Maximum Contaminant Level Recommendations for 1,2,3-Trichloropropane in Drinking Water

Basis and Background

New Jersey Drinking Water Quality Institute

October 5, 2016

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State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DRINKING WATER QUALITY INSTITUTE
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CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

October 5, 2016

Commissioner Bob Martin
New Jersey Department of Environmental Protection
P.O. Box 402
Trenton, NJ 08625-0402

Dear Commissioner Martin:

The members of the New Jersey Drinking Water Quality Institute (Institute) are pleased to submit the findings of their re-evaluation of the Institute's 2009 recommendation and their resultant new recommendation for a Maximum Contaminant Level (MCL) for 1,2,3-trichloropropane (1,2,3-TCP) in drinking water.

As you are aware, three subcommittees within the Institute were established to address the essential considerations for development of MCLs as outlined in the New Jersey Safe Drinking Water Act (N.J.S.A. 58:12A-20). The Health Effects Subcommittee is responsible for recommending health-based levels (Health-based MCLs) for contaminants of concern, the Testing Subcommittee is responsible for evaluating and recommending appropriate analytical methods and developing practical quantitation levels (PQLs; the levels to which a contaminant can be reliably measured by drinking water laboratories), and the Treatment Subcommittee is responsible for evaluating best available treatment technologies for removal of the contaminants of concern from drinking water. Over the last year, at your request, the three subcommittees met to review the 2009 recommended MCL for 1,2,3-TCP as well as available scientific information relevant to the health effects, analytical methods, and treatment options associated with 1,2,3-TCP.

The Institute solicited technical information September 2015, and in July 2016 accepted written comments on the individual subcommittee draft recommendation reports were accepted. The input received through the Institute's public input process was considered in developing the final documents submitted to you with this correspondence.

In March 2009, the Institute Health Effects Subcommittee developed a recommended Health-based MCL of 0.0013 µg/L (1.3 ng/L). The MCL recommended by the Institute in 2009 was 0.03 µg/L (30 ng/L), based on an analytical PQL of 0.03 µg/L and the ability of treatment removal technology to achieve this level.

The Health Effects Subcommittee has reviewed the basis for the March 2009 Health-based MCL recommendation and relevant newer information. 1,2,3-TCP is a mutagenic carcinogen, and the Health-based MCL is based on carcinogenic effects. There was no new information indicating that the 2009 cancer potency factor, 26 $(mg/kg/day)^{-1}$, should be revised. Current USEPA risk assessment guidance recommends use of age-dependent adjustment factors to the cancer potency factor, in combination with age-specific drinking water ingestion factors, to account for increased susceptibility from early life exposure to carcinogens with a mutagenic mode of action such as 1,2,3-TCP. This approach was used to develop the 2015 Health-based MCL recommendation for 1,2,3-TCP. The recommended Health-based MCL is 0.0005 µg/L (0.5 ng/L**)**, a 2.6-fold decrease from the Health-based MCL recommended in 2009 (0.0013 µg/L; 1.3 ng/L).

The Testing Subcommittee, in conducting their review considered additional analytical methods not available in 2009, as well as data collected and reporting limits used since 2009 from New Jersey laboratories. The Testing Subcommittee, in its review, verified the 2009 PQL recommendation of a PQL of 0.03 µg/L.

In its review, the Treatment Subcommittee reviewed the March 2009 Treatment Subcommittee support document, as well as more recent technical information and case studies. The Subcommittee concludes that it has been demonstrated that 1,2,3-TCP can be reliably and feasibly removed by carefully designed granular activated carbon treatment below the PQL of 0.03 µg/L recommended by the Testing Subcommittee.

Given the conclusions reached by the three subcommittees, which are detailed in the documents attached, **the Institute recommends that the Department propose and adopt an MCL of 0.03 µg/L (30 ng/L; 30 ppt) for 1,2,3-TCP in drinking water.**

Please feel free to contact me if you have any questions or need additional information related to these recommendations.

Respectfully,

Keith R. Cooper, Ph.D.
Chair

Introduction

The New Jersey Drinking Water Quality Institute (the Institute), established by the 1984 amendments to the New Jersey Safe Drinking Water Act (SDWA) at N.J.S.A. 58:12A- 20, is charged with developing standards (Maximum Contaminant Levels; MCLs) for hazardous contaminants in drinking water and for recommending those standards to the New Jersey Department of Environmental Protection (NJDEP). In September 2015, NJDEP Commissioner Bob Martin requested that the Institute review the basis for the MCL recommended by the Institute in 2009 for 1,2,3-trichloropropane (1,2,3-TCP) of 0.03 µg/L (30 ng/L) as well as available scientific information relevant to the health effects, analytical methods, and treatment options associated with 1,2,3-TCP.

Three subcommittees are established within the Institute to address the essential considerations for development of MCLs as outlined in the New Jersey SDWA. The Health Effects Subcommittee is responsible for recommending health-based levels (Health-based MCLs) for contaminants of concern, the Testing Subcommittee is responsible for evaluating and recommending appropriate analytical methods and developing practical quantitation levels (PQLs; the levels to which a contaminant can be reliably measured by drinking water laboratories), and the Treatment Subcommittee is responsible for evaluating best available treatment technologies for removal of the contaminants of concern from drinking water.

The three Institute subcommittees have reviewed the 2009 Institute MCL recommendation and the available scientific information relevant to the health effects, analytical methods, and treatment options associated with 1,2,3-TCP. Detailed documents presenting the technical basis for each of the subcommittee's current recommendation are attached in Appendices A, B, and C. The Health Effects Subcommittee developed a Health-based MCL protective for chronic drinking water exposure of 0.5 ng/L (0.0005 µg/L), and the Testing Subcommittee developed an analytical PQL of 30 ng/L (0.03 µg/L). The Treatment Subcommittee recommended that the use of granular activated carbon or an equally efficient treatment removal technology should be considered when1,2,3-TCP is detected above recommended MCLs, subject to on-site pilot testing performance results.

The Health Effects Subcommittee recommends a Health-based MCL of 0.5 ng/L (0.0005 µg/L); however, the Institute recommends an MCL of 30 ng/L (0.03 µg/L), which represents the PQL or the level to which 1,2,3-TCP can be reliably measured at this time.

<u>Background</u>

In 2015, Commissioner Bob Martin of the New Jersey Department of Environmental Protection (NJDEP) requested that the New Jersey Drinking Water Quality Institute (Institute) re-evaluate the Maximum Contaminant Level (MCL) recommended by the Institute in 2009 for 1,2,3-TCP, the subject of this recommendation.

The New Jersey Safe Drinking Water Act at N.J.S.A. 58: 12A-20, established the New Jersey Drinking Water Quality Institute, consisting of six *ex officio* and nine appointed members, to make recommendations to the NJDEP regarding drinking water quality. The members represent the public, the academic community, the water purveyors, NJDEP, New Jersey Department of Health, and the New Jersey Water Supply Advisory Council.

The Institute is responsible for providing recommendations to the Commissioner of NJDEP on implementation of the State's drinking water quality program, including MCLs. Three subcommittees are established to address the important considerations in the development of an MCL. The Health Effects Subcommittee recommends health-based Maximum Contaminant Levels; these are target drinking water levels based solely on health effects. The Testing Subcommittee reviews existing analytical methods to identify those methods with practical quantitation levels (PQLs). The Treatment Subcommittee evaluates best available treatment technologies for removal of contaminants from drinking water.

The Institute has accepted the recommendations from each of its three subcommittees that are presented in the attached Appendices A, B, and C. These recommendations, in addition to those submitted to NJDEP in 2009, form the basis for the recommended MCL for 1,2,3-TCP.

Drinking Water Quality Institute Membership

Chair
Keith Cooper, Ph.D., Rutgers University

Health Effects Subcommittee
Chair: Jessie Gleason, M.S.P.H., NJ Department of Health
Keith Cooper, Ph.D., Rutgers University
Judith Klotz, Dr. P.H.
Gloria Post, Ph.D., DABT, NJ Department of Environmental Protection
George Van Orden, Ph.D.

Testing Subcommittee
Chair: Bahman Parsa, Ph.D., NJ Department of Health
Sandy Krietzman, M.S., NJ Department of Environmental Protection
Sheng-Lu Soong, Ph.D., United Water

Treatment Subcommittee
Chair: Laura Cummings, P.E., Southeast Morris County MUA[1]
Anthony Matarazzo, NJ American Water
Norm Nelson, Van Note-Harvey Associates
Patricia Gardner, NJ Department of Environmental Protection
Carol T. Storms, Aqua NJ

[1] While Laura Cummings resigned effective June 30, 2016, she helped author the Treatment Subcommittee report on 1,2,3-TCP.