

June 19, 2007

MEMO TO THE BOARD OF DIRECTORS

Subject: Agenda Item No. 5.5 Required Report on Public Health Goals-
Review Final Draft & Set Public Hearing

Attachment: Report on the District's Water Quality Relative to Public
Health Goals

Attached for the Board's approval is the final draft of a report prepared by Staff comparing the District's drinking water quality with both Public Health Goals (PHG) adopted by the California EPA's Office of Environmental Health Hazard Assessment (OEHHA) and maximum contaminant level goals (MCLG) adopted by the US Environmental Protection Agency (USEPA). PHGs and MCLGs are not enforceable standards and no action to meet them is mandated.

SB 1307 (Calderone-Sher, Effective January 1, 1997) added new provisions to the California Health and Safety Code, which mandate that a report be prepared by July 1, 1998, and every three years thereafter. The attached report is intended to provide information to the public in addition to the Annual Water Quality Report mailed to each customer.

The District complies with all of the maximum contaminant levels (MCL) required by the California Department of Health Services (DHS) and the USEPA. The District exceeded the PHG for copper, total coliform, arsenic, Gross Alpha, and Radium 228, and the report addresses this.

The new law requires that a public hearing be held for the purpose of accepting and responding to public comment on the Public Health Goal Report. It is recommended that this public hearing be scheduled as part of the regular Board Meeting of September 4, 2007. It will be noticed as required for public hearings.

RECOMMENDED BOARD ACTION

- 1) By MOTION, accept the Report on Public Health Goals dated June 19, 2007.
- 2) By MOTION, set the regular Board Meeting for Tuesday, September 4, 2007 for the public hearing.

By _____
Gary W. Lamprecht
Operations and Maintenance Manager

SOQUEL CREEK WATER DISTRICT REPORT ON THE DISTRICT'S WATER QUALITY RELATIVE TO PUBLIC HEALTH GOALS

June 19, 2007

Background:

Provisions of the California Health and Safety Code, Section 116470 (b), specify that public water systems serving more than 10,000 service connections must prepare a special report by July 1, 1998 and every three years thereafter, that gives information on the detection of any constituents above the Public Health Goals (PHG) published by the State Office of Environmental Health Hazard Assessment (OEHHA) which is part of Cal EPA. The law also requires that where OEHHA has not adopted a PHG for a constituent, the water suppliers are to use the Maximum Contaminant Level Goals (MCLGs) adopted by United States Environmental Protection Agency (USEPA). Only constituents which have a California primary drinking water standard and for which either a PHG or MCLG has been set are to be addressed. Attached is a list of all regulated constituents with the Maximum Contaminant Levels (MCLs) and PHGs or MCLGs (Attachment 1) along with Section 116470 of the California Health and Safety Code (Attachment 2).

These reports are unique to California. They are required in addition to the extensive public reporting of water quality information that California water utilities have been doing for many years and in addition to the federally mandated annual Consumer Confidence Reports/Water Quality Reports. Hence, it should be kept in mind that in addition to this report, the Soquel Creek Water District will continue to be reporting annually in greater depth on water quality in the system.

There are a few constituents that are routinely detected in water systems at levels usually well below the drinking water standards for which no PHG nor MCLG has yet been adopted by OEHHA or USEPA. These will be addressed in a future required report after a PHG has been adopted.

The law specifies what information is to be provided in the report (Section 116470 (b)).

The purpose of the legislative requirement is to give water system customers access to information on levels of contaminants even below the enforceable mandatory MCLs. Included is the numerical public health risk associated with the MCL and the PHG or MCLG, the category or type of risk to health that could be associated with each constituent, the best treatment technology available that could be used to reduce the constituent level, and an estimate of the cost to install that treatment if it is appropriate and feasible.

What Are PHGs?

PHGs are set by OEHHA and are based solely on public health risk considerations. None of the practical risk-management factors that are considered by the USEPA or the California Department of Health Services (CDHS) in setting drinking water standards (MCLs) are considered in setting the PHGs. These factors include analytical detection capability, treatment technology available, benefits, and costs. The PHGs are not enforceable and are not required to be met by any public water system. MCLGs are the federal equivalent to PHGs.

Water Quality Data Considered:

All of the water quality data collected by our water system in 2004, 2005, and 2006 for purposes of determining compliance with drinking water standards was considered. This data was summarized in our 2004, 2005, and 2006 Annual Water Quality Reports, which were mailed to all District customers during May/June of those years.

Guidelines Followed:

The Association of California Water Agencies (ACWA) formed a workgroup, which prepared guidelines for water utilities to use in preparing these newly required Public Health Goal reports. The ACWA guidelines were used in the preparation of this report. No guidance was available from state regulatory agencies.

Best Available Treatment Technology and Cost Estimates:

Both the USEPA and CDHS adopt Best Available Technologies (BATs), which are the best known methods of reducing contaminant levels to the MCL. Costs can be estimated for such technologies. However, since many PHGs and all MCLGs are set much lower than the MCL, it is not always possible nor feasible to determine what treatment is needed to further reduce a constituent downward to or near the PHG or MCLG, many of which are set at zero. Estimating the costs to reduce a constituent to zero is difficult, if not impossible, because it is not possible to verify by analytical means that the level has been lowered to zero. In some cases, installing treatment to try and further reduce very low levels of one constituent may have adverse effects on other aspects of water quality.

Constituents Detected that Exceed a PHG or a MCLG:

The following is a discussion of constituents that were detected in one or more of our drinking water sources at levels above the PHG, or if no PHG, above the MCLG during the years 2004-2006. The District tests for over 150 constituents. Only those detected at levels above the PHG or MCLG in one or more samples are discussed in this report:

Coliform Bacteria:

During 2006, the District collected between 52 and 70 samples each month for coliform analysis. Three samples tested positive for coliform bacteria in 2006. The check samples were negative and follow-up actions were taken. A maximum of 1.49% of the samples taken in any one month were positive.

The MCL for coliform is 5% positive samples of all samples per month and the MCLG is zero. The reason for the coliform drinking water standard is to minimize the possibility of the water containing pathogens, which are organisms that cause waterborne disease. Because coliform is only a surrogate indicator of the potential presence of pathogens, it is not possible to state a specific numerical health risk. While USEPA normally sets MCLGs “at a level where no known or anticipated adverse effects on persons would occur”, they indicate that they cannot do so with coliforms.

Coliform bacteria are indicator organisms that are ubiquitous in nature and are not generally considered harmful. They are used in water quality sampling because of the ease in monitoring and analysis. If a positive sample is found, it indicates a potential problem that needs to be investigated and follow up sampling that needs to be done. It is not at all unusual for a system to have an occasional positive coliform sample. It is difficult, if not impossible, to assure that a system will never get a positive sample.

We add chlorine at our sources to assure that the water served is microbiologically safe. The chlorine residual levels are carefully controlled to provide the best health protection without either causing the water to have undesirable taste and odor or increasing the disinfection byproduct level. This careful balance of treatment processes is essential to continue supplying District customers with safe drinking water.

Other equally important measures that have been implemented include: an effective cross-connection control program, maintenance of a disinfectant residual throughout the distribution system and maintaining positive pressures in the distribution system. Our system has already taken all of the steps described by CDHS as “best available technology” for coliform bacteria in Section 64447, Title 22,CCR.

Lead and/or Copper:

There is no MCL for Lead or Copper. Instead the 90th percentile value of all samples from household taps in the distribution system cannot exceed an Action Level of 0.015 mg/L for lead and 1.3 mg/L for copper. The PHG for lead is 0.002 mg/L. The PHG for copper is 0.17 mg/L.

The category of health risk for lead is damage to the kidneys or nervous system of humans. The category of health risk for copper is gastrointestinal irritation. Numerical health risk data for lead and copper has been provided by OEHHA as follows:

Chemical	Health Risk Category	California PHG (mg/L) ¹	Cancer Risk ² @PHG	California MCL ³ (mg/L)	Cancer Risk @ California MCL	District level (mg/L)
Copper	Acute toxicity (gastrointestinal effects, human data)	0.17	NA ⁴	1.3 (AL) ⁵	NA	0.36
Lead	Neurotoxicity (decreased learning ability, human data)	0.002	NA	0.015 (AL)	NA	0

¹ mg/L = milligrams per liter of water (PHGs are expressed in milligrams per liter for consistency with MCLs and MCLGs)

² Cancer Risk = theoretical 70-year lifetime excess cancer risk at the statistical upper confidence limit. Actual cancer risk may be lower or zero. Cancer risk is stated in terms of excess cancer cases per million (or fewer) population, e.g., 1x10⁻⁶ means one excess cancer case per million population; 5x10⁻⁵ means 5 excess cancer cases per 100,000 population.

³ MCL = maximum contaminant level

⁴ NA = not applicable. No cancer risk is calculated for chemicals considered “noncarcinogens.” For noncarcinogens, an exact numerical public health risk cannot be calculated. The PHG for these chemicals is set at a level which is believed to be without any significant public health risk to individuals exposed to that chemical over a lifetime.

⁵ AL = action level

All of our source (well) water samples for lead and copper in 2004 were less than the PHG. Based on extensive sampling at the consumers tap in 2004, our 90th percentile value for lead was 0 and for copper was 0.36 mg/L. The District was granted a three-year waiver for sampling of lead and copper and will be sampling again in 2007.

The district is in full compliance with the Federal and State Lead and Copper Rule. Based on our extensive sampling, it was determined according to State regulatory requirements, that the District has met the Action Levels for Lead and Copper. Therefore, we are deemed by CDHS to have “optimized corrosion control” for the distribution system.

In general, optimizing corrosion control is considered to be the best available technology to deal with corrosion issues and with any lead or copper findings. The District continues to monitor water quality parameters that relate to corrosivity, such as the pH, hardness, alkalinity, and total dissolved solids. We will take action if necessary, to maintain the system in an “optimized corrosion control” condition.

Arsenic:

The PHG for Arsenic was established at 0.000004 mg/L (0.004 parts per billion) and announced by OEHHA on March 7, 2003. The California Department of Health Services (DHS) sets drinking water standards and has determined that arsenic is a health concern at certain levels of exposure. Arsenic is found naturally in air, water, soil, mineral deposits, and food. While arsenic in water typically is naturally occurring, the improper disposal of waste chemicals can also contaminate water supplies with arsenic. Long-term exposure to arsenic in drinking water can increase the risk of lung and bladder cancer and, to a lesser extent, increase the risk of skin,

liver, and kidney cancer. Other serious health effects stemming from long-term ingestion of arsenic in drinking water include heart attacks, stroke, diabetes, mellitus, high blood pressure, liver and nerve damage, abnormal skin growths, and some reproductive and developmental problems.

For many years, the state and federal drinking water standard (MCL) was set at 50 parts per billion (ppb). In January of 2006, a new federal standard of 10 ppb took effect. With the DHS adoption of an arsenic PHG of 0.004 ppb, the state may accept the federal standard or enact a lower MCL for California. The numerical health risk data for arsenic has been provided by OEHHA as follows:

Chemical	Health Risk Category	State PHG (mg/L)	Cancer Risk @PHG	State MCL (mg/L)	Cancer Risk @ California MCL	District levels (mg/L)
Arsenic	Carcinogenicity	0.000004 (0.004 parts per billion)	One per million	0.010 (10 parts per billion)	One in a hundred	0.002-0.0046 (2 -4.6 parts per billion)*

* Before treatment. “Non-detect” or <2.0 ppb after treatment.

With the PHG at 0.004 parts per billion, it is 500 times lower than the Detection Limit Requirement (DLR) of 2 ppb for arsenic, hence, below the level that can be reliably determined by current laboratory methods. Consequently, all laboratory results below the DLR of 2 ppb are potentially in excess of the PHG, even if there isn't any arsenic detected.

District water, system wide, meets all federal and state water quality standards for the presence of arsenic. The District does have three wells that test lower than the new federal MCL standard of 10 parts per billion but exceed the state PHG of 0.004 parts per billion. Although not required by the DHS, the District voluntarily did a pilot study for arsenic removal at one of the well sites and, upon receiving favorable results, has installed arsenic removal treatment for all three wells. Based on the pilot study conclusions, a Coagulation/Filtration treatment system, using the existing iron and manganese filter, was adopted. Two of the wells are presently being treated and the third well is being prepared for treatment. Treatment results are below the DLR of 2 ppb and reported as “non-detect” (arsenic not present) by the laboratory.

Radionucleotides:

The term radionucleotide refers to naturally occurring elemental radium, radon, uranium, and thorium with an unstable atomic nucleus that spontaneously decays producing ionizing radiation. Exposure to ionizing radiation in concentrations exceeding the maximum contaminate level may have carcinogenic (cancer causing),

mutagenic (causing mutation of cells), or teratogenic (causing abnormalities in offspring) effects.

The District has two radiological constituents that exceed a PHG or MCLG. They are Gross Alpha particle activity, which is defined as total radioactivity caused by alpha particle emission, and Radium 228, defined as a naturally occurring radioactive element created in the decay of uranium and thorium. Both constituents can be produced in the environment through the erosion of natural deposits. The District is required to meet the following analytical testing schedule for radionucleotides in domestic water supplies:

1. Gross Alpha is tested for 4 consecutive quarters every 4 years. The last cycle was completed in 2006. Gross Alpha testing can be substituted for Radium 226 and 228 testing if the initial 4 quarters of testing show Radium 226 and 228 to be below 5 pCi/L (the term pico curies per liter, pCi/L, is a measure of radioactivity).
2. The average of the four results is used to determine compliance with the MCL.
3. If the Gross Alpha exceeds an average of 15 pCi/L, then the water utility is required to test 4 consecutive quarters for uranium.
4. If uranium exceeds 20 pCi/L, then the water utility is required to test 4 consecutive quarters for Radium 226 and 228.
5. If the sum of the Radium 226 and 228 exceeds 5 pCi/L, then the source (well) must be treated or abandoned.

Because the District water system tested well below the MCL (5 pCi/L) for Radium 226 and 228 for the initial 4 quarters of testing, the DHS directed the District to substitute Gross Alpha testing on the “4 quarters every 4 years” schedule.

The normal health risk data for Gross Alpha Particle Activity and Radium 228 has been provided by OEHHA as follows:

Constituent	Health Risk Category	CA PHG (MCLG) (pCi/L)	Cancer Risk @PHG	State MCL (pCi/L)	Cancer Risk @ California MCL	District levels (pCi/L)
Gross Alpha	Carcinogenicity	(zero)	zero	15 pCi/L	One in a thousand	0.09-0.80 pCi/L
Radium 228	Carcinogenicity	0.019 pCi/L	One in a million	5 pCi/L (combined Ra 226+228)	Three in ten thousand	<1.0-2.93 pCi/L

The District meets all federal and state water quality standards for the presence of Gross Alpha and Radium 228. The best known treatment methods, or BAT, for

Gross Alpha is Reverse Osmosis and for Radium 228 is Ion Exchange. Both methods are expensive and produce waste products that are expensive to handle and dispose of. The estimated unit cost in dollars per 1000 gallons of treated water is \$2.40 for Reverse Osmosis (Gross Alpha) and \$.58 for Ion Exchange (Radium 228) per treatment plant. This does not include waste disposal costs.

Recommendations for Further Action:

The drinking water quality of the Soquel Creek Water District meets all California Department of Health Services and USEPA drinking water standards set to protect public health. To further reduce the levels of the constituents identified in the report (that are already significantly below the health-based Maximum Contaminant Levels established to provide “safe drinking water”) would require additional costly treatment processes. The effectiveness of the treatment processes to provide any significant reductions in constituent levels at these already low values is uncertain. The health protection benefits of these further reductions are not clear at this time and may not be quantifiable.

Summary list of all contaminants detected above the Public Health Goals (PHG) published by the State Office of Environmental Health Hazard Assessment (OEHHA):

Chemical	Health Risk Category	CA PHG (MCLG) (mg/L)	Cancer Risk @ MCLG	California MCL (mg/L)	Cancer Risk @ California MCL	District level (mg/L)
Copper	Acute toxicity (gastrointestinal effects, human data)	0.17	NA	1.3 (AL)	NA	0.36
Coliform bacteria	NA	zero	NA	5% in any month	NA	1.49% in a single month
Arsenic	Carcinogenicity	0.000004 (0.004 parts per billion)	One in a million	0.01 (10 parts per billion)	One in a hundred	0.002-.0046 (2-4.6 parts per billion)*
Gross Alpha	Carcinogenicity	(zero)	zero	15 pCi/L	One in a thousand	0.09-0.80 pCi/L
Radium 228	Carcinogenicity	0.019 pCi/L	One in a million	5 pCi/L (combined Ra 226+228)	Three in ten thousand	<1.0-2.93 pCi/L

* Before treatment. “Non-detect” or <2.0 ppb after treatment.

Section 116470. Consumer Confidence Report

- (a) As a condition of its operating permit, every public water system shall annually prepare a consumer confidence report and mail or deliver a copy of that report to each customer, other than an occupant, as defined in Section 799.28 of the Civil Code, of a recreational vehicle park. A public water system in a recreational vehicle park with occupants as defined in Section 799.28 of the Civil Code shall prominently display on a bulletin board at the entrance to or in the office of the park, and make available upon request, a copy of the report. The report shall include all of the following information:
- (1) The source of the water purveyed by the public water system.
 - (2) A brief and plainly worded definition of the terms "maximum contaminant level," "primary drinking water standard," and "public health goal."
 - (3) If any regulated contaminant is detected in public drinking water supplied by the system during the past year, the report shall include all of the following information:
 - (A) The level of the contaminant found in the drinking water, and the corresponding public health goal and primary drinking water standard for that contaminant.
 - (B) Any violations of the primary drinking water standard that have occurred as a result of the presence of the contaminant in the drinking water and a brief and plainly worded statement of health concerns that resulted in the regulation of that contaminant.
 - (C) The public water system's address and phone number to enable customers to obtain further information concerning contaminants and potential health effects.
 - (4) Information on the levels of unregulated contaminants, if any, for which monitoring is required pursuant to state or federal law or regulation.
 - (5) Disclosure of any variances or exemptions from primary drinking water standards granted to the system and the basis therefore.
- (b) On or before July 1, 1998, and every three years thereafter, public water systems serving more than 10,000 service connections that detect one or more contaminants in drinking water that exceed the applicable public health goal, shall prepare a brief written report in plain language that does all of the following:
- (1) Identifies each contaminant detected in drinking water that exceeds the applicable public health goal.
 - (2) Discloses the numerical public health risk, determined by the office, associated with the maximum contaminant level for each contaminant identified in paragraph (1) and the numerical public health risk determined by the office associated with the public health goal for that contaminant.

- (3) Identifies the category of risk to public health, including, but not limited to, carcinogenic, mutagenic, teratogenic, and acute toxicity, associated with exposure to the contaminant in drinking water, and includes a brief plainly worded description of these terms.
 - (4) Describes the best available technology, if any is then available on a commercial basis, to remove the contaminant or reduce the concentration of the contaminant. The public water system may, solely at its own discretion, briefly describe actions that have been taken on its own, or by other entities, to prevent the introduction of the contaminant into drinking water supplies.
 - (5) Estimates the aggregate cost and the cost per customer of utilizing the technology described in paragraph (4), if any, to reduce the concentration of that contaminant in drinking water to a level at or below the public health goal.
 - (6) Briefly describes what action, if any, the local water purveyor intends to take to reduce the concentration of the contaminant in public drinking water supplies and the basis for that decision.
- (c) Public water systems required to prepare a report pursuant to subdivision (b) shall hold a public hearing for the purpose of accepting and responding to public comment on the report. Public water systems may hold the public hearing as part of any regularly scheduled meeting.
 - (d) The department shall not require a public water system to take any action to reduce or eliminate any exceedance of a public health goal.
 - (e) Enforcement of this section does not require the department to amend a public water system's operating permit.
 - (f) Pending adoption of a public health goal by the Office of Environmental Health Hazard Assessment pursuant to subdivision (c) of Section 116365, and in lieu thereof, public water systems shall use the national maximum contaminant level goal adopted by the United States Environmental Protection Agency for the corresponding contaminant for purposes of complying with the notice and hearing requirements of this section.
 - (g) This section is intended to provide an alternative form for the federally required consumer confidence report as authorized by 42 U.S.C. Section 300g-3(c).