

1,2,3-Trichloropropane

Maximum Contaminant Level (MCL)

Development Process

State Water Resources Control Board (State Water Board)
Division of Drinking Water

Focused Stakeholder Meeting
June 2, 2016

Purpose of Meeting

- Overview of 1,2,3-Trichloropropane
- Explain our MCL Development Process
- Talk with impacted Water Systems
- Identify practical questions, concerns & issues
- Talk about our overall schedule and how it impacts you

Outline

- 1,2,3-Trichloropropane
 - History and Background
 - Occurrence Data
 - Health Effects
 - Advisory/Notification Levels
- MCL Development Process
- 1,2,3-TCP MCL – Draft Regulation and Schedule
- Questions

1,2,3-TCP - History and Background

1,2,3-Trichloropropane – What is it?

- Colorless to straw-colored liquid
- Sweet but strong odor
- Not naturally occurring
- Uses as industrial solvent, cleaning and degreasing agent, chemical production intermediary, found in soil fumigants

1,2,3-TCP - History and Background

Previous Monitoring under Unregulated Chemical Monitoring Rule (UCMR)

- **California UCMR – effective January 2001**
 - PWS required to complete sampling by Dec. 31, 2003
 - Small PWS with fewer than 150 service connections exempt
 - Analytical methods not capable of achieving 5 parts per trillion (ppt) detection limit
 - Some PWS monitored with higher detection limits
 - PWS required to report results in CCR (range/avg)

1,2,3-TCP - History and Background

- **Federal UCMR3 May 2012**
 - Required sampling during 12-month period from January 2012 through December 2015
 - PWS > 10,000 population
 - Selected PWS < 10,000 population
 - Used EPA Method 524.3 with a minimum reporting limit of 30 parts per trillion (ppt)
 - Requirement to report detections in annual CCR

1,2,3-TCP Occurrence Data

AB2222 State Water Board Report to Legislature (2013):

Communities That Rely On A Contaminated Groundwater Source For Drinking Water

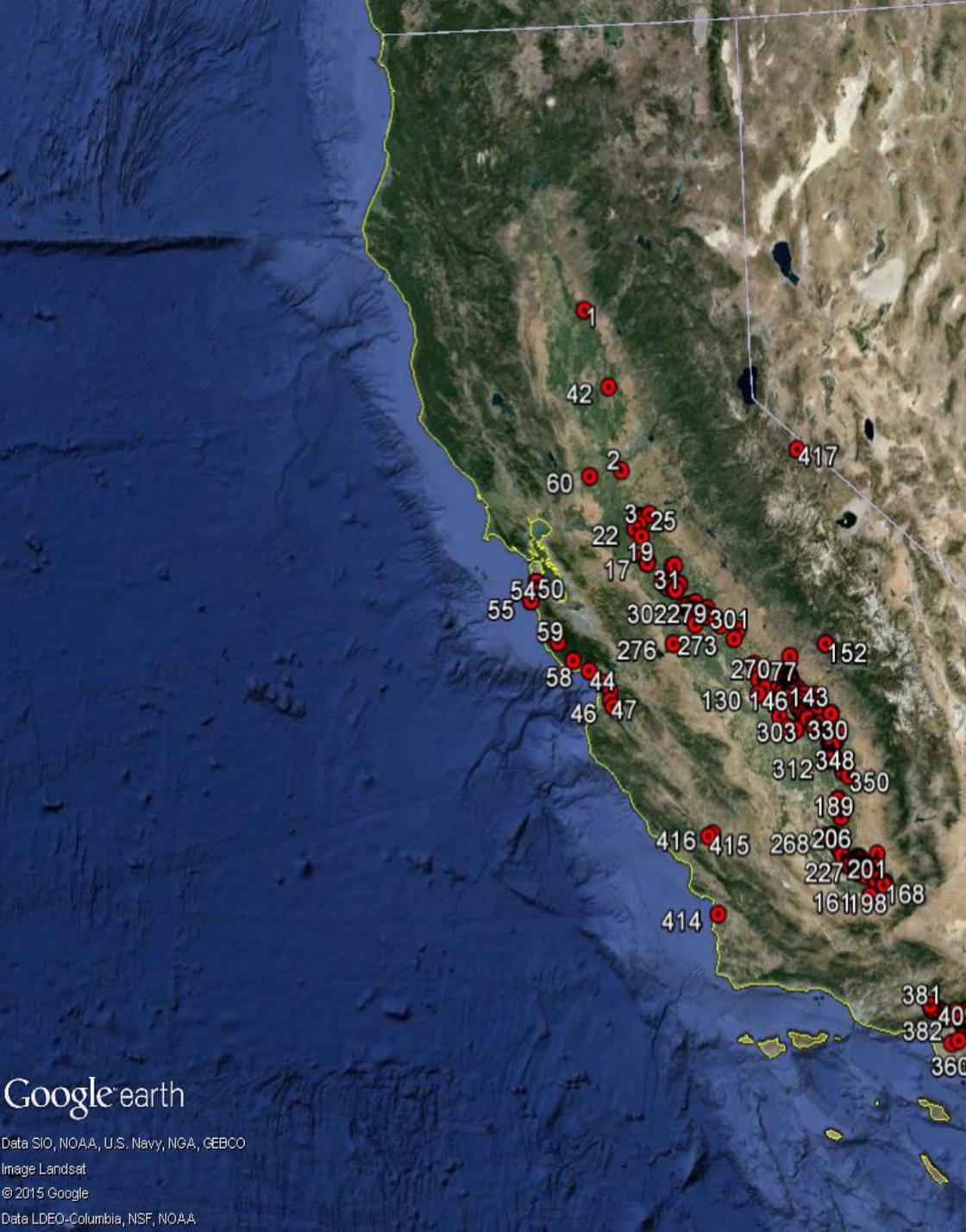
Table 1: Ten Most Frequently Detected Principal Contaminants

| Principal Contaminant | Number of Wells | Number of Community Water systems | Type of Contaminant |
|------------------------------------|-----------------|-----------------------------------|--------------------------------------|
| Arsenic | 587 | 287 | Naturally occurring |
| Nitrate | 451 | 205 | Anthropogenic nutrient ¹ |
| Gross alpha activity | 333 | 182 | Naturally occurring |
| Perchlorate | 179 | 57 | Industrial/military use ¹ |
| Tetrachloroethylene (PCE) | 168 | 60 | Solvent |
| Trichloroethylene (TCE) | 159 | 44 | Solvent |
| Uranium | 157 | 89 | Naturally occurring |
| 1,2-dibromo-3-chloropropane (DBCP) | 118 | 36 | Legacy pesticide |
| Fluoride | 79 | 41 | Naturally occurring |
| Carbon tetrachloride | 52 | 17 | Solvent |

Notes:
 1. Also can be naturally occurring, but typically at levels below maximum contaminant level

1,2,3-TCP Occurrence Data

- **2001-2015 Occurrence Data:** detections in **471 sources**
- **Groundwater vs Surface Water**
 - 1,2,3-TCP tends to not be absorbed by soil and enters groundwater
 - Overwhelming number of identified contaminated sources are groundwater wells
 - Approximately **1** surface water source
100 groundwater sources
- **Range of Detections: 5 ppt – 10 ppb**
ppt – parts per trillion
ppb – parts per billion



1,2,3-TCP Occurrence Data

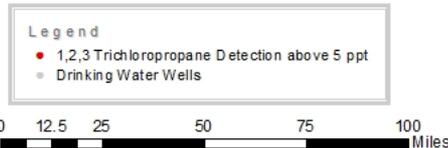
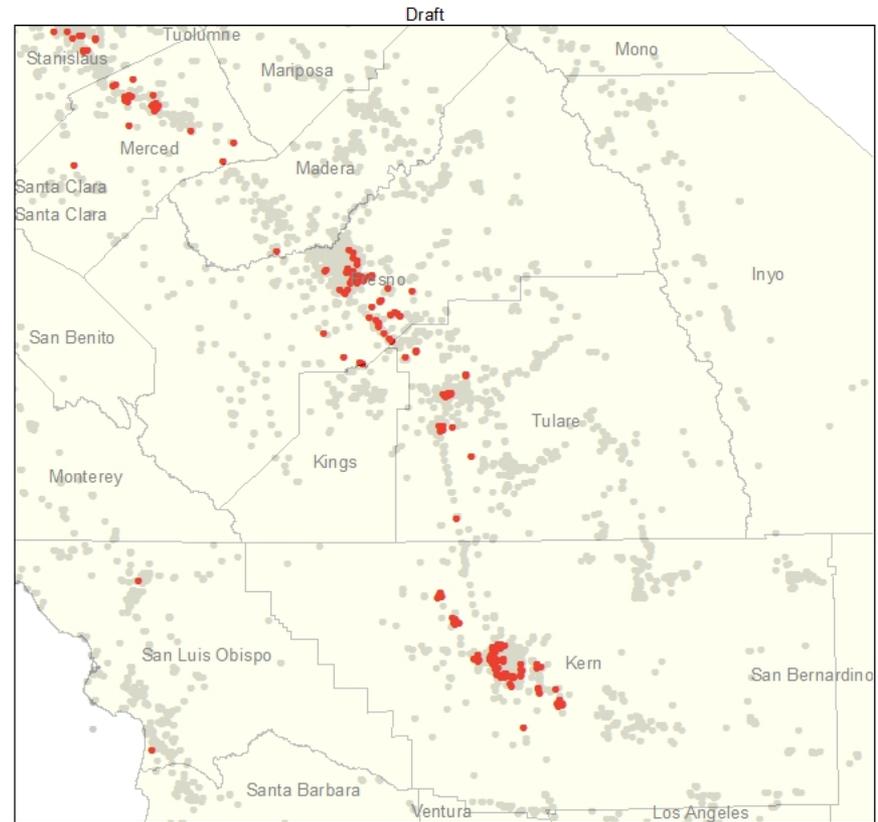
| County | # of known sources | County | # of known sources |
|-------------|--------------------|-----------------|--------------------|
| BUTTE | 1 | SAN BERNARDINO | 31 |
| FRESNO | 90 | SAN DIEGO | 6 |
| KERN | 117 | SAN JOAQUIN | 20 |
| LOS ANGELES | 58 | SAN LUIS OBISPO | 3 |
| MADERA | 2 | SAN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

Google earth

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
 Image Landsat
 © 2015 Google
 Data LDEO-Columbia, NSF, NOAA

Sources with 1,2,3-TCP Concentrations above 5 ppt

1,2,3-TCP Concentrations Above 5 ppt



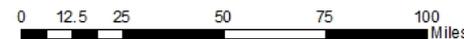
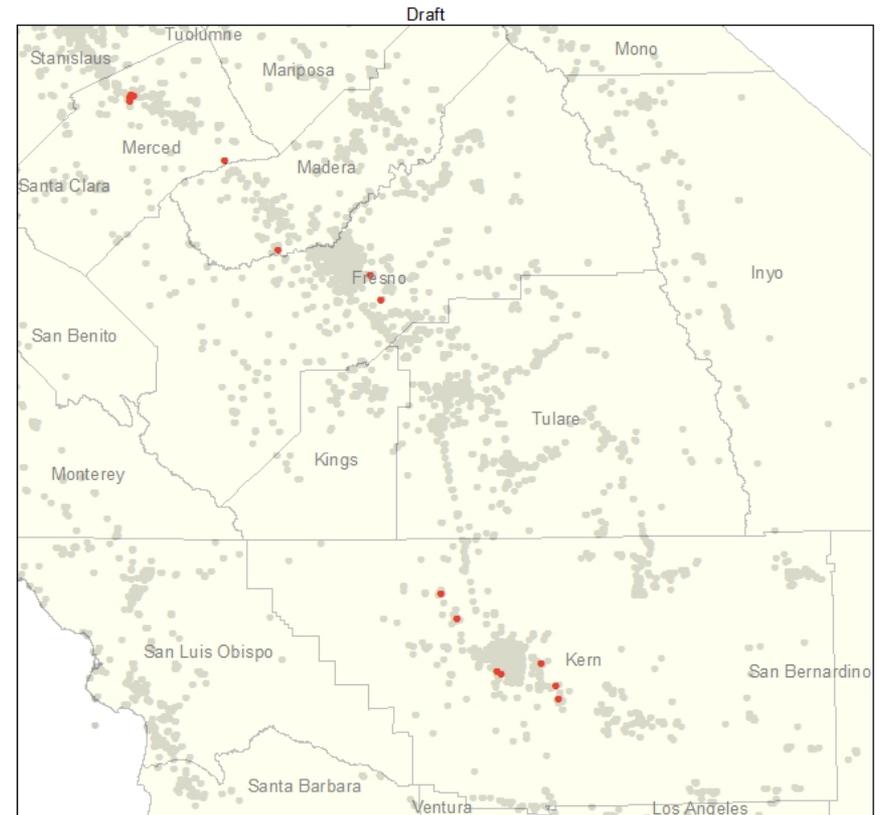
| Legend | |
|--------|----------------------------------------------|
| ● | 1,2,3 Trichloropropane Detection above 5 ppt |
| ● | Drinking Water Wells |

| 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 |
| 7 ppt | 245 |
| 5 ppt | 289 |

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

Sources with 1,2,3-TCP Concentrations above 150 ppt

1,2,3-TCP Concentrations Above 150 ppt



| 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 |
| 7 ppt | 245 |
| 5 ppt | 289 |

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

1,2,3-TCP – Health Effects

- Exposure attributed to **drinking** and **inhalation**
- **Dermal exposure (absorption through skin)** – not significant
- OEHHA Public Health Goal document: *“The PHG is based on carcinogenic effects observed in animals”*
- In 1999, 1,2,3-TCP was added to the list of chemicals known to the state to cause cancer (Proposition 65)
- PHG also established a health protective level of 0.08 milligram per liter (mg/L) or 80 parts per billion (ppb) for drinking water for non-carcinogenic effects; 80 ppb = 80,000 ppt

1,2,3-TCP – Advisory/Notification Levels

- **Public Health Goal (PHG)**

- Office of Environmental Health Hazard Assessment (OEHHA) established a PHG in 2009
- PHG is a target for the MCL
- PHG set at 0.0000007 mg/L or **0.7 ppt**



Lake Tahoe: 39 trillion gallons

- **No Federal MCL**

- **Hawaii MCL: 600 ppt**

- **State Water Board**

- ELAP-Certified Laboratories – Analytical Detection Limit of **5 ppt**
- Notification Level of **5 ppt**
- Response Level of **500 ppt**

1,2,3-TCP – Advisory/Notification Levels

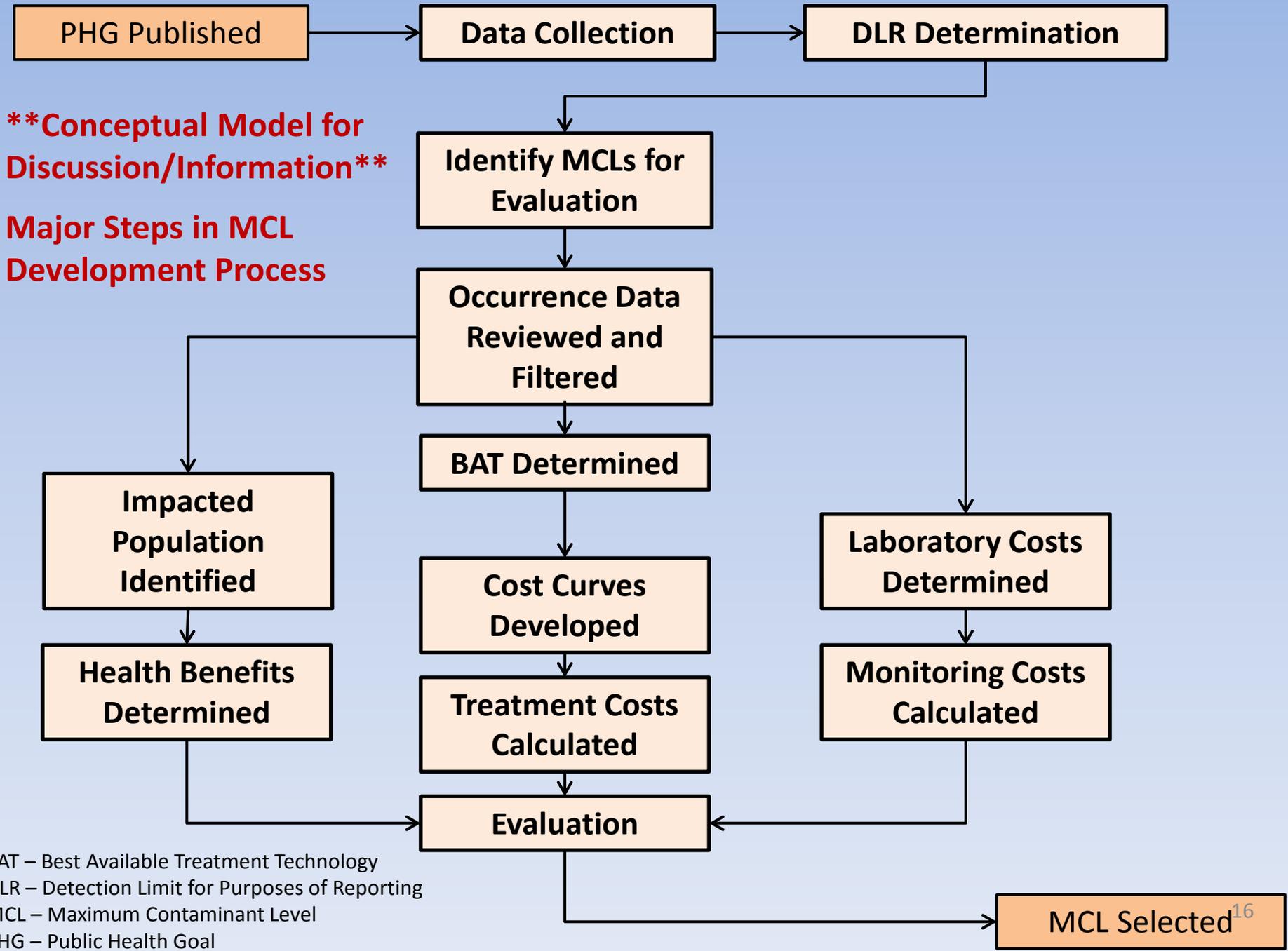
- **State Water Board Notification Level – 5 ppt**
 - Water system must notify governing bodies
 - DDW recommends that the water system inform its customers and consumers re presence and health concerns associated with exposure
 - Consumer notification: CCR, separate mailing, other
- **Response Level – 500 ppt**
 - Water system must notify governing bodies
 - DDW recommends customer/consumer notification (see above)
 - DDW recommends that source be taken out of service
 - Press Release to local media
 - DDW recommends monthly sampling and analysis and quarterly customer notification for duration of exceedance
- **Resource:**
http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/NotificationLevels.shtml



The MCL Development Process

Health and Safety Code Section 116365 describes the process by which the State Board is to set primary drinking water standards. Among other requirements, the *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) with respect to acutely toxic substances, avoids any known or anticipated adverse effects on public health with an adequate margin of safety.
- 2) with respect to carcinogens, or any substances that may cause chronic disease, avoids any significant risk to public health.



Determining Technological and Economic Feasibility

The State Board evaluates the **technological and economic feasibility** of regulating a chemical contaminant which includes the following steps:

1. Select possible MCL concentration or concentrations for evaluation
(for example 5, 7, 35, 70, and 150 ppt for 1,2,3-TCP)
2. Evaluate available occurrence data
3. Evaluate available analytical methods and estimate monitoring costs for possible MCL concentrations

Determining Technological and Economic Feasibility

4. Identify best available technologies (BAT) for treatment and estimate treatment costs
5. Calculate the associated health benefits (health risk reductions) that result from treatment to each of the possible MCL concentrations
6. Consider the economic feasibility based on steps 4 and 5 and select the MCL in accordance with law, Health and Safety Code 116365

MCL Development - Requirements

- **External Scientific Peer Review**
 - Health and Safety Code 57004
 - http://www.waterboards.ca.gov/water_issues/programs/peer_review/
- **Compliance with CEQA**
- **Major Regulations Analysis**
 - Senate Bill 617 (Chapter 496, Statutes of 2011)
 - Proposed regulation with economic impact > \$50 million



The Formal Rule Making Process

Administrative Procedure Act (APA)

- **Office of Administrative Law (OAL)** review for publication in California Regulatory Notice Register
- Minimum **45-day public comment period**
- **Public Hearing**
- Prepare and Present Final Statement of Reasons (including responses to public comments) and the final Regulations for **adoption by the State Water Board**
- Submit **Final Regulatory Package to OAL for review and approval**
- **OAL transmits approved regulations to Secretary of State**

1,2,3-TCP MCL – Draft Regulation

- **Granular activated carbon (GAC)** is expected to be the **Best Available Technology (BAT)**
 - Air stripping shown to remove some 1,2,3-TCP
 - Not anticipated to be particularly difficult to remove 1,2,3-TCP using GAC but GAC selection is important
 - Short pilot study may help select longer-lasting GAC

1,2,3-TCP MCL – Draft Regulation

- **Monitoring**

- Initial quarterly monitoring for 1 year – starts **January 2018**
- Routine monitoring after initial monitoring
 - Waivers are possible if 1,2,3-TCP not detected
- During initial monitoring - if 1,2,3-TCP detected **above** the MCL
 - >3,300 population = 6 monthly samples then quarterly sampling
 - <=3,300 population = quarterly sampling
- During initial monitoring - if 1,2,3-TCP detected **below** the MCL: quarterly sampling

1,2,3-TCP MCL – Draft Regulation

- **Consideration of Grandfathering of Samples**
 - Sampling performed prior to MCL effective date may be eligible for use of initial monitoring
 - State Water Board issued Early Monitoring Letter
- **Waivers (T22, 64445(d))**
 - Source is eligible if:
 - Document that there is no history of use in watershed or zone of influence
 - Unknown or known usage but can show source is not susceptible through various criteria (monitoring results, land use, source protection, etc)

1,2,3-TCP MCL – Draft Regulation

- **PWS that supply drinking water exceeding MCL:**
 - Public notification to customers of the violation of drinking water standard in accordance with this regulation and State and Federal Safe Drinking Water Acts
 - Take corrective action to reduce and eliminate such violations, in accordance with any enforcement action taken by the Division of Drinking Water District Office

1,2,3-TCP MCL – Draft Regulation

- **Options for 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 – Draft Regulation

- **If Source exceeds running annual average above MCL:**
 - GAC already installed for other contaminants:
 - Possible GAC effectiveness study
 - Permit amendment
 - GAC not installed
 - Compliance order
 - Design and installation of treatment
 - Permit amendment
 - Begin monthly treated water monitoring, continue quarterly raw water monitoring

1,2,3-TCP MCL – Draft Regulation

- **Consumer Confidence Report**
 - New language for health effects
 - New language for sources of contamination

1,2,3-TCP MCL – Schedule

- **Public Workshops** Fresno, Bakersfield, Sacramento: *June 2016*
- **Public Comment Period:** *beg September to mid October 2016*
- **Public Hearing:** *October 19, 2016 (Sacramento)*
- **State Water Board Adoption:** *early 2017*
- **Effective Date:** *April 1, 2017*

***** *Dates are tentative and may change***

Contact Information

Contacts

- **DDW District Engineer**
- **DDW Regional Engineer:**
 - Carl Carlucci, Supervising Engineer
- **DDW Regulatory Development Unit**
 - Mark Bartson, Supervising Engineer, (916) 449-5622, mark.bartson@waterboards.ca.gov
 - Conny Mitterhofer, Senior Engineer, (916) 341-5720, conny.mitterhofer@waterboards.ca.gov

Resources

- **Website:**

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/

- 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/>

Our Questions for You

1. What impacts would various potential MCLs have on the operation of your system?
2. What other water system priority issues do you have? Other contaminants? Old water mains? Insufficient supply? Aesthetic quality?
3. How aware are your customers of the detections of 1,2,3-TCP? Do you include this in your Consumer Confidence Report?
4. What type of question do you hear (or expect to hear) from your customers about 1,2,3-TCP?
5. How can we help you understand the issues better and communicate with your customers?