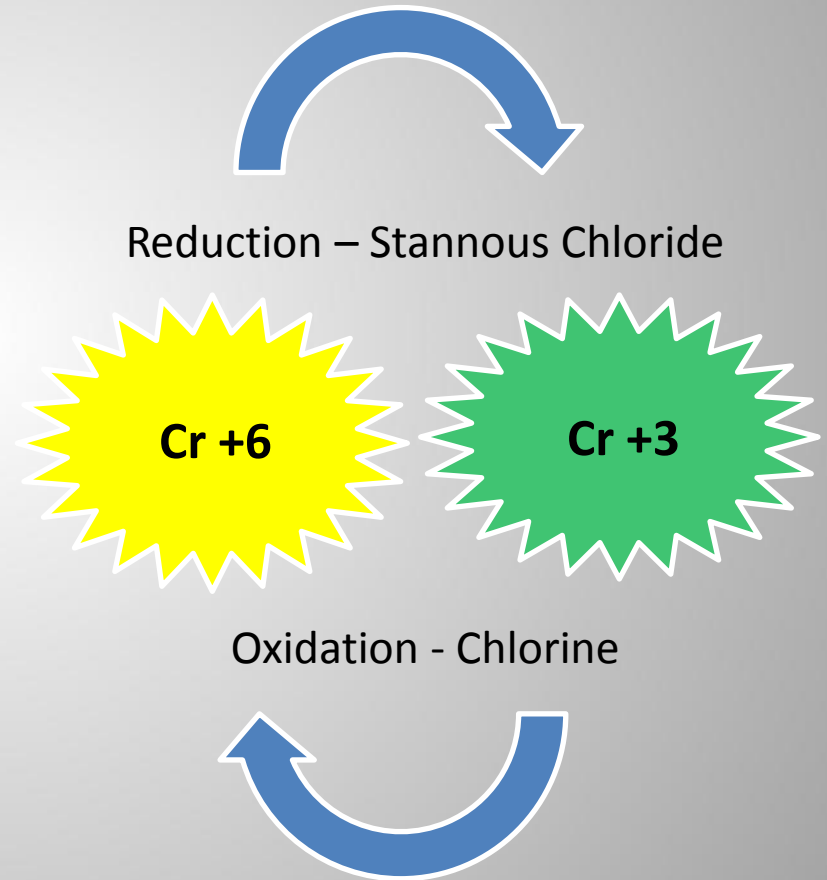
V.



# Early “Cr6 Treatment” Work

## Cr6 Reduction

- Proved reduction of Cr6 to Cr3 was possible
- More cost effective than removing Cr
- Critical limiting factor
  - Drinking water is chlorinated to meet bacteria standards
  - Chlorine oxidizes Cr3 to Cr6
  - Can provide residual  $\text{Cl}_2$  or reduced Cr, not both



# CHROMIUM REMOVAL BEST AVAILABLE TECHNOLOGIES (BAT)

**Weak-Base Anion Exchange (WBA)**



**Strong-Base Anion Exchange with Residuals Treatment (SBA)**



**Reduction Coagulation Filtration (RCF or RCMF)**



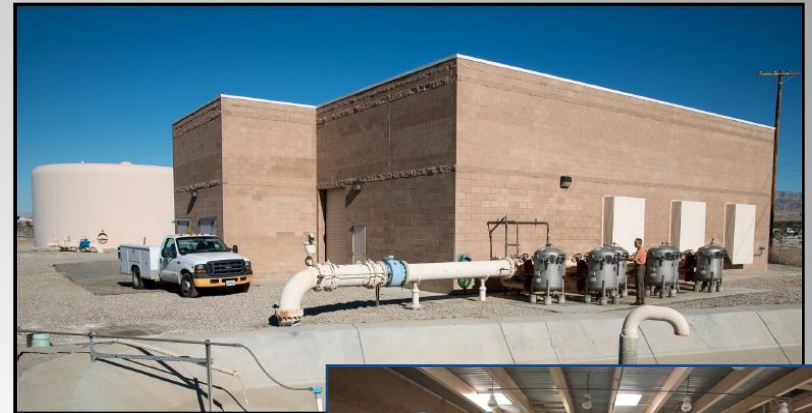
**Reverse Osmosis (RO)**





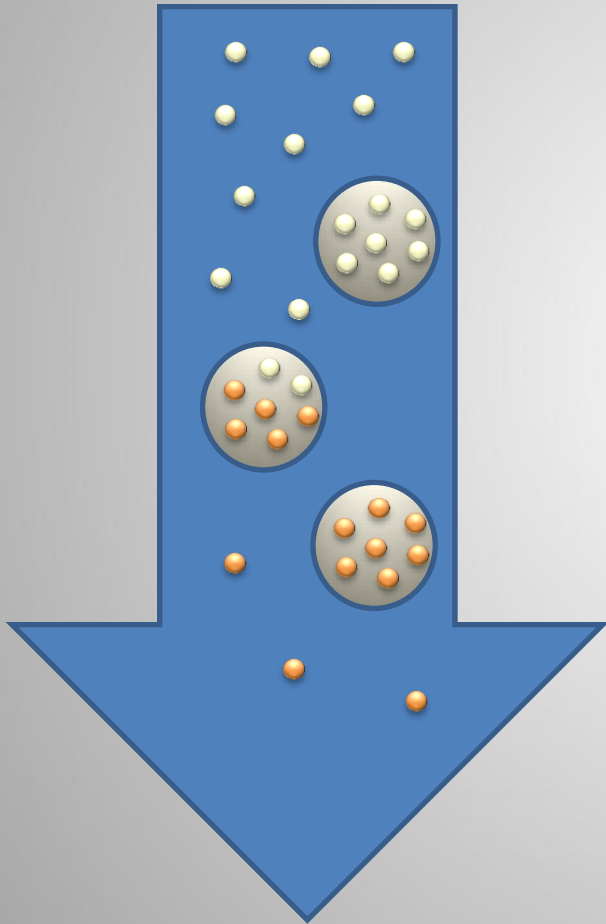
# CVWD's Cr6 Treatment Work

- 2001 – Cr6 added to pilot Arsenic removal tests
- 2006 – Two Ion Exchange treatment plants begin removing Arsenic and Cr6 (\$13 million)
- 2011 – Collaborative Water Research Foundation Cr6 pilot study (IX & RCF)
- 2012 – CVWD absorption media pilot test for Cr6
- 2013 – Second Cr6 Water Research Foundation study (RCMF & Brine)
- 2013 – Begin Source Study (draft MCL)
- 2014 – Multiple ion-exchange and brine pilot test programs (Hazen)
- 2015 – Follow-up pilot tests to finalize Facilities Basis of Design



# Cr6 Removal By Ion Exchange

Water



## Ion Exchange

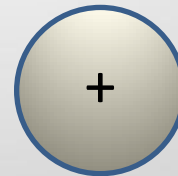
Ions of Cr6 attach to specially coated resin beads



Cr6 in water



Chloride on resin



Resin bead

# Additional Control Measure

- Must achieve “no unreasonable risk”
- Install Point Of Use Treatment – too costly and not quick enough
  - Exceeds BAT cost
- Provide bottled water – quick but too costly
  - \$1.60 gallon delivered
  - \$0.84/person/day = \$92 million/year
- What about Cr6 reduction at the tap?

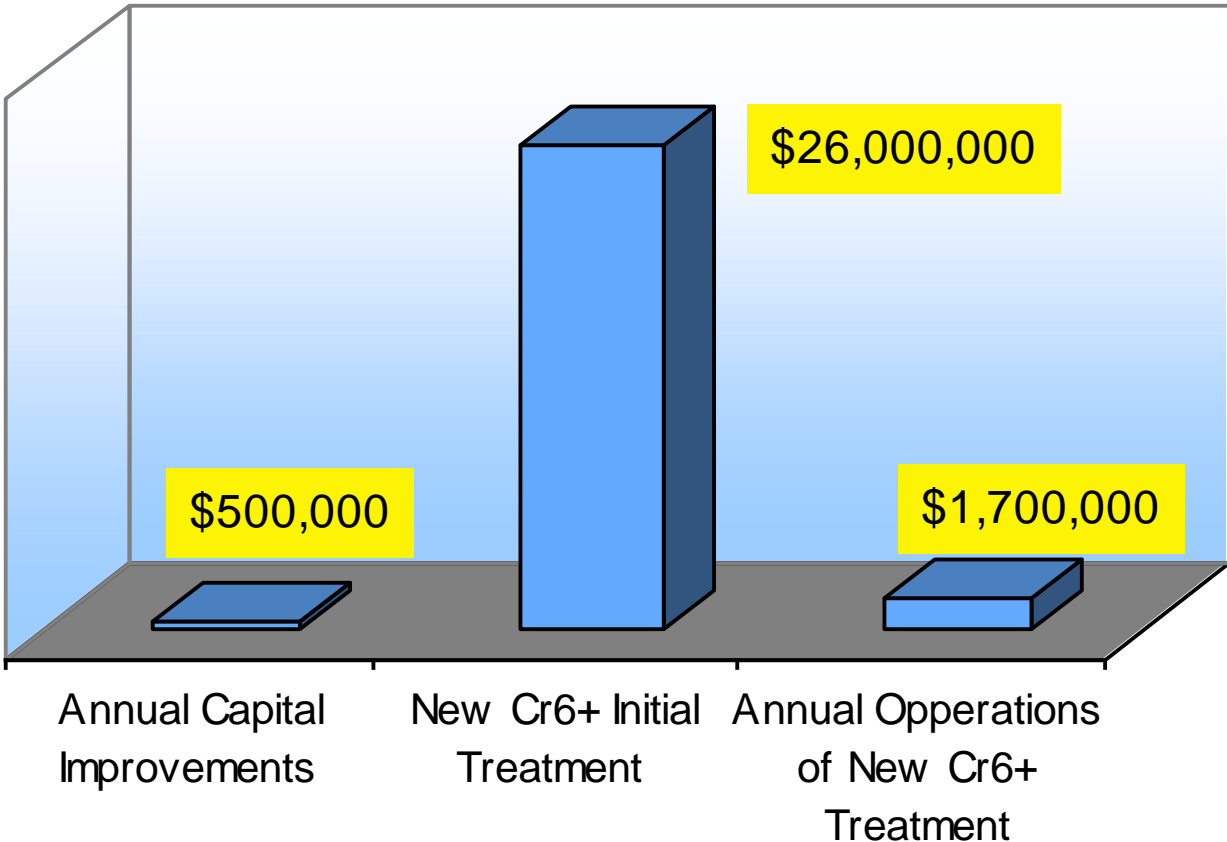


# Hexavalent Chromium (Cr-6)

- **Total chromium regulated in 1991 at 100 ppb**
- **“Erin Brockovich” increased interest in Cr-6**
- **Draft risk assessment now in late 2013**
  - Final risk assessment thereafter
    - EPA will have to then decide if regulation needs to be revised to address Cr-6 (a likely outcome)
      - Not sure if this would be part of SY3 or an “out-of-cycle” regulatory determination
- **Total and Cr-6 included in UCMR3 monitoring**
  - Relationship between the two can vary quite a bit
- **Treatment is challenging and expensive**
  - Total treatment costs for a potential Cr-6 regulation could be higher than all SDWA regulations to date

# Economic Impact of Proposed State Chromium MCL in Watsonville

## City of Watsonville Water Expenses

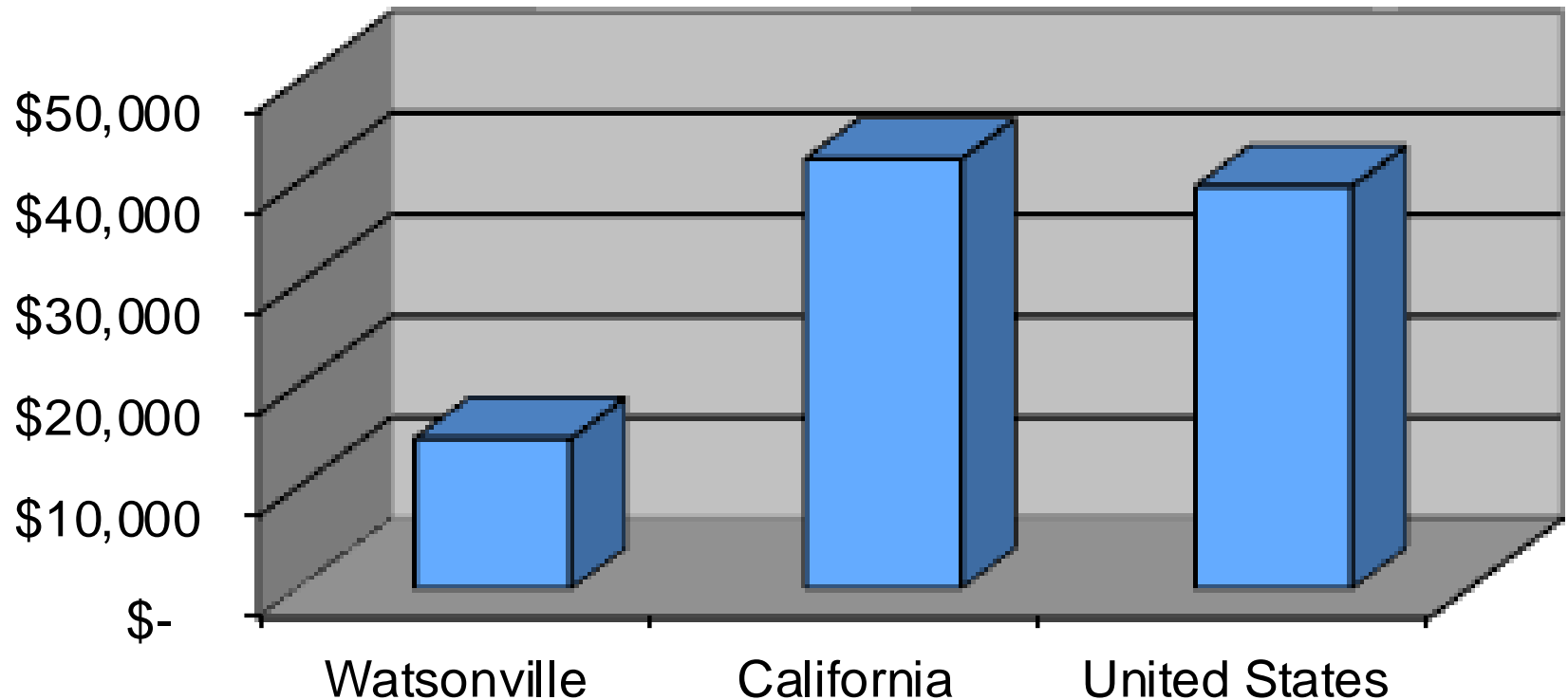


# Cost to City Residents

- Cost of Compliance:
  - **78% rate increase**
  - Currently, nearly 1000 water connections in jeopardy of shut off each year due to delinquency
    - This number would dramatically increase with a 78% rate increase
- Cost of Non-compliance:
  - Loss of public confidence in our drinking water system
  - Enforcement penalties unknown at this time

# Watsonville is an Economically Disadvantaged Community

## Per Capita Income





Public Health Alliance of Southern California  
"Regulation and California's  
Tightening Drinking Water Standards:  
Where Do We Draw the Line?"



Adán Ortega, Executive Director  
California Association of Mutual  
Water Companies

# Sky-Rocketing Trend

- Compliance with the regulations has been good among large water systems. However, some small water systems, particularly community PWS serving less than 200 service connections and smaller non-transient, non-community water systems, have had considerably more difficulty complying with the regulations - SWRCB 2015 Safe Drinking Water Plan
- Non-Compliance in 2012: 467 (Arsenic 191, Nitrates 125)  
SWRCB 2015 Safe Drinking Water Plan
- PLUS Non-Compliance with 10ppb Hex Chrom Standard 2015: 332 - 71% INCREASE - source: ACWA/AWWA cost study 2014
- 105% increase if one compares only Arsenic/Nitrates that affect mostly small systems as does the standard for HexChrom

# Is Water Quality Deteriorating?

- It's really a matter of advances in detection technology and an outdated regulatory framework
- Leaving health officials in a quagmire as the public's perception of risk is warped
- Bankrupting small water systems who can't predict what meeting new regulations will cost
- Cost of treating from parts per-million to parts per-billion to parts per-trillion greater by orders of magnitude

# Options for Reason

- A “Strategic Plan” for Safe Drinking Water
- Focus on availability of technology *for compliance based on affordability - not just cost/benefit analysis*
- Consider a “multi-contaminant” approach so utilities are governed by timelines where remedies (treatment technologies) are “validated” until the final contaminant is up for review
- Stop alarming the public with false notions of risk and engender appreciation for technological advances that will make us all SAFER but probably not healthier

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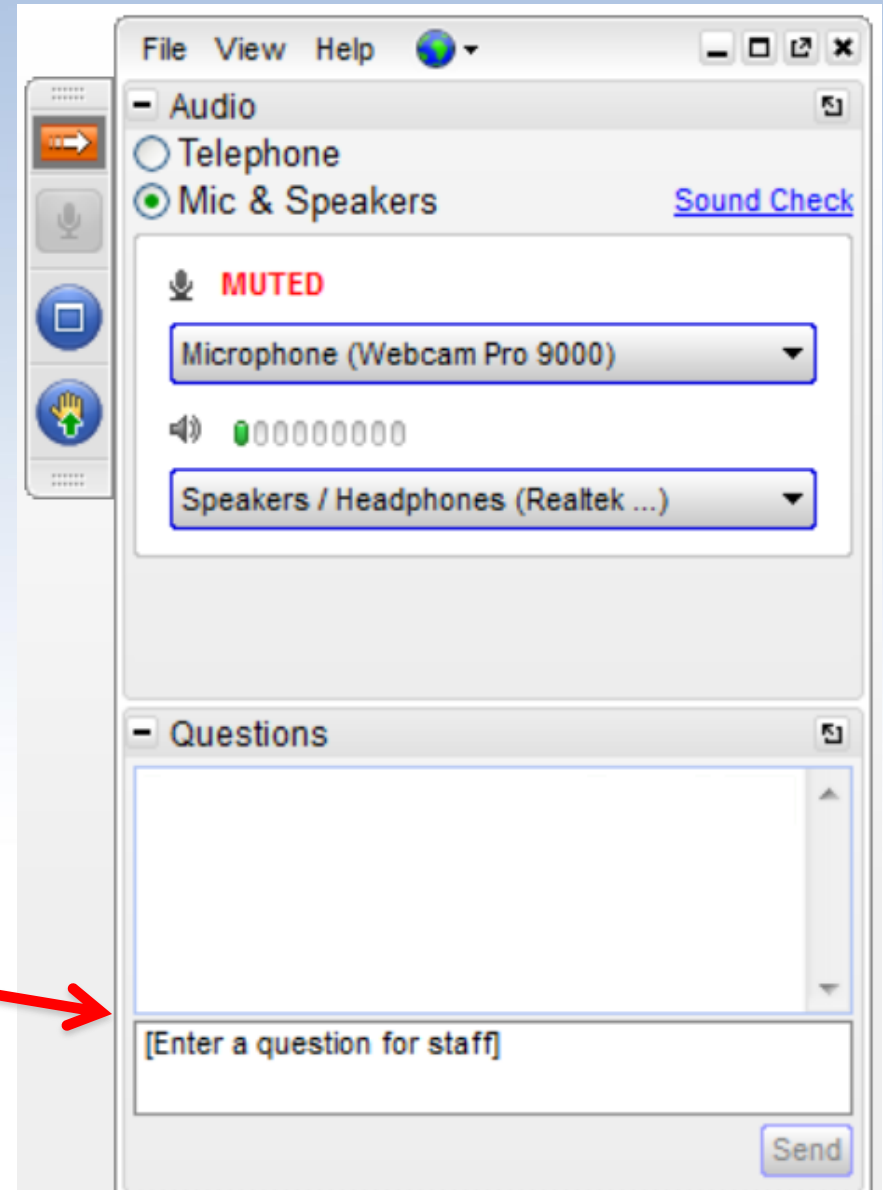
# Q&A and Raise Hand Feature

We want to hear from you!

Join the discussion by using the **Raise Hand Feature**

Or

Ask questions by using the **Q&A Feature**



# Group Discussion

- How much can a property be worth when it has been deemed contaminated?
- Consolidate – or join forces?
- Compliance is not sustainable for small water systems.
- The role of Public Health Depts.?
  - Collect reliable data – which systems are viable?
  - Reach out to Env. Justice groups
  - Awareness of abandoned systems





# Thank you to our Speakers!



**Eric Miguelino**  
Research Scientist  
Division of Drinking Water  
State Water Resources  
Control Board



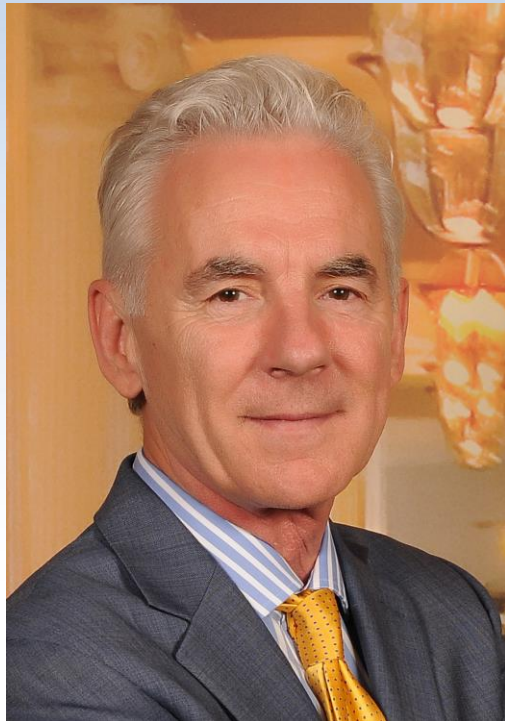
**Edgar Dymally**  
Senior Environmental  
Specialist  
Metropolitan Water District



**Adán Ortega**  
California Association of  
Mutual Water Companies



# Thank You to Our Moderator!



**Angelo J. Bellomo**

Deputy Director for Health Protection

Los Angeles County Department of Public Health (DPH)



# Water and Health Webinar Series

Water, Drought and Environmental Health

**November 18 (12-1pm)**

High Opportunity Levers for Water and Health: Resources, Policy and Next Steps

<http://phasocal.org/water-initiative/webinar-series-environmental-health/>

# Regulation and California's Tightening Drinking Water Standards: Where do we Draw the Line?

**Thank you for joining the conversation!**

The **recording** and **slides** will be available shortly at:  
<http://phasocal.org/water-initiative/webinar-series-environmental-health/>



Questions?  
Contact Katy Mamen  
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(707) 239-8879

