



# **1,2,3-Trichloropropane (1,2,3-TCP) Maximum Contaminant Level (MCL)**

## **AWWA, California-Nevada Section**

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Division of Drinking Water

State Water Resources Control Board

# Presentation Outline

- Overview of 1,2,3-Trichloropropane (1,2,3-TCP)
- 1,2,3-TCP MCL Development Process
- Preliminary Staff Recommendation for 1,2,3-TCP MCL
- Elements in Draft Regulations
- Questions

# 1,2,3-TCP - History and Background

## 1,2,3-Trichloropropane – What is it?

- Was used as industrial solvent and for degreasing
- Was an ingredient in soil fumigants widely used for many decades
- Moves to groundwater aquifer w/little soil adsorption

# 1,2,3-TCP - History and Background

## Previous Monitoring

- California Unregulated Chemical Monitoring Rule (UCMR) – January 2001-2003
- Federal UCMR3 May 2012-2015
- Some water systems continued to monitor for 1,2,3-TCP voluntarily
- Laboratory reporting limits varied

# 1,2,3-TCP Occurrence Data

- **2001-2015 Occurrence Data:**
  - **471 wells with confirmed detections above 5 parts per trillion (ppt)**
  - Range of Detections: **5 ppt to >10,000 ppt**  
(current laboratory reporting limit is 5 ppt)
- **Vast majority in groundwater**

# 1,2,3-TCP Detections (2001-2015)

County	#	County	#
BUTTE	1	SAN BERNARDINO	31
FRESNO	90	SAN DIEGO	6
KERN	117	SAN JOAQUIN	20
LOS ANGELES	58	SAN LUIS OBISPO	3
MADERA	2	SAN MATEO	7
MENDOCINO	1	SANTA CLARA	1
MERCED	31	SANTA CRUZ	3
MONO	1	SOLANO	1
MONTEREY	4	STANISLAUS	19
RIVERSIDE	25	<b>TULARE</b>	<b>49</b>
SACRAMENTO	1		

Google earth

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Image Landsat

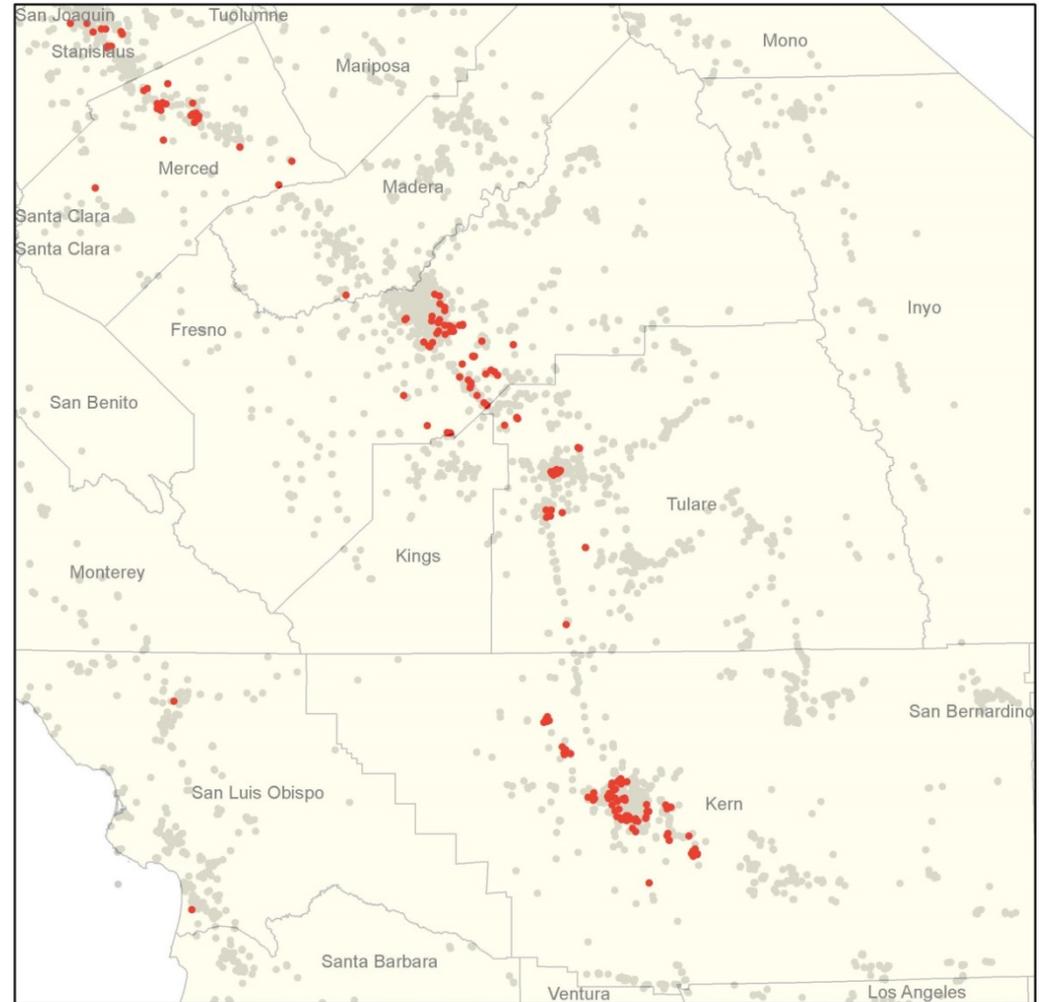
© 2015 Google

Data LDEO-Columbia, NSF, NOAA

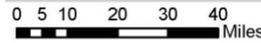
# Sources with Average 1,2,3-TCP Concentration above 5 ppt (2001-2015)

## 1,2,3-TCP Concentrations Above 5 ppt

Draft



**Legend**  
 ● 1,2,3 Trichloropropane Detection above 5 ppt  
 ● Drinking Water Wells

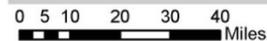
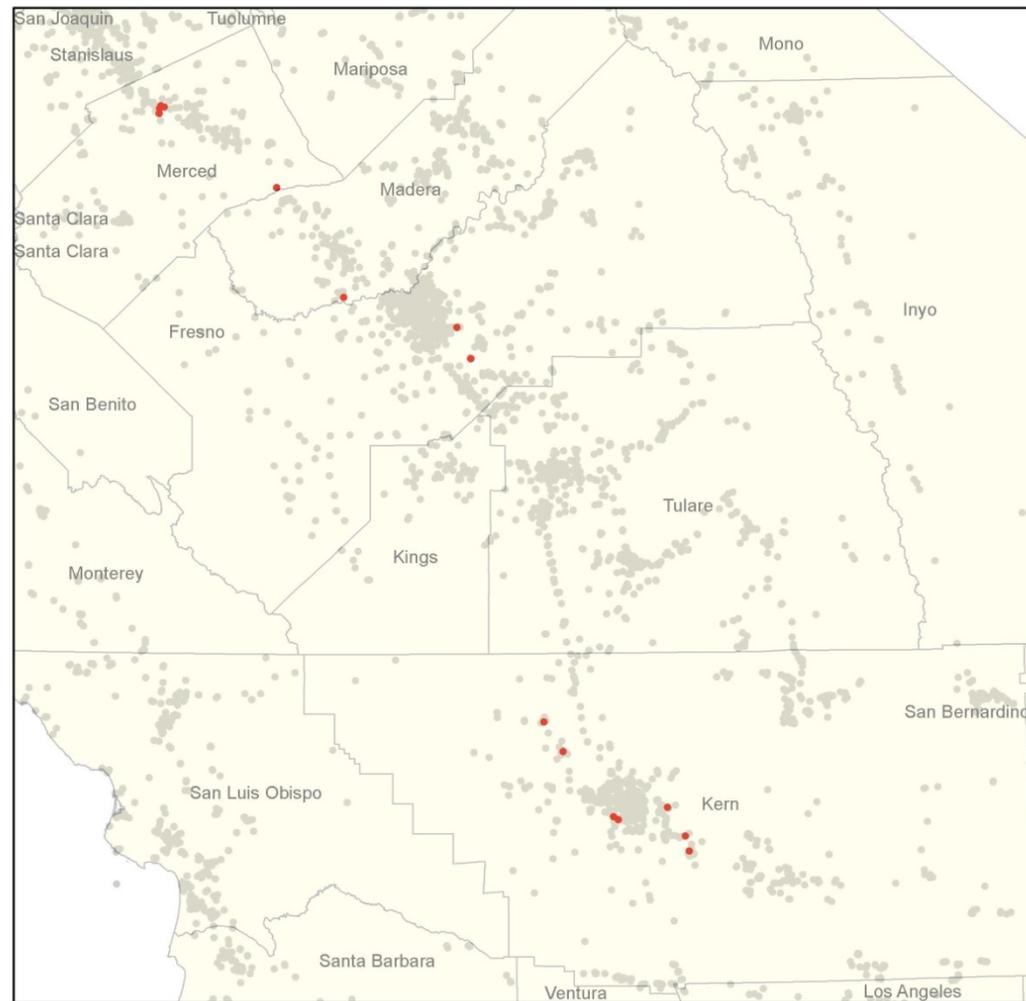


Average Concentration of 1,2,3-TCP Based on average of all samples for each well	Number of wells impacted at each concentration
150 ppt	20
70 ppt	60
35 ppt	104
15 ppt	174
7 ppt	245
<b>5 ppt</b>	<b>289</b>

1,2,3-TCP = Trichloropropane  
 ppt = parts per trillion

# Sources with Average 1,2,3-TCP Concentration above 150 ppt (2001-2015)

## 1,2,3-TCP Concentrations Above 150 ppt Draft



Average Concentration of 1,2,3-TCP Based on average of all samples for each well	Number of wells impacted at each concentration
<b>150 ppt</b>	<b>20</b>
70 ppt	60
35 ppt	104
15 ppt	174
7 ppt	245
5 ppt	289

1,2,3-TCP = Trichloropropane  
ppt = parts per trillion

# 1,2,3-TCP Health Effects

- **1,2,3-TCP is a Carcinogen (cancer causing chemical)**
- **Drinking water**
  - Your body absorbs much or all of 1,2,3-TCP in the drinking water
- **Breathing the air in your house**
  - Your body absorbs some of the trace levels of 1,2,3-TCP that can be found in air in your house



# 1,2,3-TCP Health Effects

For any environmental contaminant, your exposure depends on:

- The length of time that you have been exposed (e.g., days, months, years)
- **Acute exposure:** short term (hours, days, weeks)
- **Chronic exposure:** long term (many months, years or lifetime)

# Public Health Goal (PHG)

- The PHG of 0.7 ppt is based on chronic (long-term) exposure:
  - drinking 2 liters of water per day over a lifetime (70 years)
  - breathing air containing 1,2,3-TCP over a lifetime
- PHGs are **not regulatory requirements** and can be set lower than detection limits or treatment capability

# 1,2,3-TCP – PHG vs MCL

1,2,3-TCP PHG	1,2,3-TCP MCL
OEHHA, 2009	Set by State Water Board
PHG = 0.7 ppt	MCL has not been established
Not enforceable	Regulatory and enforceable
Does not consider technological or economic feasibility	Must be technologically and economically feasible.



# 1,2,3-TCP – Current Notification Recommendations

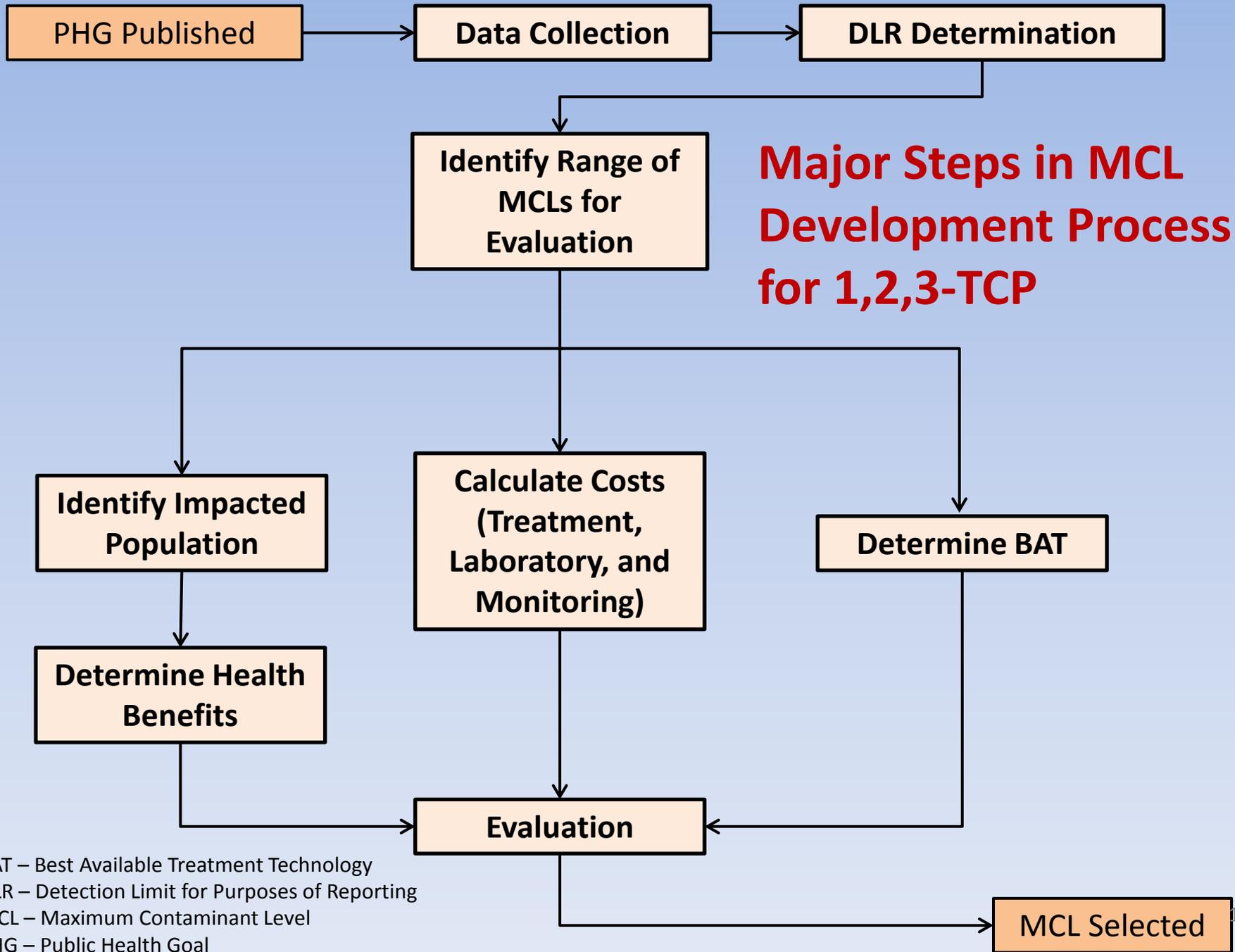
- **State Water Board Notification Level – 5 ppt**
  - The water system informs its customers and consumers regarding 1,2,3-TCP presence and health concerns
  - Uses Consumer Confidence Report, separate mailing, or other



# 1,2,3-TCP MCL Development Process

## Health and Safety Code Section 116365:

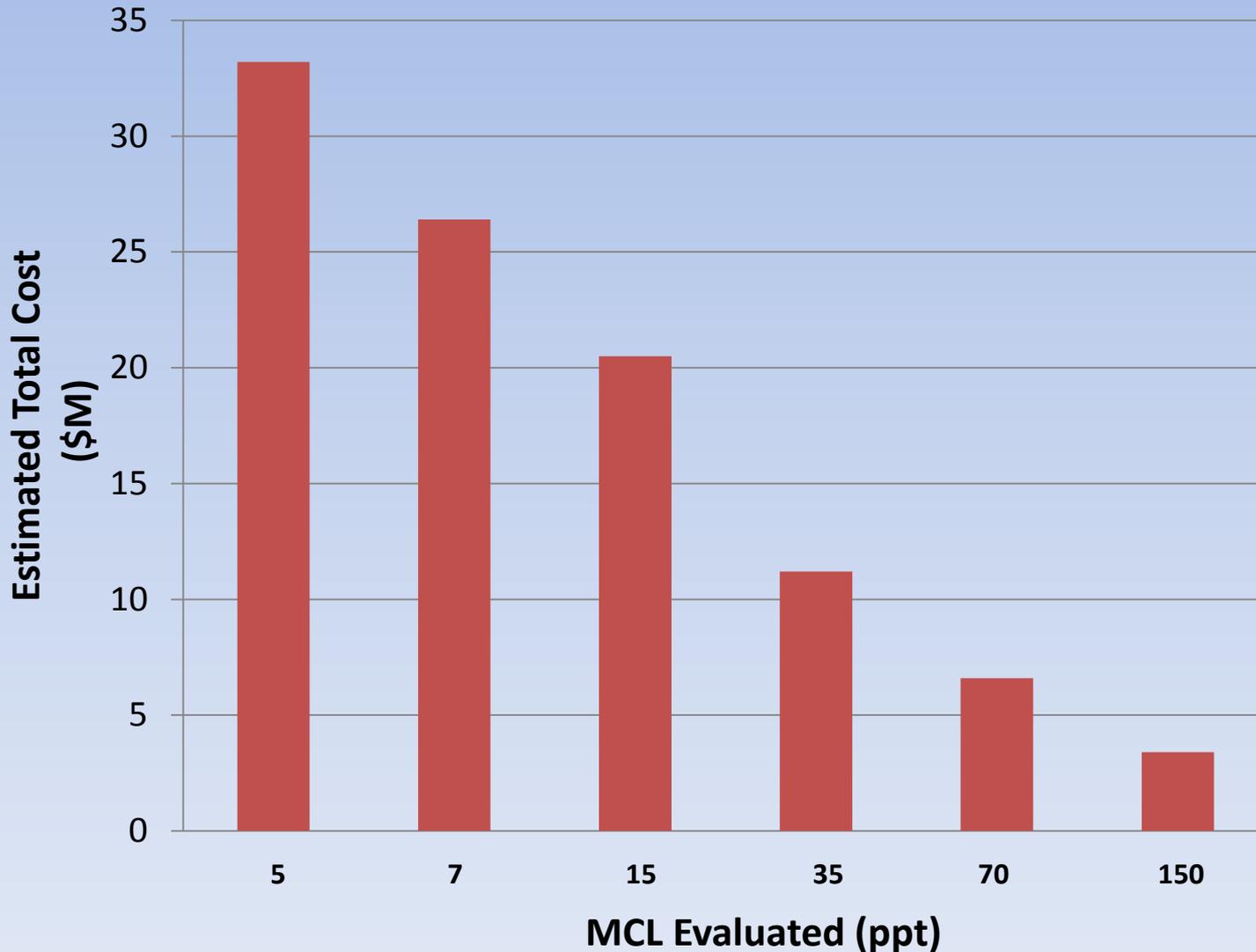
State Water Board must set the MCL at a level that is as close as feasible to the corresponding public health goal placing primary emphasis on the protection of public health, and that, to the extent **technologically and economically feasible...**



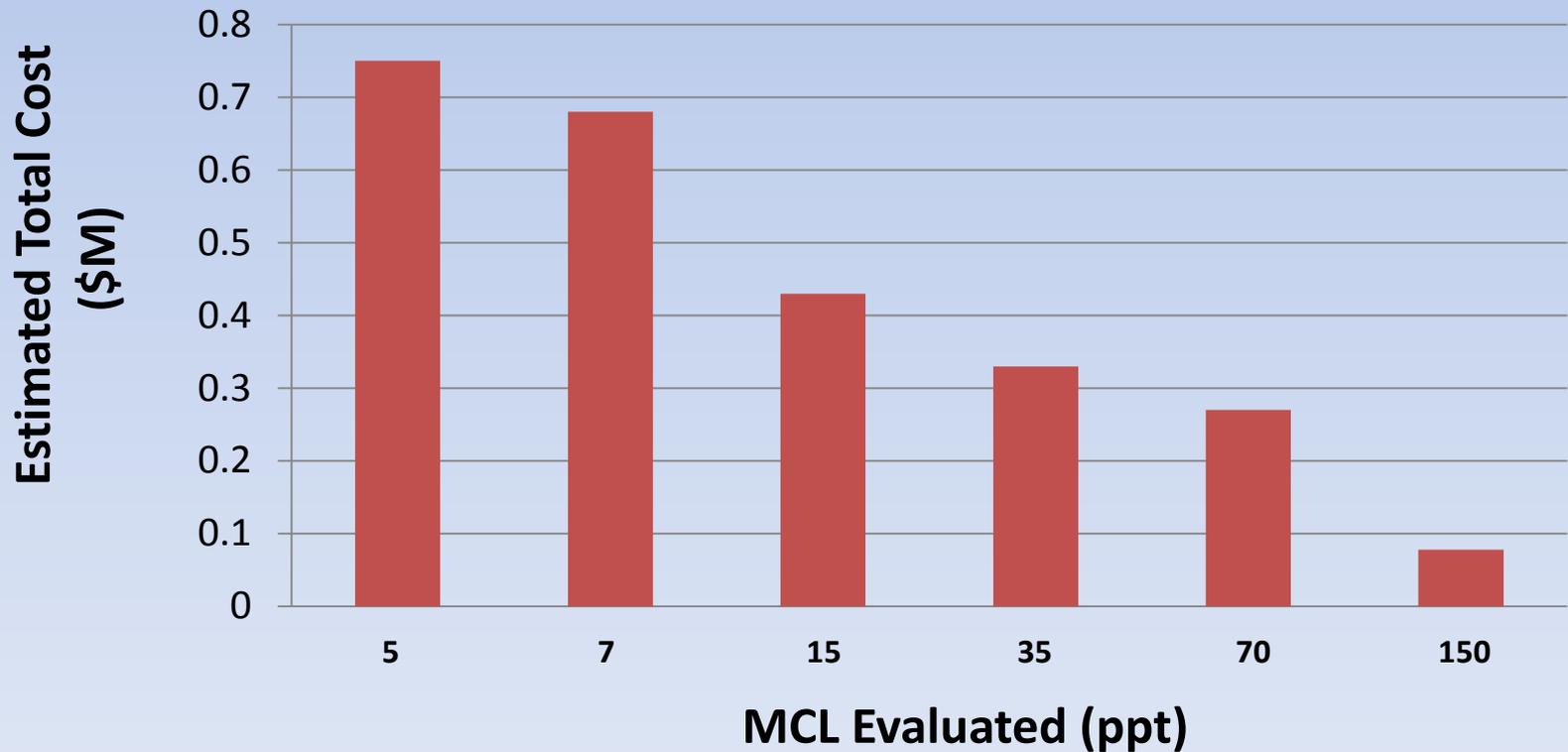
# 1,2,3-TCP MCL Development – Additional Requirements for Rulemaking

- **External Scientific Peer Review**
  - Health and Safety Code 57004
  - [http://www.waterboards.ca.gov/water\\_issues/programs/peer\\_review/](http://www.waterboards.ca.gov/water_issues/programs/peer_review/)
- **Compliance with CEQA**
- **Major Regulations Analysis**
  - State Administrative Procedure Act requirement for any proposed regulation with economic impact > \$50 million

# ***DRAFT* Total Annual Cost at 1,2,3-TCP MCL Review Points (Large Systems only)**



# ***DRAFT* Total Annual Cost at 1,2,3-TCP MCL Review Points (Small Systems only)**



# Lifetime Cancer Risk For 1,2,3-TCP

MCL Review Point	Theoretical Increase in Lifetime Cancer Risk*	Estimated Population Protected by MCL at this level**	Total Annual Cost (in Million \$)
0.7 (PHG)	1 in 1,000,000	More than 928,921	Unknown
5 (DLR)	1 in 142,857	928,921	\$34M
7	1 in 100,000	754,503	\$27M
15	1 in 47,619	601,556	\$21M
35	1 in 20,000	342,501	\$11M
70	1 in 10,000	190,634	\$7M
150	1 in 4,673	94,826	\$4M

\* 2 liters of water per day for 70 years

\*\* Population associated with known contaminated sources

**Preliminary Staff Recommendation  
for  
1,2,3-TCP MCL = 5 ppt**

# Preliminary Staff Recommendation – 1,2,3-TCP MCL

1,2,3-TCP MCL = 5 ppt is based on the following considerations:

## 1. Technical Feasibility:

- ELAP-Certified Laboratories – Analytical Detection Limit of 5 ppt
- The standard treatment for 1,2,3-TCP (Granular Activated Carbon) is proven, cost-effective and reliable down to 5 ppt

## 2. Economic Feasibility

## 3. Protection of Public Health:

- 5 ppt would result in a theoretical cancer risk of less than 1/100,000
- GAC reduces inhalation exposure (not addressed by bottled water)

# 1,2,3-TCP MCL – Draft Regulation

- **Compliance**

- Based on Running Annual Average (RAA)
- May be out of compliance before collecting 4 quarterly samples

- **Monitoring**

- Initial quarterly monitoring for 1 year – starts **January 2018**

# 1,2,3-TCP MCL – Draft Regulation

- **Monitoring (continued)**
  - Initial quarterly monitoring
  - Subsequent routine monitoring (every 3 years)
  - If 1,2,3-TCP is detected **at or above** the MCL
    - More frequent monitoring is then required to determine compliance with MCL
    - Consistent w/current regulations for Synthetic Organic Chemicals

# 1,2,3-TCP MCL – Draft Regulation

- **Consideration of Grandfathering of Sample Results for Initial Monitoring**
  - Sampling performed prior to MCL effective date may be eligible for use of initial monitoring

# 1,2,3-TCP MCL – Draft Regulation

- **Granular activated carbon (GAC)** is expected to be the **Best Available Technology (BAT)**
- **Consumer Confidence Report**
  - New language for 1,2,3-TCP health effects
  - New language for sources of 1,2,3-TCP contamination

# 1,2,3-TCP MCL – Draft Regulation



Well without treatment



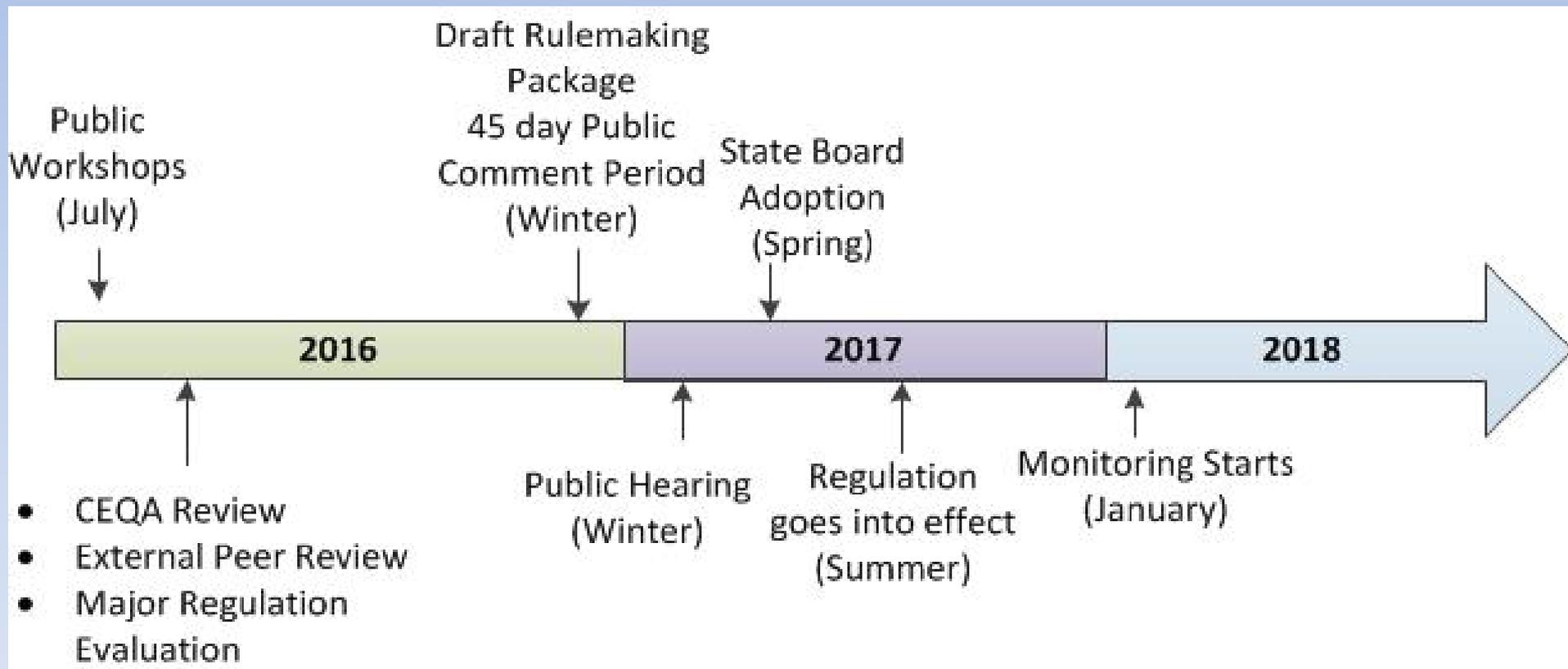
GAC treatment system

# 1,2,3-TCP MCL – Some Implementation Options

- **Options for a well that is out of compliance:**
  - Provide treatment
  - Drill new well
  - Remove the well from use
  - Purchase water from a nearby utility
  - Consolidate with a nearby larger water system
  - Blend contaminated water with a clean source to reduce overall concentrations of 1,2,3-TCP to below MCL

# 1,2,3-TCP MCL – Schedule

(Dates may change)



# Contact Information

## DDW Regulatory Development Unit

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Conny Mitterhofer, Senior Engineer, (916) 341-5720
- Email: [DDWRegUnit@waterboards.ca.gov](mailto:DDWRegUnit@waterboards.ca.gov)

## State Water Board Office of Public Participation

- Español: Ms. Mandy Roman (916) 341-5265

# State Water Board Funding Resources

- **Division of Financial Assistance,**  
Drinking Water State Revolving Fund  
[http://www.waterboards.ca.gov/drinking\\_water/services/funding/SRF.shtml](http://www.waterboards.ca.gov/drinking_water/services/funding/SRF.shtml)
- **Funding application:**  
<https://faast.waterboards.ca.gov/>
- **California Financing Coordinating Committee (CFCC):**  
[http://cfcc.ca.gov/funding\\_fairs.htm](http://cfcc.ca.gov/funding_fairs.htm)

# Resources Cont'd

- **Website:**

[http://www.waterboards.ca.gov/drinking\\_water/certlic/drinkingwater/123TCP.shtml](http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/123TCP.shtml)

- **Subscribe to Email List:**

- Go to

[http://www.waterboards.ca.gov/resources/email\\_subscriptions/](http://www.waterboards.ca.gov/resources/email_subscriptions/)

- Select "State Water Resources Control Board"

- Fill in contact information with your email address and full name

- Select category "Drinking Water" and then select the first box "Drinking Water Program Announcements"

- You may select other categories as well

- Click "subscribe"

- **Drinking Water Watch:**

<https://sdwis.waterboards.ca.gov/PDWW/>

# Questions