

**STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC HEALTH**

IN RE: Western Hills Water District, Diablo Grande Water System
9521 Morton Davis Drive
Patterson, CA 95363

TO: Mr. Dwain Sanders, President
Western Hills Water District

CITATION FOR NONCOMPLIANCE - WATER SYSTEM NO. 5010039

CITATION NO. 03-10-08C-001

Issued on June 20, 2008

Section 116650, Article 9, Chapter 4, Part 12, Division 104 of the California Health and Safety Code (H & S Code), authorizes the issuance of a citation for failure to comply with the requirements of the California Safe Drinking Water Act, or any regulation, standard, permit or order issued thereunder.

VIOLATION

The Department of Public Health, Drinking Water Field Operations Branch (hereinafter Department), hereby issues a citation to the Western Hills Water District (hereinafter WHWD) (mailing address: 9521 Morton Davis Drive, Patterson, California 95363) for the following violation:

DISINFECTION BYPRODUCT RULE (DBPR)

Title 22, California Code of Regulations (CCR), Section 64533 (a): Specifically, the drinking water supplied to the public by WHWD exceeded the maximum contaminant level (MCL) for total trihalomethanes (TTHMs) during the third quarter of 2007, the fourth quarter of 2007, and the first quarter of 2008 as specified by monitoring requirements in Section 64534 and 64534.2

and compliance determinations specified by Section 64535 and 64535.2. A public water system shall not exceed 0.080 mg/L (80 parts per billion [ppb]) for TTHMs in the drinking water supplied to the public based on a running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected pursuant to Section 64534.2 (a).

In accordance with Section 116650 (c) of the California Health and Safety Code, this violation is classified as a continuing violation.

PREVIOUS ENFORCEMENT ACTIONS

On December 9, 2004, a Notice of Violation (NOV) was issued to the WHWD for failure to comply with the DBPR. In summary, the NOV was issued for failure to comply with the Maximum Contaminant Levels for both TTHMs and the group of 5 regulated Haloacetic Acids (HAA5s) during the four quarters of 2004. The TTHM test results for the 4th quarter of 2004 put the Running Annual Average (RAA) of quarterly samples at 0.1318 mg/L, well above the MCL of 0.08 mg/L. The RAA of the quarterly HAA5 samples was 0.082 mg/L, also well above the MCL of 0.060 mg/L.

On February 22, 2005, the Department issued an Enforcement Letter to Veolia Water, the treatment plant operator, for a failure to adequately disinfect the filtered water. Although the formation of DBPs is related to the concentration of free chlorine available in the filtered water, a reduction in DBP concentrations cannot be achieved at the expense of inadequately disinfecting the water.

Since the exceedences of the DBP MCL violations continued into the summer of 2005, an Enforcement Letter notifying Veolia Water and the EPA of the exceedences of the Federal DBP MCLs was issued on August 30, 2005. By then, the RAA for TTHMs was 0.170 mg/L and the RAA for HAA5s was 0.0955 mg/L.

The next enforcement action was Citation No. 03-10-07C-010, issued to the WHWD on November 14, 2007. Although treatment modifications implemented in January of 2006 had resulted in a dramatic decrease in the concentration of HAA5s and considerable decrease in the concentration of TTHMs, the WHWD was again in violation of the TTHM MCL after the third quarter monitoring results produced a RAA of 0.0895 mg/L based on samples collected on September 6, 2007.

Because the WHWD failed to bring its water into compliance with the TTHM MCL in the following months, the Department issued Compliance Order No. 03-10-08CO-001 on February 7, 2008.

BACKGROUND

The WHWD is a community water system with approximately 350 service connections and serves a population of about 1000. The DBPR applies to community water systems that treat their water with a chemical disinfectant in any part of the treatment process or which provide water that contains a chemical disinfectant. WHWD operates the Diablo Grande Water Treatment Plant, which uses chlorine as the primary disinfectant. The source of the water available for

domestic use at Diablo Grande is water exported from the Delta via the California Aqueduct.

When the Diablo Grande water system was first proposed to use water from the Delta, conveyed through the California Aqueduct, in an application filed in December 2002, the Department cautioned that Disinfection By-Products (DBPs) should be a primary concern related to the treatment process; however, the Federal DBP rule had not yet taken effect, so the Department's position to challenge the proposed disinfection process was tenuous. Therefore, on April 2, 2003, the Department issued a permit for the interim surface water treatment plant with the following condition: "The WHWD shall prepare a plan for conducting a study, using the interim plant as a pilot plant, for determining the potential for the formation of Disinfection By-Products (DBPs) in the treated water entering and residing in the distribution system and for monitoring actual concentrations of DBPs in the distribution system during the months between initiation of operation of the interim WTP and replacement of the interim WTP with a permanent WTP. The plan shall include a proposal related to the determination of total trihalomethane (TTHM) and total halo acetic acid (THAA) formation potential and a monthly distribution system TTHM and THAA concentration monitoring plan to characterize the occurrence of DBPs in the distribution system in order to predict the potential of the permanent WTP to comply with the new DBP rules. This information will be critical in the establishment of the disinfection process to be used in the permanent plant to assure compliance with the Disinfection By-Product Rule. The draft plan shall be submitted to the Department by March 31, 2003 for review and approval. The

approved plan shall be implemented upon initiation of operation of the interim WTP". However, the WHWD failed to prepare the required plan.

The WHWD took the position that the Actifloc process was a new water treatment technology that was so efficient in removing surface water contaminants, including DBP precursors, that they predicted achieving very high levels of Total Organic Carbon (TOC) removal, leaving minimal levels of TOC in the water to form DBPs. The Department had observed pilot testing of the Actifloc process on Delta water and had reviewed the results of the pilot testing, which demonstrated exceptional performance in removing TOC. As a result, the Department allowed the permanent WHWD treatment plant to be placed in service with a condition that: "The WHWD shall prepare and implement a plan for controlling the formation of Disinfection By-Products (DBPs) in the treated water entering and residing in the distribution system to assure compliance with the provisions of the Disinfection By-Product Rule".

The Federal DBP rule became effective on January 1, 2004 and required DBP monitoring. By the end of the 2004, it was evident that both the TTHM and HAA5 MCLs were being exceeded in the water served by the WHWD. The Department issued a Notice of Violation of the Federal DBP MCLs on December 9, 2004 directing the WHWD to submit a plan for corrective actions to bring the water into compliance with the DBP rule by March 15, 2005. The initial public notification of the violation of the DBP MCLs was also required.

The WHWD and Veolia Water, the contract operator of the WHWD water treatment plant, first responded by decreasing the chlorine dose. By January

2005, that strategy resulted in a CT ratio below the regulatory limit for effective disinfection, so an Enforcement Letter was issued to warn the WHWD and Veolia Water of the need to achieve adequate disinfection at all times. Veolia Water indicated that, with its extensive experience in water treatment throughout the world, it would readily be able to abate the DBP violations. With no resolution of the MCL violations by late summer, a letter notifying Veolia Water and the EPA of the exceedences of the Federal DBP MCLs was issued on August 30, 2005. By then, the RAA for TTHMs was 0.170 mg/L and the RAA for HAA5s was 0.0955 mg/L. Veolia Water brought its water treatment experts to the site to perform a study using different coagulants, flocculants, and powdered activated carbon (PAC) in jar tests and determined removals of TOC and Dissolved Organic Carbon (DOC) and resulting Trihalomethane Formation Potential (THMFP). While the tests showed that changing from alum to ferric chloride coagulant, along with a dose of about 60 mg/L of PAC gave the best results, Veolia concluded that the addition of the PAC added issues related to turbidity, filtration, safety and operational costs that lead the company to opt for the use of ferric chloride alone in the dose range of 30 to 60 mg/L. The report relevant to this study was provided to the Department in December 2005.

In the first quarter of 2006 when the change in coagulant was implemented, the TTHM values dropped to less than 50% of previous values and the quarterly average was slightly below the 0.080 Mg/L limit for the first time. It took until the fourth quarter of 2006 for the RAA to drop below the MCL. Similarly, the concentration of HAA5s dropped below the 0.060 Mg/L standard in the first quarter of 2006 and the RAA returned to compliance in the third quarter of 2006. Since the first quarter of 2006, HAA5 values have been in the range of 18 to 30

ug/L for the following 9 quarters. So, clearly, the ferric chloride coagulant has been successful in lowering HAA5 levels from values once exceeding twice the 0.060 mg/L standard to half or less of the standard.

However, the TTHM quarterly average remained below the 0.080 mg/L MCL for only 3 quarters since monitoring began in the first quarter of 2004. Similarly, the RAA dropped below 0.080 mg/L in the 4th quarter of 2006 and the first 2 quarters of 2007, but then returned to values exceeding the MCL for every subsequent quarter.

After returning to compliance with the TTHM MCL in the 4th quarter of 2006 and the first two quarters of 2007, the WHWD returned to violation status which has continued through the first quarter of 2008. In response, the Department issued Citation No. 03-10-07C-010 on November 14, 2007 directing the WHWD to submit a plan to modify the treatment process to significantly reduce the concentration of TTHMs in the distribution system and return to compliance with the MCL for TTHMs.

The WHWD did not comply with the requirements of Citation No. 03-10-07C-010. Therefore, on February 7, 2008, the Department issued Compliance Order No. 03-10-08CO-001, with the primary purpose of ordering the WHWD to submit a plan and schedule, by February 15, 2008, to implement process changes to result in compliance with the TTHM MCL and to deliver water to its customers free of objectionable color and odors that had become a source of numerous complaints. The order also directed the WHWD to provide the Department with written records of its response to complaints about the water served to its

customers. Veolia Water submitted one record of a complaint response with its next monthly report. The enforcement document also ordered the WHWD to begin using Powdered Activated Carbon (PAC) in the treatment process if other control strategies did not result in compliance with the TTHM MCL by March 7, 2008. This requirement was established as an interim TTHM abatement measure because the treatment study submitted by Veolia Water in December of 2005 showed that the best reduction in Trihalomethane Formation Potential (THMFP). Since the water treatment plant was designed and constructed with equipment to facilitate the use of PAC in the treatment process, the use of PAC to reduce the concentration of TTHMs being served to the customers had been demonstrated and was easily achievable as an interim measure while a more optimal TTHM abatement strategy was being developed.

The WHWD responded on February 17, 2008, with a letter indicating that Veolia Water disagreed with the order to improve the treatment process as a means of abating the TTHM violations. Veolia water presented some data that indicated that the THMFP in the water leaving the treatment plant was below the 0.080 mg/L MCL for TTHMs, indicating to the company that it was not possible for the concentration of TTHMs in the water the company treated to exceed the MCL in the distribution system. Veolia Water postulated that, "Organic material within the distribution system either left over from new construction or other sources maybe (sic) causing this increase". Veolia Water also presented some data that showed that the concentration of TTHMs at the extreme of the distribution system was only 0.075 mg/L in a sample collected in January when flushing in that area was practiced. The WHWD asked to meet with the Department to discuss this position.

The Department met with representatives of the WHWD and Veolia Water on February 22, 2008. Veolia argued that they changed to ferric chloride coagulant late in 2005, which resulted in TOC in the treated water of less than 1 mg/L (although they didn't state that they only got below 1 mg/L in only 33% of the months since they changed coagulant). They also argued that they had THMFP measured on the filtered water leaving their WTP and it showed values considerably below the 0.080 mg/L MCL, leading them to restate their conclusion that there was a lot of construction debris or other sources of organic material in the distribution system that needed to be flushed out to abate the TTHM violations. The Department is aware that flushing water from a distribution system to limit residence time can decrease the formation of DBPs. However, when the water has a high potential for DBP formation, the amount of flushing necessary to limit water residence time in a distribution system can make such an approach an unaffordable solution. For that reason, the Department directed the WHWD to prepare a design of a chloramination system to control DBP formation. Chloramination is a proven DBP control strategy that has been used for many years by other utilities that treat water from the California Aqueduct and by many utilities on other water sources.

As a result of the meeting, the WHWD responded with a letter committing to an "aggressive flushing program to limit the TTHM concentrations within the system". The letter also stated that the WHWD would be implementing an engineering study to evaluate the use of chloramines, since the Department expressed the opinion that flushing to solve the TTHM violation would waste so

much water that the cost of the program would make it unaffordable and environmentally un-sustainable.

Subsequent to the February 22 meeting, the Department wrote a letter, dated March 11, 2008, to the WHWD to define the Department's expectations with respect to a flushing program to accomplish the goal of TTHM compliance and to restate the need for the development of a chloramination plan by the WHWD.

In the nearly 4 months that have passed since the February 22 meeting, the Department has not received positive indication that the WHWD has fulfilled its commitments to implement an appropriate flushing plan to lower the concentration of TTHMs in the distribution system nor to complete a chloramination plan.

Instead, the Department recently received laboratory results for THMFP measurements for samples collected on April 2, 2008. The sample collected from the effluent of Filter 1 showed a THMFP of 98 ug/L, and the sample collected from the effluent of Filter 2 had a THMFP of 130 ug/L. Furthermore, the analysis of a sample collected from the 1 million gallon Zone 3 water storage reservoir, from which water is distributed to the residents of Diablo Grande revealed that the concentration of DBPs in the water was already 0.092 mg/L, which is in exceedence of the 0.080 mg/L MCL even before time is allowed for additional TTHM formation as the water flows to Diablo Grande water users. These data certainly discredit the theory that debris and construction residue in the distribution system is responsible for the high DBPs in the distribution system.

SUMMARY CHRONOLOGY OF EVENTS IS ATTACHED

DIRECTIVES

WHWD is hereby directed to:

1. Cease violating the DBPR requirements of Section 64533, Title 22, California Code of Regulations.
2. By **July 31, 2008**, WHWD shall direct its contract water treatment operator, Veolia Water, to begin feeding Powdered Activated Carbon to the Actifloc clarification process to adsorb organic TTHM precursor chemicals from the water in order to reduce the potential for formation of TTHMs in the distribution system. The DBP precursor reduction study conducted by Veolia Water in the latter months of 2005 showed that the ferric chloride plus PAC produced the lowest THMFP. Therefore upgrading the treatment process to include the beneficial TTHM precursor chemical removal benefits of PAC shall be practiced as an interim TTHM control measure until the WHWD receives approval from this Department to complete other treatment process changes that will assure compliance with the TTHM MCL throughout the Diablo Grande water distribution system.
3. By **September 1, 2008**, WHWD shall submit to the Department a preliminary design and a schedule for: completing plans and specifications; initiating construction; and completing the installation of a system to convert from free chlorine to chloramines as a distribution system disinfectant in order to minimize the concentration of TTHMs in the water served to the domestic water customers of the Diablo Grande water system and to abate the violation of the TTHM MCL.

4. By **July 15, 2008**, the WHWD shall file the Annual Report to the Drinking Water Program that was due on March 31, 2008. The report was requested on January 15, 2008, and is required to be submitted to the Department pursuant to Section 116530, California Health and Safety Code. The reporting form is enclosed. I WILL E-MAIL YOU THE REPORTING FORM TO PUT IN AS AN ENCLOSURE NEXT NEED TO DELETE THIS NUMBER 4

All Submittals required by this citation shall be sent to:

Joseph O. Spano, P.E.
District Engineer
Department of Public Health
Drinking Water Field Operations Branch
31 E. Channel Street, Room 270
Stockton, CA 95202

ADMINISTRATIVE PENALTIES

Sections 116650(d) and 116650(e) of the CHSC allow for the assessment of a civil penalty for failure to comply with requirements of the Safe Drinking Water Act. Despite efforts by the Department to work with the WHWD to comply with the directives of Compliance Order No. 03-10-08CO-001 and correct the on-going violations, the WHWD has not complied with all of the requirements set forth in the Order. **Therefore, the Department hereby imposes an administrative penalty of \$1000 (one thousand dollars) upon the Western Hills Water District. This civil penalty must be paid in full by July 31, 2008.**

A "Notice of Citation Issuance" is attached to this Citation and it instructs the Western Hills Water District on how payment of the civil penalty is to be made. Failure to comply with the directive of this Citation, including payment of the assessed penalty, within the specified time period, will result in further enforcement actions with increased fines up to \$1,000 (one thousand dollars) per day as of the date of violation of any provision of this Citation.

Date

Cindy A. Forbes, P.E.

Branch Chief

Southern California Branch

Drinking Water Field Operations

DRINKING WATER FIELD OPERATIONS BRANCH

**NOTICE OF CITATION ISSUANCE
ADMINISTRATIVE PENALTY**

BACKGROUND STATEMENT

On June 20, 2008, the Drinking Water Field Operations Branch of the Division of Drinking Water and Environmental Management, issued Citation No. 03-10-08C-001 to the Western Hills Water District. **This Citation carries a fine of \$1000 (five hundred dollars).**

METHOD PAYMENT

By July 31, 2008, please submit a check in the amount of **\$1000** and make payable to:

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

and mail to:

**Department of Public Health
Drinking Water Program
P.O. Box 15265
Sacramento, CA 95851-0265**

Attn: Perin Peebles

(Please indicate Citation Number on Check)

(Attach Check Here)

SUMMARY CHRONOLOGY OF EVENTS

4th Quarter 2004: WHWD collected its fourth quarterly set of TTHM samples on October 6, 2004, after initiating DBP monitoring for this new water system at the beginning of 2004. The quarterly average was 0.180 mg/L and the running annual arithmetic average was 0.1318 mg/L. The high and low TTHM sample results were 0.18 mg/L and 0.087 mg/L respectively.

4th Quarter 2005: WHWD continued to collect one TTHM sample per quarter throughout 2005, with the last sample being collected on October 5, 2005. The quarterly average for that fourth quarter was 0.190 mg/L and the running annual arithmetic average was 0.172 mg/L. The high and low TTHM sample results were 0.200 mg/L and 0.14 mg/L respectively. The RAA for TTHMs exceeded the 0.080 mg/L MCL every quarter during 2005.

1st Quarter 2006: WHWD changed its coagulant from alum to ferric chloride on January 19, 2006. The District collected its first quarterly TTHM sample on March 9, 2006. The quarterly average was 0.074 mg/L and the running annual arithmetic average was 0.151 mg/L.

2nd Quarter 2006: WHWD collected its second quarterly TTHM sample on April 27, 2006. The quarterly average was 0.091 mg/L and the running annual arithmetic average was 0.1388 mg/L.

3rd Quarter 2006: WHWD collected its third quarterly TTHM sample on August 16, 2006. The quarterly average was 0.053 mg/L and the running annual arithmetic average was 0.102 mg/L.

4th Quarter 2006: WHWD collected its second quarterly TTHM sample on November 9, 2006. The quarterly average was 0.065 mg/L and the running annual arithmetic average was 0.0708 mg/L, constituting the first return to compliance with the MCL for TTHMs since monitoring was initiated in 2004.

1st Quarter 2007: WHWD collected its first quarterly TTHM sample for 2007 on March 5, 2007. The quarterly average was 0.098 mg/L and the running annual arithmetic average was 0.0768 mg/L.

2nd Quarter 2007: WHWD collected its second quarterly TTHM sample on June 13, 2007. The quarterly average was 0.088 mg/L and the running annual arithmetic average was 0.076 mg/L.

3rd Quarter 2007: WHWD collected its third quarterly TTHM sample on September 6, 2007. The quarterly average was 0.107 mg/L and the running annual arithmetic average was 0.0895 mg/L. The RAA concentration of TTHMs in excess of the 0.080 mg/L MCL constituted the return of the water system to a state of violation of the MCL for TTHMs.

4th Quarter 2007: WHWD collected its fourth quarterly TTHM sample on December 3, 2007. The quarterly average was 0.096 mg/L and the running annual arithmetic average was 0.0973 mg/L. The RAA concentration of TTHMs remained in excess of the 0.080 mg/L MCL.

1st Quarter 2008: WHWD collected its first quarterly TTHM sample on March 5, 2008. The quarterly average was 0.0913 mg/L and the running annual arithmetic average was 0.0956 mg/L. The RAA concentration of TTHMs remained in excess of the 0.080 mg/L MCL and the Diablo Grande water system remained in violation of the MCL for TTHMs.

2nd Quarter 2008: WHWD collected samples to assess progress toward compliance on April 2, 2008. The sample collected from the effluent of Filter 1 showed a THMFP of 98 ug/L, and the sample collected from the effluent of Filter 2 had a THMFP of 130 ug/L. Furthermore, the analysis of a sample collected from the 1 million gallon Zone 3 water storage reservoir revealed that the concentration of DBPs in the water was already 0.092 mg/L, which is in exceedence of the 0.080 mg/L MCL even before time is allowed for additional TTHM formation as the water flows to Diablo Grande water users.