AGENDA ITEM G-2

CITY OF LODI
COUNCIL COMMUNICATION

TM

AGENDA TITLE: Public Hearing to Receive Comments on and Consider Accepting City of Lodi's Report on Water Quality Relative to Public Health Goals

MEETING DATE: October 2, 2013

PREPARED BY: Public Works Director

RECOMMENDED ACTION: Public hearing to receive comments on and consider accepting the City of Lodi's Report on Water Quality Relative to Public Health Goals.

BACKGROUND INFORMATION: Our water system complies with all of the health-based drinking water standards and maximum contaminant levels as required by the California Department of Health Services and the United States Environmental Protection Agency. The attached report prepared by staff compares Lodi's drinking water with the California Environmental Protection Agency's public health goals (PHGs) and with the United States Environmental Protection Agency's maximum contaminant level goals (MCLGs). PHGs and MCLGs are not enforceable standards and no action to meet them is mandated.

California Code of Regulations, Title 22, Section 116470, mandates that a report be prepared every three years. The attached report is intended to provide information to the public, in addition to the Annual Water Quality Report mailed to each customer in June 2013. On August 10, 2013, a public notice appeared in the *Lodi News Sentinel* to inform any interested party of the Public Health Goals Report and its availability. The report is also posted on the City's website.

The law also requires that a public hearing be held (which can be part of a regularly-scheduled public meeting) for the purpose of accepting and responding to public comment on the report. A notice of public hearing will be published in the *Lodi News Sentinel*. No additional actions are required or recommended.

FISCAL IMPACT: Not applicable.

FUNDING AVAILABLE: Not applicable.

F. Wally Sandelin
Public Works Director

Prepared by Larry Parlin, Deputy Public Works Director – Utilities
FWS/LP/pmf
Attachment
cc: Deputy Public Works Director – Utilities
Utilities Superintendent
Water Plant Chief Operator

APPROVED: _____
Konradt Bartlam, City Manager

CITY OF LODI

PUBLIC WORKS DEPARTMENT

Report on Water Quality

Relative to Public Health Goals

2010-2012

September 2013

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Background

Provisions of the California Health and Safety Code (Reference No. 1) specify that larger (>10,000 service connections) water utilities prepare a special report every three years if their water quality measurements have exceeded any Public Health Goals (PHGs). PHGs are non-enforceable goals established by the Cal-EPA's Office of Environmental Health Hazard Assessment (OEHHA). 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 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.

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 been adopted by OEHHA or USEPA. If a constituent was detected in the City's water supply between 2010 and 2012 at a level exceeding an applicable PHG or MCLG, this report provides the information required by law. Included is the numerical public health risk associated with the MCL and the PHG or MCLG, the category or type of risk to health associated with each constituent, the best available treatment technology that could be used to reduce the constituent level, and an estimate of the cost to implement that treatment if it is appropriate and feasible.

What Are PHGs?

PHGs are set by the California Office of Environmental Health Hazard Assessment (OEHHA) which is part of Cal-EPA, 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 Public Health (CDPH) in setting drinking water standards (MCLs) are considered in setting the PHGs. These factors include analytical detection capability, available treatment technology, benefit and cost. The PHGs are not enforceable and are not required to be met by any public water system. MCLGs are the federal equivalent to PHGs.

City of Lodi Water Sources

The City of Lodi's water supply consists of both groundwater and surface water sources. Approximately 70 percent of the water supplied to our customers originates from wells owned by the City and the remainder of the City's drinking water is treated surface water produced through the new Surface Water Treatment Facility (SWTF).

Water Quality Data Considered

All of the water quality data collected by our water system between 2010 and 2012 for purposes of determining compliance with drinking water standards was considered. This data was summarized in our 2010, 2011, and 2012 Annual Water Quality Reports which were mailed to all customers before July 1st each year. The triennial lead and copper monitoring for 2012 was deferred by CDPH to 2013 and is not included in this report.

Guidelines Followed

The Association of California Water Agencies (ACWA) formed a workgroup that prepared guidelines that were used in the preparation of this report.

Best Available Treatment Technology and Cost Estimates

Both the USEPA and CDPH adopt what are known as Best Available Technologies (BATs) which are the best known methods of reducing contaminant levels to the MCL. Costs can be estimated for implementing such technologies. Since many PHGs and all MCLGs are set much lower than the MCL, it is not always possible or feasible to determine what treatment is needed to further reduce a constituent down 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. It is not possible to verify by analytical means that the level has been lowered to zero. In some cases, installing treatment to 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.

Coliform Bacteria

In 2010-12, we collected 3,141 samples from our distribution system for coliform analysis. Of these samples, 0.22% was positive for coliform bacteria. In 2010-12 a maximum of 3.4% (April 2011) of these samples were positive for one month.

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 an indicator of the potential presence of pathogens, it is not possible to state a specific numerical health risk. While U.S. EPA 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 organisms that are found just about everywhere in nature and are not generally considered harmful. They are used as an indicator because of the ease for monitoring and analysis. If a positive sample is found, it indicates a potential problem that needs to be investigated and follow up sampling is done. It is not at all unusual for a system to have an occasional positive sample. It is difficult, if not impossible, to assure that a system will never get a positive sample. A further test that is performed on all total coliform positive results is for fecal coliform or E. coli. There were no positive fecal coliform or E. coli results in 20010-12.

The City adds chlorine to all City water sources to assure that the water served is microbiologically safe. The chlorine residual levels are carefully controlled to provide the best health protection without 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 our customers with safe drinking water.

Trichloroethylene (TCE)

The PHG for TCE is 1.7 micrograms per liter (µg/L or parts per billion). The MCL or drinking water standard for TCE is 5 µg/L. We detected TCE at levels above the PHG but not exceeding the MCL in the discharge from 1 of the 26 City wells used in 2010-12. The average value for the City wells can be found in the Water Quality Report (Appendix).

The category of health risk associated with TCE, and the reason that a drinking water standard was adopted for it, is that the people who drink water containing TCE above the MCL throughout their lifetime could theoretically experience an increased risk of getting cancer. CDPH says that "Drinking water which meets this standard (the MCL) is associated with little to none of this risk and should be considered safe with respect to TCE." (CDPH Blue Book of drinking water law and regulations, Section 64468.2, Title 22, CCR.) The Best Available Technology for TCE to lower the level below the MCL is either Granular Activated Carbon or Packed Tower Aeration.

The estimated cost to install such a treatment system on one City well and enhance the capacity on one City well with an existing treatment system that would reliably reduce the TCE level to below 1.7 µg/L would be approximately $490,000 and require annual operation and maintenance costs of approximately $77,000 per year. This would result in an estimated increased cost to each customer of approximately $5 per year.

Dibromochloropropane (DBCP)

The PHG for DBCP is 1.7 nanograms per liter (ng/L or parts per trillion). The MCL for DBCP is 200 ng/L. We detected DBCP at levels not exceeding the MCL in the discharges from 12 of the 26 City wells used in 2010-12. City Well No. 6 was taken out of service and placed in standby (January 2012) when the average analysis exceeded the MCL. Since then, the City has taken necessary steps to add Granulated Activated Carbon (GAC) vessels for treatment. This treatment was funded by Lodi's settlement agreement with DBCP manufactures and construction of the new treatment is near completion. The average value for these City wells can be found in the Water Quality Report (Appendix).

The category for health risk associated with DBCP, and the reason that a drinking water standard was adopted for it, is the people who drink water containing DBCP above the MCL throughout their lifetime could theoretically experience an increased risk of getting cancer. CDPH says that "Drinking water which meets this standard (the MCL) is associated with little to none of this risk and should be considered safe with respect to DBCP." (CDPH Blue Book of drinking water law and regulations, Section 64468.3, Title 22, CCR.) The numerical health risk for an MCLG of zero is zero.

The Best Available Technology for DBCP to lower the level below the MCL is either Granular Activated Carbon or Packed Tower Aeration. To attempt to maintain the DBCP levels at zero, Granular Activated Carbon Treatment Systems with longer empty bed contact times and more frequent carbon change-outs would likely be required.

The estimated cost to install such a treatment system on 12 City wells and enhance capacities on six City wells with existing treatment systems that would reliably reduce the DBCP level to zero would be approximately $5.4 million. The increased annual operation and maintenance costs would be approximately $797,000 per year. This would result in an estimated increased cost to each customer of approximately $42 per year. (Note: This increased cost may not be reimbursable under the terms of Lodi's settlement agreement with the DBCP manufacturers.)

1,1,2,2-Tetrachloroethylene (PCE)

The PHG for PCE is 0.06 micrograms per liter (µg/L or parts per billion). The MCL or drinking water standard for PCE is 5 µg/L. We detected PCE at levels not exceeding the MCL in the discharges from three of the 26 City wells used in 2010-12. The average value for these City wells can be found in the Water Quality Report (Appendix).

The category of health risk associated with PCE, and the reason that a drinking water standard was adopted for it, is the people who drink water containing PCE above the MCL throughout their lifetime could theoretically experience an increased risk of getting cancer. CDPH says that "Drinking water which meets this standard (the MCL) is associated with little to none of this risk and should be considered safe with respect to PCE." (CDPH Blue Book of drinking water law and regulations, Section 64468.2, Title 22, CCR.)

The Best Available Technology for PCE to lower the level below the MCL is either Granular Activated Carbon or Packed Tower Aeration. Since the PCE level in these three City wells is already below the MCL, a Granular Activated Carbon Treatment System with larger vessels would likely be required to attempt to keep PCE levels below the PHG.

The estimated cost to install such a treatment system on three City wells that would reliably reduce the PCE level to the PHG of 0.06 µg/L would be approximately $1.5 million and require annual operation and maintenance costs of approximately $180,000 per year. This would result in an estimated increased cost to each customer of approximately $14 per year.

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

The PHG for 1,2,3-TCP is 0.0007 micrograms per liter (µg/L or parts per billion). There is no California or federal Maximum Contaminant Level (MCL) for 1,2,3-TCP. The California Notification Level for 1,2,3-TCP is set at 0.005 µg/L, the detection limit for the purposes of reporting Detectable Level Required (DLR). Notification levels are health-based advisory levels established by CDPH for chemicals in drinking water that lack MCLs. CDPH advises "If a chemical concentration is greater than its notification level in drinking water that is provided to consumers, CDPH recommends that the utility inform its customers and consumers about the presence of the chemical, and about health concerns associated with exposure to it". We detected 1,2,3-TCP at levels exceeding the PHG in the source water from six of the 26 City wells used in 2010-12. The average value for these City wells can be found in the Water Quality Report (Appendix).

Currently, there is no MCL for 1,2,3-TCP. The category for health risk associated with 1,2,3-TCP, and the reason that a drinking water standard (PHG) was adopted for it, is the people who drink

water containing 1,2,3-TCP throughout their lifetime could theoretically experience an increased risk of getting cancer.

An estimate of the best approach for 1,2,3-TCP removal in Lodi is not necessary at this time.

Arsenic

The PHG for Arsenic is 0.004 micrograms per Liter (µg/L or parts per billion). The MCL or drinking water standard for arsenic is 10 µg/L. There were arsenic levels detected at levels not exceeding the MCL in discharges from 26 of the 26 City wells and the water treatment plant used in 2010-12. The values for these water sources can be found in the Water Quality Report (Appendix).

Arsenic is a naturally occurring element found in many types of rocks and soils. Leaching of these deposits is the primary source of arsenic in this area. Some people who drink water containing arsenic in excess of the MCL over many years may experience skin damage or circulatory system problems and may have an increased risk of getting cancer. The PHG of 0.004 µg/L for arsenic is far below the Detection Limit Requirement (DLR) of 2 µg/L for arsenic. The DLR is the level that can be reliably determined by current laboratory methods.

The Best Available Treatment (BAT) for arsenic removal is dependent on the water chemistry of the source to be treated. While research into new methods of removing arsenic continues, the current recommendations include:

- Activated Alumina
- Coagulation / Filtration
- Lime Softening
- Reverse Osmosis

All of the above-listed methods are expensive and have a concentrated residual, which requires safe disposal. An estimate of the best approach for arsenic removal in Lodi is not necessary at this time.

Radium 226

The PHG for Radium 226 is 0.05 pCi/L and MCL for Radium 226 plus Radium 228 is 5 pCi/L. Testing for radium is not required unless the level of gross alpha particle activity detected exceeds 5 pCi/L. We detected Radium 226 at levels not exceeding the MCL in the discharges from two of the 26 City wells used in 2010-12. The average value for this City well can be found in the Water Quality Report (Appendix).

The category of health risk associated with Radium 226 is carcinogenicity. People who drink water containing Radium 226 particles above the MCL throughout their lifetime could experience an increased risk of getting cancer. The numerical health risk for Radium 226 based on the PHG is 1 x 10-6. This means one excess cancer case per million population. The BAT to lower the level of Radium 226 below the MCL is reverse osmosis, although it is not known if the technology is feasible of achieving the PHG level of 0.06 pCi/L.

The estimated annual cost to install and operate a reverse osmosis systems at all of the City's wells would be approximately $2.60 per 1,000 gallons of treated water, which includes annualized cost of construction plus operation and maintenance costs. This translates into an estimated additional

annual cost of approximately $35 per service connection per year for the life of the treatment system.

Radium 228

The PHG for Radium 228 is 0.019 pCi/L and MCL for Radium 226 plus Radium 228 is 5 pCi/L. Testing for radium is not required unless the level of gross alpha particle activity detected exceeds 5 pCi/L. We detected Radium 228 at levels not exceeding the MCL in the discharges from two of the 26 City wells used in 2010-12. The average value for this City well can be found in the Water Quality Table (Appendix D).

The category of health risk associated with Radium 228 is carcinogenicity. People who drink water containing Radium 228 particles above the MCL throughout their lifetime could experience an increased risk of getting cancer. The numerical health risk for Radium 228 based on the PHG is 1 x 10-6. This means one excess cancer case per million population. The BAT to lower the level of Radium 228 below the MCL is reverse osmosis, although it is not known if the technology is feasible of achieving the PHG level of 0.019 pCi/L.

The estimated annual cost to install and operate a reverse osmosis systems at all of the City's wells would be approximately $2.60 per 1,000 gallons of treated water, which includes annualized cost of construction plus operation and maintenance costs. This translates into an estimated additional annual cost of approximately $35 per service connection per year for the life of the treatment system.

Uranium

The PHG for Uranium is 0.43 picocuries per liter (pCi/L). The MCL or drinking water standard for Uranium is 20 pCi/L. There was Uranium detected at levels not exceeding the MCL in discharges from 15 of the 25 City wells used in 2010-12. The values for these water sources can be found in the Water Quality Report (Appendix).

CDPH, which sets drinking water standards, has determined that total Uranium is a health concern at certain levels of exposure. This radiological constituent is a naturally occurring contaminant in some groundwater and surface water supplies. This constituent has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Constituents that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time.

BATs for removal of Uranium from drinking water are: Ion Exchange - Reverse Osmosis or Lime Softening. These methods are expensive and require disposal of a waste stream, which would contain concentrated radio nucleotides. The estimated cost to install such a treatment system on fifteen City wells that have historically exceeded the PHG which would reliably reduce the Uranium level to the PHG of 0.43 pCi/L would be approximately $19.6 million and require annual operation and maintenance at a cost of approximately $820,000 per year. This would result in an estimated increased cost for each customer of approximately $121 per year.

Recommendations for Further Action

The drinking water quality of the City of Lodi Public Water System meets all State of California, CDPH and U.S. EPA drinking water standards set to protect public health. To further reduce the levels of the constituent's identified in this report that are already below the Maximum Contaminant Levels established by the State and Federal government, additional costly treatment processes would be required.

The effectiveness of the treatment processes to provide significant reductions in constituent levels at these already low values is uncertain. The theoretical health protection benefits of these further reductions are not clear and may not be quantifiable. Therefore, staff is not recommending further action at this time.

This report was completed by City of Lodi Public Works Department staff. Any questions relating to this report should be directed to:

Larry Parlin, Deputy Public Works Director, 1331 South Ham Lane, Lodi, CA, 95242 or call (209) 333-6800, extension 2661.

Andrew Richle, Chief Plant Operator, 2001West Turner Road, Lodi, CA, 95242 or call (209) 333-6800, extension 2690.

Appendix

Appendix

City of Lodi Water Quality Report Relative to Public Health Goals

Trichloroethylene (TCE)	Result	MCL	PHG or (MCLG)
Well 2	2 ug/L	5 ug/L	1.7 ug/L
Dibromochloropropane (DBCP)			
Well 1R	56 ng/L	200 ng/L	17 ng/L
Well 4R	37 ng/L	200 ng/L	17 ng/L
Well 6R	476 ng/L	200 ng/L	17 ng/L
Well 8	176 ng/L	200 ng/L	17 ng/L
Well 13	50 ng/L	200 ng/L	17 ng/L
Well 14	40 ng/L	200 ng/L	17 ng/L
Well 16	30 ng/L	200 ng/L	17 ng/L
Well 17	177 ng/L	200 ng/L	17 ng/L
Well 19	100 ng/L	200 ng/L	17 ng/L
Well 22	40 ng/L	200 ng/L	17 ng/L
Well 23	20 ng/L	200 ng/L	17 ng/L
Well 28	95 ng/L	200 ng/L	17 ng/L
Perchloroethylene (PCE)			
Well 6R	2.43 ug/L	6 ug/L	0.06 ug/L
Well 8	0.66 ug/L	6 ug/L	0.06 ug/L
Well 12	0.88 ug/L	6 ug/L	0.06 ug/L
Arsenic			
Well 1R	5.6 ug/L	10 ug/L	0.004 ug/L
Well 2	3.4 ug/L	10 ug/L	0.004 ug/L
Well 3R	5.0 ug/L	10 ug/L	0.004 ug/L
Well 4R	4.0 ug/L	10 ug/L	0.004 ug/L
Well 5	4.4 ug/L	10 ug/L	0.004 ug/L
Well 6R	2.2 ug/L	10 ug/L	0.004 ug/L
Well 7	4.5 ug/L	10 ug/L	0.004 ug/L
Well 9	3.7 ug/L	10 ug/L	0.004 ug/L
Well 10C	4.3 ug/L	10 ug/L	0.004 ug/L
Well 11R	5.5 ug/L	10 ug/L	0.004 ug/L
Well 12	3.6 ug/L	10 ug/L	0.004 ug/L
Well 13	8.7 ug/L	10 ug/L	0.004 ug/L
Well 14	3.6 ug/L	10 ug/L	0.004 ug/L
Well 15	4.6 ug/L	10 ug/L	0.004 ug/L
Well 16	3.3 ug/L	10 ug/L	0.004 ug/L
Well 17	3.9 ug/L	10 ug/L	0.004 ug/L
Well 18	2.4 ug/L	10 ug/L	0.004 ug/L

Notes:

*MCL for Radium 226 plus 228 is 5.0 pCi/L

**Source Water Sample

Arsenic (Cont.)	Result	MCL	PHG or (MCLG)
Well 19	2.9 ug/L	10 ug/L	0.004 ug/L
Well 20	3.2 ug/L	10 ug/L	0.004 ug/L
Well 21	2.5 ug/L	10 ug/L	0.004 ug/L
Well 22	2.4 ug/L	10 ug/L	0.004 ug/L
Well 23	2.7 ug/L	10 ug/L	0.004 ug/L
Well 24	6.1 ug/L	10 ug/L	0.004 ug/L
Well 25	6.2 ug/L	10 ug/L	0.004 ug/L
Well 26	9.1 ug/L	10 ug/L	0.004 ug/L
Well 28	6.2 ug/L	10 ug/L	0.004 ug/L
Surafce Water Plant	0.4 ug/L	10 ug/L	0.004 ug/L
Uranium			
Well 2	4.0 pCi/l	20 pCi/L	0.43 pCi/L
Well 6R	11.2 pCi/l	20 pCi/L	0.43 pCi/L
Well 8	12.5 pCi/l	20 pCi/L	0.43 pCi/L
Well 9	5.2 pCi/l	20 pCi/L	0.43 pCi/L
Well 12	7.4 pCi/l	20 pCi/L	0.43 pCi/L
Well 13	1.5 pCi/l	20 pCi/L	0.43 pCi/L
Well 14	4.0 pCi/l	20 pCi/L	0.43 pCi/L
Well 16	4.7 pCi/l	20 pCi/L	0.43 pCi/L
Well 17	4.5 pCi/l	20 pCi/L	0.43 pCi/L
Well 19	4.6 pCi/l	20 pCi/L	0.43 pCi/L
Well 20	2.5 pCi/l	20 pCi/L	0.43 pCi/L
Well 21	1.0 pCi/l	20 pCi/L	0.43 pCi/L
Well 22	9.5 pCi/l	20 pCi/L	0.43 pCi/L
Well 23	7.7 pCi/l	20 pCi/L	0.43 pCi/L
Radium 226			
Well 8	0.25 pCi/L	*5.0 pCi/L	0.05 pCi/L
Well 20	0.05 pCi/L	*5.0 pCi/L	0.05 pCi/L
Radium 228			
Well 8	0.075 pCi/L	*5.0 pCi/L	0.019 pCi/L
Well 20	0.116 pCi/L	*5.0 pCi/L	0.019 pCi/L
****1,2,3 Trichoropropane**			
Well 6R	0.005 ug/L	N/A	0.0007 ug/L
Well 13	0.026 ug/L	N/A	0.0007 ug/L
Well 16	0.004 ug/L	N/A	0.0007 ug/L
Well 18	0.009 ug/L	N/A	0.0007 ug/L
Well 20	0.015 ug/L	N/A	0.0007 ug/L
Well 21	0.003 ug/L	N/A	0.0007 ug/L

Attachments

ATTACHMENT No. 1

2013 PHG Triennial Report: Calendar Years 2010-2011-2012

MCLs, DLRs, and PHGs for Regulated Drinking Water Contaminants
(Units are in milligrams per liter (mg/L), unless otherwise noted.)

Last Update: February 12, 2013
(Reference: http://www.cdph.ca.gov/certlic/drinkingwater/Pages/MCLsandPHGs.aspx)

This table includes:

- CDPH's maximum contaminant levels (MCLs)
- CDPH's detection limits for purposes of reporting (DLRs)
- Public health goals (PHGs) from the Office of Environmental Health Hazard Assessment (OEHHA)
- PHGs for NDMA and 1,2,3-Trichloropropane (1,2,3-TCP is unregulated) are at the bottom of this table
- The federal MCLG for chemicals without a PHG, microbial contaminants, and the DLR for 1,2,3-TCP

Constituent	MCL	DLR	PHG or (MCLG)	Date of PHG
Chemicals with MCLs in 22 CCR §64431—Inorganic Chemicals				
Aluminum	1	0.05	0.6	2001
Antimony	0.006	0.006	0.02	1997
Arsenic	0.010	0.002	0.000004	2004
Asbestos (MFL = million fibers per liter; for fibers >10 microns long)	7 MFL	0.2 MFL	7 MFL	2003
Barium	1	0.1	2	2003
Beryllium	0.004	0.001	0.001	2003
Cadmium	0.005	0.001	0.00004	2006
Chromium, Total - OEHHA withdrew the 1999 0.0025 mg/L PHG in Nov 2001	0.05	0.01	(0.100)	
Chromium, Hexavalent (Chromium-6) - MCL to be established - currently regulated under the total chromium MCL	--	0.001	0.00002	2011
Cyanide	0.15	0.1	0.15	1997
Fluoride	2	0.1	1	1997
Mercury (inorganic)	0.002	0.001	0.0012	1999 (rev2005)*
Nickel	0.1	0.01	0.012	2001
Nitrate (as NO3)	45	2	45	1997
Nitrite (as N)	1 as N	0.4	1 as N	1997
Nitrate + Nitrite	10 as N	0.4	10 as N	1997
Perchlorate	0.006	0.004	0.006	2004
Selenium	0.05	0.005	0.03	2010
Thallium	0.002	0.001	0.0001	1999 (rev2004)
Copper and Lead, 22 CCR §64672.3				
Values referred to as MCLs for lead and copper are not actually MCLs; instead, they are called "Action Levels" under the lead and copper rule				
Copper	1.3	0.05	0.3	2008
Lead	0.015	0.005	0.0002	2009

ATTACHMENT No. 1

Constituent	MCL	DLR	PHG or (MCLG)	Date of PHG
Radionuclides with MCLs in 22 CCR §64441 and §64443—Radioactivity [units are picocuries per liter (pCi/L), unless otherwise stated; n/a = not applicable]				
Gross alpha particle activity - OEHHA concluded in 2003 that a PHG was not practical	15	3	(zero)	n/a
Gross beta particle activity - OEHHA concluded in 2003 that a PHG was not practical	4 mrem/yr	4	(zero)	n/a
Radium-226	--	1	0.05	2006
Radium-228	--	1	0.019	2006
Radium-226 + Radium-228	5	--	(zero)	--
Strontium-90	8	2	0.35	2006
Tritium	20,000	1,000	400	2006
Uranium	20	1	0.43	2001
Chemicals with MCLs in 22 CCR §64444—Organic Chemicals				
(a) Volatile Organic Chemicals (VOCs)				
Benzene	0.001	0.0005	0.00015	2001
Carbon tetrachloride	0.0005	0.0005	0.0001	2000
1,2-Dichlorobenzene	0.6	0.0005	0.6	1997 (rev2009)
1,4-Dichlorobenzene (p-DCB)	0.005	0.0005	0.006	1997
1,1-Dichloroethane (1,1-DCA)	0.005	0.0005	0.003	2003
1,2-Dichloroethane (1,2-DCA)	0.0005	0.0005	0.0004	1999 (rev2005)
1,1-Dichloroethylene (1,1-DCE)	0.006	0.0005	0.01	1999
cis-1,2-Dichloroethylene	0.006	0.0005	0.1	2006
trans-1,2-Dichloroethylene	0.01	0.0005	0.06	2006
Dichloromethane (Methylene chloride)	0.005	0.0005	0.004	2000
1,2-Dichloropropane	0.005	0.0005	0.0005	1999
1,3-Dichloropropene	0.0005	0.0005	0.0002	1999 (rev2006)
Ethylbenzene	0.3	0.0005	0.3	1997
Methyl tertiary butyl ether (MTBE)	0.013	0.003	0.013	1999
Monochlorobenzene	0.07	0.0005	0.2	2003
Styrene	0.1	0.0005	0.0005	2010
1,1,2,2-Tetrachloroethane	0.001	0.0005	0.0001	2003
Tetrachloroethylene (PCE)	0.005	0.0005	0.00006	2001
Toluene	0.15	0.0005	0.15	1999
1,2,4-Trichlorobenzene	0.005	0.0005	0.005	1999
1,1,1-Trichloroethane (1,1,1-TCA)	0.2	0.0005	1	2006
1,1,2-Trichloroethane (1,1,2-TCA)	0.005	0.0005	0.0003	2006
Trichloroethylene (TCE)	0.005	0.0005	0.0017	2009
Trichlorofluoromethane (Freon 11)	0.15	0.005	0.7	1997
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	1.2	0.01	4	1997 (rev2011)
Vinyl chloride	0.0005	0.0005	0.00005	2000
Xylenes	1.75	0.0005	1.8	1997

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Constituent	MCL	DLR	PHG or (MCLG)	Date of PHG
Chemicals with MCLs in 22 CCR §64444—Organic Chemicals				
(b) Non-Volatile Synthetic Organic Chemicals (SOCs)				
Alachlor	0.002	0.001	0.004	1997
Atrazine	0.001	0.0005	0.00015	1999
Bentazon	0.018	0.002	0.2	1999 (rev2009)
Benzo(a)pyrene	0.0002	0.0001	0.000007	2010
Carbofuran	0.018	0.005	0.0017	2000
Chlordane	0.0001	0.0001	0.00003	1997 (rev2006)
Dalapon	0.2	0.01	0.79	1997 (rev2009)
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00001	0.0000017	1999
2,4-Dichlorophenoxyacetic acid (2,4-D)	0.07	0.01	0.02	2009
Di(2-ethylhexyl)adipate	0.4	0.005	0.2	2003
Di(2-ethylhexyl)phthalate (DEHP)	0.004	0.003	0.012	1997
Dinoseb	0.007	0.002	0.014	1997 (rev2010)
Diquat	0.02	0.004	0.015	2000
Endrin	0.002	0.0001	0.0018	1999 (rev2008)
Endothal	0.1	0.045	0.58	1997
Ethylene dibromide (EDB)	0.00005	0.00002	0.00001	2003
Glyphosate	0.7	0.025	0.9	2007
Heptachlor	0.00001	0.00001	0.000008	1999
Heptachlor epoxide	0.00001	0.00001	0.000006	1999
Hexachlorobenzene	0.001	0.0005	0.00003	2003
Hexachlorocyclopentadiene	0.05	0.001	0.05	1999
Lindane	0.0002	0.0002	0.000032	1999 (rev2005)
Methoxychlor	0.03	0.01	0.00009	2010
Molinate	0.02	0.002	0.001	2008
Oxamyl	0.05	0.02	0.026	2009
Pentachlorophenol	0.001	0.0002	0.0003	2009
Picloram	0.5	0.001	0.5	1997
Polychlorinated biphenyls (PCBs)	0.0005	0.0005	0.00009	2007
Simazine	0.004	0.001	0.004	2001
2,4,5-TP (Silvex)	0.05	0.001	0.025	2003
2,3,7,8-TCDD (dioxin)	$3x10^{-8}$	$5x10^{-9}$	$5x10^{-11}$	2010
Thiobencarb	0.07	0.001	0.07	2000
Toxaphene	0.003	0.001	0.00003	2003

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Constituent	MCL	DLR	PHG or (MCLG)	Date of PHG
Chemicals with MCLs in 22 CCR §64533—Disinfection Byproducts				
Total Trihalomethanes	0.080	--	--	--
Bromodichloromethane	--	0.0010	(zero)	--
Bromoform	--	0.0010	(zero)	--
Chloroform	--	0.0010	(0.07)	--
Dibromochloromethane	--	0.0010	(0.06)	--
Haloacetic Acids (five) (HAA5)	0.060	--	--	--
Monochloroacetic Acid	--	0.0020	(0.07)	--
Dichloroacetic Adic	--	0.0010	(zero)	--
Trichloroacetic Acid	--	0.0010	(0.02)	--
Monobromoacetic Acid	--	0.0010	--	--
Dibromoacetic Acid	--	0.0010	--	--
Bromate	0.010	0.0050 or 0.0010[a]	0.0001	2009
Chlorite	1.0	0.020	0.05	2009
Microbiological Contaminants (TT = Treatment Technique)				
Coliform % positive samples	%	5	(zero)	
*Cryptosporidium***		TT	(zero)	
*Giardia lamblia***		TT	(zero)	
*Legionella***		TT	(zero)	
Viruses**		TT	(zero)	
Chemicals with PHGs established in response to CDPH requests. These are <u>not</u> currently regulated drinking water contaminants.				
N-Nitrosodimethylamine (NDMA)	--	--	0.000003	2006
1,2,3-Trichloropropane	--	0.000005	0.0000007	2009

Notes:

[a] CDPH will maintain a 0.0050 mg/L DLR for bromate to accommodate laboratories that are using EPA Method 300.1. However, laboratories using EPA Methods 317.0 Revision 2.0, 321.8, or 326.0 must meet a 0.0010 mg/L MRL for bromate and should report results with a DLR of 0.0010 mg/L per Federal requirements.

*OEHHA's review of this chemical during the year indicated (rev20XX) resulted in no change in the PHG

** Surface water treatment = TT

Attachment No. 2

Health Risk Information for Public Health Goal Exceedance Reports

Prepared by

Office of Environmental Health Hazard Assessment
California Environmental Protection Agency

February 2013

Under the Calderon-Sher Safe Drinking Water Act of 1996 (the Act), water utilities are required to prepare a report every three years for contaminants that exceed public health goals (PHGs) (Health and Safety Code Section 116470 (2)[b]). The numerical health risk for a contaminant is to be presented with the category of health risk, along with a plainly worded description of these terms. The cancer health risk is to be calculated at the PHG and at the California maximum contaminant level (MCL). This report is prepared by the Office of Environmental Health Hazard Assessment (OEHHA) to assist the water utilities in meeting their requirements.

PHGs are concentrations of contaminants in drinking water that pose no significant health risk if consumed for a lifetime. PHGs are developed and published by OEHHA (Health and Safety Code Section 116365) using current risk assessment principles, practices and methods.

Numerical health risks. Table 1 presents health risk categories and cancer risk values for chemical contaminants in drinking water that have PHGs.

The Act requires that OEHHA publish PHGs based on health risk assessments using the most current scientific methods. As defined in statute, PHGs for non-carcinogenic chemicals in drinking water are set at a concentration "at which no known or anticipated adverse health effects will occur, with an adequate margin of safety." For carcinogens, PHGs are set at a concentration that "does not pose any significant risk to health." PHGs provide one basis for revising MCLs, along with cost and technological feasibility. OEHHA has been publishing PHGs since 1997 and the entire list published to date is shown in Table 1.

Table 2 presents health risk information for contaminants that do not have PHGs but have state or federal regulatory standards. The Act requires that, for chemical contaminants with California MCLs that do not yet have PHGs, water utilities use the

federal maximum contaminant level goal (MCLG) for the purpose of complying with the requirement of public notification. MCLGs, like PHGs, are strictly health based and include a margin of safety. One difference, however, is that the MCLGs for carcinogens are set at zero because the United States Environmental Protection Agency (U.S. EPA) assumes there is no absolutely safe level of exposure to them. PHGs, on the other hand, are set at a level considered to pose no *significant* risk of cancer; this is usually a no more than one-in-a-million excess cancer risk (1×10^{-6}) level for a lifetime of exposure. In Table 2, the cancer risks shown are based on the U.S. EPA's evaluations.

For more information on health risks: The adverse health effects for each chemical with a PHG are summarized in each PHG technical support document. These documents are available on the OEHHA Web site (http://www.oehha.ca.gov). Also, U.S. EPA has consumer and technical fact sheets on most of the chemicals having MCLs. For copies of the fact sheets, call the Safe Drinking Water Hotline at 1-800-426-4791, or explore the U.S. EPA Ground Water and Drinking Water web page at http://water.epa.gov/drink/.

Attachment No. 2

Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Alachlor	carcinogenicity (causes cancer)	0.004	NA[5]	0.002	NA
Aluminum	neurotoxicity and immunotoxicity (harms the nervous and immune systems)	0.6	NA	1	NA
Antimony	digestive system toxicity (causes vomiting)	0.02	NA	0.006	NA
Arsenic	carcinogenicity (causes cancer)	0.000004 ($4x10^{-6}$)	1×10^{-6} (one per million)	0.01	2.5×10^{-3} (2.5 per thousand)
Asbestos	carcinogenicity (causes cancer)	7 MFL[6] (fibers >10 microns in length)	1×10^{-6}	7 MFL (fibers >10 microns in length)	1×10^{-6} (one per million)
Atrazine	carcinogenicity (causes cancer)	0.00015	1×10^{-6}	0.001	7×10^{-6} (seven per million)

[1] Based on the OEHHA PHG technical support document unless otherwise specified. The categories are the hazard traits defined by OEHHA for California's Toxics Information Clearinghouse (online at: http://oehha.ca.gov/multimedia/green/pdf/GC_Regtext011912.pdf).
[2] mg/L = milligrams per liter of water or parts per million (ppm)
[3] Cancer Risk = Upper estimate of excess cancer risk from lifetime exposure. Actual cancer risk may be lower or zero. 1×10^{-6} means one excess cancer case per million people exposed.
[4] MCL = maximum contaminant level.
[5] NA = not applicable. Risk cannot be calculated. The PHG is set at a level that is believed to be without any significant public health risk to individuals exposed to the chemical over a lifetime.
[6] MFL = million fibers per liter of water.

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Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Barium	cardiovascular toxicity (causes high blood pressure)	2	NA	1	NA
Bentazon	hepatotoxicity and digestive system toxicity (harms the liver, intestine, and causes body weight effects[7])	0.2	NA	0.018	NA
Benzene	carcinogenicity (causes leukemia)	0.00015	1×10^{-6}	0.001	7×10^{-6} (seven per million)
Benzo[a]pyrene	carcinogenicity (causes cancer)	0.000007	1×10^{-6}	0.0002	3×10^{-5} (three per hundred thousand)
Beryllium	digestive system toxicity (harms the stomach or intestine)	0.001	NA	0.004	NA
Bromate	carcinogenicity (causes cancer)	0.0001	1×10^{-6}	0.01	1×10^{-4} (one per ten thousand)
Cadmium	nephrotoxicity (harms the kidney)	0.00004	NA	0.005	NA
Carbofuran	reproductive toxicity (harms the testis)	0.0017	NA	0.018	NA

[7] Body weight effects are an indicator of general toxicity in animal studies.

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Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Carbon tetrachloride	carcinogenicity (causes cancer)	0.0001	1×10^{-6}	0.0005	5×10^{-6} (five per million)
Chlordane	carcinogenicity (causes cancer)	0.00003	1×10^{-6}	0.0001	3×10^{-6} (three per million)
Chlorite	hematotoxicity (causes anemia) neurotoxicity (causes neurobehavioral effects)	0.05	NA	1	NA
Chromium, hexavalent	carcinogenicity (causes cancer)	0.00002	1×10^{-6}	---	NA
Copper	digestive system toxicity (causes nausea, vomiting, diarrhea)	0.3	NA	1.3 (AL)[8]	NA
Cyanide	neurotoxicity (damages nerves) endocrine toxicity (affects the thyroid)	0.15	NA	0.15	NA
Dalapon	nephrotoxicity (harms the kidney)	0.79	NA	0.2	NA
1,2-Dibromo-3-chloropropane (DBCP)	carcinogenicity (causes cancer)	0.0000017 (1.7×10^{-6})	1×10^{-6}	0.0002	1×10^{-4} (one per ten thousand)

[8] AL = action level. The action levels for copper and lead refer to a concentration measured at the tap. Much of the copper and lead in drinking water is derived from household plumbing (The Lead and Copper Rule, Title 22, California Code of Regulations [CCR] section 64672.3).

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Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
1,2-Dichloro-benzene (o-DCB)	hepatotoxicity (harms the liver)	0.6	NA	0.6	NA
1,4-Dichloro-benzene (p-DCB)	carcinogenicity (causes cancer)	0.006	1×10^{-6}	0.005	8×10^{-7} (eight per ten million)
1,1-Dichloro-ethane (1,1-DCA)	carcinogenicity (causes cancer)	0.003	1×10^{-6}	0.005	2×10^{-6} (two per million)
1,2-Dichloro-ethane (1,2-DCA)	carcinogenicity (causes cancer)	0.0004	1×10^{-6}	0.0005	1×10^{-6} (one per million)
1,1-Dichloro-ethylene (1,1-DCE)	hepatotoxicity (harms the liver)	0.01	NA	0.006	NA
1,2-Dichloro-ethylene, cis	nephrotoxicity (harms the kidney)	0.1	NA	0.006	NA
1,2-Dichloro-ethylene, trans	hepatotoxicity (harms the liver)	0.06	NA	0.01	NA
Dichloromethane (methylene chloride)	carcinogenicity (causes cancer)	0.004	1×10^{-6}	0.005	1×10^{-6} (one per million)
2,4-Dichloro-phenoxyacetic acid (2,4-D)	hepatotoxicity and nephrotoxicity (harms the liver and kidney)	0.02	NA	0.07	NA

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Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
1,2-Dichloro-propane (propylene dichloride)	carcinogenicity (causes cancer)	0.0005	1×10^{-6}	0.005	1×10^{-5} (one per hundred thousand)
1,3-Dichloro-propene (Telone II®)	carcinogenicity (causes cancer)	0.0002	1×10^{-6}	0.0005	2×10^{-6} (two per million)
Di(2-ethylhexyl) adipate (DEHA)	developmental toxicity (disrupts development)	0.2	NA	0.4	NA
Diethylhexyl-phthalate (DEHP)	carcinogenicity (causes cancer)	0.012	1×10^{-6}	0.004	3×10^{-7} (three per ten million)
Dinoseb	reproductive toxicity (harms the uterus and testis)	0.014	NA	0.007	NA
Dioxin (2,3,7,8-TCDD)	carcinogenicity (causes cancer)	5×10^{-11}	1×10^{-6}	3×10^{-8}	6×10^{-4} (six per ten thousand)
Diquat	ocular toxicity (harms the eye) developmental toxicity (causes malformation)	0.015	NA	0.02	NA
Endothall	digestive system toxicity (harms the stomach or intestine)	0.58	NA	0.1	NA
Endrin	hepatotoxicity (harms the liver) neurotoxicity (causes convulsions)	0.0018	NA	0.002	NA

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Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Ethylbenzene (phenylethane)	hepatotoxicity (harms the liver)	0.3	NA	0.3	NA
Ethylene dibromide	carcinogenicity (causes cancer)	0.00001	1×10^{-6}	0.00005	5×10^{-6} (five per million)
Fluoride	musculoskeletal toxicity (causes tooth mottling)	1	NA	2	NA
Glyphosate	nephrotoxicity (harms the kidney)	0.9	NA	0.7	NA
Heptachlor	carcinogenicity (causes cancer)	0.000008	1×10^{-6}	0.00001	1×10^{-6} (one per million)
Heptachlor epoxide	carcinogenicity (causes cancer)	0.000006	1×10^{-6}	0.00001	2×10^{-6} (two per million)
Hexachloroben-zene	carcinogenicity (causes cancer)	0.00003	1×10^{-6}	0.001	3×10^{-5} (three per hundred thousand)
Hexachloro-cyclopentadiene (HEX)	digestive system toxicity (causes stomach lesions)	0.05	NA	0.05	NA

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Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Lead	developmental neurotoxicity (causes neurobehavioral effects in children) cardiovascular toxicity (cause high blood pressure) carcinogenicity (causes cancer)	0.0002	3×10^{-8} (PHG is not based on this effect)	0.015 (AL)[8]	2×10^{-6} (two per million)
Lindane (γ-BHC)	carcinogenicity (causes cancer)	0.000032	1×10^{-6}	0.0002	6×10^{-6} (six per million)
Mercury (inorganic)	nephrotoxicity (harms the kidney)	0.0012	NA	0.002	NA
Methoxychlor	endocrine toxicity (causes hormone effects)	0.00009	NA	0.03	NA
Methyl tertiary-butyl ether (MTBE)	carcinogenicity (causes cancer)	0.013	1×10^{-6}	0.013	1×10^{-6} (one per million)
Molinate	carcinogenicity (causes cancer)	0.001	1×10^{-6}	0.02	2×10^{-5} (two per hundred thousand)
Monochloro-benzene (chlorobenzene)	hepatotoxicity (harms the liver)	0.2	NA	0.07	NA
Nickel	developmental toxicity (causes increased neonatal deaths)	0.012	NA	0.1	NA

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Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Nitrate	hematotoxicity (causes methemoglobinemia)	45 as nitrate	NA	45 as NO_3	NA
Nitrite	hematotoxicity (causes methemoglobinemia)	1 as nitrogen	NA	1 as nitrite-nitrogen	NA
Nitrate and Nitrite	hematotoxicity (causes methemoglobinemia)	10 as nitrogen	NA	10 as nitrogen	NA
N-nitroso-dimethyl-amine (NDMA)	carcinogenicity (causes cancer)	0.000003	1×10^{-6}	---	NA
Oxamyl	general toxicity (causes body weight effects)	0.026	NA	0.05	NA
Pentachloro-phenol (PCP)	carcinogenicity (causes cancer)	0.0003	1×10^{-6}	0.001	3×10^{-6} (three per million)
Perchlorate	endocrine toxicity (affects the thyroid) developmental toxicity (causes neurodevelop-mental deficits)	0.006[9]	NA	0.006	NA
Picloram	hepatotoxicity (harms the liver)	0.5	NA	0.5	NA

[9] This is the current PHG value for perchlorate. A revised draft PHG for perchlorate was posted online for public comment on December 7, 2012. http://www.oehha.ca.gov/water/phg/120712Perchlorate.html.

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Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Polychlorinated biphenyls (PCBs)	carcinogenicity (causes cancer)	0.00009	1×10^{-6}	0.0005	6×10^{-6} (six per million)
Radium-226	carcinogenicity (causes cancer)	0.05 pCi/L	1×10^{-6}	5 pCi/L	1×10^{-4} (one per ten thousand)
Radium-228	carcinogenicity (causes cancer)	0.019 pCi/L	1×10^{-6}	5 pCi/L (combined $Ra^{226+228}$)	3×10^{-4} (three per ten thousand)
Selenium	integumentary toxicity (causes hair loss and nail damage)	0.03	NA	0.05	NA
Silvex (2,4,5-TP)	hepatotoxicity (harms the liver)	0.025	NA	0.05	NA
Simazine	general toxicity (causes body weight effects)	0.004	NA	0.004	NA
Strontium-90	carcinogenicity (causes cancer)	0.35 pCi/L	$1x10^{-6}$	8 pCi/L	2×10^{-5} (two per hundred thousand)
Styrene (vinylbenzene)	carcinogenicity (causes cancer)	0.0005	$1x10^{-6}$	0.1	2×10^{-4} (two per ten thousand)

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Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
1,1,2,2-Tetrachloro-ethane	carcinogenicity (causes cancer)	0.0001	1×10^{-6}	0.001	1×10^{-5} (one per hundred thousand)
Tetrachloro-ethylene (perchloro-ethylene, or PCE)	carcinogenicity (causes cancer)	0.00006	1×10^{-6}	0.005	8×10^{-5} (eight per hundred thousand)
Thallium	integumentary toxicity (causes hair loss)	0.0001	NA	0.002	NA
Thiobencarb	general toxicity (causes body weight effects) hematotoxicity (affects red blood cells)	0.07	NA	0.07	NA
Toluene (methylbenzene)	hepatotoxicity (harms the liver) endocrine toxicity (harms the thymus)	0.15	NA	0.15	NA
Toxaphene	carcinogenicity (causes cancer)	0.00003	1×10^{-6}	0.003	1×10^{-4} (one per ten thousand)
1,2,4-Trichloro-benzene (Unsym-TCB)	endocrine toxicity (harms adrenal glands)	0.005	NA	0.005	NA

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Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
1,1,1-Trichloro-ethane	neurotoxicity (harms the nervous system), reproductive toxicity (causes fewer offspring) hepatotoxicity (harms the liver) hematotoxicity (causes blood effects)	1	NA	0.2	NA
1,1,2-Trichloro-ethane	carcinogenicity (causes cancer)	0.0003	$1x10^{-6}$	0.005	2×10^{-5} (two per hundred thousand)
1,1,2-Trichloro-ethylene (TCE)	carcinogenicity (causes cancer)	0.0017	1×10^{-6}	0.005	3×10^{-6} (three per million)
Trichlorofluoro-methane (Freon 11)	hepatotoxicity (harms the liver)	0.7	NA	0.15	NA
1,2,3-Trichloro-propane (1,2,3-TCP)	carcinogenicity (causes cancer)	0.0000007	$1x10^{-6}$	---	NA
1,1,2-Trichloro-1,2,2-trifluoro-ethane (Freon 113)	hepatotoxicity (harms the liver)	4	NA	1.2	NA
Tritium	carcinogenicity (causes cancer)	400 pCi/L	$1x10^{-6}$	20,000 pCi/L	$5x10^{-5}$ (five per hundred thousand)

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Table 1: Health Risk Categories and Cancer Risk Values for Chemicals with California Public Health Goals (PHGs)

Chemical	Health Risk Category[1]	California PHG (mg/L)[2]	Cancer Risk[3] at the PHG	California MCL[4] (mg/L)	Cancer Risk at the California MCL
Uranium	carcinogenicity (causes cancer)	0.43 pCi/L	1×10^{-6}	20 pCi/L	5×10^{-5} (five per hundred thousand)
Vinyl chloride	carcinogenicity (causes cancer)	0.00005	1×10^{-6}	0.0005	1×10^{-5} (one per hundred thousand)
Xylene	neurotoxicity (affects the senses, mood, and motor control)	1.8 (single isomer or sum of isomers)	NA	1.75 (single isomer or sum of isomers)	NA

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Table 2: Health Risk Categories and Cancer Risk Values for Chemicals without California Public Health Goals

Chemical	Health Risk Category[1]	U.S. EPA MCLG[2] (mg/L)	Cancer Risk[3] @ MCLG	California MCL[4] (mg/L)	Cancer Risk @ California MCL
Disinfection byproducts (DBPS)					
Chloramines	acute toxicity (causes irritation) digestive system toxicity (harms the stomach) hematotoxicity (causes anemia)	4[5]	NA	none	NA
Chlorine	acute toxicity (causes irritation) digestive system toxicity (harms the stomach)	4[5]	NA	none	NA
Chlorine dioxide	hematotoxicity (causes anemia) neurotoxicity (harms the nervous system)	0.8[5]	NA	none	NA
Disinfection byproducts: haloacetic acids (HAA5)					
Chloroacetic acid	general toxicity (causes body and organ weight changes[6])	0.07	NA	none	NA
Dichloroacetic acid	carcinogenicity (causes cancer)	0	0	none	NA
Trichloroacetic acid	hepatotoxicity (harms the liver)	0.02	0	none	NA
Bromoacetic acid	NA	none	NA	none	NA

[1] Health risk category based on the U.S. EPA MCLG document or California MCL document unless otherwise specified.
[2] MCLG = maximum contaminant level goal established by U.S. EPA.
[3] Cancer Risk = Upper estimate of excess cancer risk from lifetime exposure. Actual cancer risk may be lower or zero. 1×10^{-6} means one excess cancer case per million people exposed.
[4] California MCL = maximum contaminant level established by California.
[5] Maximum Residual Disinfectant Level Goal, or MRDLG
[6] Body weight effects are an indicator of general toxicity in animal studies.

Table 2: Health Risk Categories and Cancer Risk Values for Chemicals without California Public Health Goals

Chemical	Health Risk Category[1]	U.S. EPA MCLG[2] (mg/L)	Cancer Risk[3] @ MCLG	California MCL[4] (mg/L)	Cancer Risk @ California MCL
Dibromoacetic acid	NA	none	NA	none	NA
Total haloacetic acids	carcinogenicity (causes cancer)	none	NA	0.06	NA
Disinfection byproducts: trihalomethanes (THMs)					
Bromodichloro-methane (BDCM)	carcinogenicity (causes cancer)	0	0	none	NA
Bromoform	carcinogenicity (causes cancer)	0	0	none	NA
Chloroform	hepatotoxicity and nephrotoxicity (harms the liver and kidney)	0.07	NA	none	NA
Dibromo-chloromethane (DBCM)	hepatotoxicity, nephrotoxicity, and neurotoxicity (harms the liver, kidney, and nervous system)	0.06	NA	none	NA
Total (sum of BDCM, bromoform, chloroform and DBCM)	carcinogenicity (causes cancer), hepatotoxicity, nephrotoxicity, and neurotoxicity (harms the liver, kidney, and nervous system)	none	NA	0.08	NA

Table 2: Health Risk Categories and Cancer Risk Values for Chemicals without California Public Health Goals

Attachment No. 2

Chemical	Health Risk Category[1]	U.S. EPA MCLG[2] (mg/L)	Cancer Risk[3] @ MCLG	California MCL[4] (mg/L)	Cancer Risk @ California MCL
Radionuclides					
Gross alpha particles[7]	carcinogenicity (causes cancer)	0 (^{210}Po included)	0	15 pCi/L[8] (includes ^{226}Ra but not radon and uranium)	up to 1×10^{-3} (for ^{210}Po, the most potent alpha emitter
Beta particles and photon emitters[7]	carcinogenicity (causes cancer)	0 (^{210}Pb included)	0	50 pCi/L (judged equiv. to 4 mrem/yr)	up to 2×10^{-3} (for ^{210}Pb, the most potent beta-emitter)

[7] MCLs for gross alpha and beta particles are screening standards for a group of radionuclides. Corresponding PHGs were not developed for gross alpha and beta particles. See the OEHHA memoranda discussing the cancer risks at these MCLs at http://www.oehha.ca.gov/water/phg/index.html.
[8] pCi/L = picocuries per liter of water.

ATTACHMENT NO. 3
Table 1
Reference: 2012 ACWA PHG Survey

COST ESTIMATES FOR TREATMENT TECHNOLOGIES

(INCLUDES ANNUALIZED CAPITAL AND O&M COSTS)

No.	Treatment Technology	Source of Information	Estimated Unit Cost 2012 ACWA Survey ($/1,000 gallons treated)
1	Ion Exchange	Coachella Valley WD, for GW, to reduce Arsenic concentrations. 2011 costs.	1.84
2	Ion Exchange	City of Riverside Public Utilities, for GW, for Perchlorate treatment.	0.89
3	Ion Exchange	Carollo Engineers, anonymous utility, 2012 costs for treating GW source for Nitrates. Design souce water concentration: 88 mg/L NO_3. Design finished water concentration: 45 mg/L NO_3. Does not include concentrate disposal or land cost.	0.67
4	Granular Activated Carbon	City of Riverside Public Utilities, GW sources, for TCE, DBCP (VOC, SOC) treatment.	0.45
5	Granular Activated Carbon	Carollo Engineers, anonymous utility, 2012 costs for treating SW source for TTHMs. Design souce water concentration: 0.135 mg/L. Design finished water concentration: 0.07 mg/L. Does not include concentrate disposal or land cost.	0.32
6	Granular Activated Carbon, Liquid Phase	LADWP, Liquid Phase GAC treatment at Tujunga Well field. Costs for treating 2 wells. Treament for 1,1 DCE (VOC). 2011-2012 costs.	1.36
7	Reverse Osmosis	Carollo Engineers, anonymous utility, 2012 costs for treating GW source for Nitrates. Design souce water concentration: 88 mg/L NO_3. Design finished water concentration: 45 mg/L NO_3. Does not include concentrate disposal or land cost.	0.72
8	Packed Tower Aeration	City of Monrovia, treatment to reduce TCE, PCE concentrations. 2011-12 costs.	0.39
9	Ozonation+ Chemical addition	SCVWD, STWTP treatment plant includes chemical addition + ozone generation costs to reduce THM/HAAs concentrations. 2009-2012 costs.	0.08
10	Ozonation+ Chemical addition	SCVWD, PWTP treatment plant includes chemical addition + ozone generation costs to reduce THM/HAAs concentrations, 2009-2012 costs.	0.18

COST ESTIMATES FOR TREATMENT TECHNOLOGIES

(INCLUDES ANNUALIZED CAPITAL AND O&M COSTS)

No.	Treatment Technology	Source of Information	Estimated Unit Cost 2012 ACWA Survey ($/1,000 gallons treated)
11	Coagulation/Filtration	Soquel WD, treatment to reduce manganese concentrations in GW. 2011 costs.	0.68
12	Coagulation/Filtration Optimization	San Diego WA, costs to reduce THM/Bromate, Turbidity concentrations, raw SW a blend of State Water Project water and Colorado River water, treated at Twin Oaks Valley WTP.	0.77
13	Blending (Well)	Rancho California WD, GW blending well, 1150 gpm, to reduce fluoride concentrations.	0.64
14	Blending (Wells)	Rancho California WD, GW blending wells, to reduce arsenic concentrations, 2012 costs.	0.52
15	Blending	Rancho California WD, using MWD water to blend with GW to reduce arsenic concentrations. 2012 costs.	0.62
16	Corrosion Inhibition	Atascadero Mutual WC, corrosion inhibitor addition to control aggressive water. 2011 costs.	0.08

Please immediately confirm receipt of this fax by calling 333-6702

CITY OF LODI
P. O. BOX 3006
LODI, CALIFORNIA 95241-1910

ADVERTISING INSTRUCTIONS

SUBJECT: **PUBLIC HEARING TO RECEIVE COMMENTS ON AND CONSIDER ACCEPTING CITY OF LODI'S REPORT ON WATER QUALITY RELATIVE TO PUBLIC HEALTH GOALS**

PUBLISH DATE: **SATURDAY, SEPTEMBER 7, 2013**

LEGAL AD

TEAR SHEETS WANTED: **One (1) please**

SEND AFFIDAVIT AND BILL TO:
LNS ACCT. #0510052

RANDI JOHL-OLSON, CITY CLERK
City of Lodi
P.O. Box 3006
Lodi, CA 95241-1910

DATED: THURSDAY, SEPTEMBER 5, 2013

ORDERED BY: RANDI JOHL-OLSON
CITY CLERK

Jennifer M. Robison

JENNIFER M. ROBISON, CMC
ASSISTANT CITY CLERK

MARIA DITMORE
ADMINISTRATIVE CLERK

Verify Appearance of this Legal in the Newspaper – Copy to File

Faxed to the Sentinel at 369-1084 at _____(time) on _____(date) _____(pages)
LNS _____ Phoned to confirm receipt of all pages at _____(time) ____MD ____JMR (initials)

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DECLARATION OF POSTING

PUBLIC HEARING TO RECEIVE COMMENTS ON AND CONSIDER ACCEPTING CITY OF LODI'S REPORT ON WATER QUALITY RELATIVE TO PUBLIC HEALTH GOALS

On Thursday, September 5, 2013, in the City of Lodi, San Joaquin County, California, a Notice of Public Hearing to receive comments on and consider accepting City of Lodi's Report on Water Quality Relative to Public Health Goals (attached and marked as Exhibit A) was posted at the following locations:

Lodi Public Library
Lodi City Clerk's Office
Lodi City Hall Lobby
Lodi Carnegie Forum

I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 5, 2013, at Lodi, California.

ORDERED BY:

RANDI JOHL-OLSON
CITY CLERK

Jennifer M. Robison

JENNIFER M. ROBISON, CMC
ASSISTANT CITY CLERK

MARIA DITMORE
ADMINISTRATIVE CLERK

N:\Administration\CLERK\Forms\DECPOSTPW.DOC

CITY OF LODI

Carnegie Forum
305 West Pine Street, Lodi

NOTICE OF PUBLIC HEARING
Date: October 2, 2013
Time: 7:00 p.m.

For information regarding this notice please contact:
Randi Johl-Olson,
City Clerk
Telephone: (209) 333-6702

EXHIBIT A

NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that on **Wednesday, October 2, 2013**, at the hour of 7:00 p.m., or as soon thereafter as the matter may be heard, the City Council will conduct a public hearing at the Carnegie Forum, 305 West Pine Street, Lodi, to consider the following matter:

a) **Receive comments on and consider accepting City of Lodi's Report on Water Quality Relative to Public Health Goals.**

Information regarding this item may be obtained in the Public Works Department, 221 West Pine Street, Lodi, (209) 333-6706. All interested persons are invited to present their views and comments on this matter. Written statements may be filed with the City Clerk, City Hall, 221 West Pine Street, 2nd Floor, Lodi, 95240, at any time prior to the hearing scheduled herein, and oral statements may be made at said hearing.

If you challenge the subject matter in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice or in written correspondence delivered to the City Clerk, 221 West Pine Street, at or prior to the close of the public hearing.

By Order of the Lodi City Council:

Randi Johl-Olson
City Clerk

Dated: September 4, 2013

Approved as to form:

D. Stephen Schwabauer
City Attorney