2019 PUBLIC HEALTH GOALS REPORT

PREPARED FOR:

CITY OF SACRAMENTO DEPARTMENT OF UTILITIES
SACRAMENTO, CALIFORNIA

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BACKGROUND

The California Health and Safety Code (Section 116470(b)) requires that public water systems with 10,000 or more service connections prepare a special report every three years if water quality measurements exceed a Public Health Goal (PHG). Attachment 1 includes Section 116470(b)).

The report must be completed by July 1 of the year in which it is due and new reports are required every three years. The City of Sacramento Department of Utilities prepared reports in 1998, 2001, 2004, 2007, 2010, 2013, 2016 and the current report was completed by July 1, 2019 as required.

The PHG report must present information on (1) contaminants that have been detected above a PHG, (2) health risk information for the detected contaminants, (3) an estimate of the cost to install Best Available Technology to reduce the level of a given contaminant, and (4) what action, if any, the local water purveyor intends to take to reduce the concentration of the contaminant(s) and the basis for that decision.

The State Water Resources Control Board Division of Drinking Water (DDW) sets Maximum Contaminant Levels (MCLs) as close as feasible to the PHG taking treatment costs and available analytical and treatment technology into consideration. MCLs are enforceable limits that water purveyors must meet to protect public health.

The California Office of Environmental Health Hazard Assessment (OEHHA) is required to determine and publish the "numerical public health risk" associated with PHGs and MCLs. This PHG report uses the most recent health risk information published by OEHHA.

This report identifies each contaminant that exceeded its PHG during the 2016 through 2018 period, describes the public health risk at both the PHG and the MCL, identifies the Best Available Technology (BAT) for treatment, and the costs to install BAT to reduce levels of the contaminant.

Only constituents that are regulated in drinking water, either with an MCL or Treatment Technique requirement, and for which either a PHG or Maximum Contaminant Level Goal (MCLG) has been set are to be included in the report. There are some regulated constituents that are routinely monitored and detected by water systems at levels below the drinking water standard for which no PHG or MCLG have yet been adopted. One example is disinfection byproducts, including trihalomethanes and haloacetic acids. These constituents will be addressed in a future report if PHGs are adopted by OEHHA.

WHAT ARE PUBLIC HEALTH GOALS?

PHGs are non-enforceable goals established by OEHHA. PHGs are developed using available toxicological data in scientific literature. A PHG is the level below which OEHHA has determined that a drinking water contaminant does not pose a significant health risk. None of the practical

risk-management factors that are considered by the US Environmental Protection Agency (USEPA) or DDW in setting enforceable drinking water standards are considered in setting the PHGs. Such factors include analytical detection capability, treatment technology availability, and benefits and costs. If a constituent does not have a PHG then, for the preparation of this report, public water systems are to use Maximum Contaminant Level Goals (MCLGs) developed by the USEPA. Like PHGs set by OEHHA, MCLGs are the level of contaminant in drinking water at which the USEPA believes there are no known or expected risks to health, with a margin of safety. USEPA sets the MCL as close as feasible to the MCLG, taking costs and technology into consideration. Attachment 2 presents a list of constituents with their respective MCLs and PHGs.

WHAT IS BEST AVAILABLE TECHNOLOGY (BAT)?

State law requires that at the same time DDW adopts a primary drinking water standard (i.e., health based) they identify BAT for the specific constituent being regulated. BATs are the best known treatment methods to reduce contaminant levels to the MCL. To be considered BAT, the treatment must be proven effective under full-scale field applications.

WHAT ARE DETECTION LIMITS FOR PURPOSES OF REPORTING (DLRS)?

In addition, when DDW establishes a drinking water regulation, the Agency evaluates available analytical methods and sets a DLR for the constituent. DLRs are the lowest concentration of the constituent that laboratories report for determining compliance. A constituent is considered by DDW to be "detected" when measured concentrations are above the DLR.

WHAT WATER QUALITY DATA WAS REVIEWED TO PREPARE THIS REPORT?

The 2019 PHG report was prepared based upon a review of water quality data for the years 2016 through 2018. Water quality data was collected and reviewed for both surface water treatment plants (Sacramento River Water Treatment Plant and the E.A. Fairbairn Water Treatment Plant), the City's wells, and water purchased from the Sacramento Suburban Water District (see addendum).

WHAT GUIDELINES WERE FOLLOWED IN PREPARING THIS REPORT?

The Association of California Water Agencies (ACWA) prepares guidelines for water utilities to use in producing their PHG reports. The most recent ACWA guidelines (ACWA, "2019 PHG Guidance") were used to prepare this report. No guidance materials are available from DDW regarding preparation of PHG reports. OEHHA publishes a document with health risk information for regulated constituents. The OEHHA publication (OEHHA, "Health Risk Information for PHG Exceedance Reports," February 2019) was used to prepare this report (see Attachment 3).

WHAT CONSTITUENTS WERE DETECTED ABOVE A PHG (OR MCLG)?

Table 1 presents the constituents that were detected by the City of Sacramento Department of Utilities above a PHG or an MCLG during 2016 through 2018.

Table 1: Constituents Detected Above PHG or MCLG (2016-2018)

Constituent	PHG (MCLG)	MCL
Arsenic	0.004 µg/L	10 µg/L
Coliform Bacteria	(0)	5.0 %
Gross alpha	(0)	15 pCi/L
Radium-226	0.05 pCi/L	5 pCi/L*
Radium-228	0.019 pCi/L	
Uranium	0.43 pCi/L	20 pCi/L

µg/L = micrograms per liter (equivalent to parts per billion, ppb)
pCi/L = picoCuries per liter
*5 pCi/L is the MCL for combined radium-226/radium-228

INORGANIC CHEMICALS

The following section of the PHG report presents a discussion of inorganic chemicals detected above their PHG.

Arsenic. The PHG for arsenic is 0.004 µg/L[1]. The federal and state MCL for arsenic is 10 µg/L (the federal MCLG is 0 µg/L). The DLR for arsenic is 2 µg/L and at the present time there are no laboratory methods available that can reliably measure arsenic as low as the PHG. The health risk category associated with arsenic is carcinogenicity. At the PHG, the theoretical cancer risk is 1×10^{-6}. This means the 70-year lifetime cancer risk for drinking water at the PHG is 1 excess case of cancer per million people exposed. At the federal MCL of 10 µg/L, the theoretical cancer risk is 2.5×10^{-3}. This means the 70-year lifetime cancer risk for drinking water at the federal MCL is 2.5 excess cases per 1,000 people exposed.

The California DDW has identified the following treatment technologies as Best Available Technology for reducing arsenic levels in drinking water to levels closer to the PHG of 0.004 µg/L.

- Activated alumina
- Coagulation/filtration
- Ion Exchange
- Lime softening
- Reverse Osmosis
- Electrodialysis
- Oxidation/filtration

[1] 1 µg/L (microgram per liter) is equivalent to 1 part per billion.

From the above list of Best Available Technology, the cost evaluation was conducted using ion exchange, given that ion exchange is also best available technology for radium-226/228 and uranium (also included in this PHG report). It is noted that while ion exchange is Best Available Technology for arsenic, uranium, and radium, the type of resin typically used for arsenic and uranium treatment is strong base anion (SBA) resin and that for radium is strong acid cation (SAC) resin. Like ion exchange, reverse osmosis and lime softening have also been identified as Best Available Technology for all three constituents (arsenic, radium 226/228 and uranium). While many factors (both technical and financial) go in to the use of a given technology, ion exchange would be a more cost-effective approach than either reverse osmosis or lime softening. Specifically, reverse osmosis was not selected for this analysis, due to higher capital and operating costs, the amount of water that would be lost as a concentrated brine solution as well as the elevated energy consumption. Lime softening was not selected for this analysis as it can require large amounts of land and would likely need additional labor to operate and maintain.

All samples that exceeded the arsenic PHG during 2016 through 2018 were in groundwater wells. Table 2 presents the 20 wells where detections exceeded the arsenic PHG during 2016 through 2018. The water quality data presented in Table 2 indicates arsenic levels at an average of 4.4 µg/L (with a range of 2.2 µg/L to 8.5 µg/L). All results were below the MCL of 10 µg/L.

The total estimated capital cost to provide SBA ion-exchange treatment at all the wells presented in Table 2, at their respective maximum well water production during 2016 through 2018, is $49,500,000 (the total annual O&M costs are estimated to be $5,500,000/year)[2]. Ion-exchange treatment produces a concentrated waste brine that the City of Sacramento would need to dispose. The estimated costs assume that the waste brine is discharged to the sewer. Capital and O&M costs were estimated with the goal of achieving the arsenic 0.004 µg/L PHG. There is no information available, however, to indicate that ion exchange treatment could in fact reduce arsenic concentrations to such a low level. In addition, the DLR as determined by DDW is 2 µg/L and there is no analytical method available that can reliably measure arsenic in drinking water down to 0.004 µg/L.

[2]Attachment 4 presents a description of the model and methodology used to estimate capital and O&M costs presented in this PHG Report.

Table 2: Wells Where Arsenic Was Detected Above PHG (2016-2018)

Well Number	Arsenic Concentration (µg/L)			Maximum Water Production (gpm)	SBA Exchange Treatment Cost	
	2016	2017	2018		Capital ($M)	Annual O&M ($M/Year)
83*	6.5/4.7	6.1/5.9/5.7/6.1	5.1/5.9/5.7/6.5/7.4	679	2.20	0.27
93		4.2		478	2.08	0.26
94		2.6		796	2.80	0.28
107		3.4		942	2.81	0.28
112		2.3		556	2.17	0.26
123		3.9/4.4/4	3.5/4.3/4.4/4.6	541	2.17	0.26
126		3		731	2.20	0.27
129	2.7		2.4	698	2.20	0.27
131	2.4		2.4	514	2.17	0.26
133		3.7		1,201	3.54	0.30
134		2.6		716	2.20	0.27
137		2.5		677	2.20	0.27
138	2.8	2.2		891	2.80	0.28
139		3.3		347	1.49	0.24
153A	3.9	3.5		1,017	2.90	0.29
155	2.2		2.3	752	2.80	0.28
156		3.7		802	2.81	0.28
158		2.7		864	2.80	0.28
159*		2.4		611	2.19	0.26
164	4.6/4/3.8	5.2/6.8/7.4/8.6	7.9/8.5/5.4/5.2	1,167	2.93	0.30

gpm = gallons per minute
$M = dollars in millions (2018 Dollars)
O&M = operation and maintenance costs
*Well 83 has been taken out of service and likely will not return to service. Well 159 has been permanently taken out of service.

RADIONUCLIDES

During 2016 to 2018, three naturally occurring radionuclides were detected in groundwater wells: radium-226/228, uranium and gross alpha. The following sections present an evaluation of the health risks and treatment costs for reducing the levels of these three constituents.

Radium-226/228. Radium-226/228 is a naturally occurring radionuclide. Radium can be present as several isotopes that have different radioactive properties. The most common isotopes in groundwater are radium-226 and radium-228. The PHG for radium-226 is 0.05 pCi/L (picoCuries

per liter)[3] and the DLR is 1 pCi/L. The PHG for radium-228 is 0.019 pCi/L and the DLR is 1 pCi/L. The MCL for combined radium-226/228 is 5 pCi/L. The health risk category associated with radium-226 is carcinogenicity. At the PHG, the theoretical cancer risk is 1×10^{-6}. This means the 70-year lifetime theoretical cancer risk for drinking water at the PHG is 1 excess case of cancer per million people exposed. At the MCL of 5 pCi/L, the numerical cancer risk for radium-226, assuming all radium is present a radium-226, is 1×10^{-4}, whereas that for radium-228 is 3×10^{-4}. This means the 70-year lifetime theoretical cancer risk for drinking water at the MCL is between 1 and 3 excess cases per 10,000 people exposed.

The State Water Resources Control Board DDW has identified the following treatment technologies as Best Available Technology for reducing radium-226/228 levels in drinking water.

- Ion exchange
- Reverse Osmosis
- Lime softening

From the above list of best available treatment technology, the cost evaluation was conducted using ion exchange, given that ion exchange is also Best Available Technology for arsenic and uranium (also included in this PHG report). However, as previously described, while ion-exchange is Best Available Technology for arsenic, uranium, and radium, the type of ion-exchange resin typically used for arsenic and uranium treatment is SBA resin and that for radium is SAC resin.

Table 3 presents the four wells where radium-226/228 was detected above the PHG, but below the MCL of 5 pCi/L during 2016 through 2018. The levels detected above the PHG ranged from 1.1 pCi/L to 3.0 pCi/L. The total estimated capital cost to provide SAC ion-exchange treatment at the four wells presented in Table 3 is estimated at $7,500,000 (and the total annual O&M costs are estimated to be $1,000,000/year). Ion-exchange treatment produces a concentrated waste brine that the City of Sacramento would need to dispose. The estimated costs assume that the waste brine is discharged to the sewer.

Table 3: Wells Where Radium-226/228 Was Detected Above the PHG (2016-2018)

Well Number	Radium-226/228 Concentration (pCi/L)			Maximum Water Production (gpm)	SAC Ion-Exchange Treatment Cost	
	2016	2017	2018		Capital ($M)	Annual O&M ($M/Year)
107		1.9/2.3		942	2.2	0.27
155	1.1			752	0.97	0.23
159		2.6		611	1.50	0.25
164*	1.6/0	3.0/2.0		1,167	2.85	0.29

gpm = gallons per minute; $M = dollars in millions (2018 Dollars); O&M = operation and maintenance costs; *Quarterly monitoring conducted for Well 164 during 2016 and 2017.

[3] A pCi/L is the unit typically used to describe the concentration of radioactivity in drinking water.

Uranium. Uranium is a naturally occurring radionuclide. The PHG for uranium is 0.43 pCi/L and the DLR is 1 pCi/L. The MCL for uranium is 20 pCi/L. The health risk category associated with uranium is carcinogenicity. At the PHG, the theoretical cancer risk is 1×10^{-6}. This means the 70-year lifetime theoretical cancer risk for drinking water at the PHG is 1 excess case of cancer per million people exposed. At the MCL of 20 pCi/L, the numerical cancer risk is 5×10^{-5}. This means the 70-year lifetime theoretical cancer risk for drinking water at the MCL is five excess cases per 100,000 people exposed.

The State Water Resources Control Board DDW has identified the following treatment technologies as Best Available Technology for reducing uranium levels in drinking water.

- Ion exchange
- Reverse Osmosis
- Lime softening
- Coagulation/filtration

From the above list of Best Available Technology, the cost evaluation was conducted using ion exchange, given that ion exchange is also best available technology for arsenic and radium (also included in this PHG report).

Table 4 presents the three wells where uranium was detected above the PHG, but below the MCL during 2016 through 2018. The levels detected above the PHG were 1 pCi/L, 1.7 pCi/L and 2.9 pCi/L (below the MCL of 20 pCi/L). The total estimated capital cost to provide ion exchange treatment with the SBA resin at the three wells presented in Table 4 is estimated at $5,000,000 (and the total annual O&M costs are estimated to be $700,000/year). Ion-exchange treatment produces a concentrated waste brine that the City of Sacramento would need to dispose. The estimated costs assume that the waste brine is discharged to the sewer.

Table 4: Wells Where Uranium Was Detected Above the PHG (2016-2018)

Well Number	Uranium Concentration (pCi/L)			Maximum Water Production (gpm)	SBA Ion-Exchange Treatment Cost	
	2016	2017	2018		Capital ($M)	Annual O&M ($M/Year)
83	2.9			679	2.1	0.24
107		1.7		942	2.1	0.24
159		1		611	0.75	0.22

gpm = gallons per minute
$M = dollars in millions (2018 dollars)
O&M = operation and maintenance costs

Gross Alpha. OEHHA has not established a PHG for gross alpha activity because the results are used as a screening tool for naturally occurring radionuclides (i.e., gross alpha does not represent a specific constituent). The federal MCLG for gross alpha is 0 pCi/L due to the classification of gross alpha radioactivity as carcinogenic. The cancer health risk at 0 pCi/L is zero. The MCL for gross alpha

activity is 15 pCi/L and the DLR is 3 pCi/L. Gross alpha measurements can indicate the presence of a number of alpha emitting radionuclides, such as uranium and radium. OEHHA indicates that depending upon which isotopes are present, the numerical cancer health risk at the MCL of 15 pCi/L could be 1×10^{-3}. That means for a 70-year lifetime exposure at the MCL, there could be a theoretical risk of one excess case of cancer per 1,000 people exposed.

During 2016 through 2018, Well 83 had a gross alpha detection above the MCLG. Table 5 presents the gross alpha result of 3.8 pCi/L (below the MCL of 15 pCi/L) for Well 83. DDW has identified reverse osmosis as the Best Available Technology for reducing gross alpha levels in drinking water. The cost evaluation was conducted using reverse osmosis given that no other technology has been identified as best available technology. The total estimated capital cost for reverse osmosis treatment at Well 83 would be $6,000,000 (the total annual O&M costs would be $600,000/year). A brief description of the estimated cost procedure for Well 83 is presented in Attachment 4 of this document. Reverse osmosis treatment produces a concentrated waste that the City of Sacramento would need to dispose. The estimated costs assume that the reverse osmosis concentrate is discharged to the sewer and do not include the costs to replace the lost water.

Table 5: Wells Where Gross Alpha Was Detected Above the PHG (2016-2018)

Well Number	Gross Alpha Concentration (pCi/L)			Maximum Water Production (gpm)	Reverse Osmosis Treatment Cost	
	2016	2017	2018		Capital ($M)	Annual O&M ($M/Year)
83*	3.8			679	6.0	0.6

gpm = gallons per minute; $M = dollars in millions (2018 dollars); O&M = operation and maintenance costs
*Well 83 has been removed from service and is unlikely to be returned to service.

COLIFORM BACTERIA

The MCL for coliform bacteria is 5% positive samples of all distribution system samples per month. There is no PHG set for coliforms but USEPA set an MCLG of zero. Coliform bacteria are ubiquitous in nature and are not generally considered harmful. They are used as an indicator of bacteriological contamination because of the ease in monitoring and analysis. If a positive sample is found, follow up sampling is required. It is difficult, if not impossible, to assure that a system will never get a positive sample. During 2016 through 2018, the City of Sacramento Department of Utilities collected approximately 240 samples each month throughout the entire distribution system for coliform analysis (approximately 2,900 samples were collected each year).

Because coliform bacteria are only a surrogate indicator of the potential presence of pathogens, it is not possible to state a specific numerical health risk. Table 6 presents the monthly results from 2016 through 2018 when at least one monthly sample was positive for total coliforms.

Table 6: Months Where at Least One Sample Was Total Coliform Positive (2016 – 2018)

2016		2017		2018	
Month	**Percent Positive**	**Month**	**Percent Positive**	**Month**	**Percent Positive**
Jan	2.3	Apr	0.4	Mar	0.4
Feb	0.9	May	0.4	Nov	0.4
Mar	--	Sept	1.2	Dec	0.4
Apr	0.4	Nov	0.4	--	--
May	0.4	--	--	--	--
June	0.8	--	--	--	--
July	1.6	--	--	--	--
Aug	1.2	--	--	--	--
Sept	0.4	--	--	--	--
Oct	1.9	--	--	--	--
Nov	1.6	--	--	--	--
Dec	0.8	--	--	--	--

Table 7 presents the total number of samples collected, the total number of positive coliform samples detected, and the percent of the total number of samples that were positive for each year during 2016 – 2018.

Table 7: Positive Coliform Samples (2016-2018)

Year	Total Number of Samples Collected	Number of Positives/Year	Percent Positives/Year
2016	2,975	31	1%
2017	2,890	6	0.2%
2018	2,882	3	0.1%

Title 22 lists the following Best Available Technology for microbiological contaminants (Section 64447, CCR):

- Protection of wells from coliform contamination by appropriate placement and construction,
- Maintenance of a disinfectant residual throughout the distribution system,
- Proper maintenance of the distribution system, and
- Filtration and disinfection of approved surface water or disinfection of groundwater.

The City of Sacramento Department of Utilities implements the above Best Available Technology for total coliforms. The City's two surface water sources are filtered and disinfected and all wells are

disinfected at the source before serving water to the system. City staff collect samples from throughout the City's water distribution system on a daily basis to check for the presence of coliforms and to measure the level of disinfectant in the water. The City maintains positive pressure throughout the distribution system to minimize the chance of intrusion of constituents into drinking water pipes. The City also maintains an effective cross-connection control program. This is to prevent water used for industrial or irrigation purposes from flowing back into the distribution system. All groundwater wells are properly constructed and operated and are inspected annually by the State Water Resources Control Board DDW.

SUMMARY OF TOTAL COSTS AND POTENTIAL IMPACT ON CUSTOMER BILLS

As required, treatment costs were estimated for regulated constituents that were detected above the PHG but below the MCL. For arsenic, radium-226/228 and uranium, ion exchange costs were evaluated for all three constituents, given that ion-exchange is one of the Best Available Technologies for all three constituents. The type of ion-exchange resin typically used for arsenic and uranium treatment is SBA resin and that for radium is SAC resin. Thus, for those wells containing water with arsenic or uranium and radium (Wells 107, 155, 159, 164), a two-stage ion exchange treatment train was selected. The cost for the two-stage ion-exchange treatment was estimated by adding the individual costs of the SBA (for arsenic and uranium treatment) and SAC (for radium) exchange treatment technologies. For gross alpha, costs were estimated using reverse osmosis. Table 8 presents the capital costs and annual O&M costs for each well evaluated in this PHG Report. In addition, Table 8 presents the annualized total cost for each well (this is the sum of the annualized capital cost plus the annual O&M costs). For 2016 through 2018, the total capital costs to install ion-exchange and reverse osmosis Best Available Technology are estimated to be $60,700,000 and the annual O&M cost is estimated to be $7,200,000. The total annualized capital cost plus the annual O&M costs would be approximately $11,700,000. The estimated increase in each City of Sacramento customer's water bill would be approximately $83 per year or $6.90 per month.

Table 8: Summary of Capital and O&M Costs (2016 – 2018)

Well Number	Constituents Detected	Constituent Driving the Cost (& Treatment)	Cost of Treatment (2018 Dollars)		
			Capital Cost, $M	Annual O&M ($M/Year)	Annualized Total Cost* ($M/Year)
83	Gross alpha, Uranium, Arsenic	Gross alpha (RO)	6.0	0.6	1.1
93	Arsenic	Arsenic (IX - SBA)	2.1	0.3	0.4
94	Arsenic	Arsenic (IX - SBA)	2.8	0.3	0.5
107	Arsenic, Uranium, Radium	Arsenic (IX - SBA) & Radium (IX - SAC)	5.0	0.6	1.0
112	Arsenic	Arsenic (IX - SBA)	2.2	0.3	0.4
123	Arsenic	Arsenic (IX - SBA)	2.2	0.3	0.4
126	Arsenic	Arsenic (IX - SBA)	2.2	0.3	0.5
129	Arsenic	Arsenic (IX - SBA)	2.2	0.3	0.4
131	Arsenic	Arsenic (IX - SBA)	2.2	0.3	0.4
133	Arsenic	Arsenic (IX - SBA)	3.5	0.3	0.6
134	Arsenic	Arsenic (IX - SBA)	2.2	0.3	0.4
137	Arsenic	Arsenic (IX - SBA)	2.2	0.3	0.4
138	Arsenic	Arsenic (IX - SBA)	2.8	0.3	0.5
139	Arsenic	Arsenic (IX - SBA)	1.5	0.2	0.4
153A	Arsenic	Arsenic (IX - SBA)	2.9	0.3	0.5
155	Arsenic, Radium	Arsenic (IX - SBA) & Radium (IX - SAC)	3.8	0.5	0.8
156	Arsenic	Arsenic (IX - SBA)	2.8	0.3	0.5
158	Arsenic	Arsenic (IX - SBA)	2.8	0.3	0.5
159	Arsenic, Uranium, Radium	Arsenic (IX - SBA) & Radium (IX - SAC)	3.7	0.5	0.8
164	Arsenic, Radium	Arsenic (IX - SBA) & Radium (IX - SAC)	5.8	0.6	1.1
		Total	**60.7**	**7.2**	**11.7**

*Annualized total cost is the sum of the annual O&M cost and the amortized capital annual cost. The amortized capital annual cost was calculated assuming a 20-year amortization period and an interest rate of 5%.
**The total costs are the sum of the actual costs from the model. The individual well costs are presented using one significant figure. For example, for well 112 the modeled capital cost was $2.17M. The table presents this value as $2.2M.
IX = ion-exchange, SBA = strong base anion, SAC = strong acid cation, RO = reverse osmosis

RECOMMENDATIONS

The drinking water quality of the City of Sacramento Department of Utilities meets all State of California and USEPA drinking water standards set to protect public health. To further reduce the

levels of the constituents identified in this report that are already below the health-based MCLs established to provide "safe drinking water," would require additional costly treatment processes and would increase the annual customer water bills. The health protection benefits of these potential reductions are unclear and may not be quantifiable. Therefore, no action is proposed.

ADDENDUM: PURCHASED WATER FROM SACRAMENTO SUBURBAN WATER DISTRICT

As part of a State of California-approved groundwater substitution transfer, the City received water from Sacramento Suburban Water District (SSWD) during July 2018 through September 2018. A total of 1,236 million gallons was received over an 80-day period. The water entered the City's distribution system through a single interconnection with SSWD. Assuming the SSWD water entered the City's distribution system 24/7, the average flow was 10,729 gallons/minute. This water represented 4% of the total amount of water consumed by the City during 2018. Based on water quality data provided by SSWD, the following constituents exceeded their respective PHGs:

- Arsenic
- Gross alpha
- Radium 226/228
- Uranium

As determined for the City's PHG report, the appropriate Best Available Technology (reverse osmosis) was identified that would treat all of the above constituents.

If treatment were needed for these constituents, it would be provided by SSWD at the individual sources. It would not be reasonable for the City to provide treatment. However, for the sake of completeness for this PHG report, capital and O&M costs were developed to install and operate reverse osmosis treatment for these constituents at the point of entry into the City's distribution system. The estimated total capital cost, in 2018 dollars, would be $50,500,000, and the annual O&M would be $8,800,000. The total annualized capital cost plus the annual O&M costs would be approximately $12,900,000. The estimated increase in each City of Sacramento customer's water bill would be approximately $91 per year or $7.60 per month. The cost estimates assume that the reverse osmosis concentrate is discharged to the sewer. The estimated costs do not include the costs to replace that lost water.

ATTACHMENTS

No. 1 Excerpt from California Health & Safety Code: Section 116470 (b)

No. 2 Table of California Regulated Constituents with MCLs and PHGs

No. 3 Health Risk Information for Public Health Goal Exceedance Reports. Prepared by the Office of Environmental Health Hazard Assessment. February 2019

No. 4 Description of Cost Estimating Methodology for this PHG Report

No.5 City of Sacramento – Department of Utilities 2016, 2017 and 2018 Consumer Confidence Reports.

ATTACHMENT 1

EXCERPT FROM CALIFRONIA HEALTH & SAFETY CODE SECTION 116470 (b)

116470. (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.

ATTACHMENT 2

TABLE OF CALIFORNIA REGULATED CONSTITUENTS WITH MCLs AND PHGs

MCLs, DLRs, and PHGs for Regulated Drinking Water Contaminants

(Units are in milligrams per liter (mg/L), unless otherwise noted.)

Last Update: March 13, 2019

This table includes:

California's maximum contaminant levels (MCLs)

Detection limits for purposes of reporting (DLRs)

Public health goals (PHGs) from the Office of Environmental Health Hazard Assessment (OEHHA)

Also, the PHG for NDMA (which is not yet regulated) is included at the bottom of this table.

For comparison:

Federal MCLs and Maximum Contaminant Level Goals (MCLGs) (US EPA)

Regulated Contaminant	MCL	DLR	PHG	Date of PHG	MCL	MCLG
Chemicals with MCLs in 22 CCR §64431—Inorganic Chemicals						
Aluminum	1	0.05	0.6	2001	--	--
Antimony	0.006	0.006	0.001	2016	0.006	0,006
Arsenic	0.010	0.002	0.000004	2004	0.010	zero
Asbestos (MFL = million fibers per liter; for fibers >10 microns long)	7 MFL	0.2 MFL	7 MFL	2003	7 MFL	7 MFL
Barium	1	0.1	2	2003	2	2
Beryllium	0.004	0.001	0.001	2003	0.004	0.004
Cadmium	0.005	0.001	0.00004	2006	0.005	0.005
Chromium, Total - OEHHA withdrew the 0.0025-mg/L PHG	0.05	0.01	withdrawn Nov. 2001	1999	0.1	0.1
Chromium, Hexavalent - 0.01-mg/L MCL & 0.001-mg/L DLR repealed September 2017	--	--	0.00002	2011	--	--
Cyanide	0.15	0.1	0.15	1997	0.2	0.2
Fluoride	2	0.1	1	1997	4.0	4.0
Mercury (inorganic)	0.002	0.001	0.0012	1999 (rev2005)	0.002	0.002
Nickel	0.1	0.01	0.012	2001	--	--
Nitrate (as nitrogen, N)	10 as N	0.4	45 as NO3 (=10 as N)	2018	10	10
Nitrite (as N)	1 as N	0.4	1 as N	2018	1	1
Nitrate + Nitrite (as N)	10 as N	--	10 as N	2018	--	--
Perchlorate	0.006	0.004	0.001	2015	--	--
Selenium	0.05	0.005	0.03	2010	0.05	0.05
Thallium	0.002	0.001	0.0001	1999 (rev2004)	0.002	0.0005
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	1.3	1.3
Lead	0.015	0.005	0.0002	2009	0.015	zero
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	none	n/a	15	zero
Gross beta particle activity - OEHHA concluded in 2003 that a PHG was not practical	4 mrem/yr	4	none	n/a	4 mrem/yr	zero
Radium-226	--	1	0.05	2006		
Radium-228	--	1	0.019	2006		
Radium-226 + Radium-228	5	--	--	--	5	zero
Strontium-90	8	2	0.35	2006	--	--
Tritium	20,000	1,000	400	2006	--	--
Uranium	20	1	0.43	2001	30 µg/L	zero
Chemicals with MCLs in 22 CCR §64444—Organic Chemicals						
(a) Volatile Organic Chemicals (VOCs)						
Benzene	0.001	0.0005	0.00015	2001	0.005	zero

Carbon tetrachloride	0.0005	0.0005	0.0001	2000	0.005	zero
1,2-Dichlorobenzene	0.6	0.0005	0.6	1997 (rev2009)	0.6	0.6
1,4-Dichlorobenzene (p-DCB)	0.005	0.0005	0.006	1997	0.075	0.075
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)	0.005	zero
1,1-Dichloroethylene (1,1-DCE)	0.006	0.0005	0.01	1999	0.007	0.007
cis-1,2-Dichloroethylene	0.006	0.0005	0.013	2018	0.07	0.07
trans-1,2-Dichloroethylene	0.01	0.0005	0.05	2018	0.1	0.1
Dichloromethane (Methylene chloride)	0.005	0.0005	0.004	2000	0.005	zero
1,2-Dichloropropane	0.005	0.0005	0.0005	1999	0.005	zero
1,3-Dichloropropene	0.0005	0.0005	0.0002	1999 (rev2006)	--	--
Ethylbenzene	0.3	0.0005	0.3	1997	0.7	0.7
Methyl tertiary butyl ether (MTBE)	0.013	0.003	0.013	1999	--	--
Monochlorobenzene	0.07	0.0005	0.07	2014	0.1	0.1
Styrene	0.1	0.0005	0.0005	2010	0.1	0.1
1,1,2,2-Tetrachloroethane	0.001	0.0005	0.0001	2003	0.1	0.1
Tetrachloroethylene (PCE)	0.005	0.0005	0.00006	2001	0.005	zero
Toluene	0.15	0.0005	0.15	1999	1	1
1,2,4-Trichlorobenzene	0.005	0.0005	0.005	1999	0.07	0.07
1,1,1-Trichloroethane (1,1,1-TCA)	0.200	0.0005	1	2006	0.2	0.2
1,1,2-Trichloroethane (1,1,2-TCA)	0.005	0.0005	0.0003	2006	0.005	0.003
Trichloroethylene (TCE)	0.005	0.0005	0.0017	2009	0.005	zero
Trichlorofluoromethane (Freon 11)	0.15	0.005	1.3	2014	--	--
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	0.002	zero
Xylenes	1.750	0.0005	1.8	1997	10	10
(b) Non-Volatile Synthetic Organic Chemicals (SOCs)						
Alachlor	0.002	0.001	0.004	1997	0.002	zero
Atrazine	0.001	0.0005	0.00015	1999	0.003	0.003
Bentazon	0.018	0.002	0.2	1999 (rev2009)	--	--
Benzo(a)pyrene	0.0002	0.0001	0.000007	2010	0.0002	zero
Carbofuran	0.018	0.005	0.0007	2016	0.04	0.04
Chlordane	0.0001	0.0001	0.00003	1997 (rev2006)	0.002	zero
Dalapon	0.2	0.01	0.79	1997 (rev2009)	0.2	0.2
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00001	0.0000017	1999	0.0002	zero
2,4-Dichlorophenoxyacetic acid (2,4-D)	0.07	0.01	0.02	2009	0.07	0.07
Di(2-ethylhexyl)adipate	0.4	0.005	0.2	2003	0.4	0.4
Di(2-ethylhexyl)phthalate (DEHP)	0.004	0.003	0.012	1997	0.006	zero
Dinoseb	0.007	0.002	0.014	1997 (rev2010)	0.007	0.007
Diquat	0.02	0.004	0.006	2016	0.02	0.02
Endothal	0.1	0.045	0.094	2014	0.1	0.1
Endrin	0.002	0.0001	0.0003	2016	0.002	0.002
Ethylene dibromide (EDB)	0.00005	0.00002	0.00001	2003	0.00005	zero
Glyphosate	0.7	0.025	0.9	2007	0.7	0.7
Heptachlor	0.00001	0.00001	0.000008	1999	0.0004	zero
Heptachlor epoxide	0.00001	0.00001	0.000006	1999	0.0002	zero
Hexachlorobenzene	0.001	0.0005	0.00003	2003	0.001	zero
Hexachlorocyclopentadiene	0.05	0.001	0.002	2014	0.05	0.05
Lindane	0.0002	0.0002	0.000032	1999 (rev2005)	0.0002	0.0002
Methoxychlor	0.03	0.01	0.00009	2010	0.04	0.04
Molinate	0.02	0.002	0.001	2008	--	--
Oxamyl	0.05	0.02	0.026	2009	0.2	0.2
Pentachlorophenol	0.001	0.0002	0.0003	2009	0.001	zero
Picloram	0.5	0.001	0.166	2016	0.5	0.5
Polychlorinated biphenyls (PCBs)	0.0005	0.0005	0.00009	2007	0.0005	zero
Simazine	0.004	0.001	0.004	2001	0.004	0.004
Thiobencarb	0.07	0.001	0.042	2016	--	--
Toxaphene	0.003	0.001	0.00003	2003	0.003	zero
1,2,3-Trichloropropane	0.000005	0.000005	0.0000007	2009	--	--

2,3,7,8-TCDD (dioxin)	$3x10^{-8}$	$5x10^{-9}$	$5x10^{-11}$	2010	$3x10^{-8}$	zero
2,4,5-TP (Silvex)	0.05	0.001	0.003	2014	0.05	0.05
Chemicals with MCLs in 22 CCR §64533—Disinfection Byproducts						
Total Trihalomethanes	0.080	--	--	--	0.080	--
Bromodichloromethane	--	0.0010	0.00006	2018 draft	--	zero
Bromoform	--	0.0010	0.0005	2018 draft	--	zero
Chloroform	--	0.0010	0.0004	2018 draft	--	0.07
Dibromochloromethane	--	0.0010	0.0001	2018 draft	--	0.06
Haloacetic Acids (five) (HAA5)	0.060	--	--	--	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**	0.0001	2009	0.01	zero
Chlorite	1.0	0.020	0.05	2009	1	0.8
Chemicals with PHGs established in response to DDW requests. These are not currently regulated drinking water contaminants.						
N-Nitrosodimethylamine (NDMA)	--	--	0.000003	2006	--	--
*OEHHA's review of this chemical during the year indicated (rev20XX) resulted in no change in the PHG.						
**The DLR for Bromate is 0.0010 mg/L for analysis performed using EPA Method 317.0 Revision 2.0, 321.8, or 326.0.						

ATTACHMENT 3

HEALTH RISK INFORMATION FOR PUBLIC HEALTH GOAL EXCEEDANCE REPORTS

PREPARED BY OEHHA
FEBRUARY 2019

OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT

Public Health Goals

Health Risk Information for Public Health Goal Exceedance Reports

February 2019

Pesticide and Environmental Toxicology Branch
Office of Environmental Health Hazard Assessment
California Environmental Protection Agency

Health Risk Information for Public Health Goal Exceedance Reports

Prepared by

Office of Environmental Health Hazard Assessment
California Environmental Protection Agency

February 2019

Under the Calderon-Sher Safe Drinking Water Act of 1996 (the Act), public water systems with more than 10,000 service connections are required to prepare a report every three years for contaminants that exceed their respective Public Health Goals (PHGs).[1] This document contains health risk information on regulated drinking water contaminants to assist public water systems in preparing these reports. A PHG is the concentration of a contaminant in drinking water that poses no significant health risk if consumed for a lifetime. PHGs are developed and published by the Office of Environmental Health Hazard Assessment (OEHHA) using current risk assessment principles, practices and methods.[2]

The water system's report is required to identify the health risk category (e.g., carcinogenicity or neurotoxicity) associated with exposure to each regulated contaminant in drinking water and to include a brief, plainly worded description of these risks. The report is also required to disclose the numerical public health risk, if available, associated with the California Maximum Contaminant Level (MCL) and with the PHG for each contaminant. This health risk information document is prepared by OEHHA every three years to assist the water systems in providing the required information in their reports.

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

[1] Health and Safety Code Section 116470(b)
[2] Health and Safety Code Section 116365

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 US Environmental Protection Agency (US EPA) assumes there is no absolutely safe level of exposure to such chemicals. PHGs, on the other hand, are set at a level considered to pose no *significant* risk of cancer; this is usually no more than a one-in-one-million excess cancer risk (1×10^{-6}) level for a lifetime of exposure. In Table 2, the cancer risks shown are based on the US EPA's evaluations.

For more information on health risks: The adverse health effects for each chemical with a PHG are summarized in a PHG technical support document. These documents are available on the OEHHA website (http://www.oehha.ca.gov). Also, technical fact sheets on most of the chemicals having federal MCLs can be found at http://www.epa.gov/your-drinking-water/table-regulated-drinking-water-contaminants.

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[5,6]	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 (4×10^{-6})	1×10^{-6} (one per million)	0.01	2.5×10^{-3} (2.5 per thousand)
Asbestos	carcinogenicity (causes cancer)	7 MFL[7] (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 bound 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. Cancer risk cannot be calculated.
[6] The PHG for alachlor is based on a threshold model of carcinogenesis and is set at a level that is believed to be without any significant cancer risk to individuals exposed to the chemical over a lifetime.
[7] MFL = million fibers per liter of water.

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[8])	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 (7×10^{-6})	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)	0.0007	NA	0.018	NA

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

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}	none	NA
Copper	digestive system toxicity (causes nausea, vomiting, diarrhea)	0.3	NA	1.3 (AL[9])	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
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)

[9] 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).

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-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)
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)	0.013	NA	0.006	NA
1,2-Dichloro-ethylene, trans	immunotoxicity (harms the immune system)	0.05	NA	0.01	NA
Dichloromethane (methylene chloride)	carcinogenicity (causes cancer)	0.004	1×10^{-6}	0.005	1×10^{-6} (one per million)

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
2,4-Dichloro-phenoxyacetic acid (2,4-D)	hepatotoxicity and nephrotoxicity (harms the liver and kidney)	0.02	NA	0.07	NA
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)
Dinoseb	reproductive toxicity (harms the uterus and testis)	0.014	NA	0.007	NA
Diquat	ocular toxicity (harms the eye) developmental toxicity (causes malformation)	0.006	NA	0.02	NA
Endothall	digestive system toxicity (harms the stomach or intestine)	0.094	NA	0.1	NA
Endrin	neurotoxicity (causes convulsions) hepatotoxicity (harms the liver)	0.0003	NA	0.002	NA
Ethylbenzene (phenylethane)	hepatotoxicity (harms the liver)	0.3	NA	0.3	NA
Ethylene dibromide (1,2-Dibromoethane)	carcinogenicity (causes cancer)	0.00001	1×10^{-6}	0.00005	5×10^{-6} (five per million)

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
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 (8×10^{-6})	1×10^{-6}	0.00001	1×10^{-6} (one per million)
Heptachlor epoxide	carcinogenicity (causes cancer)	0.000006 (6×10^{-6})	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 (HCCPD)	digestive system toxicity (causes stomach lesions)	0.002	NA	0.05	NA
Lead	developmental neurotoxicity (causes neurobehavioral effects in children) cardiovascular toxicity (causes high blood pressure) carcinogenicity (causes cancer)	0.0002	$<1\times10^{-6}$ (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

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
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)	nephrotoxicity (harms the kidney)	0.07	NA	0.07	NA
Nickel	developmental toxicity (causes increased neonatal deaths)	0.012	NA	0.1	NA
Nitrate	hematotoxicity (causes methemoglobinemia)	45 as nitrate	NA	10 as nitrogen (=45 as nitrate)	NA
Nitrite	hematotoxicity (causes methemoglobinemia)	3 as nitrite	NA	1 as nitrogen (=3 as nitrite)	NA
Nitrate and Nitrite	hematotoxicity (causes methemoglobinemia)	10 as nitrogen[10]	NA	10 as nitrogen	NA

[10] The joint nitrate/nitrite PHG of 10 mg/L (10 ppm, expressed as nitrogen) does not replace the individual values, and the maximum contribution from nitrite should not exceed 1 mg/L nitrite-nitrogen.

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
N-nitroso-dimethyl-amine (NDMA)	carcinogenicity (causes cancer)	0.000003 (3×10^{-6})	1×10^{-6}	none	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)	0.001	NA	0.006	NA
Picloram	hepatotoxicity (harms the liver)	0.166	NA	0.5	NA
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 (combined $Ra^{226+228}$)	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

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
Silvex (2,4,5-TP)	hepatotoxicity (harms the liver)	0.003	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	1×10^{-6}	8 pCi/L	2×10^{-5} (two per hundred thousand)
Styrene (vinylbenzene)	carcinogenicity (causes cancer)	0.0005	1×10^{-6}	0.1	2×10^{-4} (two per ten thousand)
1,1,2,2-Tetrachloro-ethane	carcinogenicity (causes cancer)	0.0001	1×10^{-6}	0.001	1×10^{-5} (one per hundred thousand)
2,3,7,8-Tetra-chlorodibenzo-*p*-dioxin (TCDD, or dioxin)	carcinogenicity (causes cancer)	5×10^{-11}	1×10^{-6}	3×10^{-8}	6×10^{-4} (six per ten 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

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
Thiobencarb	general toxicity (causes body weight effects) hematotoxicity (affects red blood cells)	0.042	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	endocrine toxicity (harms adrenal glands)	0.005	NA	0.005	NA
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)
Trichloro-ethylene (TCE)	carcinogenicity (causes cancer)	0.0017	1×10^{-6}	0.005	3×10^{-6} (three per million)

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
Trichlorofluoro-methane (Freon 11)	accelerated mortality (increase in early death)	1.3	NA	0.15	NA
1,2,3-Trichloro-propane (1,2,3-TCP)	carcinogenicity (causes cancer)	0.0000007 (7×10^{-7})	$1\text{x}10^{-6}$	0.000005 (5×10^{-6})	7×10^{-6} (seven per million)
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	$1\text{x}10^{-6}$	20,000 pCi/L	$5\text{x}10^{-5}$ (five per hundred thousand)
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

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

Chemical	Health Risk Category[1]	US 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[5,6]	NA[7]	none	NA
Chlorine	acute toxicity (causes irritation) digestive system toxicity (harms the stomach)	4[5,6]	NA	none	NA
Chlorine dioxide	hematotoxicity (causes anemia) neurotoxicity (harms the nervous system)	0.8[5,6]	NA	none	NA
Disinfection byproducts: haloacetic acids (HAA5)					
Monochloroacetic acid (MCA)	general toxicity (causes body and organ weight changes[8])	0.07	NA	none	NA
Dichloroacetic acid (DCA)	carcinogenicity (causes cancer)	0	0	none	NA

[1] Health risk category based on the US EPA MCLG document or California MCL document unless otherwise specified.
[2] MCLG = maximum contaminant level goal established by US 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] The federal Maximum Residual Disinfectant Level (MRDL), or highest level of disinfectant allowed in drinking water, is the same value for this chemical.
[7] NA = not available.
[8] 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]	US EPA MCLG[2] (mg/L)	Cancer Risk[3] @ MCLG	California MCL[4] (mg/L)	Cancer Risk @ California MCL
Trichloroacetic acid (TCA)	hepatotoxicity (harms the liver)	0.02	NA	none	NA
Monobromoacetic acid (MBA)	NA	none	NA	none	NA
Dibromoacetic acid (DBA)	NA	none	NA	none	NA
Total haloacetic acids (sum of MCA, DCA, TCA, MBA, and DBA)	general toxicity, hepatotoxicity and carcinogenicity (causes body and organ weight changes, harms the liver and 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

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

Chemical	Health Risk Category[1]	US EPA MCLG[2] (mg/L)	Cancer Risk[3] @ MCLG	California MCL[4] (mg/L)	Cancer Risk @ California MCL
Total trihalomethanes (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
Radionuclides					
Gross alpha particles[9]	carcinogenicity (causes cancer)	0 (^{210}Po included)	0	15 pCi/L[10] (includes ^{226}Ra but not radon and uranium)	up to $1x10^{-3}$ (for ^{210}Po, the most potent alpha emitter
Beta particles and photon emitters[9]	carcinogenicity (causes cancer)	0 (^{210}Pb included)	0	50 pCi/L (judged equiv. to 4 mrem/yr)	up to $2x10^{-3}$ (for ^{210}Pb, the most potent beta-emitter)

[9] 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/reports/grossab.html.
[10] pCi/L = picocuries per liter of water.

ATTACHMENT 4

DESCRIPTION OF COST ESTIMATE PROCEDURES

Estimate of Ion-Exchange Treatment Costs **–** Cost estimates were developed for ion-exchange treatment of arsenic and uranium with a strong-base anion (SBA) resin and radium treatment with a strong acid cation (SAC) resin. The SBA treatment costs were estimated for arsenic, uranium, and radium levels to meet their respective PHG levels of 0.004 µg/L, 0.43 pCi/L, 0.05 pCi/L for radium-226, and 0.019 pCi/L for radium-228 in the finished water under the assumption that IX treatment can reduce these constituents to those levels and that these levels can be detected. The cost estimates were developed for each individual well using the maximum concentration measured during 2016 – 2018 as the treatment design influent concentration for arsenic, uranium, and radium and using the maximum well production during the same period. The cost estimates were developed with WQTS' in-house ion exchange treatment design and cost model. The cost estimates were based on 2016 costs and have an expected accuracy range of +50/-30%. For the model to predict cost, it needed to make projections about treatment performance based on water quality, and then constructed capital and annual O&M cost based on specific unit costs of equipment, chemicals, supplies, labor, energy, disposal fees, etc. Cost estimates assume that the cost of the SBA resin is similar to that of the SAC resin. The estimated costs also assume that the untreated liquid waste brine is discharged to the sewer. The capital and annual O&M costs were adjusted from 2016 dollars to 2018 dollars using the 20-city national average Engineering News Record Construction Cost Index for capital cost adjustment and the Consumer Price Index for O&M cost adjustment.

Estimate of Reverse Osmosis Treatment Cost – Cost estimates for gross alpha treatment of Well 83 and SSWD waters with reverse osmosis (RO) were estimated from cost equations generated for the removal of CrVI with RO technology and are reported in Seidel, et al. 2013.[4] Cost equations are provided for estimating capital and O&M costs in 2012 dollars. Capital costs are based on the design flow, whereas O&M costs are based on the average flow, which was set to 70% of the design flow. The cost equations assume that the RO concentrate is discharged to the sewer. The maximum water production for Well 83 during 2016 through 2018 was 679 gpm, which was used as the design flow. For SSWD, the design flow was set to 10,729 gpm. The capital and annual O&M costs were adjusted from 2012 dollars to 2018 dollars using the 20-city national average Engineering News Record Construction Cost Index for capital cost adjustment and the Consumer Price Index for O&M cost adjustment.

[4] Seidel, C. J., Najm, I. N., Blute, N. K., Corwin, C. J., & Wu, X. (2013). National and California treatment costs to comply with potential hexavalent chromium MCLs. American Water Works Association, 105(6), E320–E336.

ATTACHMENT 5

CITY OF SACRAMENTO – DEPARTMENT OF UTILITIES

2016, 2017 AND 2018 CONSUMER CONFIDENCE REPORTS

City of SACRAMENTO Department of Utilities

For water quality questions or to report a concern

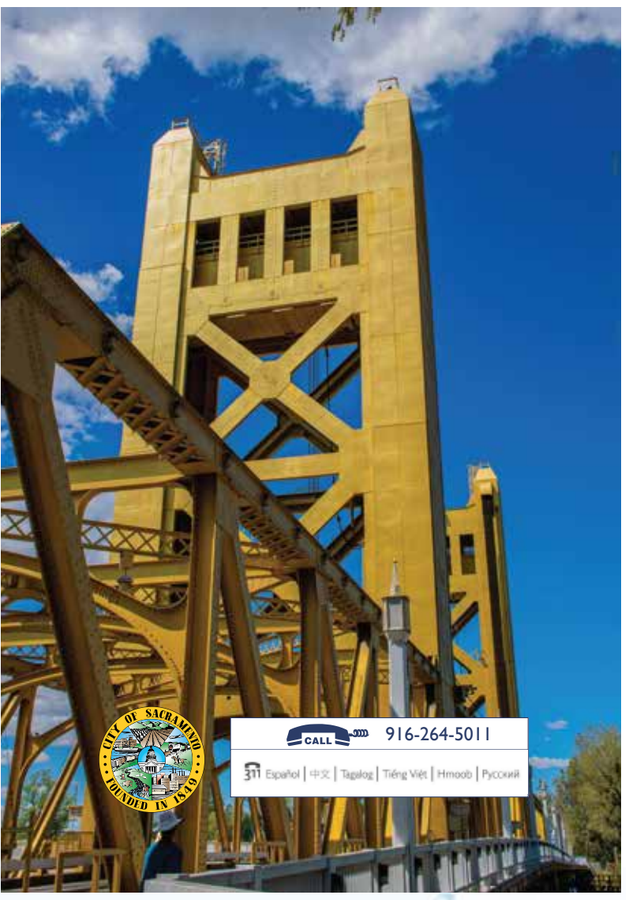
City of Sacramento, Department of Utilities
311 or 916-264-5011
(24 hours a day, 7 days a week)
www.cityofsacramento.org/utilities

Additional water quality information is available

USEPA Safe Drinking Water Hotline
1-800-426-4791
http://epa.gov/ground-water-and-drinking-water

Notice of opportunity for public participation

The Sacramento City Council holds public meetings most Tuesdays at 6 p.m. in the City Council Chambers at 915 I Street, Sacramento. You can access Council agendas at www.cityofsacramento.org/clerk.



"هذا التقرير يحتوي على معلوماً ت مهمّة تتعلق بمياه الشفة (أو الشرب). ترجم التقرير , أو تكلم مع شخص يستطيع أن يفهم التقرير."

Այս զեկույցը պարունակում է կարեւոր տեղեկատվություն Ձեր խմելու ջրով: Թարգմանել այն, կամ խոսել մեկի հետ, ով հասկանում է այն:

此份有關你的食水報告,內有重要資料和訊息,請找他人為你翻譯及解釋清楚。

此份有关你的食水报告,内有重要资料和讯息,请找他人为你翻译及解释清楚。

این اطلاعیه شامل اطلاعات مهمی راجع به آب آشامیدنی است.اگر نمیتوانید این اطلاعات را بزبان انگلیسی بخوانید لطفاً از کسی که میتواند بزبان بگیرید تا مطالب را برای شما به فارسی ترجمه کند.

यह सूचना महत्वपूर्ण है ।
कृपा करके किसी से :सका अनुवाद करायें ।

Daimntawv tshaj tawm no muaj lus tseemceeb txog koj cov dej haus. Tshab txhais nws, los yog tham nrog tej tug neeg uas totaub txog nws.

この報告書には上水道に関する重要な情報が記されております。翻訳を御依頼なされるか、内容をご理解なさっておられる方にお尋ね下さい。

របាយការណ៍នេះមានពត៌មានសំខាន់អំពីទឹកបរិភោគ ។ សូមបកប្រែ ឬពិគ្រោះជាមួយអ្នកដែលមើលយល់ របាយការណ៍នេះ ។

이 안내는 매우 중요합니다.
본인을 위해 번역인을 사용하십시요.

ລາຍງານນີ້ມີຂໍ້ມູນສຳຄັນກ່ຽວກັບນ້ຳປະປາຂອງທ່ານ. ຈົ່ງໃຫ້ຄົນອື່ນແປຄວາມໃຫ້ທ່ານ, ຫລືໃຫ້ປຶກສາກັບຄົນໃດທີ່ເຂົ້າໃຈເນື້ອງ.

Naaiv norm sou maaih jienv nyei fienx gorngv taux meih nyei wuom hopv. Faan fai gorngv bun mienh hiuv duqv.

ਇਹ ਸੂਚਨਾ ਮਹਤੱਵਪੂਰਣ ਹੈ।
ਕ੍ਰਿਪਾ ਕਰਕੇ ਕਿੱਸੀ ਤੋ ਇਸ ਦਾ ਅਨੁਵਾਦ ਕਰਾਉ।

Acest raport conține informații importante despre apa de băut. Traduceți-o sau discutați cu cineva care o înțelege.

Этот отчет содержит важную информацию о вашей питьевой воды. Переведите его или поговорите с тем, кто это понимает.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

Mahalaga ang impormasyong ito. Mangyaring ipasalin ito.

Цей звіт містить важливу інформацію про вашу питну воду. Перекласти його, або поговорити з кимось, хто його розуміє.

Chi tiết này thật quan trọng.
Xin nhờ người dịch cho quý vị.

FOR MORE INFORMATION, VISIT:
www.cityofsacramento.org/utilities
www.facebook.com/SacramentoCityUtilities
www.twitter.com/saccityutility

3 Constituents With No Established MCL
Unregulated constituent monitoring helps determine where certain water constituents occur and whether they should be regulated

Constituent	Units	Year Sampled	Surface Water Range	Surface Water Average	Groundwater Range	Groundwater Average	Distribution System Range	Distribution System Average
Androstene	ppb	2014	ND - 0.00034	ND	ND	ND	NA	NA
Chlorate	ppb	2014	ND	ND	ND	ND	ND - 61	ND
1,4-Dioxane	ppb	2014	ND	ND	ND - 0.2	ND	NA	NA
Molybdenum	ppb	2014 - 2015	ND	ND	ND	ND	ND - 1	ND
Strontium	ppb	2014 - 2015	48 - 130	76	180 - 430	273	48 - 370	192
Testosterone	ppb	2014	ND - 0.00026	ND	ND	ND	NA	NA
Vanadium	ppb	2014 - 2015	0.4 - 3	1.4	15 - 41	25	0.4 - 38	14

4 Other Parameters of Interest to Customers

Constituent	Units	Year Sampled[a]	Surface Water Range	Surface Water Average	Ground Water Range	Ground Water Average
Alkalinity	ppm	2016	22 - 66	44	90 - 220	137
Bicarbonate as HCO3	ppm	2014 - 2016	27 - 80	54	110 - 268	162
Calcium	ppm	2014 - 2016	9.9 - 13	11	14 - 49	26
Hardness	ppm	2014 - 2016	40 - 62	51	86 - 260	147
Magnesium	ppm	2014 - 2016	1.5 - 3.5	2.5	7.5 - 37	18
Sodium	ppm	2014 - 2016	2.1 - 4.1	3.1	18 - 36	25

WATER QUALITY REGULATIONS

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) and the California State Water Resources Control Board (State Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and it can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

Microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.

Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.

Pesticides and herbicides, that may come from a variety of sources such as agriculture, urban stormwater runoff and residential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural applications and septic systems.

Radioactive contaminants, that can be naturally-occurring or be the result of oil and gas production and mining activities.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline at 1-800-426-4791.

CITY OF SACRAMENTO DEPARTMENT OF UTILITIES

2016 WATER QUALITY REPORT

A Consumer Confidence Report for the Citizens of Sacramento

WATER EFFICIENCY
Water-use efficiency is a California way of life, and the City of Sacramento continues to encourage water conservation. Find tips to save water and available rebates at **SacWaterWise.com**

Congratulations! Your water meets or exceeds all federal and state drinking water standards.

TRADITION OF EXCELLENCE

Since its founding in 1849, the City of Sacramento has considered water quality of the utmost importance. This Consumer Confidence Report is presented to enhance your understanding of where your water comes from, what it contains, and to confirm that your drinking water continues to meet or exceed all state and federal drinking water standards.

The City of Sacramento, Department of Utilities is dedicated to providing our customers with dependable, high quality water, storm drainage and wastewater services in a fiscally and environmentally sustainable manner. In doing so, we work to conserve and preserve our water sources.

The City takes many steps to ensure high water quality including protecting our source waters, treating the water, operating our distribution system, maintaining facilities and addressing customer concerns. To actively protect water quality, management efforts on watershed, groundwater and water quality are performed.

TEAMWORK: TOGETHER WE CAN PROTECT OUR WATER RESOURCES

The City of Sacramento, Department of Utilities works hard to bring you quality drinking water. Please be careful as you live, work and play to limit what goes into the storm drains and rivers, so we can continue to preserve the quality of the water and our diverse river ecosystem.

City of SACRAMENTO Department of Utilities

SACRAMENTO'S WATER SOURCE ASSESSMENT

The City of Sacramento has two independent water sources. Our primary water source is river water from the American and Sacramento Rivers, which provides 79 percent of our water supply. Groundwater provides the remaining 21 percent. Assessments of potential contaminating activities for the City's Sacramento River and American River water sources were completed in 2000 and 2001, and most recently updated in 2015 and 2013 respectively. These reports indicated that both rivers are most vulnerable to contaminants from recreational activities and that the Sacramento River is also most susceptible to agricultural contaminants. The City of Sacramento, along with several other water utilities, updates assessments of the river water sources every five years.

An assessment of the City's groundwater wells was completed in December 2002. Due to the proximity to potential contaminant sources, the wells north of the American River are considered most vulnerable to sewage collection systems, leaking underground storage tanks, known contaminant plumes, agricultural drainage, gas stations, dry cleaners, metal plating and chemical processing storage facilities, electrical/electronic manufacturing, and automobile repair and body shops. Wells south of the American River are considered vulnerable to leaking underground storage tanks and sewage collection systems.

Copies of the complete assessments are available for review at the City of Sacramento, Department of Utilities, 1395 35th Avenue, or call 916-808-5454 to request a summary of the assessments.

WHAT YOU SHOULD KNOW ABOUT ARSENIC

While your drinking water meets the federal and state standard for arsenic, it does contain low levels of arsenic. The arsenic standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The U.S. Environmental Protection Agency continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

WHAT YOU SHOULD KNOW ABOUT LEAD

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. City of Sacramento, Department of Utilities is responsible for providing high quality drinking water but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for cooking or drinking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the USEPA's Safe Drinking Water Hotline 1-800-426-4791 or at http://www.epa.gov/lead/.

POPULATIONS WITH LOW RESISTANCE

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbial contaminants are available from the USEPA's Safe Drinking Water Hotline at 1-800-426-4791.

CRYPTOSPORIDIUM

Cryptosporidium is a microbial pathogen found in surface water throughout the U.S. Although filtration removes cryptosporidium, the most commonly-used filtration methods cannot guarantee 100-percent removal. 2015-2016 monitoring indicated the presence of these organisms in one out of forty-two samples of our source water. The City's treatment process ensures that the 2-log removal treatment technique MCL required by regulation is met. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Ingestion of cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks; however, immuno-compromised people, infants and small children, and the elderly are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water.

CYANOBACTERIA

Cyanobacteria, common to freshwater ecosystems, can under certain conditions form scum or "blooms" at the surface of a water body. These blooms are capable of producing compounds, some of which can be harmful to human health and others which affect the taste and odor of drinking water. While none of these compounds are presently regulated in drinking water, the City of Sacramento did voluntarily monitor for several of them during 2016.

Microcystins and cylindrospermopsin, which were subject to USEPA Health Advisories, were monitored throughout 2016 but were not detected. Geosmin and 2-Methylisoborneol (MIB) are considered an aesthetic issue; they can give water an earthy, musty taste, even at very low levels and are not removed by conventional treatment processes. Geosmin levels ranged between non-detect and 12 parts per trillion while MIB results ranged between non-detect and 22 parts per trillion in our source water.

WATER QUALITY ANALYSIS RESULTS FOR 2016

Your water meets or exceeds all federal and state drinking water standards.

The following tables show the measured amount of constituents detected in 2016 or in the most recent year sampling was required. Although the City of Sacramento tests for more than 100 substances, this report only lists those detected at or above the federal or state level for reporting.

Key Terms and Abbreviations

µS/cm	**Microsiemens per centimeter;** measure of electrical conductivity.
90th Percentile	The value for which 90 percent of samples had a lower result.
AL	**Action Level:** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.
constituent	A chemical or parameter measured in the water supply.
DBP	**Disinfection By-Products:** Substances that can form during a reaction of a disinfectant with naturally present organic matter in the water.
MCL	**Maximum Contaminant Level:** The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHG (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.
MCLG	**Maximum Contaminant Level Goal:** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.
MRDL	**Maximum Residual Disinfectant Level:** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
MRDLG	**Maximum Residual Disinfectant Level Goal:** The level of drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
NA	**Not Applicable.**
ND	**Not Detected.**
NTU	**Nephelometric Turbidity Units**; measures cloudiness of water.
oocysts/L	**oocysts per liter;** count of organisms.
pCi/L	**Picocuries per liter;** measures radiation.
PHG	**Public Health Goal:** The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.
ppb	**parts per billion;** one ppb is like 3 seconds in 100 years.
ppm	**parts per million;** one ppm is like 32 seconds in one year.
ppt	**parts per trillion;** one ppt is like 3 seconds in 100,000 years.
TOC	**Total Organic Carbon;** a measurement of the potential of water to form DBPs.
TT	**Treatment Technique:** A required process intended to reduce the level of a contaminant in drinking water.

1 Regulated for Public Health - Primary MCL

Constituent	Units	Year Sampled	State or Federal Goal PHG	Highest Amount Allowed MCL	Surface Water		Groundwater		Typical Sources
					Range	Average	Range	Average	
Aluminum	ppm	2014 - 2016	0.6	1[a]	ND	ND	ND - 0.05	ND	Erosion of natural deposits; water treatment chemicals
Arsenic	ppb	2014 - 2016	0.004	10	ND	ND	2.2 - 6.5	3.0	Erosion of natural deposits
Barium	ppm	2014 - 2016	2	1	ND	ND	ND - 0.2	ND	Erosion of natural deposits
Control of DBP Precursors / TOC	ppm	2016	NA	TT	Requirement met		NA		Various natural and man-made sources
Fluoride in source water[b]	ppm	2016	1	2.0	ND	ND	ND - 0.2	0.1	Erosion of natural deposits
Gross Alpha[c]	pCi/L	2012 - 2016	0 (MCLG)	15	ND	ND	ND - 7.8	ND	Erosion of natural deposits
Hexavalent Chromium	ppb	2014 - 2016	0.02	10	ND	ND	ND - 11[d]	5.2	Erosion of natural deposits; industrial wastes
Nitrate (as Nitrogen)	ppm	2016	10	10	ND	ND	ND - 3.4	1.5	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Turbidity	NTU	2016	NA	1 (TT)	0.14[e]		NA	NA	Soil runoff
				Mininum 95% of samples <0.3	100%[f]		NA	NA	

Constituent	Units	Year Sampled	State or Federal Goal PHG	Highest Amount Allowed MCL	Distribution System		Typical Sources
					Range	Average	
Chlorine	ppm	2016	4 (MRDLG)	4.0 (MRDL)	ND[g] - 1.2	0.5	Drinking water disinfectant added for treatment
Fluoride[b]	ppm	2016	1	2.0	ND - 0.9	0.7	Water additive that promotes strong teeth
Haloacetic Acids	ppb	2016	NA	60	4 - 58[h]	42[i]	By-product of drinking water disinfection
Total Coliform Bacteria	% samples positive	2016	0 (MCLG)	5.0%	2.3%[j]		Naturally present in the environment
Trihalomethanes	ppb	2016	NA	80	12 - 80[h]	73[i]	By-product of drinking water disinfection

Constituent	Units	Year Sampled	State or Federal Goal PHG	Action Level	# Of Samples Collected	90th Percentile Level	# Of Sites Exceeding AL	Typical Sources
Lead	ppb	2014	0.2	15	53	ND	0	Internal corrosion of household water plumbing systems; discharge from industrial manufacturing; erosion of natural deposits
Copper	ppm	2014	0.3	1.3	53	ND	0	Internal corrosion of household water plumbing systems; erosion of natural deposits; leaching from wood preservatives

NOTES: (a) Aluminum is also regulated by a secondary MCL of 0.2 ppm. (b) In accordance with State law, the City of Sacramento adjusts the natural levels of fluoride in our water supplies to the optimal level determined by the Centers for Disease Control. More information about fluoridation is available at: http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Fluoridation.shtml (c) Gross alpha is used as a general indicator for the presence of radiological constituents. The gross alpha result for one well was just over half the MCL. As required, the well was then tested for uranium and the result was 4 pCi/L, which is less than the uranium MCL of 20 pCi/L. (d) A single result of 11 ppb was measured on one well during 2016. Ultimately the well was sampled for hexavalent chromium 17 times during the year, with an average result of 6.4 ppb and there were no additional results above the MCL. This indicates that the well is in compliance with the MCL and that the single high result was an anomaly. (e) Value given is the highest individual value measured during 2016. (f) Value given is the lowest monthly percent compliance achieved during 2016. (g) Distribution samples with no detectable chlorine residual undergo further analysis to ensure compliance with microbiological water quality regulations. (h) Range is based on all individual sample values from 2016. (i) Average given is maximum of all locational running annual averages calculated during 2016. (j) Value given is the maximum % positive of any month during 2016.

2 Regulated for Drinking Water Aesthetics - Secondary MCL

Constituent	Units	Year Sampled[a]	State or Federal Goal PHG	Highest Amount Allowed MCL	Water Treatment Plants		Wells		Typical Sources
					Range	Average	Range	Average	
Chloride	ppm	2014 - 2016	NA	500	ND	ND	17 - 66	38	Erosion or leaching of natural deposits
Manganese	ppb	2014 - 2016	NA	50	ND	ND	ND - 29	ND	Leaching from natural deposits
Specific Conductance	µS/cm	2014 - 2016	NA	1600	96 - 160	126	290 - 691	408	Substances that form ions when in water
Sulfate	ppm	2014 - 2016	NA	500	7.2 - 11	9.2	4.4 - 31	11	Erosion or leaching of natural deposits
Total Dissolved Solids	ppm	2014 - 2016	NA	1000	65 - 99	82	198 - 430	292	Erosion or leaching of natural deposits

Constituent	Units	Year Sampled	State or Federal Goal PHG	Highest Amount Allowed MCL	Distribution System		Typical Sources
					Range	Average	
Color	color units	2016	NA	15	1 - 1	1	Naturally occurring organic materials
Turbidity	NTU	2016	NA	5	0.06 - 0.60	0.12	Soil runoff

CITY OF SACRAMENTO DEPARTMENT OF UTILITIES

2017 WATER QUALITY REPORT

A Consumer Confidence Report for the Citizens of Sacramento

WATER EFFICIENCY

Water-use efficiency is a California way of life, and the City of Sacramento continues to encourage water conservation. Find tips to save water and available rebates at **SacWaterWise.com**

Congratulations! Your water meets or exceeds all federal and state drinking water standards.

TRADITION OF EXCELLENCE

Since its founding in 1849, the City of Sacramento has considered water quality of the utmost importance. This Consumer Confidence Report is presented to enhance your understanding of where your water comes from, what it contains, and to confirm that your drinking water continues to meet or exceed all state and federal drinking water standards.

The City of Sacramento, Department of Utilities is dedicated to providing our customers with dependable, high quality water, storm drainage and wastewater services in a fiscally and environmentally sustainable manner. In doing so, we work to conserve and preserve our water sources.

The City takes many steps to ensure high water quality including protecting our source waters, treating the water, operating our distribution system, maintaining facilities and addressing customer concerns. To actively protect water quality, management efforts on watershed, groundwater and water quality are performed.

TEAMWORK: TOGETHER WE CAN PROTECT OUR WATER RESOURCES

The City of Sacramento, Department of Utilities works hard to bring you quality drinking water. Please be careful as you live, work and play to limit what goes into the storm drains and rivers, so we can continue to preserve the quality of the water and our diverse river ecosystem.

City of SACRAMENTO
Department of Utilities

WATER QUALITY ANALYSIS RESULTS FOR 2017

Your water meets or exceeds all federal and state drinking water standards.

The following tables show the measured amount of constituents detected in 2017 or in the most recent year sampling was required. Although the City of Sacramento tests for more than 100 substances, this report only lists those detected at or above the federal or state level for reporting.

Key Terms and Abbreviations

µS/cm	**Microsiemens per centimeter;** measure of electrical conductivity.
90th Percentile	The value for which 90 percent of samples had a lower result.
AL	**Action Level:** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.
Constituent	A chemical or parameter measured in the water supply.
DBP	**Disinfection By-Products:** Substances that can form during a reaction of a disinfectant with naturally present organic matter in the water.
MCL	**Maximum Contaminant Level:** The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHG (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.
MCLG	**Maximum Contaminant Level Goal:** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.
MRDL	**Maximum Residual Disinfectant Level:** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
MRDLG	**Maximum Residual Disinfectant Level Goal:** The level of drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
NA	**Not Applicable.**
ND	**Not Detected.**
NTU	**Nephelometric Turbidity Units**; measures cloudiness of water.
pCi/L	**Picocuries per liter;** measures radiation.
PDWS	**Primary Drinking Water Standard:** MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.
PHG	**Public Health Goal:** The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.
ppb	**parts per billion;** one ppb is like 3 seconds in 100 years.
ppm	**parts per million;** one ppm is like 32 seconds in one year.
ppt	**parts per trillion;** one ppt is like 3 seconds in 100,000 years.
TOC	**Total Organic Carbon;** a measurement of the potential of water to form DBPs.
TT	**Treatment Technique:** A required process intended to reduce the level of a contaminant in drinking water.

1 Regulated for Public Health - Primary MCL

Constituent	Units	Year Sampled	State or Federal Goal PHG	Highest Amount Allowed MCL	Surface Water		Groundwater		Typical Sources
					Range	Average	Range	Average	
Aluminum	ppm	2016 - 2017	0.6	1[A]	ND	ND	ND - 0.05	ND	Erosion of natural deposits; water treatment chemicals
Arsenic	ppb	2016 - 2017	0.004	10	ND	ND	ND - 7.0	2.7	Erosion of natural deposits
Barium	ppm	2016 - 2017	2	1	ND	ND	ND - 0.2	ND	Erosion of natural deposits
Fluoride in source water[B]	ppm	2017	1	2.0	ND	ND	ND - 0.2	0.1	Erosion of natural deposits
Gross Alpha	pCi/L	2012 - 2017	0 (MCLG)	15	ND	ND	ND - 4.9	ND	Erosion of natural deposits
Nitrate (as Nitrogen)	ppm	2017	10	10	ND	ND	ND - 4.3	1.4	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Selenium	ppb	2016 - 2017	30	50	ND	ND	ND - 8.8	ND	Erosion of natural deposits
TOC / Control of DBP Precursors	ppm	2017	NA	2.0 (TT)	1.4		NA		Various natural and man-made sources
Turbidity	NTU	2017	NA	1 (TT)	0.13[C]		NA	NA	Soil runoff
				Minimum 95% of samples <0.3	100%[D]		NA	NA	

Constituent	Units	Year Sampled	State or Federal Goal PHG	Highest Amount Allowed MCL	Distribution System		Typical Sources
					Range	Average	
Chlorine	ppm	2017	4 (MRDLG)	4.0 (MRDL)	ND[E] - 1.3	0.6	Drinking water disinfectant added for treatment
Fluoride[B]	ppm	2017	1	2.0	0.3 - 1.1	0.7	Water additive that promotes strong teeth
Haloacetic Acids	ppb	2017	NA	60	ND - 47[F]	40[G]	By-product of drinking water disinfection
Total Coliform Bacteria	% samples positive	2017	0 (MCLG)	5.0%	1.2%[H]		Naturally present in the environment
Trihalomethanes	ppb	2017	NA	80	ND - 78[F]	72[G]	By-product of drinking water disinfection

Constituent	Units	Year Sampled	State or Federal Goal PHG	Action Level	# of Samples Collected	90th Percentile Level	# of Sites Exceeding AL	Typical Sources
Lead	ppb	2017	0.2	15	62	ND	0	Internal corrosion of household water plumbing systems
Copper	ppm	2017	0.3	1.3	62	0.11	0	Internal corrosion of household water plumbing systems

NOTES: (A) Aluminum is also regulated by a Secondary MCL of 0.2 ppm. (B) In accordance with State law, the City of Sacramento adjusts the natural levels of fluoride in our water supplies to the optimal level determined by the Centers for Disease Control. More information about fluoridation is available at: http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Fluoridation.shtml (C) Value given is the highest individual value measured during 2017. (D) 100% of turbidity measurements were in compliance during 2017. (E) Distribution samples with no detectable chlorine residual undergo further analysis to ensure compliance with microbiological water quality regulations. (F) Range is based on all individual sample values from 2017. (G) Average given is maximum of all locational running annual averages calculated during 2017. (H) Value given is the maximum percent positive of any month during 2017.

2 Regulated for Drinking Water Aesthetics - Secondary MCL

Constituent	Units	Year Sampled	State or Federal Goal PHG	Highest Amount Allowed MCL	Surface Water		Groundwater		Typical Sources
					Range	Average	Range	Average	
Chloride	ppm	2016 - 2017	NA	500	ND	ND	14 - 79	39	Erosion or leaching of natural deposits
Manganese	ppb	2016 - 2017	NA	50	ND	ND	ND - 29	ND	Leaching from natural deposits
Specific Conductance	µS/cm	2016 - 2017	NA	1600	64 - 128	96	290 - 740	421	Substances that form ions when in water
Sulfate	ppm	2016 - 2017	NA	500	5.9 - 13	9	3.3 - 34	11	Erosion or leaching of natural deposits
Total Dissolved Solids	ppm	2016 - 2017	NA	1000	47 - 86	67	198 - 466	297	Erosion or leaching of natural deposits

Constituent	Units	Year Sampled	State or Federal Goal PHG	Highest Amount Allowed MCL	Distribution System		Typical Sources
					Range	Average	
Color	color units	2017	NA	15	ND - 1	1	Naturally occurring organic materials
Turbidity	NTU	2017	NA	5	0.05 - 0.47	0.09	Soil runoff

3 Constituents With No Established MCL

Unregulated constituent monitoring helps determine where certain water constituents occur and whether they should be regulated

Constituent	Units	Year Sampled	PHG	Surface Water		Groundwater		Distribution System	
				Range	Average	Range	Average	Range	Average
Androstene	ppb	2014	NA	ND - 0.00034	ND	ND	ND	NA	NA
Chlorate	ppb	2014	NA	ND	ND	ND	ND	ND - 61	ND
1,4-Dioxane	ppb	2014	NA	ND	ND	ND - 0.2	ND	NA	NA
Hexavalent chromium	ppb	2016 - 2017	0.02[I]	ND	ND	ND - 8.7	4.6	NA	NA
Molybdenum	ppb	2014 - 2015	NA	ND	ND	ND	ND	ND - 1	ND
Strontium	ppb	2014 - 2015	NA	48 - 130	76	180 - 430	273	48 - 370	192
Testosterone	ppb	2014	NA	ND - 0.00026	ND	ND	ND	NA	NA
Vanadium	ppb	2014 - 2015	NA	0.4 - 3	1.4	15 - 41	25	0.4 - 38	14

(I) There is currently no MCL for hexavalent chromium. The previous MCL of 10 ppb was withdrawn on September 11, 2017.

4 Other Parameters of Interest to Customers

Constituent	Units	Year Sampled	Surface Water		Groundwater	
			Range	Average	Range	Average
Alkalinity	ppm	2016 - 2017	19 - 43	31	97 - 226	145
Bicarbonate as HCO_3	ppm	2016 - 2017	23 - 52	37	118 - 276	145
Calcium	ppm	2016 - 2017	8.8 - 17	13	16 - 53	28
Hardness	ppm	2016 - 2017	24 - 51	38	92 - 304	157
Magnesium	ppm	2016 - 2017	1.1 - 3.9	2.5	9.6 - 37	19
Sodium	ppm	2016 - 2017	1.8 - 5.8	3.8	19 - 42	28

WATER QUALITY REGULATIONS

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and it can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

• Microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.

• Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.

• Pesticides and herbicides, that may come from a variety of sources such as agriculture, urban stormwater runoff and residential uses.

• Organic chemical contaminants, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural applications and septic systems.

• Radioactive contaminants, that can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (U.S. EPA) and the California State Water Resources Control Board (State Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the U.S. EPA Safe Drinking Water Hotline at 1-800-426-4791.

POPULATIONS WITH LOW RESISTANCE

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. U.S. EPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbial contaminants are available from the U.S. EPA's Safe Drinking Water Hotline at 1-800-426-4791.

SACRAMENTO'S WATER SOURCE ASSESSMENT

The City of Sacramento has two independent water sources. Our primary water source is surface water from the American and Sacramento Rivers, which provides 72 percent of our water supply. Groundwater provides the remaining 28 percent. Assessments of potential contaminating activities for the City's Sacramento River and American River water sources were completed in 2000 and 2001, and most recently updated in 2015 and 2013 respectively. These reports indicated that both rivers are most vulnerable to contaminants from recreational activities and that the Sacramento River is also most susceptible to agricultural contaminants. The City of Sacramento, along with several other water utilities, updates assessments of the river water sources every five years.

An assessment of the City's groundwater wells was completed in January 2001. Due to the proximity to potential contaminant sources, the wells north of the American River are considered most vulnerable to sewage collection systems, leaking underground storage tanks, known contaminant plumes, agricultural drainage, gas stations, dry cleaners, metal plating and chemical processing storage facilities, electrical/electronic manufacturing, and automobile repair and body shops. Wells south of the American River are considered vulnerable to leaking underground storage tanks and sewage collection systems. Despite these potential vulnerabilities, your water continues to meet or exceed all state and federal drinking water standards.

Copies of the complete assessments are available for review at the City of Sacramento, Department of Utilities, 1395 35th Avenue, or call 916-808-5454 to request a summary of the assessments.

WHAT YOU SHOULD KNOW ABOUT ARSENIC

While your drinking water meets the federal and state standard for arsenic, it does contain low levels of arsenic. The arsenic standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The U.S. Environmental Protection Agency continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

WHAT YOU SHOULD KNOW ABOUT LEAD

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. City of Sacramento, Department of Utilities is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you do so, you may wish to collect the flushed water and reuse it for another beneficial purpose, such as watering plants. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the U.S. EPA's Safe Drinking Water Hotline 1-800-426-4791 or at http://www.epa.gov/lead/.

LEAD TESTING IN SCHOOLS

Recent events in the United States have shown that lead in drinking water remains an on-going public health concern, particularly for children. In 2017, the City of Sacramento responded proactively to a requirement from the California State Water Resources Control Board that public water systems provide assistance with testing water for lead for any local school that requests it. Through outreach efforts and coordinating with local school districts, 531 samples from 112 schools were tested by the end of 2017.

CYANOBACTERIA

Cyanobacteria, common to freshwater ecosystems, can under certain conditions form scum or "blooms" at the surface of a water body. These blooms are capable of producing compounds, some of which can be harmful to human health and others which affect the taste and odor of drinking water. While none of these compounds are presently regulated in drinking water, the City of Sacramento did voluntarily monitor for several of them during 2017.

Microcystins and cylindrospermopsin, which are subject to U.S. EPA Health Advisories, were monitored in 2017 but were not detected. Geosmin and 2-Methylisoborneol (MIB) are considered an aesthetic issue; they can give water an earthy, musty taste, even at very low levels and are not removed by conventional treatment processes. Geosmin levels ranged between non-detect and 3.3 parts per trillion while MIB results ranged between non-detect and 7.9 parts per trillion in our source water.

CRYPTOSPORIDIUM

Cryptosporidium is a microbial pathogen found in surface water throughout the U.S. Although filtration removes cryptosporidium, the most commonly-used filtration methods cannot guarantee 100-percent removal. Monitoring performed between 2015 and 2017 indicated that these organisms were present in one of 24 samples from the Sacramento River and zero of 24 samples from the American River. The City's treatment process ensures that the 2-log removal treatment technique MCL required by regulation is met. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Ingestion of cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks; however, immuno-compromised people, infants and small children, and the elderly are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. Cryptosporidium must be ingested to cause disease, and it may be spread throughmeans other than drinking water.

City of
SACRAMENTO
Department of Utilities

To report a concern

City of Sacramento, Department of Utilities
311 or 916-264-5011
(24 hours a day, 7 days a week)
www.cityofsacramento.org/utilities

For questions about this report contact

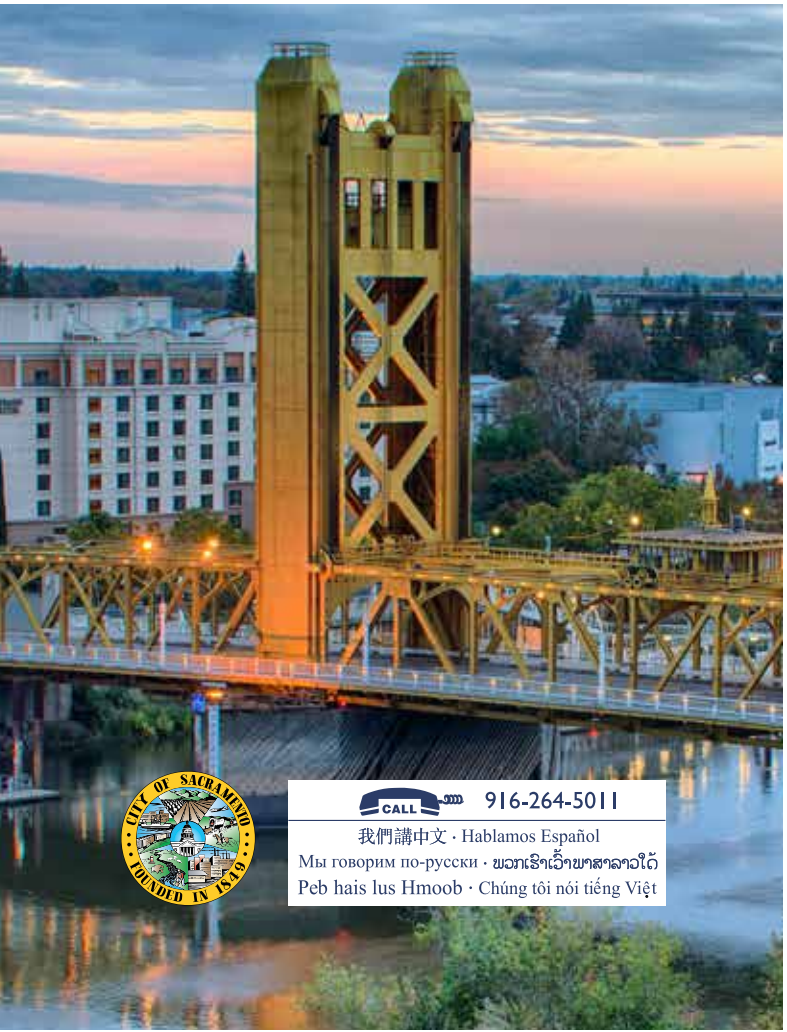
Rory Hartkemeyer
916-808-3737

Additional water quality information is available

U.S. EPA Safe Drinking Water Hotline
1-800-426-4791
http://epa.gov/ground-water-and-drinking-water

Notice of opportunity for public participation

The Sacramento City Council holds public meetings most Tuesdays at 5 p.m. in the City Council Chambers at 915 I Street, Sacramento. You can access Council agendas at www.cityofsacramento.org/clerk.



"هذا التقرير يحتوي على معلوماً ت مهمّة تتعلق بمياه الشفة (أو الشرب).
ترجم التقرير , أو تكلم مع شخص يستطيع أن يفهم التقرير."

Այս զեկույցը պարունակում է կարեւոր տեղեկատվություն Ձեր խմելու ջրով: Թարգմանել այն, կամ խոսել մեկի հետ, ով հասկանում է այն:

此份有關你的食水報告,內有重要資料和訊息,請找
他人為你翻譯及解釋清楚。

此份有关你的食水报告,内有重要资料和讯息,请找
他人为你翻译及解释清楚。

این اطلاعیه شامل اطلاعات مهمی راجع به آب آشامیدنی است.اگر نمیتوانید این اطلاعات را بزبان انگلیسی
بخوانید لطفاً از کسی که میتواند یاری بگیرید تا مطالب را برای شما به فارسی ترجمه کند.

यह सूचना महत्वपूर्ण है ।
कृपा करके किसी से :सका अनुवाद करायें ।

Daimntawv tshaj tawm no muaj lus tseemceeb txog koj cov dej haus. Tshab txhais nws, los yog tham nrog tej tug neeg uas totaub txog nws.

この報告書には上水道に関する重要な情報が記されて
おります。翻訳を御依頼なされるか、内容をご理解なさっ
ておられる方にお尋ね下さい。

របាយការណ៍នេះមានពត៌មានសំខា
ន់អំពីទឹកបរិភោគ ។ សូមបកប្រែ
ឬពិគ្រោះជាមួយអ្នកដែលមើលយល់
របាយការណ៍នេះ ។

이 안내는 매우 중요합니다.
본인을 위해 번역인을 사용하십시요.

ລາຍງານນີ້ມີຂໍ້ມູນສຳຄັນກ່ຽວກັບນ້ຳປະປາຂອງທ່ານ. ຈົ່ງໃຫ້ຄົນອື່ນແປຄວາມໃຫ້ທ່ານ,
ຫລືໃຫ້ປຶກສາກັບຄົນໃດຄົນໜຶ່ງທີ່ເຂົ້າໃຈເລື່ອງ.

Naaiv norm sou maaih jienv nyei fienx gorngv taux meih nyei wuom hopv. Faan fai gorngv bun mienh hiuv duqv.

ਇਹ ਸੂਚਨਾ ਮਹਤੱਵਪੂਰਣ ਹੈ ।
ਕ੍ਰਿਪਾ ਕਰਕੇ ਕਿਸੀ ਤੋ ਇਸ ਦਾ ਅਨੁਵਾਦ ਕਰਾਉ ।

Acest raport conține informații importante despre apa de băut. Traduceți-o sau discutați cu cineva care o înțelege.

Этот отчет содержит важную информацию о вашей питьевой воды. Переведите его или поговорите с тем, кто это понимает.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

Mahalaga ang impormasyong ito. Mangyaring ipasalin ito.

Цей звіт містить важливу інформацію про вашу питну воду. Перекласти його, або поговорити з кимось, хто його розуміє.

Chi tiết này thật quan trọng.
Xin nhờ người dịch cho quý vị.

FOR MORE INFORMATION, VISIT:
www.cityofsacramento.org/utilities

www.facebook.com/SacramentoCityUtilities

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CITY OF SACRAMENTO DEPARTMENT OF UTILITIES

2018 WATER QUALITY REPORT

A Consumer Confidence Report for the Citizens of Sacramento

WATER EFFICIENCY

Water-use efficiency is a California way of life, and the City of Sacramento continues to encourage water conservation. Find tips to save water and available rebates at **SacWaterWise.com**

Your water meets or exceeds all federal and state drinking water standards.

TRADITION OF EXCELLENCE

The City of Sacramento considers water quality of the utmost importance. This Consumer Confidence Report is presented to enhance your understanding of where your water comes from, what it contains, and to confirm that your drinking water continues to meet or exceed all state and federal drinking water standards.

The City of Sacramento, Department of Utilities is dedicated to providing our customers with dependable, high quality water, storm drainage and wastewater services in a fiscally and environmentally sustainable manner. In doing so, we work to conserve and preserve our water sources.

The City takes many steps to ensure high water quality including protecting our source waters, treating the water, operating our distribution system, maintaining facilities and addressing customer concerns.

TEAMWORK: TOGETHER WE CAN PROTECT OUR WATER RESOURCES

Did you know that storm drains flow directly to our creeks and rivers without passing through a treatment facility? Please be careful as you live, work and play to limit what goes into the storm drains, creeks and rivers, so we can continue to preserve the quality of the water and our diverse river ecosystem.

City of SACRAMENTO Department of Utilities

DRINKING WATER SOURCES

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

• Microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

• Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

• Pesticides and herbicides, that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

• Organic chemical contaminants, including synthetic and volatile organic chemicals, that are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.

• Radioactive contaminants, that can be naturally-occurring or be the result of oil and gas production and mining activities.

DRINKING WATER REGULATIONS

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (U.S. EPA) and the State Water Resources Control Board (State Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. State Board regulations also establish limits for contaminants in bottled water that provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the U.S. EPA Safe Drinking Water Hotline 1-800-426-4791.

POPULATIONS WITH LOW RESISTANCE

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. U.S. EPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

ARSENIC IN GROUNDWATER

While your drinking water meets the federal and state standard for arsenic, it does contain low levels of arsenic. The arsenic standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The U.S. Environmental Protection Agency continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

WHAT YOU SHOULD KNOW ABOUT LEAD

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Sacramento is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. [Optional: If you do so, you may wish to collect the flushed water and reuse it for another beneficial purpose, such as watering plants.] If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/lead.

LEAD TESTING IN SCHOOLS

Recent events in the United States have shown that lead in drinking water remains an on-going public health concern, particularly for children. The City of Sacramento responded proactively to state requirements to test for lead in schools and, through outreach efforts and coordinating with local school districts, over 600 samples from 132 schools were tested by the end of 2018.

SOURCE WATER ASSESMENT

The City of Sacramento has two independent water sources. Our primary water source is surface water from the American and Sacramento Rivers, which provides 68 percent of our water supply. Groundwater provides the remaining 32 percent.

Assessments of potential contaminating activities for the City's Sacramento River and American River water sources were completed in 2000 and 2001, and most recently updated in 2015 and 2018 respectively. These reports indicated that both rivers are most vulnerable to contaminants from recreational activities and that the Sacramento River is also most susceptible to agricultural contaminants. The City of Sacramento, along with several other water utilities, updates assessments of the river water sources every five years.

An assessment of the City's groundwater wells was completed in January 2001. Due to the proximity to potential contaminant sources, the wells north of the American River are considered most vulnerable to sewage collection systems, leaking underground storage tanks, known contaminant plumes, agricultural drainage, gas stations, dry cleaners, metal plating and chemical processing storage facilities, electrical/electronic manufacturing, and automobile repair and body shops. Wells south of the American River are considered vulnerable to leaking underground storage tanks and sewage collection systems. **Despite these potential vulnerabilities, your water continues to meet or exceed all state and federal drinking water standards.**

Copies of the complete assessments are available for review at the City of Sacramento, Department of Utilities, 1395 35th Avenue, or call 916-808-5454 to request a summary of the assessments.

CRYPTOSPORIDIUM

Cryptosporidium is a microbial pathogen found in surface water throughout the U.S. Although filtration removes cryptosporidium, the most commonly-used filtration methods cannot guarantee one hundred percent removal. A single sample in 2015 indicated the presence of Cryptosporidium in the Sacramento River before treatment; an additional 47 samples collected from the American and Sacramento Rivers between 2015 and 2017 did not show the presence of these organisms. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Ingestion of Cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immuno-compromised people, infants and small children, and the elderly are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water.

CYANOBACTERIA

Cyanobacteria, common to freshwater ecosystems, can under certain conditions form scum or "blooms" at the surface of a water body. These blooms are capable of producing compounds, some of which can be harmful to human health and others which affect the taste and odor of drinking water. While none of these compounds are presently regulated in drinking water, the City of Sacramento did voluntarily monitor for several of them during 2018.

Microcystins and cylindrospermopsin, which are subject to U.S. EPA Health Advisories, were monitored in 2018 but were not detected. Geosmin and 2-Methylisoborneol (MIB) are considered an aesthetic issue; they can give water an earthy, musty taste, even at very low levels and are not removed by conventional treatment processes. Geosmin levels ranged between non-detect and 8.8 parts per trillion while MIB was not detected during 2018 monitoring (one part per trillion is like 1 second in 33,000 years).

WATER QUALITY ANALYSIS RESULTS FOR 2018

Your water meets or exceeds all federal and state drinking water standards.

The State allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of our data, though representative, are more than one year old. While the City of Sacramento tests for more than 100 substances, this report only lists those detected at or above the federal or state level for reporting.

1 Regulated for Public Health - Primary MCL

Constituent	Unit	Year Sampled	State or Federal Goal PHG	Highest Amount Allowed MCL	Surface Water		Groundwater		Typical Sources
					Range	Average	Range	Average	
Arsenic	µg/L	2017 - 2018	0.004	10	ND	ND	ND - 7.0	2.7	Erosion of natural deposits
Barium	mg/L	2017 - 2018	2	1	ND	ND	ND - 0.2	ND	Erosion of natural deposits
Fluoride in source water[A]	mg/L	2018	1	2.0	ND	ND	ND - 0.2	0.1	Erosion of natural deposits
Gross Alpha	pCi/L	2012 - 2018	MCLG = 0	15	ND	ND	ND - 4.9	ND	Erosion of natural deposits
Nitrate (as Nitrogen)	mg/L	2017 - 2018	10	10	ND	ND	ND - 3.9	1.5	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Selenium	µg/L	2017 - 2018	30	50	ND	ND	ND - 8.8	ND	Erosion of natural deposits
TOC / Control of DBP Precursors	removal ratio	2018	NA	TT = ≥1.0[B]	1.0		NA		Various natural and man-made sources
Turbidity[C]	NTU	2018	NA	TT = 1 NTU	0.10[D]		NA	NA	Soil runoff
				TT = 95% of samples ≤0.3 NTU	100%[E]		NA	NA	

Constituent	Unit	Year Sampled	State or Federal Goal PHG	Highest Amount Allowed MCL	Distribution System		Typical Sources
					Range	Average	
Chlorine	mg/L	2018	MRDLG = 4 (as Cl_2)	MRDL = 4.0 (as Cl_2)	ND[F] - 1.3	0.6	Drinking water disinfectant added for treatment
Fluoride[A]	mg/L	2018	1	2.0	0.3 - 0.9	0.7	Water additive that promotes strong teeth
Haloacetic Acids	µg/L	2018	NA	60	ND - 45[G]	34[H]	By-product of drinking water disinfection
Total Coliform Bacteria	% samples positive	2018	MCLG = 0	5.0%	0.4%[I]		Naturally present in the environment
Trihalomethanes	µg/L	2018	NA	80	ND - 79[G]	59[H]	By-product of drinking water disinfection

Constituent	Unit	Year Sampled	State or Federal Goal PHG	Action Level	# of Samples Collected	90th Percentile Level	# of Sites Exceeding AL	Typical Sources
Lead	µg/L	2017	0.2	15	62	ND	0	Internal corrosion of household water plumbing systems
Copper	mg/L	2017	0.3	1.3	62	0.11	0	Internal corrosion of household water plumbing systems

NOTES: (A) In accordance with State law, the City of Sacramento adjusts the natural levels of fluoride in our water supplies to the optimal level determined by the Centers for Disease Control. More information about fluoridation is available at: http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Fluoridation.shtml (B) Removal ratio greater than or equal to 1.0 indicates that TOC removal requirements were met or exceeded (C) Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system. (D) Value given is the highest individual value measured during 2018. (E) 100% of turbidity measurements were in compliance during 2018. (F) Distribution samples with no detectable chlorine residual undergo further analysis to ensure compliance with microbiological water quality regulations. (G) Range is based on all individual sample values from 2018. (H) Average given is maximum of all locational running annual averages calculated during 2018. (I) Value given is the maximum percent positive of any month during 2018.

2 Regulated for Drinking Water Aesthetics - Secondary MCL

Constituent	Unit	Year Sampled	Highest Amount Allowed MCL	Surface Water		Groundwater		Typical Sources
				Range	Average	Range	Average	
Chloride	mg/L	2017 - 2018	500	ND - 5.0	ND	14 - 79	40	Erosion or leaching of natural deposits
Manganese	µg/L	2017 - 2018	50	ND	ND	ND - 22	ND	Leaching from natural deposits
Specific Conductance	µS/cm	2017 - 2018	1600	89 - 139	114	300 - 740	418	Substances that form ions when in water
Sulfate	mg/L	2017 - 2018	500	7.2 - 13	10	3.3 - 34	11	Erosion or leaching of natural deposits
Total Dissolved Solids	mg/L	2017 - 2018	1000	49 - 74	62	226 - 466	295	Erosion or leaching of natural deposits

Constituent	Unit	Year Sampled	MCL	Distribution System		Typical Sources
				Range	Average	
Color	color units	2018	15	ND - 5	ND	Naturally occurring organic materials
Odor	TON	2018	3	ND - 2	ND	Naturally occurring organic materials
Turbidity	NTU	2018	5	ND - 1	ND	Soil runoff

3 Constituents With No Established MCL

Unregulated constituent monitoring helps determine where certain water constituents occur and whether they should be regulated

Constituent	Unit	Year Sampled	PHG	Surface Water		Groundwater		Distribution System	
				Range	Average	Range	Average	Range	Average
Androstene	µg/L	2014	NA	ND - 0.00034	ND	ND	ND	NA	NA
Chlorate	µg/L	2014	NA	ND	ND	ND	ND	ND - 61	ND
1,4-Dioxane	µg/L	2014	NA	ND	ND	ND - 0.2	ND	NA	NA
Hexavalent chromium	µg/L	2016 - 2017	0.02[J]	ND	ND	ND - 8.7	4.8	NA	NA
Molybdenum	µg/L	2014 - 2015	NA	ND	ND	ND	ND	ND - 1	ND
Strontium	µg/L	2014 - 2015	NA	48 - 130	76	180 - 430	273	48 - 370	192
Testosterone	µg/L	2014	NA	ND - 0.00026	ND	ND	ND	NA	NA
Vanadium	µg/L	2014 - 2015	NA	0.4 - 3	1.4	15 - 41	25	0.4 - 38	14

(J) There is currently no MCL for hexavalent chromium. The previous MCL of 10 µg/L was withdrawn on September 11, 2017.

4 Other Parameters of Interest to Customers

Constituent	Unit	Year Sampled	Surface Water		Groundwater	
			Range	Average	Range	Average
Total Alkalinity	mg/L	2017 - 2018	25 - 36	36	97 - 226	142
Bicarbonate as HCO_3	mg/L	2017 - 2018	30 - 56	43	118 - 276	173
Calcium	mg/L	2017 - 2018	11 - 15	13	16 - 53	28
Hardness	mg/L	2017 - 2018	36 - 54	45	91 - 304	158
Magnesium	mg/L	2017 - 2018	2.2 - 4.5	3.4	9.6 - 37	19
Sodium	mg/L	2017 - 2018	2.2 - 6.1	4.2	19 - 42	28

Key Terms and Abbreviations

µS/cm	**Microsiemens per centimeter;** measure of electrical conductivity
90th Percentile	The value for which 90 percent of samples had a lower result
AL	**Action Level:** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow
Constituent	A chemical or parameter measured in the water supply
DBP	**Disinfection By-Products:** Substances that can form during a reaction of a disinfectant with naturally present organic matter in the water
Cl_2	**Free Chlorine**; chlorine available for disinfection
MCL	**Maximum Contaminant Level:** The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHG (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water
MCLG	**Maximum Contaminant Level Goal:** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency
mg/L	**Milligrams per liter;** equivalent to 1 second in 11.5 years
MRDL	**Maximum Residual Disinfectant Level:** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants
MRDLG	**Maximum Residual Disinfectant Level Goal:** The level of drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants
NA	**Not Applicable**
ND	**Not Detected**
NTU	**Nephelometric Turbidity Units**; measures cloudiness of water
pCi/L	**Picocuries per liter;** measures radiation
PDWS	**Primary Drinking Water Standards: MCLs, MRDLs and treatment techniques (TTs) for contaminants that affect health, along with their monitoring and reporting requirements**
PHG	**Public Health Goal:** The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency
TOC	**Total Organic Carbon;** a measurement of the potential of water to form DBPs
TON	**Theshold Odor Number;** the greatest dilution of a sample with odor-free water that yields a detectable odor
TT	**Treatment Technique:** A required process intended to reduce the level of a contaminant in drinking water
µg/L	**Micrograms per liter**; equivalent to 1 second in nearly 32 years

SACRAMENTO SUBURBAN WATER DISTRICT TABLES

Between July and September, the City of Sacramento water supply was supplemented with groundwater received from Sacramento Suburban Water District (SSWD), representing about 4% of water consumed in 2018. The following tables summarize SSWD's detected constituents in the most recent year they were monitored.

S1 DETECTED PRIMARY DRINKING WATER CONSTITUENTS - Regulated to protect your health

Constituent	Units	MCL	PHG or (MCLG)	SSWD South Service Area Groundwater			Typical Sources
				Range	Average	Sample Date	
Aluminium	PPM	1	0.6	ND-0.15	ND	2017	Some people who drink water containing aluminum in excess of the MCL over many years may experience short-term gastrointestinal tract effects.
Arsenic	PPB	10	0.004	ND-4.8	2.2	2017-2018	Erosion of natural deposits
Barium	PPM	1	2	ND-0.13	ND	2017	Erosion of natural deposits
Dichloromethane	PPB	5	4	ND	ND	2017-2018	Discharge from pharmaceutical and chemical factories; insecticide
Nitrate (as Nitrogen)*	PPM	10	10	ND-6.5	2.0	2018	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits
Tetrachloroethylene (PCE)	PPB	5	0.06	ND	ND	2017-2018	Discharge from factories, dry cleaners, and auto shops (metal degreaser)
Trichloroethylene (TCE)	PPB	5	1.7	ND	ND	2017-2018	Discharge from metal degreasing sites and other factories
Gross Alpha	pCi/L	15	(0)	ND-3.86	ND	2014	Erosion of natural deposits
Combined Radium (Ra226 + Ra228)	pCi/L	5	(0)	ND-2.11	ND	2014	Erosion of natural deposits
Uranium	pCi/L	20	0.43	ND-3.2	ND	2014	Erosion of natural deposits

* Nitrate in drinking water at levels above 10 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 10 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider.

S2 DETECTED SECONDARY DRINKING WATER CONSTITUENTS - Regulated for aesthetic qualities

Constituent	Units	MCL	SSWD South Service Area Groundwater			Typical Sources
			Range	Average	Sample Date	
Aluminium	PPB	200	ND-150	ND	2017	Erosion of natural deposits; residue from some surface water treatment processes
Chloride	PPM	500	2.4-53	20.3	2017	Runoff/leaching from natural deposits
Color	CU	15	ND	ND	2017	Naturally-occurring organic materials
Copper	PPM	1	ND	ND	2017	Internal corrosion of household plumbing; erosion of natural deposits
Iron	PPB	300	ND-250	ND	2017-2018	Leaching from natural deposits; industrial wastes
Manganese	PPB	50	ND-43	ND	2017-2018	Leaching from natural deposits
Odor	TON	3	ND-2	ND	2017	Naturally-occurring organic materials
Specific Conductance	µS/cm	1600	150-530	325	2017	Substances that form ions when in water
Sulfate	PPM	500	1.5-30	9	2017	Runoff/leaching from natural deposits; industrial wastes
Total Dissolved Solids	PPM	1000	110-350	230	2017	Runoff/leaching from natural deposits
Turbidity	NTU	5	ND-0.66	ND	2017	Soil runoff

S3 DETECTED UCMR3 MONITORING CONSTITUENTS

Constituent	Units	SSWD South Service Area Groundwater			Typical Sources
		Range	Average	Sample Date	
1,1-Dichloroethane	PPB	ND	ND	2014-2015	Extraction and degreasing solvent; used in manufacture of pharmaceuticals, stone, clay and glass products; fumigant
1,4-Dioxane	PPB	ND-0.17	ND	2014-2015	Cyclic aliphatic ether; used as a solvent or solvent stabilizer in manufacture and processing of paper, cotton, textile products, automotive coolant, cosmetics, and shampoos
17-beta-Estradiol	PPB	ND	ND	2014-2015	Estrogenic hormone naturally produced in the human body; used in pharmaceuticals
Chlorate	PPB	ND-890	218	2014-2015	Decomposition of Sodium Hypochlorite; disinfection by-product
Chlorodifluoromethane	PPB	ND	ND	2014-2015	Chlorofluorocarbon; occurs as a gas and used as a refrigerant, as a low-temperature solvent and in fluorocarbon resins, especially tetrafluoroethylene polymers
Chromium (total)	PPB	ND-8.2	3.3	2014-2015	Naturally-occurring element; used in making steel and other alloys; Chromium-3 or -6 forms are used for chrome plating, dyes and pigments, leather tanning, and wood preservation
Hexavalent Chromium (dissolved)	PPB	ND-8.2	3.6	2014-2015	Naturally-occurring element; used in making steel and other alloys; Chromium-3 or -6 forms are used for chrome plating, dyes and pigments, leather tanning, and wood preservation
Molybdenum	PPB	ND-2.8	ND	2014-2015	Naturally-occurring element found in ores and present in plants, animals, and bacteria; commonly used form molybdenum trioxide used as a chemical reagent
Strontium	PPB	140-630	276	2014-2015	Naturally-occurring element; historically, commercial use of strontium has been in the faceplate glass of cathode-ray tube televisions to block x-ray emissions
Vanadium	PPB	4.9-21	11.8	2014-2015	Naturally-occurring elemental metal; used as vanadium pentoxide which is a chemical intermediate and a catalyst

S4 ADDITIONAL DRINKING WATER CONSTITUENTS

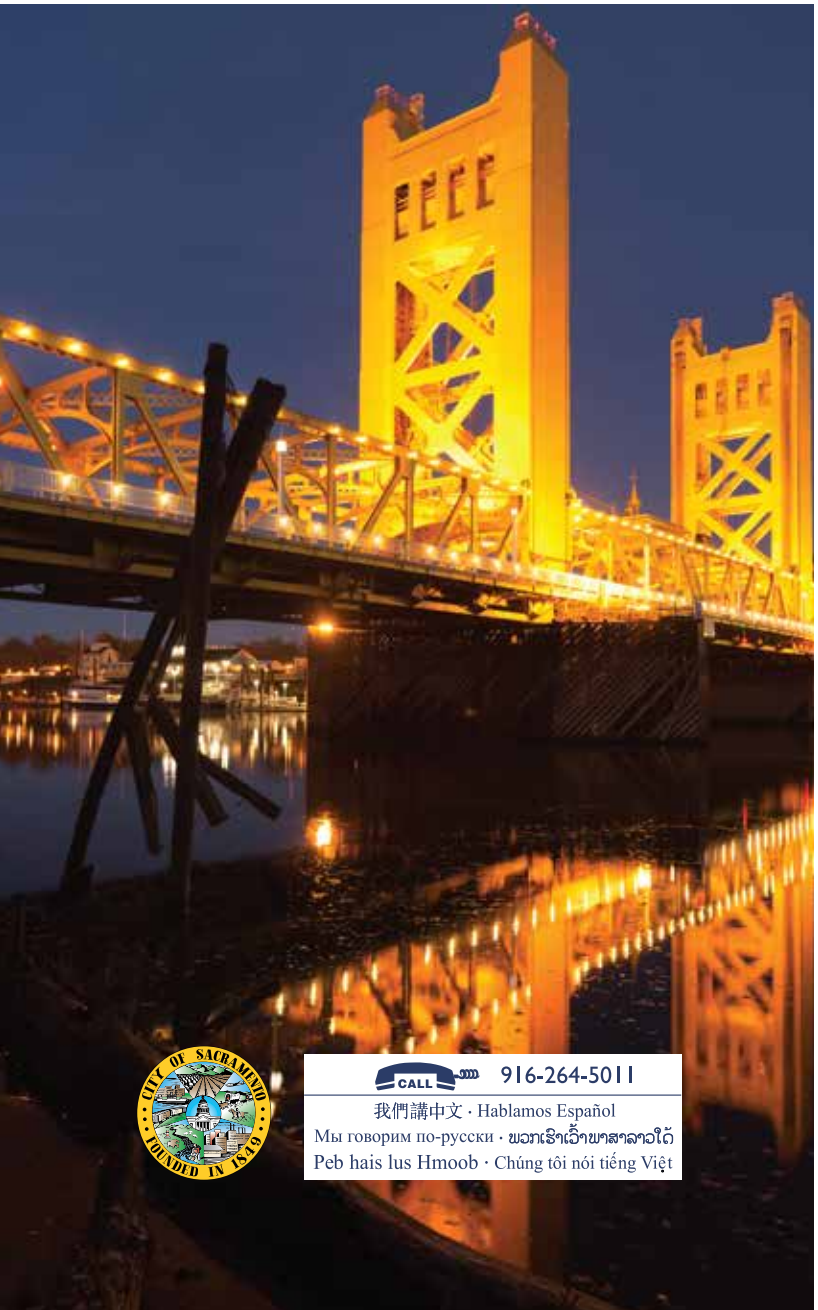
Constituent	Units	SSWD South Service Area Groundwater			Typical Sources
		Range	Average	Sample Date	
Alkalinity	PPM	64-190	116	2017	Leaching from natural deposits
Calcium	PPM	14-43	25	2017	Erosion of natural deposits
Hardness	grains/gallon	3.2-12.9	7.5	2017	Leaching from natural deposits; hardness is the sum of polyvalent cations present in the water, generally naturally-occurring magnesium and calcium
	PPM	55-220	130		
Magnesium	PPM	4.8-29	16.4	2017	Erosion of natural deposits
pH	NONE	7.3-8.1	7.7	2017	Leaching from natural deposits; a measurement of hydrogen ion activity
Sodium	PPM	7.8-23	14	2017	Erosion of natural deposits

To report a concern
City of Sacramento, Department of Utilities
311 or 916-264-5011
(24 hours a day, 7 days a week)
www.cityofsacramento.org/utilities

For questions about this report contact
Rory Hartkemeyer
916-808-3737

Additional water quality information is available
U.S. EPA Safe Drinking Water Hotline
1-800-426-4791
http://epa.gov/ground-water-and-drinking-water

Notice of opportunity for public participation
The Sacramento City Council generally holds public meetings the 1st and 4th Tuesday of the month at 5 p.m., and 2nd Tuesday of the month at 2 p.m. in the City Council Chambers at 915 I Street, Sacramento. You can access Council agendas at www.cityofsacramento.org/clerk.



This report contains important information translations

"هذا التقرير يحتوي على معلومات مهمّة تتعلق بمياه الشفة (أو الشرب).
ترجم التقرير , أو تكلم مع شخص يستطيع أن يفهم التقرير."

Այս զեկույցը պարունակում է կարեւոր տեղեկատվություն Ձեր խմելու ջրով: Թարգմանել այն, կամ խոսել մեկի հետ, ով հասկանում է այն:

此份有關你的食水報告,內有重要資料和訊息,請找
他人為你翻譯及解釋清楚。

此份有关你的食水报告,内有重要资料和讯息,请找
他人为你翻译及解释清楚。

این اطلاعیه شامل اطلاعات مهمی راجع به آب آشامیدنی است.اگر نمیتوانید این اطلاعات را بزبان انگلیسی
بخوانید لطفاً از کسی که میتواند برای بگیرید تا مطالب را برای شما به فارسی ترجمه کند.

यह सूचना महत्वपूर्ण है ।
कृपा करके किसी से :सका अनुवाद करायें ।

Daimntawv tshaj tawm no muaj lus tseemceeb txog koj cov dej haus. Tshab txhais nws, los yog tham nrog tej tug neeg uas totaub txog nws.

この報告書には上水道に関する重要な情報が記されております。翻訳を御依頼なされるか、内容をご理解なさっておられる方にお尋ね下さい。

របាយការណ៍នេះមានពត៌មានសំខាន់អំពីទឹកបរិភោគ ។ សូមបកប្រែ
ឬពិគ្រោះជាមួយអ្នកដែលមើលយល់
របាយការណ៍នេះ ។

이 안내는 매우 중요합니다.
본인을 위해 번역인을 사용하십시요.

ລາຍງານນີ້ມີຂໍ້ມູນສຳຄັນກ່ຽວກັບນ້ຳປະປາຂອງທ່ານ. ຈົ່ງໃຫ້ຄົນອື່ນແປຄວາມໃຫ້ທ່ານ,
ຫລືໃຫ້ປຶກສາກັບຄົນໃດຄົນໜຶ່ງທີ່ເຂົ້າໃຈເລື່ອງ.

Naaiv norm sou maaih jienv nyei fienx gorngv taux meih nyei wuom hopv. Faan fai gorngv bun mienh hiuv duqv.

ਇਹ ਸੂਚਨਾ ਮਹਤੱਵਪੂਰਣ ਹੈ ।
ਕ੍ਰਿਪਾ ਕਰਕੇ ਕਿਸੀ ਤੋ ਇਸ ਦਾ ਅਨੁਵਾਦ ਕਰਾਉ ।

Acest raport conține informații importante despre apa de băut. Traduceți-o sau discutați cu cineva care o înțelege.

Этот отчет содержит важную информацию о вашей питьевой воды. Переведите его или поговорите с тем, кто это понимает.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

Mahalaga ang impormasyong ito. Mangyaring ipasalin ito.

Цей звіт містить важливу інформацію про вашу питну воду. Перекласти його, або поговорити з кимось, хто його розуміє.

Chi tiết này thật quan trọng.
Xin nhờ người dịch cho quý vị.

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