INITIAL STATEMENT OF REASONS
1,2,3-Trichloropropane Maximum Contaminant Level Regulations
Title 22, California Code of Regulations

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I. BACKGROUND/AUTHORITY

All public water systems, as defined in Health & Safety Code (HSC) Section 116275, are subject to regulations adopted by the United States Environmental Protection Agency (U.S. EPA) under the Safe Drinking Water Act of 1974, as amended (42 U.S.C. 300f et seq.), as well as by the State Water Resources Control Board (State Water Board) under the California Safe Drinking Water Act (HSC, div. 104, pt. 12, ch. 4, § 116270 et seq.). California has been granted primary enforcement responsibility ("primacy") by U.S. EPA for public water systems (PWS) in California. California has no authority to enforce federal regulations, but only state regulations. Federal laws and regulations require that California, in order to receive and maintain primacy, promulgate regulations that are no less stringent than the federal regulations.

Pursuant to HSC sections 116271, 116275, 116325, 116350, 116370, 116375, 116385, 116450, 116460, 116550, and 116555, the State Water Board has the responsibility and authority to adopt the subject regulations, including regulations for water quality monitoring frequencies.

California requires community water systems (CWS) and nontransient-noncommunity water systems (NTNC) to sample their drinking water sources and have the samples analyzed for organic chemicals to determine compliance with drinking water standards, including maximum contaminant levels (MCLs). Primary MCLs are based on health protection, technological feasibility, and costs. PWS must notify the State Water Board and the public when drinking water supplied to the public is noncompliant with a primary MCL, and take appropriate action.

Health and Safety Code section 116365 imposes requirements on the State Water Board for adoption of primary drinking water standards for the protection of public health. One of those requirements is that the State Water Board set an adopted MCL as close to the contaminant's public health goal (PHG) as is technologically and economically feasible at the time of adoption, while placing primary emphasis on protection of public health. Public health goals are established by the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA). In August 2009, OEHHA established the PHG for 1,2,3-Trichloropropane (1,2,3-TCP) at 0.0007 micrograms per liter (µg/L), equivalent to 0.0000007 milligrams per liter (mg/L).

II. SUMMARY OF PROPOSAL

The primary purpose of the proposed regulations is to adopt primary drinking water standards for 1,2,3-TCP in drinking water, consistent with and meeting the requirements of HSC section 116365.

The State Water Board also proposes a number of non-substantive changes to correct spacing, use of upper/lower case, references to paragraphs, and deletion of redundant text and unnecessary punctuation and text.

Pursuant to federal primacy requirements and HSC sections 116271, 116350, and 116375, the State Water Board proposes the below noted changes to Title 22:

- Amend Section 64444 (Maximum Contaminant Levels – Organic Chemicals) as follows:
    - First paragraph and Table 64444-A to make nonsubstantive changes; and
    - Table 64444-A to adopt a 1,2,3-TCP MCL.
- Amend section 64445 (Initial Sampling – Organic Chemicals) as follows:
    - Section title to make nonsubstantive changes;
    - (g) to be made more clear; and
    - (i) to allow limited “grandfathering” of monitoring data collected prior to the effective date of any regulation establishing an MCL for an organic chemical.
- Amend section 64445.1 (Monitoring and Compliance – Organic Chemicals) as follows:
    - (a) and Table 64445.1-A to make nonsubstantive changes;
    - Table 64445.1-A to adopt a 1,2,3-TCP detection limit for purposes of reporting (DLR); and
    - (b); (b)(1), (2), and (3); (c); (c)(1), (4), (5), and (5)(A) and (B); (6); and (7)(A) to make nonsubstantive changes.
- Amend section 64447.4 (Best Available Technologies (BAT) – Organic Chemicals) as follows:
    - First paragraph to make a nonsubstantive change;
    - Table 64447.4-A to make a nonsubstantive change; and
    - Table 64447.4-A to adopt BAT for 1,2,3-TCP.
- Amend section 64465 (Public Notice Content and Format) as follows:

  - Appendices 64465-A, -C, -D, and -E to make nonsubstantive changes;
  - Appendix 64465-F to make nonsubstantive changes and adopt public notification (health effects) language for 1,2,3-TCP; and
  - Appendix 64465-G to make a nonsubstantive change.

- Amend section 64481 (Content of the Consumer Confidence Report) as follows:

  - Appendix 64481-A to adopt Consumer Confidence Report (major origins in drinking water) language for 1,2,3-TCP.

The net effects of the proposed regulations would be as follows:

- CWS and NTNCWS would be required to monitor for 1,2,3-TCP;
- PWS would be required to comply with a 1,2,3-TCP MCL and report results of any sampling for 1,2,3-TCP;
- CWS and NTNCWS would be allowed to use groundwater monitoring data meeting specific criteria and collected prior to the establishment of a new organic chemical MCL to satisfy some of the initial monitoring requirements for that MCL;
- BAT would be specified for 1,2,3-TCP removal;
- PWS that violate the 1,2,3-TCP MCL would be required to use specific public notification (health effects) language; and
- PWS that detect 1,2,3-TCP would be required to use specific Consumer Confidence Report (major origins in drinking water) language.

None of the proposed amendments would affect California's primacy status because the net effect of these amendments is that the state's regulation would be more stringent than the federal regulation and consistent with HSC section 116270(f). The U.S. EPA has not yet proposed or adopted an MCL for 1,2,3-TCP.

III. LEGAL REQUIREMENTS FOR ADOPTION OF THE PROPOSED REGULATIONS

The State Water Board is required to address several sets of statutory requirements for the development of these regulations. First, for the development of an MCL, HSC section 116365 requires that the State Water Board set the MCL as close to the PHG as feasible, and that to the extent technologically and economically feasible, avoid any significant risk to public health. That analysis is found in section V.A.1 of this Initial Statement of Reasons (ISOR).

Second, HSC section 57004 requires the Cal/EPA organizations to submit for external scientific peer review all proposed rules that have a scientific basis or components. The final peer review comments and the State Water Board's response to those comments

can be found on the State Water Resources Control Board's website at http://www.swrcb.ca.gov/water_issues/programs/peer_review/.

Third, HSC 57005 requires that before adopting any major regulation (regulation with impacts to the state's businesses enterprises in excess of $10 million), the State Water Board must evaluate whether there are less costly alternatives to the proposed regulation that would be equally as effective in achieving environmental protection and achieve full compliance with statutory mandates. That evaluation is found in Section VI of this document and the Standardized Regulatory Impact assessment (SRIA) which is located in Attachment A.

Fourth, pursuant to Water Code section 106.3 and State Water Board Resolution No. 2016-0010, the State Water Board considers every human to have the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking and sanitary purposes, and considers that right in all activities that could affect existing or potential sources of drinking water. That discussion is found in section IX.

Fifth, the California Environmental Quality Act (CEQA) requires that state agencies consider the potentially significant environmental impacts of their discretionary actions, which include the development of regulations. As described in section X, the State Water Board has prepared an initial study and mitigated negative declaration, concluding that with the proposed mitigation incorporated into the project, the proposed regulations would not have a significant adverse impact on the environment.

In addition to the legal requirements specific to the State Water Board and its proposed MCL, the State Water Board is required to comply with the requirements of the Administrative Procedure Act (APA) for the adoption of regulations (Government Code §11340 *et. seq*). The requirements for this ISOR are set out in Government Code section 11346.2(b). That section requires the ISOR for this proposal must include:

1. A statement of the specific purpose of each adoption, amendment or repeal, the problems intended to be addressed, and the rationale of the determination that the changes are reasonably necessary to carry out the purpose and address the problem for which it is being proposed. This should include the benefits of the regulatory action. That discussion is found in section V.

2. The standardized regulatory impact analysis required by Government Code section 11346.3(c). That analysis is attached as part of the regulation package.

3. Identification of each technical, theoretical, and empirical study, report, or similar document relied upon. These are identified in sections XII and XIII.

4. A description of reasonable alternatives to the regulation and the agency's reasons for rejecting those alternatives, including a description of reasonable alternatives that would lessen any adverse impact on small business and the

agency's reasons for rejecting those alternatives. That discussion is found in section VI.

5. Facts, evidence, documents, testimony, or other evidence on which the agency relies to support a determination that the action will not have a significant adverse economic impact on business. That discussion is found in section VIII.

6. Description of efforts to avoid unnecessary duplication or conflicts with federal regulations addressing the same issues. That section is found in section VII.

IV. POLICY STATEMENT OVERVIEW

A. *Problem Statement:* A drinking water standard specific for 1,2,3-TCP does not exist at the national or state level.

Health and Safety Code section 116365 establishes criteria for the State Water Board regarding the adoption of primary drinking water standards.

The State Water Board is responsible for the adoption of primary drinking water standards to protect the public from contaminants that may be present in drinking water provided by PWS, typically through the establishment of an MCL for a contaminant. The regulations are being amended to implement, interpret, or make specific the statutory provisions of HSC Section 116365.

B. *Objective (Goal):* Broad objectives of this proposed regulatory action are to:

- Adopt a drinking water MCL for 1,2,3-TCP to protect public health consistent with statutory requirements.
- Adopt a DLR, BAT, public notification language, and consumer confidence report language to support the 1,2,3-TCP MCL.
- Adopt a method for PWS to substitute existing water quality data for initial monitoring requirements.

C. *Benefit:* Anticipated benefits from this proposed regulatory action are to:

- Provide increased public health protection by reducing the potential risk of adverse health effects associated with 1,2,3-TCP in drinking water.
- Provide consistency to minimum reported 1,2,3-TCP analytical values.
- Provide PWS and State Water Board staff with 1,2,3-TCP treatment guidance.
- Establish consistent quality of information between PWS and customers.

- Reduce potential monitoring costs to PWS by allowing PWS to substitute some existing water quality data for initial monitoring requirements. Associated proposed regulations will provide State Water Board oversight of the substitution process to better protect drinking water quality and ensure conformance with existing federal regulations.

V. SPECIFIC DISCUSSION OF PROPOSED REGULATIONS

The proposed regulations are contained in title 22, division 4, chapter 15, articles 5.5, 12, 18, and 20, California Code of Regulations (CCR). The following provides a detailed discussion of the proposed changes:

A. Title 22, CCR, Division 4, Chapter 15, Article 5.5

1. Section 64444, Maximum Contaminant Levels – Organic Chemicals

The purpose of this section is to list the organic chemicals for which drinking water MCLs have been established to protect the health of consumers served by PWS and reduce the potential risk of adverse health effects. Maximum contaminant levels are established in units of milligrams per liter (mg/L), sometimes referred to as “parts per million” (ppm). At low concentrations, contaminant concentrations are sometimes referenced using units of micrograms per liter (µg/L), also known as “parts per billion” (ppb) or nanograms per liter (ng/L), also known as “parts per trillion” (ppt).

The first paragraph would be revised to correct use of upper/lower case.

Table 64444-A would be revised to delete unnecessary text and to adopt a 1,2,3-TCP MCL of 0.000005 mg/L (or 5 ppt). The rationale for the proposed MCL is provided below; it includes 1,2,3-TCP characteristics, history, occurrence in water, analytical methodology, health effects, and a cost estimate summary.

About 1,2,3-Trichloropropane

1,2,3-TCP is a man-made chlorinated hydrocarbon. Historically, 1,2,3-TCP has been used as an industrial solvent, cleaning and degreasing agent, and paint and varnish remover. It has also been found as a component in soil fumigants. Since the 1950s, agricultural use of soil fumigants as pesticides and nematocides was prevalent in the United States. Some soil fumigants (known under the trade name of D-D and Telone), contained primarily 1,3-dichloropropene and 1,2-dichloropropane but also contained 1,2,3-TCP as a minor component. D-D is no longer available in the United States and Telone has since been reformulated.

1,2,3-TCP may also be generated as a byproduct during the production of other compounds (e.g., dichlorohydrin, dichloropropene, epichlorohydrin, glycerol, propylene

chlorohydrin, and propylene oxide). 1,2,3-TCP is used as a chemical intermediate in the production of dichloropropene, hexafluoropropylene, and polysulfone liquid polymers, and as a cross-linking agent in the synthesis of polysulfides. 1,2,3-TCP is a known toxin, and, pursuant to California's Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65), has been identified as a chemical known to the state to cause cancer.

The presence of 1,2,3-TCP found in drinking water sources is attributed to various industrial and historic pesticide uses, and leaching from hazardous waste sites. Between 2000 to 2004, 1,2,3-TCP was found in 24 of the 58 counties in California. The majority of these detections were in the counties of Kern, Los Angeles, Fresno, and Tulare. Kern County has over 100 drinking water sources with detectable levels of 1,2,3-TCP. There have been detections of 1,2,3-TCP in surface water sources, but there are currently no surface water sources with ongoing or persistent detections of 1,2,3-TCP.

Regulating 1,2,3-Trichloropropane Using an MCL vs. Treatment Technique

Primary drinking water standards are legally enforceable standards that apply to PWS. Primary drinking water standards protect drinking water quality by limiting the level of specific contaminants that may adversely affect public health and are known or anticipated to occur in water. Primary drinking water standards typically take the form of an MCL, which is the maximum permissible level of a contaminant in water, or a treatment technique, which, as provided in HSC section 116365 may be used in lieu of establishing an MCL for a contaminant if ascertaining the level of the contaminant is not technologically or economically feasible.

Although 1,2,3-TCP is currently unregulated in California some monitoring is conducted by PWS. Analytical methods (SRL 524M-TCP, SRL 525M-TCP, and EPA Method 504.1) are available to determine the concentration of 1,2,3-TCP in drinking water. The laboratory cost of 1,2,3-TCP sample analysis is approximately $132/sample. Since ascertaining the concentration of 1,2,3-TCP is technologically and economically feasible, the State Water Board finds regulating 1,2,3-TCP via an MCL to be more appropriate than using the treatment technique alternative.

A Specific MCL for 1,2,3-Trichloropane

From 1989 through the 1990s, water systems monitored for 1,2,3-TCP under earlier Unregulated Contaminant Monitoring Regulations (UCMR). Fewer than 20 sources had reported detections for 1,2,3-TCP. This likely reflected the less sensitive analytical method available at that time and the reporting limit of 0.5 µg/L (0.0005 mg/L).

In 1999, the California Department of Health Services (CDHS) established a notification level (NL) for 1,2,3-TCP at 0.005 µg/L (0.000005 mg/L). A NL is a health-based advisory level established for a chemical in drinking water that does not have an MCL. The 1,2,3-TCP NL was established after its discovery at the Burbank Operable Unit, a

southern California Comprehensive Environmental Response, Compensation, and Liability Act of 1980 site (commonly known as a CERCLA or Superfund hazardous waste site), because of concerns that the chemical might impact drinking water supplies. 1,2,3-TCP had been found in several drinking water wells elsewhere in the state at that time. The 1,2,3-TCP NL is based on cancer risks derived from laboratory animal studies, and is the same as the 1,2,3-TCP DLR of 0.000005 mg/L proposed as part of this regulation. Certain requirements and recommendations apply if 1,2,3-TCP is detected above its NL (see Drinking Water Notification Levels, http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/NotificationLevels.shtml).

To obtain additional information about the presence of 1,2,3-TCP in drinking water sources, CDHS in January 2001 adopted another UCMR that included 1,2,3-TCP as an unregulated contaminant and required some water systems to perform monitoring for those unregulated contaminants. However, the UCMR adoption occurred before the common availability of a method capable of achieving a 1,2,3-TCP detection level of 0.000005 mg/L. Some water systems proceeded to monitor using laboratory analyses with higher reporting limits, which would not have been able to identify 1,2,3-TCP at lower concentrations.

In February 2002, CDHS's Sanitation and Radiation Laboratory (SRL; now CDPH's Drinking Water and Radiation Laboratory [DWRL]) published SRL-developed analytical methods for 1,2,3-TCP with reporting levels comparable to the NL of 0.000005 mg/L and CDHS advised water systems that had previously tested for 1,2,3-TCP using reporting levels greater than 0.000005 mg/L and had no detection of the contaminant to perform follow-up 1,2,3-TCP sampling of representative sources using a method with a reporting level of 0.000005 mg/L. Monitoring under the 2001 UCMR was to have been completed by the end of 2003.

1,2,3-TCP was found in 405 sources in California between 2000 and 2004. Given the number of sources with 1,2,3-TCP detections, CDHS considered 1,2,3-TCP to be a good candidate for future regulation to ensure public health protection of consumers. Although no longer required, some water systems continue to monitor for 1,2,3-TCP and submit results to the State Water Board. The CDHS recommended that water systems' laboratories use the more sensitive analytical methods for 1,2,3-TCP to enable better characterization of the presence of the chemical in drinking water sources.

In July 2004, CDHS requested a PHG from Cal/EPA OEHHA. A PHG is a contaminant concentration in drinking water that does not pose a significant risk to health, and is needed for the development of a 1,2,3-TCP MCL. The PHG is established by OEHHA pursuant to HSC Section 116365(c), which requires OEHHA to assess the risks to public health posed by a contaminant for which the State Water Board (or, at the time, CDHS) proposes a primary drinking water standard. OEHHA's risk assessment is required to contain "*an estimate of the level of the contaminant in drinking water that is not anticipated to cause or contribute to adverse health effects, or that does not pose any significant risk to health. This level shall be known as the public health goal for the*

contaminant." A PHG is not a boundary line between a 'safe' and 'dangerous' level of a contaminant. Drinking water can still be considered safe for public consumption even if the drinking water contains contaminants at concentrations exceeding a PHG.

In September 2007, OEHHA released a draft PHG for 1,2,3-TCP at 0.0007 µg/L (0.0000007 mg/L) and a draft technical support document.

In January 2009, OEHHA released a revised draft technical support document; the draft PHG for 1,2,3-TCP remained at 0.0007 µg/L (0.0000007 mg/L). In August 2009, OEHHA established a PHG for 1,2,3-TCP at 0.0007 µg/L (0.0000007 mg/L).

With the availability of a final PHG for 1,2,3-TCP, the State Water Board is proceeding with setting a primary drinking water standard for 1,2,3-TCP by adopting an MCL for 1,2,3-TCP of 0.000005 mg/L.

Economic and Technological Feasibility of Compliance with the Proposed MCL

HSC Section 116365 mandates the State Water Board to adopt an MCL that is as close as feasible to the corresponding PHG, and that, "to the extent technologically and economically feasible," avoids any significant risk to public health. In addition, the State Water Board must consider any national primary drinking water standard that may exist, and the "technological and economic feasibility of compliance with the proposed primary drinking water standard." HSC Section 116365(b)(3) states that the economic feasibility determination is to address "the costs of compliance to public water systems, customers, and other affected parties with the proposed primary drinking water standard, including the cost per customer and aggregate cost of compliance, using best available technology."

To determine the proposed primary MCL for 1,2,3-TCP, the State Water Board first confirmed that there was no existing national primary standard, nor that would one soon be developed or promulgated to serve as an additional point of reference. The requirement to consider cost and technical feasibility led the State Water Board to review:

- The availability and cost of single sample analysis for determining the presence of 1,2,3-TCP;
- The estimated cost to the regulated water systems for contaminant monitoring as required by the regulations;
- The availability and cost of appropriate treatment technologies for removing the contaminant to levels below the proposed MCL; and
- The estimated cost of treatment to all the regulated water systems with sources that may violate the MCL and must be treated to comply with the proposed MCL.

Consequently, the State Water Board reviewed analytical method availability, BAT, and conducted a comprehensive cost estimate using the monitoring data in the State Water Board's Water Quality Information Replacement (WQIr) database. The State Water Board estimated costs and benefits associated with six possible MCLs (0.000005, 0.000007, 0.000015, 0.000035, 0.00007, and 0.00015 mg/L), using the identified analytical methods and granular activated carbon as the BAT. The UCMR-recommended reporting limit for 1,2,3-TCP was 0.000005 mg/L and an MCL below 0.000005 mg/L is not currently feasible due to analytical limits. Therefore, 0.000005 mg/L was set as the lower boundary of the analysis. The upper boundary of the analysis was set at 0.00015 mg/L, which corresponds to an excess estimated lifetime cancer risk of 2.14 people in 10,000.

Based on the PHG and the technological and economic feasibility analysis of monitoring and treatment requirements, the State Water Board proposes to adopt an MCL at 0.000005 mg/L. The technological and economic feasibility of monitoring and treatment of 1,2,3-TCP at the proposed MCL is presented below.

a. Monitoring Feasibility

The State Water Board reviewed the feasibility for PWS to conduct monitoring for 1,2,3-TCP in terms of methods available, analytical detection levels, and regulated water system costs.

Technological Feasibility of Monitoring

Three analytical methods are approved for 1,2,3-TCP analysis by the State Water Board's Environmental Laboratory Accreditation Program (ELAP) under Field of Testing 104 (SRL 524M-TCP, SRL 525M-TCP, and U.S. EPA Method 504.1).

The CDPH's SRL (now DWRL) established a recommended reporting limit for 1,2,3-TCP of 0.000005 mg/L. This recommended reporting limit has been used for 1,2,3-TCP monitoring for more than a decade at numerous laboratories in California and in thousands of sample analyses and is being proposed as a regulatory DLR in this regulation package. Currently, 29 laboratories are certified by California's ELAP for at least one of these methods.

Economic Feasibility of Monitoring

The State Water Board used the 1,2,3-TCP detections for active sources from the WQIr database for the period of January 1, 2001, through November 6, 2015 to estimate the statewide costs associated with monitoring and treating 1,2,3-TCP. 1,2,3-TCP sampling data from January 3, 2001 through December 31, 2003 came from required monitoring of vulnerable sources under the California UCMR, which was repealed in October 2007. The U.S. EPA's third UCMR (UCMR3), which required some water systems to monitor

between 2013 and 2015, provided some detection information.[1] Additionally, some water systems have continued to monitor their sources and submit their findings to the State Water Board.

While the WQIr dataset was generated from the State Water Board's database of statewide drinking water source quality data, and therefore contains a comprehensive identification of all known affected public water sources in California at the time of data acquisition (November 6, 2015), the dataset cannot be assumed to be a complete identification of systems with 1,2,3-TCP contamination above the proposed MCL of 0.000005 mg/L for the following reasons:

- Under the California UCMR, only those water sources identified by the State Water Board as vulnerable were required to monitor. Also, small water systems with fewer than 150 service connections may have applied for and received an exemption from the monitoring requirement;
- The California UCMR began before the common availability of an analytical method capable of achieving a 1,2,3-TCP DLR of 0.000005 mg/L. Some water systems proceeded with monitoring using laboratory analyses with higher DLRs. In 2002, CDHS' SRL (now CDPH's DWRL) developed methods (SRL 524M-TCP and SRL 525M-TCP) capable of achieving a 1,2,3-TCP DLR of 0.000005 mg/L. CDHS advised water systems with non-detection 1,2,3-TCP findings and reporting levels of 0.000010 mg/L or higher to perform follow-up 1,2,3-TCP sampling of representative sources using a method with a reporting level of 0.000005 mg/L;
- PWS required to sample under U.S. EPA's UCMR3 may not have submitted all of the monitoring data to WQIr prior to November 6, 2015, and even if they had, the UCMR3 DLR for 1,2,3-TCP was higher than the proposed DLR of 0.000005 mg/L; and
- In the past, the local primacy agencies that regulated small water systems (<200 service connections) were not required to submit hard copies of data to the State Water Board. This data did not start entering the WQIr's predecessor database until electronic data transmission of the results by the laboratory was required under new reporting regulations that took effect June 14, 2001.

Therefore, some sources in addition to those previously identified may be determined to be contaminated during implementation of initial monitoring requirements. The PWS

[1] The U.S. EPA adopted UCMR3 in May 2012. UCMR 3 required public water systems in the United States serving greater than 10,000 people to monitor for 1,2,3-TCP during a 12 month period from January 2012 to December 2015. The U.S. EPA also selected 800 public water systems serving less than 10,000 people to monitor at the same frequency. PWS were required to sample at the entry point to the distribution system and to use EPA Method 524.3 to analyze the sample. This method has a minimum reporting level of 0.000030 mg/L which is higher than the proposed DLR of 0.000005 mg/L. Groundwater systems were required to monitor twice during a consecutive twelve-month period and surface water systems were required to collect four consecutively quarterly samples, with the samples collected three months apart.

may have multiple sources and a PWS with an identified contaminated source may be later determined to have multiple contaminated sources. The extensive variability between sources, including but not limited to such variables as local geology, historic regional use of products or processes containing 1,2,3-TCP, and the necessity of a source to a PWS, creates significant challenges to accurately extrapolating the extent of further contamination and any subsequent need for treatment; the State Water Board therefore did not attempt to predict how many additional sources may require treatment for 1,2,3-TCP. Depending on the extent of statewide contamination, additional monitoring and treatment may be required, which would increase the statewide cost of compliance but would not change the cost per connection or cost per water system. The lack of 1,2,3-TCP monitoring data is primarily from Small Water Systems (SWS). A review of the monitoring data shows that approximately 40 percent of the community and nontransient-noncommunity SWS and approximately and 20 percent of the community and nontransient-noncommunity Large Water System (LWS) sources have not monitored for 1,2,3-TCP.

The source monitoring results in the downloaded WQIr data were evaluated to obtain an estimated average level of contamination for each affected active source. The average levels were then compared to each evaluated MCL to estimate the number of sources that would be in violation of each MCL and the number of PWS affected. The sources were grouped on the basis of water system size: for the purposes of this document, SWS are defined as water systems with less than 200 service connections and LWS are defined as water systems with 200 or more service connections.[2] The population served by each source was estimated using information obtained from the State Water Board's Safe Drinking Water Information System (SDWIS) database. The number of groundwater and surface water sources used, by water system size, was also obtained from the SDWIS database.

There are four types of monitoring costs under the existing organic chemical regulations in CCR title 22, sections 64445 and 64445.1. For purposes of estimating costs of monitoring, all sources are assumed to be vulnerable to 1,2,3-TCP and prior 1,2,3-TCP monitoring results are assumed to not be grandfathered.

Initial. A water system with drinking water sources, excluding purchased, treated sources, would be required to monitor those sources quarterly for one year, unless the system applies for and receives a use or susceptibility monitoring waiver. All sources, including standby sources, are assumed to be

[2] The use of 200 service connections to represent the division between large and small water system in this document is also reflected in some statutes and regulations, including statutes regarding the delegation of certain regulatory authority to local primacy agencies (e.g., counties) and the eligibility of water systems to install point-of-entry treatment. Other regulations and statutes use different thresholds, such as population, to separate water systems into small, medium, and large categories. This cost estimating methodology is not intended to convey that one method of categorizing water system size is more appropriate than another.

vulnerable to 1,2,3-TCP, and so initial monitoring is required.[3] Standby sources are required to be sampled once during the first three years after the effective date of the MCL, but for simplicity, standby sources are assumed to be sampled during the first year.

Routine. A water system with drinking water sources that do not show a detectable level of 1,2,3-TCP during initial monitoring would be required to monitor those sources as follows, unless the system applies for and receives a use or susceptibility monitoring waiver:

- For a system serving 3,300 persons or less, the required sampling is once during the year designated by the State Water Board of each subsequent compliance period (compliance periods are three-year calendar year periods); and

- For a system serving more than 3,300 persons, the required sampling is two quarterly samples in one year during the year designated by the State Water Board of each subsequent compliance period.

- For purposes of this cost estimate, all sources are assumed vulnerable to 1,2,3-TCP and require routine monitoring each compliance period, and 1,2,3-TCP is assumed to be not detected during initial monitoring in any additional sources; therefore, the number of sources subject to initial and routine monitoring is, excluding standby sources, identical. Only the sources with existing data indicating the presence of 1,2,3-TCP were considered in the evaluation of costs to contaminated sources

Increased. A water system with any drinking water sources found to have a detectable level of 1,2,3-TCP would be required to monitor those sources quarterly. A water system serving more than 3,300 persons with sources exceeding the proposed MCL would be required to monitor those sources monthly during the first six months. For the purposes of this cost estimate, sources on increased monitoring are assumed to be in compliance with the MCL, not require treatment following the six months of sampling and will therefore continue monitoring on a quarterly basis. Stand-by sources identified as having a detectable 1,2,3-TCP result in their historical monitoring data were not included in this portion of monitoring costs.

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[3] Under the UCMR, CWS and NTNCWS with sources designated vulnerable to 1,2,3-TCP contamination were required to conduct monitoring consisting of two samples in one year from January 3, 2001, through December 31, 2003. Results of UCMR monitoring from 2000 through 2004 showed that 1,2,3-TCP was detected in 405 sources. Some water systems have continued their monitoring for 1,2,3-TCP and may be able to substitute or "grandfather" some of that data under a proposed amendment to Title 22, CCR Section 64445(i), but the cost estimate assumes that data will be not be "grandfathered" under the proposed Section 64445(i) and any resulting potential cost savings from being able to use this pre-existing data are not estimated.

Treated. A water system treating a drinking water source for 1,2,3-TCP to comply with the proposed MCL would be required to monitor the treated water (*i.e.,* treatment effluent) monthly and the source quarterly.

To obtain average costs of sample analysis for 1,2,3-TCP, the State Water Board in September 2015 surveyed 13 commercial laboratories accredited by the State Water Board's ELAP for analyzing 1,2,3-TCP in drinking water using a DLR of 0.000005 mg/L. Eleven laboratories provided cost information. The average cost per sample was $132, with the results ranging from $60 to $200. The average value of $132 per sample analysis was used to estimate monitoring costs.

Table 1 lists the number of active and stand-by groundwater and surface water sources in use by community and nontransient-noncommunity water systems, by water system size, as of November 2015. All sources will require initial and routine monitoring unless a use or susceptibility waiver is granted pursuant to CCR title 22, section 64445. Sources with a detectable concentration of 1,2,3-TCP will require increased monitoring. Sources in violation of the proposed 1,2,3-TCP MCL will require increased monitoring and treated water monitoring. Sources with existing treatment for 1,2,3-TCP will require increased or treated water monitoring.

Table 1
Number of Sources in Safe Water Drinking Information System (SDWIS) by Water System Size
(In Terms of Service Connection Group)

Source Type	SWS (<200 Svc. Conn.)	LWS (≥200 Svc. Conn.)
Groundwater	5,231	6,488
Surface Water	488	743
Subtotal	**5,719**	**7,231**

The estimated source and treated monitoring costs, by water system size, are shown in Table 2 (located at the end of the text).

Statewide Monitoring Costs for Sources that do not Need Treatment. For the proposed MCL of 0.000005 mg/L, the cost for initial monitoring of groundwater and surface water sources is approximately $2.92 million and $3.47 million for SWS and LWS, respectively; the annualized cost for routine monitoring is approximately $0.24 million and $0.52 million for SWS and LWS, respectively; and the annualized cost for increased monitoring (detectable level ≤ MCL) is approximately $0.01 million and $0.09 million for SWS and LWS, respectively. The initial monitoring costs are a one-time cost in year one. Routine monitoring costs start during year two and are expected

to continue in year three and beyond. Increased monitoring costs start during year one and are expected to continue in years two and three. Routine and increased monitoring costs may decrease and increase, respectively, depending on the results of initial monitoring.

Statewide Monitoring Costs for Sources that need to Install Treatment. For the proposed MCL of 0.000005 mg/L, the annual cost for treated water monitoring is approximately $0.08 million and $0.48 million for SWS and LWS, respectively. Increased monitoring costs are a one-time cost that starts during year one and are approximately $0.02 million and $0.24 million for SWS and LWS, respectively. Treated monitoring costs, which include increased raw water monitoring, start in year two and are expected to continue in years three and beyond. These costs do not include performance monitoring of the treatment plant for operational purposes. Performance monitoring requirements are site specific and would increase a PWS's total monitoring costs.

Statewide Monitoring Costs for Sources with Existing 1,2,3-Treatment. For the proposed MCL of 0.000005 mg/L, the annual cost for increased and treated water monitoring is approximately $0 (no sources with existing treatment) and $0.05 million for SWS and LWS, respectively. Increased and treated water monitoring costs start during year one and are expected to continue in years two and beyond. These costs do not include performance monitoring of the treatment plant for operational purposes. Performance monitoring requirements are site specific and the costs were incurred prior to the proposed rulemaking.

b. Treatment Feasibility

The State Water Board reviewed treatment feasibility in terms of treatment technology availability and treatment costs for regulated water systems.

Technological Feasibility of Treatment

Pursuant to HSC section 116370, the State Water Board has determined one treatment technology to be a BAT: granular activated carbon (GAC) (see discussion below under section 64447.4). The State Water Board used GAC as the basis for an estimate of costs associated with treating sources in violation of the MCL because GAC was the only full-scale demonstrated treatment in California capable of removing 1,2,3-TCP to below the proposed DLR.[4]

[4] PWS with sources above the MCL may be able to comply with the MCL in ways besides installing GAC, including taking contaminated sources out of use or blending contaminated sources with uncontaminated sources. If available to a PWS, costs associated with these methods of compliance would likely be less than installing GAC treatment.

Economic Feasibility of Treatment

A water system with a drinking water source in violation of the 1,2,3-TCP MCL would be required to either remove the source from service or treat the source to come into compliance. If source treatment was required then the water system would incur both capital and operation and maintenance (O&M) costs. The following assumptions were used in the cost analysis:

- Water quality data from the State Water Board's WQIr database provides a sufficient starting basis for a cost analysis of the proposed regulations;
- Each affected source requiring treatment will have its own treatment plant and may incur capital, O&M, and monitoring costs;
- Any source exceeding a proposed MCL will require treatment to come into compliance;
- Average daily demand is 150 gallons/person/day, which is a rounded value based on water usage data provided to the State Water Board by 386 California urban water suppliers during June 2014 and increased by 10%;
- The peaking factor used to determine maximum day demand is 1.5, which is consistent with the peaking factor used to determine source capacity in title 22, division 4, chapter 16, section 64454;
- The population exposed to 1,2,3-TCP from a contaminated source in a PWS is equal to the total PWS population divided by the total number of active sources for that PWS;
- 1,2,3-TCP concentration in the treated water is less than the detection limit;
- Water systems that need to install treatment to comply with the proposed 1,2,3-TCP MCL will use GAC; and
- All sources are disinfected and water systems are monitoring in accordance with the California Stage 1 and Stage 2 Disinfectants and Disinfection Byproducts Rules in title 22, section 64534.0-64534.8.

To estimate capital and O&M costs, the State Water Board used a cost estimate model developed by U.S. EPA for the removal of assorted volatile organic chemicals, including 1,2,3-TCP, using GAC (US EPA, Office of Water, Office of Groundwater & Drinking Water, "Work Breakdown Structure Model for Granular Activated Carbon Treatment", August 12, 2014). General assumptions used to generate costs from the 2014 U.S. EPA cost model are summarized as follows:

- Small treatment systems (≤1.0 million gallons per day (MGD) design flow) use a GAC system with carbon disposal. Large treatment systems (>1.0 MGD design flow) use a GAC system with offsite carbon regeneration. Carbon regeneration is assumed to be non-hazardous.

- GAC contactors are arranged in parallel and operated with a staggered reactivation pattern.
- Empty Bed Contact Time is 10 minutes.
- GAC Replacement or reactivation occurs every eight months.
- Spent GAC is transferred from the vessels using educators.
- GAC contactors receive pressurized flow rather than gravity flow.
- Small treatment systems are manually operated. Large treatment systems are fully automated.
- The component quality level is mid-cost.
- Backwashing of the GAC media occurs every 16 weeks.
- Treatment systems with a design flow rate of less than 1 MGD do not have a backwash holding tank before discharging to sewers. Treatment systems with a design flow rate equal to or greater than 1 MGD do have a backwash holding tank.
- Land costs were excluded.
- Sources identified as having existing GAC treatment for other contaminants are assumed to have a complete carbon change-out following initial monitoring to install GAC more capable of treating 1,2,3-TCP. The initial change-out cost is considered a capital cost.
- Sources identified as having existing GAC treatment for 1,2,3-TCP, solely for 1,2,3-TCP or in combination with other contaminants, are not considered to have capital costs and only have monitoring and O&M costs. Monitoring and O&M costs for these sources, while possibly existing prior to the adoption of this regulation, will be considered new costs for this regulation.
- Operator cost adjustments due to changes in water treatment facility class were not considered.

The cost model outputs were assumed to be approximate costs for the installation and operation of a variety of GAC treatment systems at different flow rates. The State Water Board did not include adjustments for local economies, site-specific conditions, or other unique costs or savings that may be available to some PWS.

The cost data provided by the model was used to develop flow rate-based capital and O&M cost curves. The cost curves were then applied to the sources with known detections of 1,2,3-TCP in order to determine estimated total capital and O&M costs.

To amortize the total capital costs and determine the estimated annualized capital costs to install treatment, the State Water Board used the capital recovery method with an interest rate (*i* in decimal format) of 7 percent (i.e., 0.07) and an amortization period (n) of 20 years, where annualized capital cost = (initial capital cost) x (amortization factor).

$$\text{Amortization factor} = \frac{i \times (1 + i)^n}{[(1 + i)^n - 1]} = 0.0944$$

The estimated total capital costs, annualized capital costs, and annual O&M costs, by water system size and source water type, are shown in Table 3. For the proposed MCL of 0.000005 mg/L, the State Water Board estimates from review of the SDWIS and WQIr databases that 36 and 253 sources for SWS and LWS, respectively, would need to be treated for compliance with the proposed MCL. Some of these water systems may be able to meet the MCL by other means, such as blending, at lower cost. However, if all of the affected sources were to be treated using GAC, the annualized treatment (capital and O&M) costs for sources anticipated to be out of compliance with the MCL, and existing treated sources, are approximately $0.67 million and $32.63 million for SWS and LWS, respectively. The treatment costs start during year two and are expected to continue in year three and each year beyond year three.

Treatment costs incurred by a given water system will vary depending on many site-specific parameters (e.g., the concentration of 1,2,3-TCP in the source, physical qualities of the water and any other regulated chemicals present, type and method of treatment and waste disposal, availability of land, and cost of construction labor and water treatment plant operating staff) and variability of the necessary time to plan, design, permit (including environmental clearance), and build the treatment system.

c. Breakdown of Economic Feasibility

In determining the feasibility of the alternatives considered, the economic feasibility of the proposed alternative weighed more heavily than considerations of technical feasibility. The PWS have been testing and treating for 1,2,3-TCP over the last decade and the State Water Board does not consider the reliability of the methods for monitoring and treatment to be problematic. More difficult to determine is the economic feasibility of monitoring and treating for 1,2,3-TCP, especially for small systems that will require treatment. To assess economic feasibility of the proposed regulation, the State Water Board reviewed the estimated statewide annual cost of monitoring and treatment, and then also looked at costs per system, source, service connection, and theoretical excess cancer cases reduced. In addition, those costs were broken down by SWS and LWS.

Estimated Statewide Total Annualized Costs of Monitoring and Treatment

The estimated total annualized monitoring and treatment costs for water sources with concentrations of 1,2,3-TCP greater than the proposed MCL of 0.000005 mg/L, by water system size, are shown in Table 4. For the proposed MCL of 0.000005 mg/L, the total annualized costs are approximately $0.75 million and $33.16 million for SWS and LWS, respectively. The total annualized costs start during year two and are expected to continue in years 3 and afterwards.

The total set of monitored sources consists mainly of those designated vulnerable to 1,2,3-TCP contamination or those from water systems that did not receive a monitoring exemption from UCMR. Any additional monitoring costs due to 1,2,3-TCP detections during initial or routine monitoring of sources that did not perform UCMR monitoring will likely be relatively insignificant, while additional treatment costs will likely be more significant, but difficult to estimate given the lack of data. The number of sources exceeding an evaluated MCL may, therefore, increase following initial monitoring, and the amount of the increase will depend on what the adopted MCL is set at, with more sources likely exceeding the MCL as the MCL approaches 0.000005 mg/L.

The impacts from treatment costs to SWS are significantly higher than those to LWS (see following discussion under Economic Feasibility) because of the inability to spread those costs amongst as many service connections.

Estimated Annual Cost per System

The estimated annual cost per system, by water system size, is shown in Table 4. For the proposed MCL of 0.000005 mg/L, the cost per system is approximately $22.7 thousand and $474.0 thousand for SWS and LWS, respectively. LWS costs are generally greater due to the need to treat greater flows.

Estimated Annual Cost per Source

The estimated annual cost per source, by water system size, is shown in Table 4. For the proposed MCL of 0.000005 mg/L, the cost per source is approximately $20.8 thousand and $131.1 thousand for SWS and LWS, respectively. The range is somewhat broad, reflecting a number of variables (e.g., level of contamination and volume of treated flow). Again, LWS costs are generally greater due to greater flow.

Estimated Annual Cost per Service Connection

The estimated annual cost per service connection, by system size, is shown in Table 4. For the proposed MCL of 0.000005 mg/L, the cost per service connection is approximately $609 and $25 for SWS and LWS, respectively. SWS per connection costs are generally greater due to a lack of economy of scale.

Estimated Annual Cost per Theoretical Excess Cancer Cases Reduced

The estimated annual cost per theoretical excess cancer cases reduced, by system size, is shown in Table 4. Theoretical carcinogenic risk for 1,2,3-TCP was assumed to be linear. The estimated reduction in theoretical excess cancer cases for a source with 1,2,3-TCP concentrations above the proposed MCL of 0.000005 mg/L is calculated by the following equation:

Reduction = (average of source monitoring results – evaluated MCL) x (estimated population exposed) x (risk) / 70 years

Risk, or cancer potency factor, is defined as the PHG potency factor of one excess cancer case in one million people over a 70 year lifetime divided by the PHG, or 0.00142857. The per-source reductions are calculated and totaled for each evaluated MCL.

For the proposed MCL of 0.000005 mg/L, the estimated annual cost per theoretical excess cancer cases reduced is approximately $97 million and $14 million for SWS and LWS, respectively. SWS costs per theoretical excess cancer case reduced are generally greater because the relative cost of treatment for a SWS is higher than it is for a LWS (i.e., economy of scale). For the individual consumer, the increase in health protection provided by reducing the level of a contaminant is the same regardless of the system size. The State Water Board's estimate of benefits (i.e., theoretical excess cancer cases avoided per year statewide as a function of the evaluated 1,2,3-TCP MCL) found that for SWS, approximately 0.01 cases, after rounding up to the nearest hundredth case, might be avoided for any of the five evaluated MCLs. The estimated reduction in population across all system sizes exposed to a 1,2,3-TCP concentration exceeding the proposed MCL of 0.000005 mg/L would lead to an estimated total of approximately 2.35 theoretical excess cancer cases avoided per year statewide. Exposure to 1,2,3-TCP in drinking water results in calculable lifetime cancer risk at any concentration greater than zero. The PHG of 0.0000007 mg/L represents a risk that is considered negligible (i.e., one in a million excess cancer cases). At the proposed MCL of 0.000005 mg/L, the risk is seven times greater than that at the PHG. At the evaluated MCL of 0.000007 mg/L the risk is ten times greater than that at the PHG. The risk continues to increase as the evaluated MCL increases. Reduced exposure to 1,2,3-TCP results in reduced risk of cancer, and reducing that exposure as much as feasible is required by HSC Section 116365 and is of benefit to public health.

d. Conclusion as to Feasibility of Proposed MCL

Pursuant to HSC Section 116365 and its mandate to set the MCL "as close as feasible to the public health goal placing primary emphasis on the protection of public health," while considering economic and technological feasibility of doing so, the State Water Board is proposing an MCL of 0.000005 mg/L be adopted for 1,2,3-TCP.

The State Water Board considers an MCL of 0.000005 mg/L for 1,2,3-TCP to be protective of public health. The proposed MCL is as close to the public health goal as is currently technologically feasible and will help eliminate a carcinogen from numerous California drinking water sources, avoiding any significant risk to public health.

The State Water Board considers an MCL of 0.000005 mg/L for 1,2,3-TCP to be technologically feasible. Analytical methods capable of analyzing drinking water to the proposed DLR of 0.000005 mg/L have been available to commercial laboratories for over a decade and numerous laboratories throughout California are ELAP-certified for those analytical methods. GAC, the proposed BAT, has been shown to successfully remove 1,2,3-TCP to levels below the proposed MCL. The cost of GAC treatment was not estimated to increase dramatically on a per-connection basis as evaluated MCLs,

including the proposed MCL, approached the DLR. GAC is not considered to be a uniquely challenging type of treatment that would represent an undue technological burden on a water system with a source contaminated with 1,2,3-TCP.

The State Water Board considers an MCL of 0.000005 mg/L to be economically feasible. The State Water Board evaluated the costs of compliance with the proposed MCL to public water systems, customers, and other affected parties. The evaluation included the cost per connection and aggregate cost of compliance using the best available technology. The proposed MCL is not anticipated to place a significant economic burden to the State of California as a whole. The evaluated MCLs did not indicate significant changes in cost on a per-connection basis as the evaluated MCL was increased.

The State Water Board acknowledges that some SWS are economically disadvantaged and that the estimated annual cost of $609 per connection could represent a significant financial burden to some California communities. However, the data in Table 4 indicates that the cost per connection of centralized treatment does not greatly decrease at higher MCLs and therefore, an economically disadvantaged SWS would likely not find a higher MCL to be more economically feasible. There are, however, options that could assist SWS in addressing 1,2,3-TCP, including using point-of-entry (POE) treatment and off-setting some of the cost increases through funding programs maintained by the State Water Board that provide grants and low-interest loans to eligible PWS, and technical assistance providers, such as the Rural Community Assistance Corporation, that provide support to small water systems.

California Code of Regulations title 22, chapter 15, article 2.7 describes the regulatory process by which a SWS may qualify to install point-of-entry (POE) treatment after service connections in lieu of installing centralized treatment. A POE treatment is a potential cost-saving method for SWS to achieve compliance with drinking water standards because the POE devices are only required to treat water entering a house or building instead of treating all of the water sent to the distribution system. Article 2.7 also specifies that for a PWS to qualify for POE installation it must demonstrate that centralized treatment is not economically feasible. One economic feasibility criteria that is sometimes used for community water systems is looking at whether the cost of centralized treatment per connection is more than 1 percent of the median household income (MHI). The U.S. Census lists a 2014 MHI of $61,489 for California; 1 percent of that MHI is nearly equal to the estimated annual cost of $609 per connection, and therefore SWS are likely to meet the requirements of the POE regulations for demonstrating that centralized treatment is not economically feasible.

The State Water Board did not attempt to estimate the cost of POE treatment for SWS due to the high variability of cost factors between water systems that may pursue POE treatment and the lack of any POE devices currently certified for 1,2,3-TCP treatment.[5]

The State Water Board therefore asserts that although the estimated annual cost of $609 may be economically infeasible for a SWS, there may be alternative, lower-cost treatment options and financing opportunities, such as grants and low-interest loans from the State Water Board, which would make centralized treatment economically feasible.

2. Section 64445, Initial Sampling – Organic Chemicals

The purpose of this section is to establish the initial monitoring requirements for any organic chemicals, applicability of those requirements to public water systems, and the start date for initial monitoring of all applicable drinking water sources for any organic chemical added to Table 64444-A.

The section title would be revised to correct usage of lower case.

Subsection (g) would be modified for clarity by making specific that the subsection applies only to methyl tert-butyl ether (MTBE) data.

Subsection (i) would be added to allow CWS and NTNCWS to substitute some existing monitoring data to partially satisfy the initial monitoring requirements of section 64445. Sources with existing groundwater source monitoring results collected prior to the effective date of a regulation establishing an MCL for an organic chemical may substitute those results for some of the initial monitoring requirements. Conformance with any applicable monitoring requirements described in Section 64445 must have been performed if a CWS or NTNCWS wants to substitute data to meet the initial monitoring requirements of section 64445. Monitoring data for a newly-regulated organic chemical shall have been collected no more than two years prior to the effective date of the MCL for that organic chemical in order for that data to be eligible for use.

Subsection (i) is proposed to encourage public water systems to engage in monitoring for future organic chemicals in advance of an MCL being established. Allowing substitution of past groundwater monitoring results may help reduce sampling and analytical costs and allow a CWS or NTNCWS to align organic chemical monitoring schedules within a given three-year compliance period. Substitution of surface water monitoring results is not necessary because surface water sources are monitored once a year at a minimum for organic chemicals. The State Water Board is proposing that only data collected no more than two calendar years prior to the effective date of the

[5] HSC Section 116380 states that POE regulations are intended to provide PWS with an alternative to centralized treatment when centralized treatment is not immediately economically feasible. HSC 116380 also requires any PWS applying for a permit for POE for the purpose of complying with an MCL to submit a funding application to correct the MCL violation; the correction would be achieved either through centralized treatment, new source development, or some other method which does not involve the use of POE or point-of-use devices.

MCL would be eligible to be used in substitution so that any substituted monitoring would be performed within a given three-year regulatory compliance period for that contaminant, and any future routine monitoring would apply to the next compliance period, thereby helping PWS remain in compliance with monitoring requirements.

Subsection (i)(1) is proposed to provide State Water Board oversight to the substitution process by ensuring that the monitoring is performed in accordance with the rest of section 64445 and to allow State Water Board the opportunity to review the data and determine if granting the request to the PWS is protective of public health. The request shall be made in writing (i.e. not verbally) to ensure sufficient records of the request are maintained; insufficient records may, for example, result in inappropriate compliance actions taken against a PWS for failing to complete required initial monitoring.

Subsection (i)(2) is proposed to provide clarification on how the substituted data may be used to conform with the requirements of section 64445. Sample results from a given calendar quarter will only be eligible to substitute for a single required initial monitoring sample in that same quarter of initial monitoring. For example, a result from the second quarter of 2016 would only be able to be substituted for the second quarter result of 2018. This proposal is necessary to ensure that any substituted results will more likely have been collected during times of similar water usage, pumping rates, and aquifer response that may impact water quality, which in turn better ensures that the substituted results reflect water delivered to customers throughout a consecutive 12-month period.

Subsection (i)(3) is proposed to conform with existing federal regulations regarding the substitution of organic chemical monitoring data collected prior to the effective date of that organic chemical's MCL. Federal regulations (title 40, sections 141.24(f) & (h).) for organic chemical monitoring require water systems who substitute initial monitoring sampling requirements with previously collected monitoring results to begin annual monitoring for the organic chemical during the year when initial monitoring would occur. The State Water Board is proposing this subsection to ensure that at least one sample is collected during the year initial monitoring would otherwise begin for a PWS not substituting monitoring results, and therefore not potentially incur federal compliance actions. Public water systems that are allowed by the State Water Board to substitute organic chemical monitoring data as described in subsection (i) to meet the initial monitoring requirements of this section may only substitute three quarterly monitoring results.

Public water systems that have performed groundwater source water sampling for an organic chemical prior to the adoption of an MCL for that organic chemical may be able to avoid some initial monitoring costs that would otherwise be required in accordance with section 64445.

The cost estimate for the proposed 1,2,3-TCP MCL did not account for any change in first year initial monitoring costs that could result from allowing PWS to substitute some previous monitoring performed at least two years prior to required initial monitoring.

The State Water Board anticipates that the cost shifting may result in minor cost savings.

3. Section 64445.1, Repeat Monitoring and Compliance – Organic Chemicals

The purpose of this section is to establish the detection limits for chemicals with an MCL; establish monitoring requirements dependent upon size of the system and whether or not detections have occurred; and establish follow-up actions where detections are confirmed.

Subsection (a) would be revised to correct use of upper case.

Table 64445.1-A would be revised to correct spacing in the column heading and to adopt a DLR for 1,2,3-TCP of 0.000005 mg/L. All organic chemicals with MCLs have individual regulatory DLRs in order to ensure that minimum reported analytical results for organic chemicals are based on the same detection level (i.e., all non-detected results would have the same meaning) for compliance purposes. The proposed DLR is achievable within suitable limits of precision and accuracy by a sufficient number of commercial laboratories in the state such that those laboratory services should be readily available to PWS and is as close to the PHG as feasible. The proposed 1,2,3-TCP DLR of 0.000005 mg/L is based on input from the CDPH's DWRL (see previous discussion under Analytical Method Availability and Detection Limit for Purposes of Reporting) and the State Water Board's experience with UCMR monitoring for 1,2,3-TCP as an unregulated chemical. The proposed DLR is the same recommended reporting limit that has been used since 2002 for unregulated chemical monitoring of 1,2,3-TCP. A DLR of 0.000005 mg/L is adequate for determining, with confidence, the presence of 1,2,3-TCP and compliance with the proposed 1,2,3-TCP MCL of 0.000005 mg/L.

Laboratories with ELAP-certified methods capable of detecting 1,2,3-TCP at concentrations less than 0.000005 mg/L may exist before required initial monitoring for 1,2,3-TCP begins (estimated January 2018), but the State Water Board assumes that insufficient laboratory capacity will exist at that time to consider a DLR lower than 0.000005 mg/L as feasible.

The statewide regulatory cost of adopting the 1,2,3-TCP DLR was included in the monitoring cost estimates for the adoption of the 1,2,3-TCP MCL.

Subsections (b), (b)(1), (2), and (3), and (c) would be revised to correct uses of upper case.

Subsection (c)(1) would be revised to delete redundant text.

Subsections (c)(4), (5), and (5)(A) and (B) would be revised to correct uses of upper case.

Subsection (c)(6) would be revised to correct reference to a paragraph and a use of upper case.

Subsection (c)(7)(A) would be revised to correct reference to a paragraph.

B. Title 22, CCR, Division 4, Chapter 15, Article 12

1. Section 64447.4, Best Available Technologies (BAT) – Organic Chemicals

The purpose of this section is to identify the BAT for reducing the level of organic chemicals in drinking water to comply with the MCL, pursuant to HSC section 116370.

The first paragraph of section 64447.4 would be revised to correct uses of upper case.

Table 64447.4-A would be revised to delete an empty line.

Table 64447.4-A would be revised to adopt GAC as BAT for 1,2,3-TCP. Adopting a finding of a BAT for any new MCL at the same time as the adoption of a new MCL is required by HSC 116370. A finding of BAT provides PWS and State Water Board staff with guidance when selecting and designing treatment for compliance with a primary drinking water standard. A finding of BAT also serves as part of the basis for the adoption of a primary drinking water standard.

According to State Water Board records, there are seven treatment facilities in California treating groundwater for 1,2,3-TCP, solely or in combination with other organic chemicals, that use either solely GAC or both air stripping and GAC. For the water systems using air stripping and GAC, air stripping was installed for the removal of organic chemicals other than 1,2,3-TCP. A review of data from WQIr and information provided by the State Water Board engineers showed that only GAC was capable of removing 1,2,3-TCP to below the proposed MCL of 0.000005 mg/L. Air stripping provided partial removal, but did not consistently remove 1,2,3-TCP to below the proposed MCL of 0.000005 mg/L.

Some of the treatment plants had additional unit processes to remove contaminants other than 1,2,3-TCP. A review of data from WQIr and information provided by the State Water Board engineers showed that reverse osmosis provided partial removal, but did not remove 1,2,3-TCP to below the proposed MCL of 0.000005 mg/L. No PWS data was available on the performance of peroxide and ultraviolet processes for 1,2,3-TCP removal.

Based on the State Water Board's review of treatment options in PWS, GAC is proposed as BAT for 1,2,3-TCP. The statewide regulatory cost of adopting GAC as the 1,2,3-TCP BAT was included in the treatment cost estimates for the adoption of the 1,2,3-TCP MCL.

The State Water Board recognizes that there may be other potential treatment technologies being investigated as alternative options for the treatment of drinking water contaminated with 1,2,3-TCP. The designation of a BAT does not preclude a given PWS from receiving a domestic water supply permit that allows the use of alternative treatment technologies that may, for that PWS, be capable of sufficiently treating drinking water contaminated with 1,2,3-TCP.

C. Title 22, CCR, Division 4, Chapter 15, Article 18

1. Section 64465, Public Notice Content and Format

The purpose of this section is to establish the primary content (information and language) and format requirements of a public notice when a MCL, maximum residual disinfectant level, regulatory action level, or treatment technique for a contaminant has been violated; the language is intended to inform the public about the possible health effects associated with the contaminant.

Appendices 64465-A, -C, -D, and -E would be revised to delete unnecessary punctuation in the heading.

Appendix 64465-F would be revised to delete unnecessary punctuation in the heading; delete unnecessary punctuation for Dioxin (2,3,7-8 Tetrachlorodibenzodioxin [TCDD]), Oxamyl [Vydate], and PCBs [Polychlorinated biphenyls]; and adopt public notification (health effects) language for a 1,2,3-TCP MCL violation. The proposed 1,2,3-TCP public notification language is consistent with the language for other, similar chemicals with primary MCLs, and will be included in the notice sent to the public if the water system violates the 1,2,3-TCP MCL. The U.S. EPA has specific language requirements in regulations for primary MCLs. As mandated, the State Water Board has adopted language for all federal MCLs and, for consistency, has adopted similar language for state mandated MCLs as well. Required public notification language helps ensure a consistent statewide quality of information between PWS and their customers.

Appendix 64465-G would be revised to delete unnecessary punctuation for TTHMs [Total Trihalomethanes].

D. Title 22, CCR, Division 4, Chapter 15, Article 20

1. Section 64481, Content of the Consumer Confidence Report

The purpose of this section is to establish the primary content and format requirements of the Consumer Confidence Report, including the language to be communicated to the public informing the public of the major origins, or source, of a given contaminant when that contaminant has been detected. The Consumer Confidence Report is an annual report provided to customers by PWS which includes, but is not limited to, information regarding their water sources, monitoring performed, contaminants found, and compliance with applicable drinking water regulations.

Appendix 64481-A would be revised to correct uses of lower case and remove an unnecessary hyphen.

Appendix 64481-A would be revised to adopt Consumer Confidence Report language for 1,2,3-TCP. The 1,2,3-TCP language is proposed for consistency with the language for other chemicals with primary MCLs and will be included in the Consumer Confidence Reports sent by water systems to their consumers. The U.S. EPA has specific language requirements in regulations for primary MCLs. As mandated, the State Water Board has adopted language for all federal MCLs and, for consistency, has adopted similar language for state-mandated MCLs as well. Required Consumer Confidence Report language helps ensure a consistent statewide quality of information between PWS and their customers.

VI. REASONABLE ALTERNATIVES CONSIDERED AND REJECTED

Government Code section 11346.2(b)(4) requires that the State Water Board consider reasonable alternatives to the regulation and the agency's reasons for rejecting those alternatives. The State Water Board evaluated five alternatives to the proposed MCL for 1,2,3-TCP of 0.000005 mg/L. These alternatives included 1,2,3-TCP drinking water MCLs of 0.000005, 0.000007, 0.000015, 0.000035, 0.00007, and 0.00015 mg/L. The result of a higher 1,2,3-TCP MCL would be that fewer systems would likely be out of compliance with the MCL and would not require treatment. Conversely, a higher 1,2,3-TCP MCL would be associated with an increased risk to public health. Specifically, increased levels of 1,2,3-TCP in drinking water would result in an increased lifetime cancer risk.

The State Water Board's reasoning for rejecting the alternatives is that they do not ensure full compliance with HSC section 116365. That section requires that primary MCLs be set as close to the PHG as is feasible, and to the extent technologically and economically feasible, avoid any significant risk to public health. As identified above, the proposed MCL is both technologically and economically feasible. Tables 2-4 set out the costs associated with each alternative, and while they show some costs savings when the MCL is set at a higher level, those costs savings per service connection are relatively insignificant. Therefore, choosing an MCL at a higher level would be inconsistent with HSC section 116365, would be somewhat less protective of public health, and would not result in significant cost savings.

Section 11346.2(b)(4) also requires a description of reasonable alternatives to the regulation that would lessen any adverse impact on small business and the agency's reasons for rejecting those alternatives. To the extent that this regulation will have any impact on small businesses,[6] the reasons for rejecting alternatives that may reduce an impact on small businesses is the same above: a higher MCL would be inconsistent

[6] The primary impact of these regulations will be on water systems, which Government Code Section 11342.610(b)(8) explicitly exempts from the definition of "small business."

with HSC section 116365, would be somewhat less protective of public health, and would not result in significant cost savings.

Alternatives to the proposed BAT were not considered because no full-scale performance information for other technologies was found, HSC section 116370 mandates that a BAT be adopted when an MCL is adopted, and use of the BAT is not mandatory. Therefore, although GAC was identified as BAT, PWS are not precluded from using alternative treatment technologies that they find effective.

Alternatives to the proposed DLR were not considered because the proposed DLR is necessary to support the proposed MCL and there are available analytical methods sufficiently available throughout California that are able to meet the proposed DLR.

Alternatives to the proposed data substitution process were not considered because the proposed process is voluntary for PWS and no additional burden to PWS is expected as a result of adopting this process.

VII. EVALUATION AS TO WHETHER THE PROPOSED REGULATIONS DUPLICATE EXISTING FEDERAL REGULATIONS ADDRESSING THE SAME ISSUE

The State Water Board evaluated whether the proposed regulations are duplicative of existing federal regulations, and concluded that they are not. There is no existing federal regulation addressing 1,2,3-TCP.

VIII. ECONOMIC IMPACT ASSESSMENT

Government Code section 11346.2(b)(2)(B) requires that for major regulations proposed on or after November 1, 2013, the agency must include the standardized regulatory impact analysis required by section 11346.3(c). The State Water Board has identified the proposed 1,2,3-TCP MCL as a potential Major Regulation as defined by Government Code section 11342.548 and has in response developed a Standardized Regulatory Impact Assessment (SRIA). The State Water Board has determined that the proposed regulations would not significantly affect the following:

- **The creation or elimination of jobs within the State of California**. The requirements summarized above should not have any effect on jobs in California because there would not be any significant change in PWS or regulatory personnel needed for compliance with the new requirements. The model used for the economic impact assessment in the SRIA, Regional Economic Models, Inc. (REMI), predicts that there will be small impacts to employment as an indirect result of the proposed regulation. The model predicts that new jobs will be created initially in several industries (construction, professional, scientific and technical services, manufacturing, utilities, arts, and health care industries) within the first three years of the regulation being implemented; however, negative employment changes are also predicted to occur in these industries once the

treatment systems have been installed and these jobs are eliminated. Overall, the percentage of job gained or lost is less than 0.1%.

- **The creation of new businesses or the elimination of existing businesses within the State of California**. The nature of the drinking water industry is such that the adoption of this proposed regulation would not result in the creation or elimination of businesses. The impact of the proposed regulations would be insignificant. However, selected categories of businesses may experience an increased demand on their services, as an indirect result of the regulation being implemented: Analytical laboratories will likely experience an increased demand due to the additional monitoring that will be required for 1,2,3-TCP; and businesses that process, retail, and service GAC may also experience an increased demand. Consequently, these categories of businesses may expand in size and/or number. There are also opportunities for companies to be created in California in response to the increased demand for GAC systems, as an incentive for companies to research alternatives that can lower the annual cost of treatment.

- **The competitive advantages or disadvantages for businesses currently doing business within the state.** The State Water Board has determined that the proposed regulatory action would have no significant direct adverse economic impact on California business enterprises and individuals, including the ability of California businesses to compete with businesses in other states. The proposed regulations apply only to PWS, as defined pursuant to HSC section 116275, which are not businesses or individuals. PWS are water companies providing drinking water to the public and, pursuant to Government Code section 11342.610, are exempt from the definition of a small business.

  The State Water Board recognizes that a small number of the identified public water systems likely provide water solely to businesses, and that public water systems identified as community water systems often provide water to businesses. The State Water Board assumes that a public water system which is required to install treatment for 1,2,3-TCP will pass the costs of treatment onto that system's customers, which may include businesses. Some businesses may incur higher water costs as a result of the treatment, while other businesses may be able to separate their drinking water from their business uses and use water not meant for public consumption (e.g., cooling, construction). The State Water Board does not collect sufficient water usage data from each public water system to develop an accurate method of estimating what costs would be passed on to businesses and how those businesses' competitiveness would be affected.

- **The increase or decrease of investment in the State of California.** Companies working in new and emerging drinking water technologies may want to expand into the California market.

The State Water Board expects that some public water systems with 1,2,3-TCP contamination in some or all of their active sources shall apply for and receive loans and grants from various California funding programs. The State Water Board anticipates that the funding will have an impact on the ability of California to fund other projects, either due to less funding being available for those projects or from staff workload issues. The State Water Board does not have sufficient information to project the extent of the impacts from this but does not anticipate a significant impact to California.

- **The benefits of the regulation to the health and welfare of California residents, worker safety, and the state's environment**. The State Water Board has made a determination that the proposed regulations would improve the protection of the public's health and welfare through the control of 1,2,3-TCP and its associated risk in the public's drinking water supply, with no direct adverse impacts to worker safety or California's environment.

The State Water Board has relied upon the SRIA to support its initial determination that the proposed regulations will not have a significant adverse economic impact on businesses. Although it is assumed a public water system that is required to install treatment for 1,2,3-TCP will pass the costs onto its customers, which may include businesses, it is anticipated that those increases will be a small percentage of a business' total costs, and would not create a significant adverse economic impact generally. As noted previously, the State Water Board does not have sufficient information about water usage of businesses to develop an accurate assessment of impacts. Depending on their water needs, some businesses may incur higher water costs as a result of the treatment, while other businesses may be able to separate their drinking water from their business uses and use water not meant for public consumption (e.g., cooling, construction), potentially reducing rate increases. Nonetheless, any economic impact to businesses statewide is not anticipated to be significant. Similarly, businesses and individuals that were buying bottled water because of concerns about 1,2,3-TCP in the water would no longer need to buy bottled water.

The SRIA and the cost estimating methodology used in this ISOR reach similar but differing conclusions regarding various impacts to the State of California, most notably the estimated annual cost per connection or household. The SRIA estimates a monthly increase of approximately $14/ household for 'Small' systems and approximately $13/household for 'Medium' systems, translating to annual costs of $171 for 'Small' systems and $160 for 'Medium' systems, respectively. Conversely, the cost estimating methodology identifies an annual cost per service connection of approximately $609 for Small Water Systems and $25 for Large Water Systems, respectively.

The SRIA and the cost estimating methodology both used the same data sets and assumptions described in this document during the analysis. The differences in conclusions are primarily due to how impacted demographics are grouped and the use of a more broadly-reaching economic forecasting model for the SRIA. For example, the SRIA uses anticipated treatment design flow rates of less than or greater than 1 MGD to

separate water system sizes into ‘Small’ and ‘Medium’ systems, while the cost estimating methodology uses 200 service connections as the separator for ‘Small’ and ‘Large’ water systems. The difference in definition changes the extent that costs can be spread over the population and results in the estimated small water system per-service connection cost to be significantly different between the two methods.

The SRIA, the Department of Finance’s comments on the SRIA, and the State Water Board’s response to those comments are included with this ISOR as Attachment A.

IX. WATER CODE SECTION 106.3 CONSIDERATION

Section 106.3 states that it is the policy of the state that every human has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking and sanitary purposes. In establishing and adopting the proposed regulations, the State Water Board considered this statewide policy and determined the proposed regulations will further the stated policy. Even though the proposed regulations may result in increased costs to those that are served by PWS that have to install treatment to address 1,2,3-TCP, that potential cost is outweighed by the benefits of having a source of water that does not contain a known carcinogen. In addition, some consumers that may have been purchasing bottled water for themselves and their families because of concerns of 1,2,3-TCP in their drinking water supply will no longer have to do so.

X. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

The State Water Board has completed an initial study and plans to adopt a mitigated negative declaration to support its conclusion that the proposed regulations would not have a significant adverse effect on the environment. A draft initial study and mitigated negative declaration has been attached as part of the regulation package.

XI. PRE-NOTICE MEETING WITH AFFECTED PARTIES

Government Code section 11346.45(a) requires that prior to publication of the notice of proposed action, the agency proposing the regulation must involve parties who would be subject to the proposed regulations in public discussions, when the proposed regulations involve complex proposals or a large number of proposals that cannot be easily reviewed during the comment period. The regulations proposed here are neither complex nor involve large numbers of proposals that could not be easily reviewed during the comment period. Nonetheless, the State Water Board did involve PWS and water consumers in discussions about the proposed regulations. The State Water Board provided three public workshops in regions anticipated to be the most affected by the proposed regulation: Sacramento (July 20, 2016), Bakersfield (July 26, 2016), and Fresno (July 28, 2016).

XII. DOCUMENTS INCORPORATED BY REFERENCE

State Water Resource Control Board (SWRCB) 2016. Capital and O&M cost curves

SWRCB 2017. California Environmental Quality Act (CEQA) Analysis: Initial Study (IS) and Proposed Mitigated Negative Declaration (MND)

SWRCB 2017. HSC section 57004, Scientific Peer Review documents including submittals for review, peer review comments, and response to comments.

XIII. DOCUMENTS RELIED UPON

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3. CDHS, 2000. Engineering Report for Consideration of the Amended Permit Application from the City of Burbank, System No. 1910179, California Department of Health Services, October 2000.

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5. CDHS, 2002. Engineering Report for Consideration of the Amended Permit Application from the City of Glendale, System No. 1910043, California Department of Health Services, May 2002.

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13. SWRCB, 2014. Sanitary Survey for the City of Bakersfield, System No. 1510031, State Water Resources Control Board, July 30, 2014.

14. SWRCB, 2015. November 2015 Safe Drinking Water Information System and Water Quality Information Replacement databases, November 6, 2015.

15. SWRCB, 2016. May 2016 Statewide Conservation Data, State Water Resources Control Board, July 5, 2016

16. SWRCB, 2016. 1,2,3-Trichloropropane, State Water Resources Control Board, Updated: May 3, 2016 (http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/123TCP.shtml).

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18. SWRCB, 2016. 1,2,3-Trichloropropane Maximum Contaminant Level presentation slides for American Water Works Association, California-Nevada Section, State Water Resources Control Board, October 25, 2016

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