1,2,3-TRICHLOROPROPANE (1,2,3-TCP)

January 31, 2018

DIVISION OF DRINKING WATER (DDW)

PROGRAM MANAGEMENT BRANCH

CALIFORNIA Water Boards

STATE WATER RESOURCES CONTROL BOARD

REGIONAL WATER QUALITY CONTROL BOARDS

PRESENTERS

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- Kassy Chauhan, P.E., District Engineer, Merced District

Presenters

- Mark Bartson, P.E., Chief, Technical Operations Section
- Melissa Hall, P.E., Regulatory Development Unit Chief
- Eugene Leung, P.E. Senior Water Treatment Specialist

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Standard Disclaimers / Helpful Advice

- Please read the regulations and the SWRCB Letter of December 29, 2017 on this topic
- If you have questions contact your District Office or Local Primacy Agency (LPA)
- In the event of a detection of 1,2,3-TCP contact your District Office or LPA

Outline of Presentation

Section	Topic
1	Background information on 1,2,3-TCP
2	Basic requirements & Initial sampling
3	Waiver requests for reduced monitoring
4	When 1,2,3-TCP is detected – Resampling
5	Compliance with the MCL
6	Best Available Technology / Treatment Options
7	Questions and Answers

SWRCB Notification Letter of 12//29/17

Section 1

1,2,3-TCP - MCL & Public Health Goal

1. The Maximum Contaminant Level (MCL) for this Synthetic Organic Chemical (SOC) is 0.000005 mg/l

2. MCL = 5 parts per trillion (ppt)

3. The Public Health Goal (PHG) of 0.7 ppt was established in 2009 based on carcinogenic effects

4. There is no federal MCL for 1,2,3-TCP

1,2,3-TCP - Others State Standards?

1. There is no Federal MCL for 1,2,3-TCP
2. Hawaii has an MCL of 600 ppt based on acute impacts
   - Did not consider carcinogenic risk
3. Two other states have health-based **guidance values:**
   - Minnesota – 3 ppt
   - New Jersey – 5 ppt

1,2,3-TCP: Historical Use

1. 1,2,3-TCP is a man-made chlorinated hydrocarbon.

2. Historically, 1,2,3-TCP was used as an industrial solvent, cleaning and degreasing agent, and paint remover.

3. Some widely-used soil fumigants contained 1,2,3-TCP as a minor component.

1,2,3-TCP: Detections in Groundwater

1. 1,2,3-TCP has been widely detected in groundwater for many years

2. 1,2,3-TCP is very persistent in groundwater

3. Based on data up to 2016, about 289 public water system wells with confirmed detections above 5 ppt

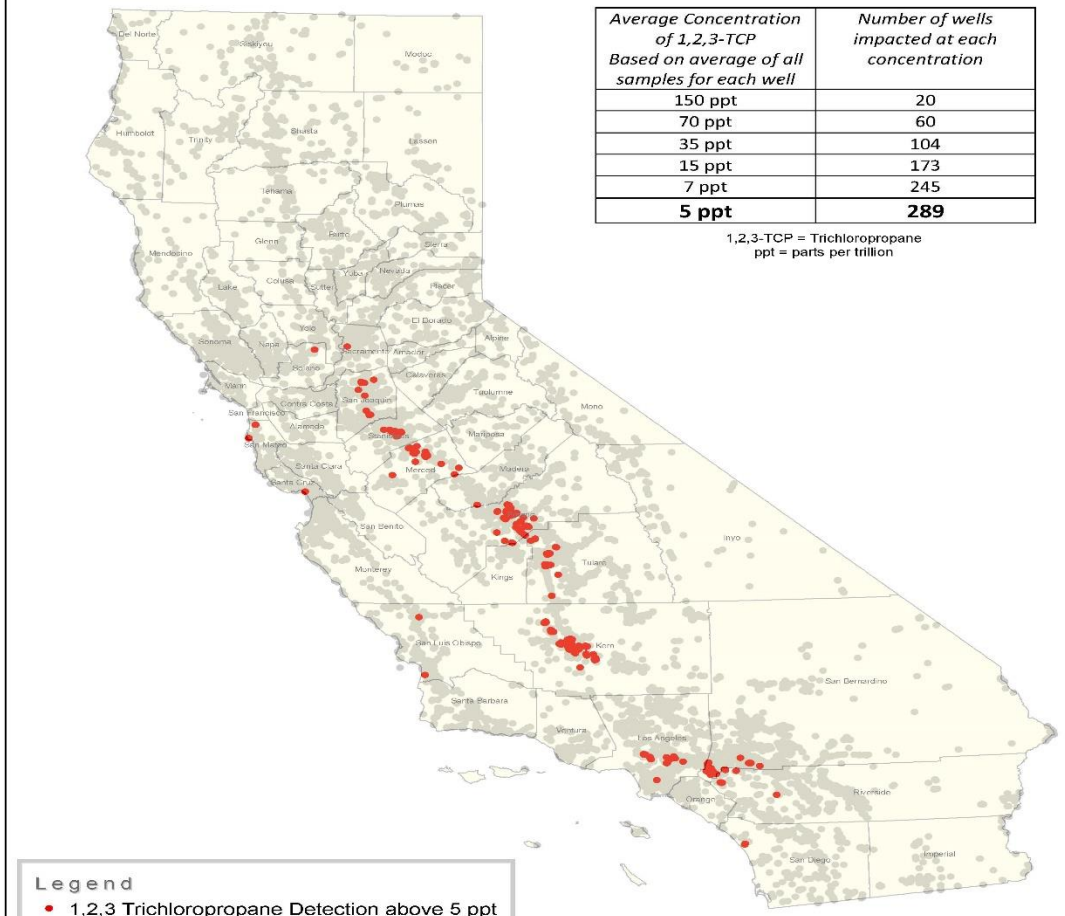
Based on data through 2015

1,2,3-TCP Concentrations Above 5 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*
150 ppt	20
70 ppt	60
35 ppt	104
15 ppt	173
7 ppt	245
5 ppt	**289**

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



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

0 25 50 100 150 200 Miles

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Section 2

Basic Requirements & Initial Sampling

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

State Water Resources Control Board
Division of Drinking Water

December 29, 2017

To: Community and Nontransient-Noncommunity Water Systems in California

Re: **STATE ADOPTION OF 1,2,3-TRICHLOROPROPANE MCL**

The purpose of this letter is to alert you to the new regulation adopted by the State Water Resources Control Board's Division of Drinking Water (DDW) establishing a maximum contaminant level (MCL), monitoring frequencies, and other requirements for 1,2,3-Trichloropropane (1,2,3-TCP). These regulations were filed with the Secretary of State and became effective on December 14, 2017. The establishment of this MCL is a key milestone in addressing a major drinking water issue in California.

Information in this letter is intended as an overview. You are encouraged to read the text of the new regulations and to review information on our web pages (listed below).

DDW Web Pages Related to 1,2,3-TCP

1. Drinking Water Program main web page for 1,2,3-TCP:
   https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/123TCP.shtml
2. Drinking Water Program web page on the regulations established for 1,2,3-TCP:
   https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/SBDDW-17-001_123TCP_MCL.html

1,2,3-TCP: What are the NEW requirements?

1. The establishment of:
   - **Maximum Contaminant Level (MCL) of 5 parts per trillion (ppt)**
   - Detection Limit for Purposes of Reporting (DLR) of 5 ppt
2. Community and Nontransient-Noncommunity Water Systems are required to:
   - Monitor their sources for 1,2,3-TCP.
   - Comply with the MCL in the water delivered to the public.
   - Report all sampling results within required time frames.

New Requirements (continued)

3. **Data Substitution** - 1,2,3-TCP water quality monitoring data collected within the two years prior to the date of the MCL may be eligible for the initial monitoring requirements.

4. Granular Activated Carbon (GAC) has been identified as the **Best Available Technology (BAT).**

5. Water Systems that violate the MCL are required to use specific public notification (health effects) language.

6. Water Systems that detect 1,2,3-TCP must use specific Consumer Confidence Report language.

New - Organic Chemical Data Substitution

1. Allows samples collected prior to the regulations effective date to be substituted for initial monitoring samples:
   - Requests must be made in writing to applicable District
   - Can only substitute samples in like calendar quarters (e.g., Q2 2016 for Q2 2018)
   - Can only substitute three of the four quarterly samples – must collect at least one sample during initial sampling.
   - Only from last two years (2016 and 2017)
   - Applies only to groundwater sources

2. Sample results eligible for data substitution must have been analyzed by a laboratory method recognized as capable of performing the analysis down to the DLR – SRL524M

Initial Quarterly Sampling – First Year

1. Water Systems must conduct initial monitoring in the quarter beginning in January, 2018 (i.e., January, February, and March).

2. Data Substitution results from groundwater samples collected during 2016 and 2017 may be eligible for up to three of the four quarters of initial monitoring.

3. Each individual source must be sampled. Composite samples are not allowed for 1,2,3-TCP since the DLR and the MCL are the same value.

- Sources officially designated as “standby” in permit must be sampled once within the three year period beginning the effective date of the MCL (i.e. December 14, 2018)/

Ongoing Monitoring – After First Year

1. Sources that have not had detects in first year of monitoring must be sampled every three years as follows:
   - One sample for systems serving 3,300 or fewer people (< = 3,300)
   - Sample two quarters for systems serving more than 3,300 people (> 3,300)
2. For sources which have had previous detections or currently exceed the MCL:
   - Contact your District Office or LPA to confirm follow-up monitoring after the first year.

Section 3

Waiver Requests for Reduced Sampling

1. Waiver requests are handled by local Drinking Water District Office or Local Primacy Agency.

2. Fumigants containing 1,2,3-TCP were widely used for many years.
   - Location of areas of use are not well-documented.
   - 1,2,3-TCP degrades very slowly in groundwater.
   - Small quantities of can contaminate a large volume of water.

Request for a “Use” Waiver

- Use Waiver Requirements: §64445(d)(1)
  - If it can be documented that the chemical has not been previously used, manufactured, transported, stored, or disposed of within the watershed or zone of influence and therefore, that the source can be designated nonvulnerable.

Request for a “Susceptibility” Waiver

- Susceptibility Waiver Requirements §64445(d)(2)

If previous use of the chemical locally is unknown or the chemical is known to have been used previously and the source cannot be designated nonvulnerable pursuant to (d)(1), it may still be eligible for a waiver based on a review related to susceptibility to contamination. The application for waiver based on susceptibility must include

(A) previous monitoring results;

(B) user population characteristics;

(C) proximity to sources of contamination;

(D) surrounding land uses;

(E) degree of protection of the water source;

(F) environmental persistence and transport of the chemical in water, soil, and air;

(G) elevated nitrate levels at the water supply source; and

(H) historical system operation and maintenance data including previous inspection results.

Section 4

When 1,2,3-TCP is Detected!

1. In the event of a detection of 1,2,3-TCP above the MCL, the Water System must:
   - Contact the District Office or LPA within 48 hours.
   - Conduct follow-up sampling as specified in the regulations.
   - If a sample result **exceeds ten times the MCL**, the water system must contact the District or LPA within 48 hours to discuss potentially removing the well from service.

1,2,3-TCP Detections: Optional Confirmation Sample(s)

1. The water system **may** first confirm the analytical result, by collecting one or two additional sample(s) to confirm the initial finding.
2. If one or both confirmation samples have 1,2,3-TCP detected, then compliance is based on the average of the initial and confirmation sample(s).
3. The initial finding is disregarded if BOTH additional confirmation samples are non-detect.

For ALL Systems: If Results Exceed 10 x the MCL (> 50 ppt)

1. The water supplier shall notify the State Board within 48 hours of the receipt of the results.
2. The contaminated site shall be resampled within 48 hours to confirm the result.
3. The water supplier shall notify the State Board of the resample results within 24 hours.
4. If the average concentration of the original and confirmation samples exceeds ten times the MCL, use of the contaminated water source shall immediately be evaluated for discontinuation.
5. A formally discontinued water source shall not be returned to service without written approval from the State Board.

1,2,3-TRICHLOROPROPANE SUMMARY

Analyte Group	Synthetic Organic Chemical (SOC)
Public Health Goal (PHG)	0.7 ppt
Detection Level for Reporting (DLR)	5 ppt
Maximum Contaminant Level (MCL)	5 ppt
Best Available Technology (BAT)	Granular Activated Carbon
Effective Date of New Regulations	December 14, 2017
Initial Monitoring Start Date	Quarter beginning January, 2018
Public Water Systems Required to Monitor	Community and Nontransient-Noncommunity

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Section 5

Compliance with the MCL

1. The MCL may be exceeded for a source based on the Running Annual Average (RAA):
   - For small systems (< = 3,300 persons) if the RAA for the FULL year exceeds the MCL.
   - For larger systems (> 3,300 people) if the RAA of ALL Samples exceeds the MCL.
2. For ALL systems, one or more relatively high results can trigger the MCL to be exceeded (even without completion of the full sampling)

Compliance with the MCL - Considerations

- Non-detects are counted as ZERO in determining averages
- Since the MCL is equal to the DLR, compliance determinations can be tricky
- A value of less than 5.5 ppt (<5.5 ppt) is a DETECTION but does not exceed the MCL
- The following values do NOT exceed MCL:

5.0, 5.1, 5.2, 5.3, 5.4

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Compliance Determinations – Example 1

ANY size system with **No detections**				
Month	**Compliance Period**	**Result**	**Average for Quarter**	**Average for FULL Year**
February	1st Quarter	**ND = 0**	0	0
May	2nd Quarter	**ND = 0**	0	0
August	3rd Quarter	**ND = 0**	0	0
November	4th Quarter	**ND = 0**	0	**0**

✓ **Initial Sampling Requirements are met!**

Following a Sample Result above the MCL

For **smaller systems** (< = 3,300 population)

- Quarterly follow-up samples for one year
- Compliance is based on the Running Annual Average (RAA)
- A single relatively high sample result can cause the RAA to exceed the MCL for the whole year (even if the year is not yet complete)

Compliance Determinations – Example 2

Smaller system (< = 3,300 people) with a Low Detection in 1st Quarter				
Month	**Compliance Period**	**Result**	**Average for Quarter**	**RAA for the Full Year**
February	1st Quarter	**7.2**	7.2	
May	2nd Quarter	**6.1**	6.1	
August	3rd Quarter	**ND**	0	
November	4th Quarter	**7.4**	7.4	**5 ppt** (rounded from 5.2 ppt)

- ✓ **Initial detection requires the completion of the full year of sampling!**
- ✓ **Followed by subsequent annual sampling in the quarter with the highest detection.**

Compliance Determinations – Example 3

Smaller system (< = 3,300 people) with a High Detection in 1st Quarter				
Month	**Compliance Period**	**Result**	**Average for Quarter**	**RAA for the Full Year**
February	1st Quarter	**18.0**	20.0	
February	**Confirmation #1**	**22.0**		
February	**Confirmation #2**	**20.0**		
May	2nd Quarter	**9.0**	9.0	***7.25 ppt*** ***(Source exceeds the MCL for whole year even if remaining results are ND)***
August	3rd Quarter	**ND**	0	
November	4th Quarter	**ND**	0	**7 ppt (rounded from 7.25)**

- **Source exceeds the MCL as of the May sampling result**

Following a Sample Result above the MCL

For **larger systems** (> 3,300 population)

1. Compliance is based on the average of the initial, confirmation sample(s), and six monthly samples.
   - The MCL is exceeded if the average of this monitoring is 5.5 ppt or greater
2. If the average of this monthly monitoring is less than 5.5 ppt
   - Continue with quarterly monitoring
   - Determine compliance based on the Running Annual Average
3. A relatively high single sample result can cause the MCL to be exceeded for the whole year (even if the year is not yet complete)

Compliance Determinations – Example 4

Larger system (> 3,300 people) with a Low Detection in 1st Quarter			
Month	**Compliance Period**	**Result**	**RAA of seven samples**
February	**1st Quarter**	**7**	
March	Monthly	**9**	
April	Monthly	**5**	
May	Monthly	**ND (0)**	
June	Monthly	**6**	
July	Monthly	**9**	
August	Monthly	**ND (0)**	**5.1** **(Average for 7 months)**

- ✓ **System is in compliance through August for the year.**
- ✓ **System MUST collect another quarterly sample in November.**

Compliance Determinations – Example 5

Larger system (>3,300 People) with a Detection in the 1st Quarter			
Month	**Compliance Period**	**Result**	**RAA of ALL 7 samples**
February	**1st Quarter**	**12**	
March	Monthly	**9**	
April	Monthly	**21**	***6 ppt*** ***(MCL has been exceeded – even if the rest of the results are Non-detect)***
May	Monthly	**ND**	
June	Monthly	**ND**	
July	Monthly	**ND**	
August	Monthly	**ND**	**6** =(Average for 7 months)
Source exceeds the MCL based on the April result			

Section 6

Best Available Technology

1. The BAT is Granular Activated Carbon (GAC)
   - GAC is already in use for 1,2,3-TCP treatment
   - GAC can remove 1,2,3-TCP to less than the DLR
2. BAT designation does not exclude alternative technologies capable of removing 1,2,3-TCP.

Operations and Carbon Life

1. GAC is a proven treatment technology for organic contaminants
2. Carbon life can vary depending on carbon type and source water
3. PWS may pilot test the proposed candidate GAC media to estimate treatment capacity
4. NSF/ANSI 61 certified virgin GAC should be used to minimize delay in permit review

Treatment (and other Options)

1. Consolidate with a nearby larger water system
2. Purchase water from a nearby utility
3. Provide treatment (GAC or other DDW-approved treatment)
4. Drill new well
5. Remove the well from use

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QUESTIONS?

SWRCB Division of Drinking Water Expert Panel:

- Kurt Souza, P.E. – *Southern CA Field of Operations Branch Asst. Deputy Director*
- Carl Carlucci, P.E. – *Central California Section Regional Chief*
- Betsy Lichti, P.E. – *Quality Assurance Section Manager*
- Paul Williams, P.E. – *Data Management Manager*
- Mark Bartson, P.E. – *Technical Operation Section Manager*
- Eugene Leung, P.E. – *Treatment Technology Manager*
- Melissa Hall, P.E. – *Regulatory Development Unit Manager*
- Eric Miguelino, M.D. – *Research Scientist IV*

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