Prepared in cooperation with the Colorado School of Mines, Center for Environmental Risk Assessment; National Institutes of Health/National Institute of Environmental Health Sciences (NIH/NIEHS), National Toxicology Program Laboratory; University of Illinois at Chicago, School of Public Health; U.S. Environmental Protection Agency, National Exposure Research Laboratory; U.S. Environmental Protection Agency, National Health and Environmental Effects Laboratory

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Open-File Report 2018–1098

U.S. Department of the Interior
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Conversion Factors

International System of Units to U.S. customary units

Multiply	By	To obtain
	Length	
centimeter (cm)	0.3937	inch (in.)
millimeter (mm)	0.03937	inch (in.)
	Volume	
liter (L)	33.81402	ounce, fluid (fl. oz)
liter (L)	0.2642	gallon (gal)

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$°F = (1.8 \times °C) + 32.$$

Supplemental Information

Specific conductance is given in microsiemens per centimeter at 25 degrees Celsius (µS/cm at 25 °C).

Concentrations of chemical constituents in water are given either in milligrams per liter (mg/L), micrograms per liter (µg/L), or nanograms per liter (ng/L).

Abbreviations

°C	degrees Celsius
BLYAS	Bioluminescent Yeast Androgen Screen
BLYES	Bioluminescent Yeast Estrogen Screen
CSM	Colorado School of Mines
Da	Dalton
DAI	direct aqueous injection
DCM	dichloromethane
DLBLK	detection level, determined using blank data
DLDQC	detection limit, by the DQCALC procedure
ELISA	enzyme-linked immunosorbent assays
EPA	U.S. Environmental Protection Agency
ESI	electrospray ionization
Et-FOSA	N-ethylperfluoro-1-octanesulfonamide
FOSA	perfluoro-1-octanesulfonamide
FOSAA	perfluoro-1-octanesulfonamidoacetic acid

FTA	fluorotelomer acid
FTS	fluorotelomer sulfonate
GC/MS-MS	gas chromatography/tandem mass spectrometry
GFAAS	graphite furnace atomic absorption spectrometry
GS/MS	gas chromatography/mass spectrometry
HDPE	high-density polyethylene
HLB	hydrophilic lipophilic balanced
HPLC/MS-MS	high-performance liquid chromatography/tandem mass spectrometry
ICP-MS	inductively coupled plasma-mass spectrometry
ICP-OES	inductively coupled plasma-optical emissions spectrometry
IRL	interim reporting level
IS	internal standards
LC/MS-MS	liquid chromatography/tandem mass spectrometry
LOQ	limit of quantitation
Me-FOSA	N-methylperfluoro-1-octanesulfonamide
mg/L	milligrams per liter
mL	milliliter
mm	millimeter
MRL	minimum reporting level
ms	milliseconds
MS-MS	tandem mass spectrometry
NERL	National Exposure Research Laboratory
NFHRL	National Fish Health Research Laboratory
ng/L	nanograms per liter
NHEEL	National Health and Environmental Effects Laboratory
NIH/NIEHS	National Institutes of Health/National Institute of Environmental Health Sciences
NTP	National Toxicology Program
NWQL	National Water Quality Laboratory
OCRL	Organic Chemistry Research Laboratory
OGRL	Organic Geochemistry Research Laboratory
PETG	polyethylene terephthalate glycol
PFAS	per- and polyfluoroalkyl substances
PFBA	perfluorobutyrate acid
PFDoA	perfluoro-n-dodecanoic acid
PFDoS	perfluoro-1-dodecanesulfonate

PFHpA	perfluoro-n-heptanoic acid
PFHpS	perfluoro-1-heptanesulfonate
PFODA	perfluoro-n-octadecanoic acid
PFPeA	perfluoro-n-pentanoic acid
PFPeS	perfluoro-1-pentanesulfonate
PFTeDA	perfluoro-n-tetradecanoic acid
pg	picograms
pH	potential of hydrogen
ppm	parts per million
psi	pounds per square inch
QA/QC	quality assurance and quality control
RCL	Redox Chemistry Laboratory
RLDQC	reporting limit, by the DQCALC procedure
SOP	Standard Operating Procedures
SPE	solid phase extraction
TOF-MS	time of flight-mass spectrometry
µg/L	micrograms per liter
µL	microliter
µm	micrometer
µS/cm	microsiemens per centimeter
USGS	U.S. Geological Survey
V	volts
VOC	volatile organic compounds
WFP	water filtration plants

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Abstract

In 2016, the U.S. Geological Survey (USGS) Environmental Health Mission Area, initiated the Tapwater Exposure Study as part of an infrastructure project to assess human exposure to potential threats from complex mixtures of contaminants. In the pilot phase (2016), samples were collected from 11 States throughout the United States, and in the second phase (2017), the study focused on the Greater Chicago area, including North and South Chicago, Illinois, and East Chicago, Indiana. Residential tapwater samples were collected at private residences during both phases, and during the first phase, samples were collected from Federal office buildings and from one office 19-liter water-bottle source. During the second phase, raw intake and treated (pre-distributional) water samples also were collected from four drinking-water treatment facilities in the Greater Chicago area. Samples were sent to laboratories at the USGS, U.S. Environmental Protection Agency, National Institute of Environmental Health Sciences, and Colorado School of Mines Center for Environmental Risk Assessment, for potential drinking-water pathogens, chemical, and bioassay analyses. These analyses included more than 400 chemicals such as trace elements, steroid hormones, pharmaceuticals, volatile organic compounds, pesticides, per- and polyfluorinated alkyl substances, cyanotoxins, and other organic compounds. The in vitro bioassay analyses included estrogen, androgen, and glucocorticoid receptor activity.

Introduction

A recent study by the U.S. Geological Survey (USGS) and U.S. Environmental Protection Agency (EPA) was conducted to assess potential ecological exposures to aquatic environments from mixtures of organic compounds present in streams across the country (Bradley and others, 2017). Results of the study indicate a wide range of biologically active organic compounds such as pharmaceuticals, steroid hormones, and pesticides. It should be noted that the organic compounds detected in the Nation's streams were measured at low levels (Bradley and others, 2017). A study was conducted by the EPA (Conley and others, 2017a) in which water-quality samples were analyzed to determine if biological effects from these contaminants were evident in human cells. On the basis of the results of these studies as well as concerns regarding exposures to human health, the USGS, in cooperation with the EPA, National Institutes of Health/National Institute of Environmental Health Sciences (NIH/NIEHS), and Colorado School of Mines (CSM), Center for Environmental Risk Assessment Laboratory, Golden, Colorado (herein referred to as CSM), implemented a pilot Tapwater Exposure Study to determine whether these biologically active organic compounds were detected in drinking water. Although municipalities treat and monitor public water supplies, private water supplies are not monitored in the same way. Additionally, monitoring from State and local government stops at the curb, and potential sources of contaminants may be from indoor plumbing. The Tapwater Exposure Study is designed to study the exposure potential to homeowners from drinking water at the point of use.

During the pilot phase of the Tapwater Exposure Study (2016), referred to as Phase I, 11 paired (residential and workplace) drinking-water sources were sampled in 11 States, for a total of 26 sampling sites. Samples were analyzed for more than 400 inorganic and organic compounds. These compounds included trace elements, pharmaceuticals, pesticides, steroid

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hormones and related compounds, per- and polyfluoroalkyl substances (PFASs), and volatile organic compounds (VOCs). This combination of workplace and residential sources of tapwater (including self-supply and public sources) encompasses multiple exposure pathways.

During the second year of the study (2017), referred to as Phase II, the USGS, EPA, NIEHS, and CSM collaborated with the University of Illinois at Chicago and other nongovernmental agencies to increase the number of sampling locations and participants. Phase II participants included 45 residential sampling locations and 4 water filtration plants (WFPs) in Chicago, Illinois, and East Chicago, Indiana. Samples from the WFPs were collected from the raw-water intake at Lake Michigan and from a treated-water source within the facility prior to distribution.

Purpose and Scope

This report describes the sampling site selection and sampling and analytical methods used for Phases I and II of the USGS Environmental Health Mission Area, Tapwater Exposure Study. Phase I of the study was conducted in 2016, in 11 States throughout the United States, and Phase II was conducted in 2017 and was focused solely on neighborhoods in Chicago, Illinois, and East Chicago, Indiana. Phase II was planned and implemented in cooperation with the University of Illinois at Chicago and other nongovernmental agencies. The study was designed to capture a “snap shot” of potential contaminants to which an individual may be exposed in tapwater and to gain a better understanding of the chemical or biological exposures an individual encounters on a daily basis. Therefore “first-flush” protocols were not utilized.

Methods

The description of the sampling site selection, sampling protocols, and analytical methods are provided below.

Sampling Site Selection

Sampling sites were selected for Phase I by volunteer USGS employees to ensure national distribution and a cross section of public/self-supply and paired home/workplace settings. Twenty-six samples were collected in 11 States (table 1) between May and September 2016. These samples were collected from both public and self-supply sources, which included treated and untreated groundwater and surface water and commercial sources (primary source unknown).

Sampling sites for Phase II (2017) were selected in conjunction with the University of Illinois at Chicago and nongovernmental agencies in Chicago, Illinois, and East Chicago, Indiana. Residential samples were collected from 15 sites in East Chicago, Indiana, on August 28 and 30, and September 11, 2017 (table 1). Four additional samples and one quality-assurance sample were collected twice from two City of East Chicago WFPs on August 29 and September 12, 2017. Samples collected at the two City of East Chicago WFPs include water from a raw-water intake and a source of treated water prior to distribution. In Chicago, Illinois, 30 samples were collected from residential taps on November 27 and 28, and December 4–6, 2017. Raw and treated water-quality samples (along with quality-assurance samples) were also collected twice at two City of Chicago WFPs on July 19, 2017, and November 29, 2017. Source water for both of the WFP sampling sites is from Lake Michigan.

Residential tapwater station names and identification numbers are anonymized. Latitude and longitude location data are generalized and do not indicate exact sample site location for security and protection of personally identifiable information.

Sampling Methods

Sampling methods followed basic guidelines in the USGS National Field Manual (U.S. Geological Survey, variously dated) regarding sample cleanliness, bottle labeling and handling, and sample preservation. For Phase I, detailed sampling Standard Operating Procedures (SOPs), which were developed on the basis of protocols outlined in the USGS National Field Manual and which described proper sample-handling procedures, bottle filling order, and analytical method requirements, were provided to the project personnel collecting the samples. Those conducting the sampling were instructed to don clean, nitrile gloves prior to creating a clean workspace on adjacent counter tops. The instructions included prompts to indicate when donning a new set of clean gloves and laying out new, clean workspace covers was necessary. Samples were collected from the kitchen tap into appropriately cleaned and (or) rinsed bottles, according to the SOPs that were provided. Kitchen taps were not prepared or cleaned prior to sampling, because the purpose of the study was to determine “normal, everyday exposure” for an individual. Bottles used in sample collection for PFAS analyses in Phase I were prewashed by sampling personnel prior to sample collection (first with soap and water, followed by tapwater, then three deionized water rinses, and finished with a methanol rinse before being air dried and bagged). Subsequent analyses (Phase II) for PFAS samples were performed at multiple laboratories and each laboratory provided pre-cleaned sample containers. Bottle filling began immediately after the tap was turned on; care was taken to ensure the bottles did not come in contact with the surface of the tap. For samples collected from treated-water sources (public water supplies), ascorbic acid was added to the VOC and pharmaceutical sample collection bottles to neutralize the effects of chorine or chloramine that may have been introduced during the drinking-water disinfection process. All samples were filtered and preserved when required, placed into two self-closing plastic bags, placed on ice in a cooler lined with plastic bags, and shipped overnight to participating laboratories. Additional filtering may have been performed at the laboratories, depending on the analytical method requirements. Measured qualities of water, collectively referred to as field parameters, include temperature, measured in degrees Celsius (°C); dissolved oxygen, measured in milligrams per liter (mg/L); specific conductance, measured in microsiemens per centimeter (µS/cm); and the potential of hydrogen (pH), measured in units of moles per liter of hydrogen ions. These field parameters were measured one time at each sampling site, following bottle filling, using a multiparameter instrument. Measurements were taken from an open container with the water flowing. Total sample collection time, including the measurements of field parameters, was approximately 20 to 30 minutes. Notes were taken as to whether samples were collected directly from the tap or from a point-of-use filtration system (table 1). For the sample collected from the commercial 19-liter water-bottle source, the water cooler nozzle was only activated during bottle filling and was not allowed to run the entire sampling period.

For Phase II, updated protocols were provided to sampling personnel with adjustments made on the basis of experience gained from Phase I sampling. Although the sampling methods remained the same with regard to sampling cleanliness, bottle labeling and handling, and preservation, some analytical methods were deleted or added, and those adjustments are outlined in the Analytical Methods section. As in Phase I, samples were collected either directly from the tap or from a point-of-use filtration system and were noted (table 1). No information was collected pertaining to materials in residential plumbing or service lines providing water to the residence taps. Samples from raw intake water at WFPs were collected using a dipper water-sampling device provided by the facility, and sample bottles were handled and filled as instructed in SOPs. Treated (pre-distribution) water samples at the WFPs were collected from a tap, using the same procedures as for residential samples.

Analytical Methods

Water-quality chemical and bioassay samples collected during Phases I and II were sent to USGS, EPA, NIEHS, and CSM laboratories for analyses. Microbiological samples were collected and sent to the USGS Michigan Water Science Center Bacteriological Research Laboratory in Lansing, Michigan.

Chemical Analyses

Water-quality samples collected during Phases I and II were sent to the USGS National Water Quality Laboratory (NWQL) in Denver, Colorado; the USGS Organic Geochemistry Research Laboratory (OGRL) in Lawrence, Kansas; the USGS Organic Chemistry Research Laboratory (OCRL) in Sacramento, California; the EPA National Exposure Research Laboratory (NERL) in Research Triangle Park, North Carolina; the EPA National Health and Environmental Effects Laboratory (NHEEL) in Research Triangle Park, North Carolina; the NIEHS National Toxicology Program (NTP) Laboratory in Research Triangle Park, North Carolina; and the CSM Laboratory in Golden, Colorado. Modifications for Phase II required the discontinuation of certain analytical methods and the addition of others, requiring that additional samples be sent to the NWQL and the USGS Redox Chemistry Laboratory (RCL) in Boulder, Colorado. These changes are outlined below, and a complete list of analytical laboratories, methods, and compounds are provided in table 2. Definitions of, and procedures used to determine reporting levels for participating laboratories can be found in NWQL Technical Memorandum 15.02 (U.S. Geological Survey, 2015) and Armbruster and Pry (2008).

National Water Quality Laboratory (NWQL), Denver, Colorado

The NWQL analyzed water-quality samples for steroid hormones and related compounds; human-use pharmaceuticals, pharmaceutical metabolites, and selected polar organic compounds; heat and ambient purgeable VOCs; selected trace elements and nitrate plus nitrite; and PFASs.

Steroid Hormones and Related Compounds (Phase I only)

Unfiltered samples were analyzed for 20 steroid hormone and related compounds, including natural and synthetic estrogen and androgen compounds, natural and synthetic progestin compounds, sterols, and Bisphenol A (table 2). Samples were collected in 500-milliliter (mL), clear, high-density polyethylene (HDPE) bottles. Concentrations were determined using solid phase extraction (SPE) and gas chromatography/tandem mass spectrometry (GC/MS-MS) (Foreman and others, 2012). Concentrations are reported in nanograms per liter (ng/L). Results are reported using the interim reporting levels (IRL) and minimum reporting levels (MRL) methods. The following isotope dilution standards were used as part of the internal laboratory quality assurance and quality control (QA/QC): 16-Epiestriol-2,4-d2; 17-alpha-Ethynylestradiol-2,4,16,16-d4; 17-beta-Estradiol-13,14,15,16,17,18-13C6; Bisphenol F-d10; Bisphenol-A-d16; Cholesterol-d7; cis-Androsterone-2,2,3,4,4-d5; Estriol-2,4,16,17-d4; Estrone-13,14,15,16,17,18-13C6; Medroxyprogesterone-d3; Mestranol-2,4,16,16-d4; tt-16,16,17-d3; Progesterone-2,3,4-13C3; and trans-Diethyl-1,1,1',1'-d4-stilbesterol-3,3',5,5'-d4. Results for these surrogate standards are reported in percent.

Human-Use Pharmaceuticals, Pharmaceutical Metabolites, and Selected Polar Organic Compounds (Phases I and II)

Filtered samples were analyzed for 113 human-use pharmaceuticals, pharmaceutical metabolites, and selected polar organic compounds (table 2). Samples were collected in 20-mL, amber, glass vials and were filtered in the field using a 25-millimeter (mm), 0.7-micrometer (µm), glass fiber, syringe-tip filter. Samples were analyzed using direct injection high-performance liquid chromatography/tandem mass spectrometry (HPLC/MS-MS), operated in positive ion mode (Furlong and others, 2014). Concentrations are reported in nanograms per liter. Results are reported using the RLDQC method (reporting limit by the DQCALC procedure; U.S. Geological Survey, 2015). The following isotope dilution standards were used as part of the internal laboratory QA/QC: Amitriptyline-d3, Carisoprodol-d7, Erythromycin-13C-d3, Ezetimibe-d4, Fenofibrate-d6, Fexofenadine-d10, Fluvoxamine-d4, Hydrocortisone-13C3, Ketoconazole-d4, Loperamide-d6, Loratadine-d4, Lorazepam-d4, N-Desmethyldiltiazem-d4, Oxazepam-d5, Promethazine-d6, Propoxyphene-d11, Raloxifene-d10, Ranitidine-d6, Tamoxifen-d5, Tiotropium-d3, and Verapamil-d6. Results for these surrogate standards are reported in percent.

Heat Purgeable Volatile Organic Compounds (Phase II only)

Samples were analyzed for 37 VOCs, using the heat purgeable method outlined in Rose and others (2016) (table 2). Samples were collected in three, 40-mL, glass, amber vials, which contained ascorbic acid when samples were taken from a treated water source, then preserved with hydrochloric acid and placed on ice. Helium was used to purge the sample of VOCs in order to trap them in an appropriate tube for analysis. For the heat purgeable method, samples were heated to 60 °C, then VOCs were purged from water samples by using helium. Results were determined using gas chromatography/mass spectrometry (GS/MS), with full scan/selected ion monitoring. Concentrations are reported in micrograms per liter (µg/L). The reporting level procedure used for this method is RLDQC and MRL (table 2). The following isotope dilution standards were used as part of the internal laboratory QA/QC: 1,2-Dichloroethane-d4; 1-Bromo-4-fluorobenzene; Isobutyl alcohol-d6; Tetrahydrofuran-d8; and Toluene-d8. Results for these surrogate standards are reported in percent.

Ambient Purgeable Volatile Organic Compounds (Phases I and II)

Whole-water samples were analyzed for 49 ambient purgeable VOCs by using gas chromatography (table 2). Samples were collected in three, 40-mL, glass, amber vials, which contained ascorbic acid when samples were taken from a treated water source, then preserved with hydrochloric acid and placed on ice. In brief, helium was used to remove VOCs from water samples at ambient temperature. The purged VOCs were trapped in a tube, desorbed, and prepared for analysis by GC/MS (Rose and others, 2016). Concentrations are reported in micrograms per liter. The reporting level procedure used for this method is RLDQC and MRL (table 2). The following isotope dilution standards were used as part of the internal laboratory QA/QC: 1-Bromo-3-chloropropane-d6, 1-Bromo-4-fluorobenzene, and Toluene-d8. Results for these surrogate standards are reported in percent.

Selected Trace Elements (Phases I and II) and Nitrate plus Nitrite (Phase II only)

Whole-water samples were analyzed for 19 trace elements (table 2). The methods are described in Hoffman and others (1996) and Fishman and Friedman (1989). Samples were collected in 250-mL, acid-rinsed HDPE bottles and acidified with ultra-pure nitric acid. At the laboratory, samples were digested with hydrochloric acid, heated, and analyzed by inductively coupled plasma-mass spectrometry (ICP-MS) or by atomic absorption (cadmium and calcium) as described in Fishman and Friedman (1989) and Hoffman and others (1996). The reporting level type used by the NWQL varies by analyte (table 2). The reporting level type used to report lead concentrations is DLBLK, meaning the detection level is determined using blank data.

Nitrate plus nitrite was analyzed using methods described in Patton and Kryskalla (2011). Samples were collected in a 10-mL vacuum tube and immediately placed on ice. Briefly, results of filtered water-quality samples were analyzed for nitrate plus nitrite using enzymatic reduction and colorimetric determinative methods. Concentrations are reported in milligrams per liter. Results are reported using the DLDQC procedure (detection limit by the DQCALC procedure; U.S. Geological Survey, 2015).

Per- and Polyfluroalkyl Substances (PFAS, Phases I and II)

Samples were analyzed for 11 perfluorocarboxylic acids and 5 perfluorosulfonic acids by direct aqueous injection, liquid chromatography/tandem mass spectrometry (DAI-LC/MS-MS) (table 2). Subsamples (30 mL each) were taken from PFAS samples analyzed by the CSM and stored in high-density polyethylene bottles at –4 °C prior to analysis. An 850-microliter (µL) aliquot of each raw, unfiltered sample was transferred to a polypropylene liquid chromatograph vial, amended with eight stable-isotope labeled internal standards (IS), and brought to a final volume of 950 µL with methanol. Standards were prepared with corresponding amounts of IS and methanol. Samples were analyzed by injecting 20 µL to a triple-quadrupole LC/MS-MS system modified to minimize background PFAS contamination, separating with a methanol/water/ammonium acetate gradient on a reversed-phase porous shell column, and monitoring at least two distinct precursor-product transition ions for quantitation and confirmation. Calibration and quantitation were conducted using isotope-dilution quantification over a range of 1 to 1,000 ng/L.

USGS Organic Geochemistry Research Laboratory (OGRL), Lawrence, Kansas

The OGRL analyzed water-quality samples for glyphosate, glufosinate, and aminomethylphosphonic acid; steroid hormones and phytoestrogens; acetamide herbicides and degradation products; selected antibiotics; and cyanotoxins. Samples for glyphosate, glufosinate, and aminomethylphosphonic acid; steroid hormones, hormone conjugates, and phytoestrogens; acetamide herbicides and degradation products; and selected antibiotics analyses were collected in 1,000-mL, glass, amber, baked bottles and immediately placed on ice. The reporting level procedure used by the OGRL is Limit of Quantitation (LOQ) for all methods.

Glyphosate, Glufosinate, and Aminomethylphosphonic acid (Phase I only)

Samples were analyzed for glyphosate, glufosinate, and aminomethylphosphonic acid (table 2). Samples were filtered at the laboratory upon receipt. Samples were extracted onto SPE cartridges, and the SPE cartridges were rinsed with 500 µL of deionized water. All sample extracts were analyzed by LC/MS-MS with electrospray ionization (ESI) in negative-ion mode using multiple reaction monitoring (Meyer and others, 2009). Concentrations are reported in micrograms per liter.

Steroid Hormones, Hormone Conjugates, and Phytoestrogens (Phases I and II)

Samples were analyzed for 57 steroid hormones, hormone conjugates, progestins, mycotoxins, androgens, and phytoestrogens (table 2). The method is described in Yost and others (2014) and briefly described here. The method was modified to include the analyses of progestins and mycotoxins (table 2). Samples were filtered in the laboratory upon receipt, processed with SPE using 200 milligrams (mg) hydrophilic lipophilic balanced (HLB) cartridges (Waters Corp., Milford, Massachusetts), eluted with methanol, and analyzed using ultra-pure LC/MS-MS. Concentrations are reported in nanograms per liter.

Acetamide Herbicides and Degradation Products (Phases I and II)

Samples for 33 acetamide herbicides and associated degradates were analyzed using an online SPE LC/MS-MS with ESI and positive- and negative-ion switching modified from the USGS-approved method of Lee and Strahan (2003) (table 2). Samples were filtered upon receipt at the laboratory. Concentrations are reported in micrograms per liter.

Selected Antibiotics (Phases I and II)

Samples were analyzed for five groups of antibiotic compounds (fluoroquinolines, macrolides, sulfonamides, tetracyclines, and pharmaceuticals [carbamazepine and ibuprofen]) plus chloramphenicol, lincomycin, ormetoprim, and trimethoprim (table 2). Samples were analyzed using a method modified from Meyer and others (2007). Samples were filtered in the laboratory upon receipt. Samples were extracted using SPE, and concentrations were determined using ultra-pressure LC/MS-MS with ESI using multiple reaction monitoring. Except for chloramphenicol and ibuprofen, samples were analyzed in positive-ion mode (USGS OGRL, written commun., 2014). Concentrations are reported in micrograms per liter.

Cyanotoxin Screening (Phase II only)

Screening for cyanotoxins (cylindrospermopsins, microcystins, saxitoxins, and domoic acid) was performed using the enzyme-linked immunosorbent assays (ELISA) (table 2). A description of the samples screened for cyanotoxins and the ELISA method can be found in Loftin and others (2016) and Graham and others (2010). Samples were collected in two 40-mL, glass vials or two 125-mL, sterile, polyethylene terephthalate glycol (PETG) bottles and shipped on ice to the analyzing laboratory. Samples were treated in the field with either ascorbic acid (samples collected on July 19, 2017, were also collected in replicate with no treatment) or sodium thiosulfate. Concentrations are reported in micrograms per liter.

USGS Organic Chemistry Research Laboratory (OCRL), Sacramento, California

The OCRL analyzed water-quality samples for current-use pesticides and pesticide degradates, diuron and diuron degradates and neonicotinoid insecticides, and disinfection by-products. The methods are briefly summarized below. During Phase I, samples were collected in three, 1,000-mL, amber, glass, baked bottles and placed on ice; for Phase II, samples were collected in one, 1,000-mL, amber, glass, baked bottle and placed on ice.

Pesticides and Pesticide Degradates (Phases I and II)

Filtered samples were analyzed for 60 pesticides and pesticide degradates (table 2). Samples were spiked as required, extracted using SPE, dried, and then eluted with ethyl acetate. Finally, samples were reduced to 200 µL, and an internal standard was added. Concentrations were determined using GC/MS and are described in Hladik and others (2008; additional compounds were added to the method post-publication and are noted in table 2 of the current report). Concentrations are reported in nanograms per liter. The following isotope dilution standards were used as part of the internal laboratory QA/QC: 13C Atrazine, 13C Fipronil, and d-Trifluralin. Results for these surrogate standards are reported in percent.

Diuron and Diuron Degradates and Neonicotinoid Insecticides (Phases I and II)

Filtered samples were analyzed for the herbicide diuron and three diuron degradates and six neonicotinoid insecticides (table 2). Samples were spiked with surrogate standards monuron (Chem Service, West Chester, Pennsylvania) and (or) imidacloprid-d_4 (Cambridge Isotope Laboratories, Andover, Massachusetts). The samples were then extracted using SPE, dried, and eluted with dichloromethane (DCM) and acetone. Finally, the elution was dried to less than 0.2 mL, and an IS

($^{13}C_3$-caffeine) was added. Extracted samples were analyzed using LC/MS-MS (Hladik and Calhoun, 2012; additional compounds were added to the method post-publication and are noted in table 2 of the current report). Concentrations are reported in nanograms per liter. The following isotope dilution standards were used as part of the internal laboratory QA/QC: Imidacloprid-d4 and monuron. Results for these surrogate standards are reported in percent.

Disinfection By-Products (Phase I only)

Filtered samples were analyzed for 28 disinfection by-products (table 2). Samples were spiked with surrogate standards 1-bromo-4-fluorobenzene and 1,2-dichlorobenzene-d4 and extracted using SPE within 48 hours. Extracts were then dried and eluted with 10 mL of methyl tert-butyl ether and reduced to 400 µL. Finally, 1-chlorooctane internal standard was added. Extracts were analyzed using GC/MS (Hladik and others, 2014). Concentrations are reported in nanograms per liter. The following isotope dilution standards were used as part of the internal laboratory QA/QC: 1-bromo-4-fluorobenzene and 1,2-dichlorobenzene-d4. Results for these surrogate standards are reported in percent.

USGS Redox Chemistry Laboratory (RCL), Boulder, Colorado (Phase II only)

Hexavalent chromium and total chromium, along with a suite of cations, anions, and trace elements, were analyzed at the RCL (table 2). Samples were collected in two 2-mL centrifuge tubes for each analysis. Hexavalent chromium was separated from trivalent chromium in the field, using a disposable cation-exchange cartridge and syringe/filter assemblage and preserved with hydrochloric acid (Ball and McCleskey, 2003). These speciated samples were later analyzed at the laboratory, using cation exchange with a Zeeman-corrected graphite furnace atomic absorption spectrometry (GFAAS) method as described in Ball and McCleskey, 2003.

Whole-water samples were analyzed for 32 trace elements and alkalinity. Samples were collected in a 125-mL, HDPE bottle and placed on ice. Cations and trace elements were analyzed using inductively coupled plasma-optical emissions spectrometry (ICP-OES), anions were analyzed using ion chromatography, and alkalinity was analyzed using an automated titration, with first derivative near pH 4.5 (Pfaff, 1993; EPA, 2014). Trace element cations and anions are reported in milligrams per liter, and alkalinity in milligrams per liter of bicarbonate. Lead concentrations were also analyzed by GFAAS and results are reported in micrograms per liter (Hergenreder, 2011). This method reports data based on Method Detection Levels.

EPA National Exposure Research Laboratory (NERL; Phases I and II)

Samples for per- and polyfluoroalkyl substances (PFASs) were collected in three 15-mL Falcon tubes and frozen during Phase I and in one 500-mL polyethylene bottle (with ascorbic acid added for treated water samples) in Phase II and placed on ice. Samples were analyzed using an SPE specially prepared for the retention of these compounds. After samples were eluted, concentrated, and buffered as described in the analytical SOPs, analyses were performed using ultra-high performance liquid chromatography-tandem mass spectrometry, operated in ESI (EPA, 2017). Concentrations are reported in nanograms per liter (table 2).

Colorado School of Mines (Phases I and II)

During Phase I, aliquots (approximately 7 mL) from 1-liter (L) tapwater samples were transferred to new, pre-weighed 15-mL polypropylene Falcon tubes for PFAS analysis. All remaining sample preparation was done within the vessel. The weight of the tube was recorded after sample collection to measure subsample volume gravimetrically. During Phase II, samples were collected directly into triplicate 15-mL polypropylene Falcon tubes. Each sample was diluted so that the water sample made up 64 percent of the total volume, with 23 percent Optima HPLC-grade methanol (Fisher Scientific), 3 percent of 0.01 percent Optima HPLC-grade ammonium hydroxide (Fisher Scientific, Fair Lawn, New Jersey) in Optima HPLC-grade water (Fisher Scientific), and 10 percent Optima HPLC-grade isopropanol (Fisher Scientific). Internal standards (labeled PFASs in methanol and isopropanol; appendix 1) were spiked directly into the vessel at 74 ng/L. Each sample was then homogenized by vortexing for 15–20 seconds and centrifuged at 4,000 revolutions per minute (rpm) for 10 minutes. A 1.35-mL aliquot was transferred to a 2-mL autosampler vial for analysis. Samples were kept refrigerated until analysis.

Laboratory method blanks (IS added) and method double blanks (no internal standard added) followed the same procedure used for the tapwater samples and were processed in vials, in new pre-weighed 15-mL polypropylene Falcon tubes. An additional set of double blanks prepared directly in autosampler vials were included in the analysis to check for instrumental contamination. Quality control samples were also prepared directly in autosampler vials. The QC samples consisted of 300 picograms (pg) of all target analytes and 100 pg of all internal standards brought to 1.35 mL with the same solvent mix as samples and blanks. Blanks, double blanks, and QC samples in HPLC vials were kept refrigerated until analysis.

The 7-mL in-vessel sample preparation method was demonstrated to achieve recoveries ±30 percent of known concentrations (mean range 75–113 percent) for all targeted PFASs except perfluoro-n-octadecanoic acid (PFODA; 34±14 percent) and 10:2 FTS (fluorotelomer sulfonate, 133±5 percent) via a spike recovery test in which six replicate 7-mL samples of HPLC-grade water were spiked with the target analytes and carried through the protocol (appendix 2). Perfluoro-n-octadecanoic acid and perfluorobutyrate acid (PFBA) were not included in the final analyte list for water samples analyzed in this study because of recovery issues and chromatographic issues, respectively.

High-Performance Liquid Chromatography

A 1-mL aliquot of each water sample was injected on a SCIEX ExionLC HPLC system using a Gemini C18 analytical column (3 mm × 100 mm × 5 µm; Phenomenex, Torrance, California) preceded by one SecurityGuard C18 Guard Cartridge (4 mm × 2 mm I.D.; Phenomenex) and two Zorbax DIOL guard columns (4.6 mm × 12.5 mm × 6 µm; Agilent, Santa Clara, California). The column oven was held at 40 °C. The aqueous mobile phase (A) was 20 millimolar ammonium acetate (Fisher Scientific) in Optima HPLC-grade water, and the organic mobile phase (B) was 100 percent Optima HPLC-grade methanol. Eluent flow rate was held at 0.60 milliliters per minute (mL/min). Eluent composition was ramped from 90 percent A to 50 percent A over the first 0.5 minutes, then to 1.0 percent A at 8 minutes and held until 13 minutes, then ramped to 90 percent A at 13.5 minutes and held to 20 minutes.

Quadrapole Time of Flight-Mass Spectrometry (QTOF-MS)

Per- and polyfluoroalkyl substances were measured on a SCIEX X500R QTOF-MS system (Framingham, Massachusetts), using ESI in negative mode with SWATH Data-Independent Acquisition for both time of flight-mass spectrometry (TOF-MS) and MS-MS modes. Precursor ion data were collected for m/z (ratio of an ion’s mass number in atomic mass units to its charge number) 100–1,200 for 1,283 cycles with a total scan time of 842 milliseconds (ms) and accumulation time of 20 ms, with ion spray voltage set at –4,500 volts (V) and temperature set to 550 ºC. The ion source, curtain, and collision (CAD) gas were set to 60 pounds per square inch (psi), 35 psi, and 10 psi, respectively. The collision energy was set to –5 V and the declustering potential to –20 V, both with no spread. Product ion (MS-MS) scanning was conducted for m/z 50–1,200 Dalton (Da). The accumulation time for each SWATH window was 50 ms, and collision energy was –35 V with 30V spread. The instrument was mass calibrated every five injections using SCIEX ESI Negative Calibration Solution.

Data Acquisition Parameters

Quantitative Analysis

A list of target analytes and IS used for quantitation is provided in appendix 1. All labeled and unlabeled analytical standards were purchased from Wellington Laboratories (Guelph, Ontario). Concentrations of target analytes were corrected for internal standard recovery.

Data acquisition and processing were done using SCIEX OS Version 1.2 to quantify targeted analytes. Initial integration parameters included defining 90 percent of lowest-intensity peaks as noise and using a baseline-subtract window of 2 minutes, a minimum peak intensity of 100, and a peak width of 3 points. Some peaks with peak intensity below the threshold were manually integrated where retention time, accurate mass, and isotope confidence were determined to be satisfactory. The confirmation of targeted analytes was based on retention time and accurate mass (extracted-ion chromatogram (XIC) window 0.00131 Da) compared to analytical standards. Generally, mass error was less than 5 parts per million (ppm), although a few peaks displayed mass errors less than 20 ppm. In five cases, the lowest point of the calibration curve did not meet these specifications and had a mass error greater than 20 ppm [2-perfluorohexyl ethanoic acid [6:2] [6:2 FTA, fluorotelomer acid], perfluoro-n-dodecanoic acid [PFDoA], perfluoro-n-tetradecanoic acid [PFTeDA], 3-perfluoropentyl propanoic acid [5:3] [5:3 FTA], 3-perfluoroheptyl propanoic acid [7:3] [7:3 FTA]), but the calibration points were considered acceptable based on accuracy (to predicted concentration), peak definition, and retention time.

Calibration range, limit of quantitation, and linear fit (r^2) of the calibration curves for all analytes are shown in appendix 3. Calibration curve fit was calculated on the basis of linear regression (using 1/x or $1/x^2$ weighting), and linearity ranged from r^2 of 0.974 to 0.999 (minimum acceptable $r^2 = 0.97$). Lower and upper LOQs were determined as the lowest and highest calibration standards calculated to be within 30 percent of the expected value, respectively. The lower LOQ typically ranged from 0.58 to 5.8 ng/L, with the exception of selected analytes, which ranged from less than 12 ng/L (N-methylperfluoro-1-octanesulfonamide [Me-FOSA] and N-ethylperfluoro-1-octanesulfonamide [Et-FOSA], 6:2 FTA, perfluoro-n-pentanoic acid [PFPeA], and 3-perfluoropropyl propanoic acid [3:3] [3:3 FTA]) to 23 ng/L (Perfluoro-1-octanesulfonamide [FOSA], 2-perfluorodecyl ethanoic acid [10:2] [10:2 FTA], perfluoro-n-heptanoic acid [PFHpA], PFODA, and perfluoro-1-pentanesulfonate [PFPeS]). The upper LOQs typically ranged from 1,161 to 2,323 ng/L, with the exception of selected analytes, which could not be reliably quantified above 232 ng/L (C13, C16, and C18 carboxylic acids, 7:3 FTA, the FOSA and perfluoro-1-octanesulfonamidoacetic acid [FOSAA], 2H-perfluoro-2-dodecenoic acid [10:2] [10:2 FTUA], 1H,1H,2H,2H-perfluorohexane sulfonate [10:2] [10:2 FTS], perfluoro-1-heptanesulfonate [PFHpS], and perfluoro-1-dodecanesulfonate [PFDoS]).

A QC sample was analyzed after every 10 samples to ensure all compounds remained within ±30 percent of known concentrations (that is, to monitor for instrumental drift). Accuracies ranged from 76 to 141 percent. All but one analyte (10:2 FTS) was quantified within ±30 percent.

Laboratory blanks, both experimental (blanks and double blanks prepared in 15-mL polypropylene Falcon tubes) and analytical (double blanks prepared in autosampler vials) were included to monitor for possible contamination throughout the sample pre-processing (after collection) and analytical processing. Three analytes (FOSA, Me-FOSA, and Et-FOSA) indicated low levels of contamination in one or more laboratory method blank. The lower LOQs were adjusted to be three times the highest concentration in the blanks and were applied to quantify these analytes. No contamination was identified in any of the double blanks.

Microbiological Analyses (Phases I and II)

Samples for microbiological analyses were collected in two 2.5-L PETG bottles and preserved with sodium thiosulfate, then placed on ice. Samples were collected and sent to the USGS Michigan Water Science Center Bacteriological Research Laboratory in Lansing, Michigan, for analyses. Further information regarding these methods can be found at https://mi.water.usgs.gov/projects/MBindex.html (accessed April 26, 2018).

Bioassay Analyses (Phases I and II)

Bioassay analyses were performed at the USGS National Fish Health Research Laboratory (NFHRL), Kearneysville, West Virginia; the NIEHS NTP Laboratory, Research Triangle Park, North Carolina; and the EPA NHEEL, Research Triangle Park, North Carolina. Samples for these assays were extracted at the OGRL in Lawrence, Kansas, and shipped on ice to the analyzing laboratories. Samples for these bioassays were collected in four 1,000-mL, amber, glass, baked bottles and placed on ice.

Extraction Method (Phases I and II)

Each sample was collected in four (A,B,C,D) 1-L, pre-baked, narrow-mouth bottles. The samples were shipped on ice at 2 to 4 °C to the OGRL. All water samples were logged in and filtered through a 0.7-nominal pore-size glass-fiber filter upon arrival at OGRL and refrigerated at 2 to 4 °C in the dark until processing, which occurred within 36 hours of arrival at OGRL. Each 1-L sample bottle was weighed with the cap on prior to extraction. Waters Corporation (Milford, Massachusetts) 200-mg, 6-mL, hydrophilic-lipophilic balanced SPE cartridges were prepared by rinsing with 8 mL of methanol followed by 8 mL of Type 1 water generated by an Elga Purelab Ultra water purifier. Each 1-L sample was passed through an HLB cartridge at approximately 10 mL/min, using a Supelco (St. Louis, Missouri) 24-port vacuum extraction rack. The bottle was rinsed with 8 mL of Type 1 water and passed through the cartridge. After extraction, SPE cartridges were dried by keeping them under a vacuum for an additional 20 minutes. The sample bottles with the cap were reweighed, and the volume of extracted sample was calculated. Each SPE cartridge was transferred to a 24-port vacuum rack with disposable Teflon liners to prevent cross contamination and then was eluted with two 4-mL aliquots of methanol into 15-mL, glass conical bottom test tubes. The sample eluates were placed into a Zymark (Hopkinton, Massachusetts) nitrogen evaporator at 40 °C. The A, B, C, and D aliquots were then evaporated to approximately 1 mL, and the B, C, and D, aliquots were combined with A. In addition, the B, C, and D test tubes were rinsed with two 1-mL aliquots of methanol, which were subsequently transferred into A to ensure quantitative transfer of the samples. The combined sample aliquot was evaporated to approximately 1 mL to which 10-µL of Type 1 water was added. The combined aliquot was evaporated to approximately 10-µL to which methanol was added to bring the final volume to 400 µL; then 100-µL aliquots were pipetted into four 2-mL, crimp-top vials with 100-µL glass inserts and Teflon-lined crimp tops and stored in a freezer at negative 18 °C for archival or until shipment to the NFHRL and EPA laboratories for bioassay analysis.

USGS National Fish Health Research Laboratory (NFHRL)

The Bioluminescent Yeast Estrogen Screen (BLYES) and Bioluminescent Yeast Androgen Screen (BLYAS) were performed to assess the net estrogenic or androgenic activity of water sample extracts (Sanseverino and others, 2005, 2009). Water, which was previously shipped and extracted at the OGRL, was then shipped on ice to the NFHRL where it was stored at negative 20 °C upon receipt. Samples were prepared using methanol. The assay was run using a protocol adapted from Ciparis and others (2012). Briefly, 10 µL of sample extract was added in triplicate to the wells of a white, solid-bottom 96-well plate and evaporated at room temperature in a Class II biological safety cabinet. After the solvent was evaporated, 200 µL of a 48-hour culture of strain BLYES or BLYAS adjusted to 0.4 (OD_{600}) in fresh yeast minimal media (YMM leu^-, ura^-) was added to each well. A 12-point standard curve of 17β-estradiol (E2; Sigma-Aldrich Corp.) or testosterone (T; Sigma-Aldrich Corp.) was included on each plate. A media control was included on all plates to establish background luminescence. Plates were covered and incubated in the dark at 30 °C for 4 hours. Luminescence was quantified using a SpectraMax M4 microplate reader (Molecular Devices), in luminescence mode (1,000 millisecond integration time), and relative estrogenicity or androgenicity of each sample was interpolated using a four-parameter curve fit using SoftMax Pro 6.2.2 (Molecular Devices) software. Relative net agonistic activity per liter of sample was then calculated on the basis of sample concentration.

Yeast strain (MCY-105) was used to screen for glucogenicity. Yeast was cultured in synthetic complete drop-out media lacking uracil, tryptophan, and histadine (SC-UWH). The assay was performed similar to that of Balsiger and others (2010) with modification. Yeast was grown at 30 °C in a rotary incubator for 48 hours. Yeast was diluted to an OD_{600} of 0.25, and 95 µL of sample was added to wells of a white, solid-bottom microplate (Costar). Standards ($1.5 \times 10^4 - 8$ ng well^{-1}) and samples (5 µL) were then added, and plates were incubated at 30 °C for 4 hours. After this incubation, 100 µL of Tropix GalScreen in Buffer B (Applied Biosystems, Foster City, California) was added to all wells, and the plate was incubated for an additional 2 hours at 28 °C according to manufacturer protocols. The hormone-induced chemiluminescent signal was then measured on a SpectraMax M4 microplate reader. Sample concentrations were determined as described above for the BLYES and BLYAS.

EPA National Health and Environmental Effects Laboratory (NHEERL)

Conley and others (2017a) describe the bioassay methods used in this study to measure estrogen, androgen, and glucocorticoid receptor activity: T47D-KBluc bioassay for estrogenic activity, MDA-kb2 bioassay for androgenic activity, and transduced CV-1 cell bioassay for glucocorticoid activity. In vitro assay data were processed by the EPA and are described in Conley and others (2017b).

Results

Results from Phase I of the study can be found in the associated data release (Romanok and Bradley, 2018). Selected results for Phase II trace element data can be found in Romanok and others (2018).

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Table 1. Site information for samples collected as part of the U.S. Geological Survey (USGS) Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Study, 2016–17.

[Samples were collected between May and September 2016 for Phase I and during two trips between August and December 2017 for Phase II. WDS, water distribution system; pre-WDS, collected prior to any treatment; PS, private supply; GW, groundwater; SW, surface water; LK, lake; —, unknown]

USGS site name	Sampling phase	Water source[1]	Water source type[2]	Treatment[3]	Point-of-use treatment[4]
CA001—Domestic site, Sacramento, CA	Phase I	WDS	Mixed	Treated	None
CA002—Commercial site, Sacramento, CA	Phase I	WDS	SW	Treated	None
016N003E24N003M	Phase I	WDS	Mixed	Treated	None
MH4	Phase I	PS	GW	No treatment	None
NWQL Tap	Phase I	WDS	SW	Treated	None
Domestic WU site at Seminole, FL	Phase I	WDS	Mixed	Treated	None
Commercial WU site at St Petersburg, FL	Phase I	WDS	Mixed	Treated	None
IA001—Commercial site	Phase I	WDS	Unknown	Unknown	None
IA003—Domestic site	Phase I	WDS	GW	Treated	None
IA002—Commercial site	Phase I	—	—	Treated	None
Domestic water in North Lawrence, KS	Phase I	WDS	SW	Treated	None
Kansas Water Science Center Lab-Lawrence	Phase I	WDS	SW	Treated	None
MI002—Domestic site	Phase I	WDS	GW	Treated	None
MI003—Commercial site	Phase I	WDS	LK	Treated	None
MI001—Commercial site	Phase I	WDS	GW	Treated	None
FA23001—Domestic site	Phase I	WDS	Mixed	Treated	None
FA21001—Commercial site	Phase I	WDS	SW	Treated	None
09N-03E-32 AAD 1	Phase I	PS	GW	No treatment	None
12N-03W-04 DDB 1—Office Test Site No. 1	Phase I	WDS	—	Treated	None
01.00S/01.00E-04DAA	Phase I	WDS	SW	No treatment	None
03.00S/04.00E-26DBB01	Phase I	PS	GW	No treatment	None
01.00S/01.00E-23DC	Phase I	WDS	SW	No treatment	None
Equipment blank site, USGS office	Phase I	WDS	SW	Treated	None
RIC-791	Phase I	PS	GW	No treatment	None
V061001—Domestic Tap	Phase I	PS	GW	No treatment	Yes
V059001—Commercial site	Phase I	WDS	SW	Treated	None
37N 9W 29 001	Phase II	WDS	LK	Treated	None
37N 9W 29 002	Phase II	WDS	LK	Treated	None
37N 9W 28 003	Phase II	WDS	LK	Treated	Yes
37N 9W 33 004	Phase II	WDS	LK	Treated	Yes
37N 9W 22 005	Phase II	WDS	LK	Treated	None
37N 9W 22 006	Phase II	WDS	LK	Treated	None
37N 9W 28 007	Phase II	WDS	LK	Treated	Yes
37N 9W 22 008	Phase II	WDS	LK	Treated	—
IN5245012 LAKE 05021 Intake 2 Lake Michigan	Phase II	pre-WDS	LK	No treatment	—
IN5245012 LAKE 00087 Intake 1 Lake Michigan	Phase II	pre-WDS	LK	No treatment	—
IN5245012 Lake East Chicago Water Works	Phase II	WDS	LK	Treated	—
37N 9W 27 012	Phase II	WDS	LK	Treated	None
37N 9W 21 013	Phase II	WDS	LK	Treated	None
37N 9W 29 014	Phase II	WDS	LK	Treated	None
37N 9W 33 015	Phase II	WDS	LK	Treated	Yes
37N 9W 22 016	Phase II	WDS	LK	Treated	Yes

Table 1. Site information for samples collected as part of the U.S. Geological Survey (USGS) Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Study, 2016–17.—Continued

[Samples were collected between May and September 2016 for Phase I and during two trips between August and December 2017 for Phase II. WDS, water distribution system; pre-WDS, collected prior to any treatment; PS, private supply; GW, groundwater; SW, surface water; LK, lake; —, unknown]

USGS site name	Sampling phase	Water source[1]	Water source type[2]	Treatment[3]	Point-of-use treatment[4]
37N 9W 27 017	Phase II	WDS	LK	Treated	Yes
37N 9W 27 018	Phase II	WDS	LK	Treated	None
37N 9W 27 019	Phase II	WDS	LK	Treated	None
39N-14E-10 001	Phase II	pre-WDS	LK	No treatment	—
39N-14E-10 002	Phase II	WDS	LK	Treated	—
38N-15E-29 001	Phase II	pre-WDS	LK	No treatment	—
38N-15E-29 002	Phase II	WDS	LK	Treated	—
37N 15E 6 020	Phase II	WDS	LK	Treated	None
37N 15E 18 021	Phase II	WDS	LK	Treated	None
37N 15E 7 022	Phase II	WDS	LK	Treated	None
37N 14E 7 023	Phase II	WDS	LK	Treated	Yes
37N 14E 7 024	Phase II	WDS	LK	Treated	None
40N 14E 28 025	Phase II	WDS	LK	Treated	None
40N 13E 36 026	Phase II	WDS	LK	Treated	None
40N 13E 25 027	Phase II	WDS	LK	Treated	None
40N 13E 36 028	Phase II	WDS	LK	Treated	None
40N 13E 36 029	Phase II	WDS	LK	Treated	None
40N 13E 25 030	Phase II	WDS	LK	Treated	None
40N 13E 15 031	Phase II	WDS	LK	Treated	None
40N 13E 11 032	Phase II	WDS	LK	Treated	None
40N 13E 13 033	Phase II	WDS	LK	Treated	None
40N 14E 17 034	Phase II	WDS	LK	Treated	None
40N 13E 32 038	Phase II	WDS	LK	Treated	None
39N 13E 01 039	Phase II	WDS	LK	Treated	None
40N 14E 08 040	Phase II	WDS	LK	Treated	None
41N 14E 32 041	Phase II	WDS	LK	Treated	None
38N 14E 2 042	Phase II	WDS	LK	Treated	None
38N 14E 3 043	Phase II	WDS	LK	Treated	None
38N 14E 20 044	Phase II	WDS	LK	Treated	None
38N 13E 34 045	Phase II	WDS	LK	Treated	None
38N 14E 11 046	Phase II	WDS	LK	Treated	None
38N 14E 12 047	Phase II	WDS	LK	Treated	None
38N 14E 11 048	Phase II	WDS	LK	Treated	None
38N 14E 11 049	Phase II	WDS	LK	Treated	None
38N 14E 14 050	Phase II	WDS	LK	Treated	None
38N 14E 12 051	Phase II	WDS	LK	Treated	None
38N 14E 11 052	Phase II	WDS	LK	Treated	None

[1] Denotes whether water-quality sample was collected from a private supply (PS), a treated distribution source (WDS), or a raw-water intake (pre-WDS).

[2] Denotes primary source of water (groundwater [GW], surface water [SW], or lake [LK]).

[3] Denotes whether water is treated prior to distribution.

[4] Denotes whether point-of-use (at the tap) treatment equipment was present at the time of sample collection. Does not in any way indicate effectiveness, or condition, of system.

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Erythromycin-H2O	23893-13-2	Degradation product/Macrolides	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Epi-chlorotetracycline	101342-45-4	Degradation product/Tetracyclines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Epi-iso-chlorotetracycline	NA	Degradation product/Tetracyclines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Epi-oxytetracycline	35259-39-3	Degradation product/Tetracyclines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Epi-tetracycline	79-85-6	Degradation product/Tetracyclines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Iso-chlorotetracycline	514-53-4	Degradation product/Tetracyclines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Ciprofloxacin	85721-33-1	Pharmaceutically active/Fluoroquinolines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Enrofloxacin	93106-60-6	Pharmaceutically active/Fluoroquinolines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Lomefloxacin	98079-51-7	Pharmaceutically active/Fluoroquinolines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Norfloxacin	70458-96-7	Pharmaceutically active/Fluoroquinolines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Ofloxacin	82419-36-1	Pharmaceutically active/Fluoroquinolines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Sarafloxacin	98105-99-8	Pharmaceutically active/Fluoroquinolines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Azithromycin	117772-70-0	Pharmaceutically active/Macrolides	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Erythromycin	114-07-8	Pharmaceutically active/Macrolides	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Roxithromycin	80214-83-1	Pharmaceutically active/Macrolides	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Tylosin	1401-69-0	Pharmaceutically active/Macrolides	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Virginiamycin	11006-76-1	Pharmaceutically active/Macrolides	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Chloramphenicol	56-75-7	Pharmaceutically active/other	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Lincomycin	154-21-2	Pharmaceutically active/other	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Ormetoprim	6981-18-6	Pharmaceutically active/other	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
63674	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
63731	LC/MS-MS	0.010	0.010	µg/L	LOQ	Meyer and others, 2007 (modified)
64047	LC/MS-MS	0.010	0.010	µg/L	LOQ	Meyer and others, 2007 (modified)
63729	LC/MS-MS	0.010	0.010	µg/L	LOQ	Meyer and others, 2007 (modified)
63727	LC/MS-MS	0.010	0.010	µg/L	LOQ	Meyer and others, 2007 (modified)
64175	LC/MS-MS	0.010	0.010	µg/L	LOQ	Meyer and others, 2007 (modified)
62898	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
66495	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
62900	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
62757	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
62899	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
62771	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
62792	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
62797	LC/MS-MS	0.008	0.008	µg/L	LOQ	Meyer and others, 2007 (modified)
62895	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
62896	LC/MS-MS	0.010	0.010	µg/L	LOQ	Meyer and others, 2007 (modified)
62897	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
65194	LC/MS-MS	0.100	0.100	µg/L	LOQ	Meyer and others, 2007 (modified)
62894	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
62962	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Trimethoprim	738-70-5	Pharmaceutically active/other	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Carbamazepine	298-46-4	Pharmaceutically active/Pharmaceuticals	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Ibuprofen	15687-27-1	Pharmaceutically active/Pharmaceuticals	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Sulfachloropyridazine	80-32-0	Pharmaceutically active/Sulfonamides	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Sulfadiazine	68-35-9	Pharmaceutically active/Sulfonamides	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Sulfadimethoxine	122-11-2	Pharmaceutically active/Sulfonamides	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Sulfamethazine	57-68-1	Pharmaceutically active/Sulfonamides	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Sulfamethoxazole	723-46-6	Pharmaceutically active/Sulfonamides	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Sulfathiazole	72-14-0	Pharmaceutically active/Sulfonamides	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Chlorotetracycline	64-72-2	Pharmaceutically active/Tetracyclines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Doxycycline	564-25-0	Pharmaceutically active/Tetracyclines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Oxytetracycline	6153-64-6	Pharmaceutically active/Tetracyclines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Tetracycline	60-54-8	Pharmaceutically active/Tetracyclines	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
2-4,dichlorophenoxyacetic acid (2,4-D)	94-75-7	Pesticide	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Acetochlor	34256-82-1	Pesticide	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Acetochlor deschloro	162102-65-0	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Acetochlor ESA (ethane sulfonic acid)	187022-11-3	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Acetochlor hydroxy	NA	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Acetochlor OXA (oxanilic acid)	194992-44-4	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Acetochlor SAA (sulfynil acetic acid)	NA	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
62023	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
62793	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
62014	LC/MS-MS	0.050	0.050	µg/L	LOQ	Meyer and others, 2007 (modified)
62774	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
62963	LC/MS-MS	0.100	0.100	µg/L	LOQ	Meyer and others, 2007 (modified)
62776	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
61762	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
62775	LC/MS-MS	0.005	0.005	µg/L	LOQ	Meyer and others, 2007 (modified)
62778	LC/MS-MS	0.050	0.050	µg/L	LOQ	Meyer and others, 2007 (modified)
61744	LC/MS-MS	0.010	0.010	µg/L	LOQ	Meyer and others, 2007 (modified)
62694	LC/MS-MS	0.010	0.010	µg/L	LOQ	Meyer and others, 2007 (modified)
61759	LC/MS-MS	0.010	0.010	µg/L	LOQ	Meyer and others, 2007 (modified)
62781	LC/MS-MS	0.010	0.010	µg/L	LOQ	Meyer and others, 2007 (modified)
39732	LC/MS-MS	0.020	0.020	µg/L	LOQ	Lee and Strahan, 2003 (modified)
49260	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
63778	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
61029	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
63784	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
61030	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
62847	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Acetochlor/metolachlor – 2nd amide	32428-71-0	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Acetochlor/metolachlor ESA – 2nd amide	446027-17-4	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Alachlor	15972-60-8	Pesticide	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Alachlor – 2nd amide	6967-29-9	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Alachlor deschloro	142363-53-9	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Alachlor ESA	140939-15-7	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Alachlor hydroxy	56681-55-1	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Alachlor OXA	171262-17-2	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Alachlor SAA	494847-39-1	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Alachlor ESA – 2nd amide	NA	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Dimethenamid	87674-68-8	Pesticide	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Dimethenamid deschloro	864182-54-7	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Dimethenamid ESA	205939-58-8	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Dimethenamid hydroxy	NA	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Dimethenamid OXA	NA	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Flufenacet	142459-58-3	Pesticide	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Flufenacet ESA	201668-32-8	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Flufenacet OXA	201668-31-7	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Metolachlor	51218-45-2	Pesticide	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Metolachlor deschloro	126605-22-9	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
63782	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
62850	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
46342	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
63781	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
63777	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
50009	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
63783	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
61031	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
62848	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
62849	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
61588	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
63779	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
61951	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
64045	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
62482	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
62481	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
61952	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
62483	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
39415	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
63780	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Metolachlor ESA	17118-09-5	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Metolachlor hydroxy	131068-72-9	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Metolachlor OXA	152019-73-3	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Propachlor	1918-16-7	Pesticide	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Propachlor OXA	70628-36-3	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Propachlor ESA	947601-88-9	Pesticide degradation product	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Glyphosate	1071-83-6	Pesticide	2016	Organic Geochemisty Research Laboratory, Kansas
Aminomethylphosphonic Acid (AMPA)	1066-51-9	Pesticide	2016	Organic Geochemisty Research Laboratory, Kansas
Glufosinate	77182-82-2	Pesticide	2016	Organic Geochemisty Research Laboratory, Kansas
11-Ketotestosterone	564-35-2	Hormone	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
17-α Estradiol (17α E2)	57-91-0	Hormone	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
17-α Ethinylestradiol (EE2)	57-63-6	Hormone	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
17-β Estradiol (17β E2)	50-28-2	Hormone	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Androstenedione	63-05-8	Hormone - androgen	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Epitestosterone	481-30	Hormone - androgen	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Testosterone	58-22-0	Hormone - androgen	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Trenbolone	10161-33-8	Hormone - androgen	2018 and 2017	Organic Geochemisty Research Laboratory, Kansas
Trenbolone acetate	10161-34-9	Hormone - androgen	2019 and 2017	Organic Geochemisty Research Laboratory, Kansas
Equilenin	517-09-9	Hormone - estrogen	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Equilin	474-86-2	Hormone - estrogen	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
61043	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
63785	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
61044	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
04024	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
62767	LC/MS-MS	0.02	0.02	µg/L	LOQ	Lee and Strahan, 2003 (modified)
62766	LC/MS-MS	0.05	0.05	µg/L	LOQ	Lee and Strahan, 2003 (modified)
62722	LC/MS-MS	0.02	0.02	µg/L	LOQ	Meyer and others, 2009 (modified)
62649	LC/MS-MS	0.02	0.02	µg/L	LOQ	Meyer and others, 2009 (modified)
62721	LC/MS-MS	0.02	0.02	µg/L	LOQ	Meyer and others, 2009 (modified)
64507	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
64508	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
64509	LC/MS-MS	3.0	3.0	ng/L	LOQ	Yost and others, 2013 and 2014
64510	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
64513	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
64517	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
64545	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
64526	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53518	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
64518	LC/MS-MS	1.0	1.0	ng/L	LOQ	Yost and others, 2013 and 2014
64519	LC/MS-MS	1.0	1.0	ng/L	LOQ	Yost and others, 2013 and 2014

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Estriol	50-27-1	Hormone - estrogen	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Estrone	53-16-7	Hormone - estrogen	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Trans-Diethylstilbestrol	56-53-1	Hormone - estrogen	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Zearalenone	17924-92-4	Hormone - mycoestrogen	2021 and 2017	Organic Geochemisty Research Laboratory, Kansas
α-zearalanol	26538-44-3	Hormone - mycotoxin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Beauvericin	26048-05-5	Hormone - mycotoxin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
β-Zearalenol	71030-11-0	Hormone - mycotoxin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Deoxynivalenol	51481-10-8	Hormone - mycotoxin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Nivalenol	23282-20-4	Hormone - mycotoxin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Verrucarin A	3148-09-02	Hormone - mycotoxin	2020 and 2017	Organic Geochemisty Research Laboratory, Kansas
Biochanin A	491-80-5	Hormone - phytoestrogen	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Coumestrol	479-13-0	Hormone - phytoestrogen	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Daidzein	486-66-8	Hormone - phytoestrogen	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Equol	531-95-3	Hormone - phytoestrogen	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Formonentin	485-72-3	Hormone - phytoestrogen	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Genestein	446-72-0	Hormone - phytoestrogen	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
19-Norethindrone	62-88-4	Hormone - progestin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Desogestrel	54024-55-5	Hormone - progestin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Drospirenone	67392-87-4	Hormone - progestin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Gestodene	60282-87-3	Hormone - progestin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
64520	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
64521	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
64516	LC/MS-MS	1.0	1.0	ng/L	LOQ	Yost and others, 2013 and 2014
53558	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53555	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53551	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53557	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53552	LC/MS-MS	1.0	1.0	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53553	LC/MS-MS	1.0	1.0	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53554	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53545	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53546	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53547	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53548	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53549	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53550	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53543	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53535	LC/MS-MS	1.0	1.0	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53536	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53537	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Levonor-gestrel	797-63-7	Hormone - progestin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Medroxy-progesterone	520-85-4	Hormone - progestin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Melengestrol acetate	2919-66-6	Hormone - progestin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Nestorone	7759-35-5	Hormone - progestin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Nomegestrol acetate	58652-20-3	Hormone - progestin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Norgestimate	35189-28-7	Hormone - progestin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Progesterone	57-83-0	Hormone - progestin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
17 β-estradiol-17-glucuronide	1806-98-0	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
17 β-estradiol-17-sulfate	3233-69-0	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
17 β-estradiol-3-sulfate	481-96-9	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Androsterone sulfate	2479-86-9	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Androsterone-glucuronide	1852-43-3	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
diethylstilbesterol glucuronide	2408-40-4	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Equilenin sulfate	16680-48-1	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Equilin sulfate	16680-47-0	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Estriol-17-sulfate	42028-21-7	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Estriol-3-glucuronide	2479-91-6	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Estriol-3-sulfate	481-95-8	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Estrone glucuronide	2479-90-5	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Estrone-3-sulfate	481-97-0	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
53538	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53539	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53540	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53541	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53542	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53544	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
64523	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53521	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53529	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53528	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53525	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53519	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
51908	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53526	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53527	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53531	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53522	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53530	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53523	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53532	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Ethenylestradiol-3-glucuronide	60134-76-1	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Ethinylestradiol-3-sulfate	24560-70-1	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Testosterone glucuronide	118-25-2	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Testosterone sulfate	651-45-6	Hormone conjugate	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
Trans-diethyl-stilbestrol glucuronide	2408-40-4	Hormone conjugate	2017 and 2017	Organic Geochemisty Research Laboratory, Kansas
α-Zearalenol	36455-72-8	Hormone -mycotoxin	2016 and 2017	Organic Geochemisty Research Laboratory, Kansas
IMXT-Saxitoxin	35523-89-8	Algal toxin	2017	Organic Geochemisty Research Laboratory, Kansas
IMYT-Cylindrospermopsin	143545-90-8	Algal toxin	2017	Organic Geochemisty Research Laboratory, Kansas
IMNT2-Microcystin	101043-37-2	Algal toxin	2017	Organic Geochemisty Research Laboratory, Kansas
IMAA-Anatoxin-a	64285-06-9	Algal toxin	2017	Organic Geochemisty Research Laboratory, Kansas
1,1,1-Trichloro-2-propanone	918-00-3	Disinfectant by-product/propanones	2016	Organic Chemistry Research Laboratory, California
3,4-Dichloroaniline	95-76-1	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
3,5-Dichloroaniline	626-43-7	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Acetochlor	34256-82-1	Pesticide	2017	Organic Chemistry Research Laboratory, California
Acibenzolar-S-methyl	135158-54-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Alachlor	15972-60-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Allethrin	584-79-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Atrazine	1912-24-9	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Azinphos-methyl	86-50-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Azoxystrobin	131860-33-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
53524	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53533	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53515	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53534	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014
53520	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
53556	LC/MS-MS	0.5	0.5	ng/L	LOQ	Yost and others, 2013 and 2014 (added compound)
89003	ELISA	NA	0.02	µg/L	LOQ	Loftin and others, 2016 and Graham and others, 2010
89005	ELISA	NA	0.05	µg/L	LOQ	Loftin and others, 2016 and Graham and others, 2010
89011	ELISA	NA	0.10	µg/L	LOQ	Loftin and others, 2016 and Graham and others, 2010
68287	ELISA	NA	0.15	µg/L	LOQ	Loftin and others, 2016 and Graham and others, 2010
51330	GC/MS	0.040	NA	ng/L	MDL	Hladik and others, 2014
67536	GC/MS	8.30	5.20	ng/L	MDL	Hladik and others, 2008
67536	GC/MS	7.6	7.6	ng/L	MDL	Hladik and others, 2008 (additional compound)
68520	GC/MS	NA	1.5	ng/L	MDL	Hladik and others, 2008 (additional compound)
51849	GC/MS	3.0	3.0	ng/L	MDL	Hladik and others, 2008 (additional compound)
65064	GC/MS	1.70	1.70	ng/L	MDL	Hladik and others, 2008
66586	GC/MS	6.00	6.00	ng/L	MDL	Hladik and others, 2008
65065	GC/MS	2.30	2.30	ng/L	MDL	Hladik and others, 2008
65066	GC/MS	9.4	9.4	ng/L	MDL	Hladik and others, 2008
66589	GC/MS	3.1	3.1	ng/L	MDL	Hladik and others, 2008

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Benfluralin	1861-40-1	Pesticide	2016	Organic Chemistry Research Laboratory, California
Benzovindiflupyr	1072957-71-7	Pesticide	2017	Organic Chemistry Research Laboratory, California
Bifenthrin	82657-04-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Boscalid	188425-85-6	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Bromoacetonitrile	590-17-0	Disinfectant by-product/haloacetonitrile	2016	Organic Chemistry Research Laboratory, California
Bromochloroacetonitrile	83463-62-1	Disinfectant by-product/haloacetonitrile	2016	Organic Chemistry Research Laboratory, California
Bromochloroiodomethane	34970-00-8	Disinfectant by-product/trihalomethane	2016	Organic Chemistry Research Laboratory, California
Bromochloronitromethane	135531-25-8	Disinfectant by-product/halonitromethane	2016	Organic Chemistry Research Laboratory, California
Bromoconazole	116255-48-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Bromodichloroacetonitrile	60523-73-1	Disinfectant by-product/haloacetonitrile	2016	Organic Chemistry Research Laboratory, California
Bromodichloromethane	75-27-4	Disinfectant by-product/trihalomethane	2016	Organic Chemistry Research Laboratory, California
Bromodichloronitromethane	918-01-4	Disinfectant by-product/halonitromethane	2016	Organic Chemistry Research Laboratory, California
Bromodiiodomethane	557-95-9	Disinfectant by-product/trihalomethane	2016	Organic Chemistry Research Laboratory, California
Bromonitromethane	563-70-2	Disinfectant by-product/halonitromethane	2016	Organic Chemistry Research Laboratory, California
Butralin	33629-47-9	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Butylate	2008-41-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Captan	133-06-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Carbaryl	63-25-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Carbofuran	1563-66-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Chlorodiiodomethane	638-73-3	Disinfectant by-product/trihalomethane	2016	Organic Chemistry Research Laboratory, California

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
51643	GC/MS	2.0	NA	ng/L	MDL	Hladik and others, 2008 (additional compound)
52652	GC/MS	NA	3.4	ng/L	MDL	Hladik and others, 2008 (additional compound)
65067	GC/MS	4.70	4.70	ng/L	MDL	Hladik and others, 2008
67550	GC/MS	2.80	2.80	ng/L	MDL	Hladik and others, 2008
51320	GC/MS	0.200	NA	ng/L	MDL	Hladik and others, 2014
51321	GC/MS	0.200	NA	ng/L	MDL	Hladik and others, 2014
51307	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
51313	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
68315	GC/MS	3.20	3.20	ng/L	MDL	Hladik and others, 2008
51322	GC/MS	0.040	NA	ng/L	MDL	Hladik and others, 2014
34328	GC/MS	0.100	NA	ng/L	MDL	Hladik and others, 2014
51314	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
51308	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
51315	GC/MS	0.100	NA	ng/L	MDL	Hladik and others, 2014
68545	GC/MS	2.6	2.6	ng/L	MDL	Hladik and others, 2008 (additional compound)
65068	GC/MS	1.80	1.80	ng/L	MDL	Hladik and others, 2008
68322	GC/MS	10.2	10.2	ng/L	MDL	Hladik and others, 2008
65069	GC/MS	6.50	6.50	ng/L	MDL	Hladik and others, 2008
65070	GC/MS	3.10	3.10	ng/L	MDL	Hladik and others, 2008
51309	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Chlorfenapyr	122453-73-0	Pesticide	2017	Organic Chemistry Research Laboratory, California
Chlorothalonil	1897-45-6	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Chlorpyrifos	2921-88-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Chlorpyrifos oxon	5598-15-12	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Clomazone	81777-89-1	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Cuomaphos	56-72-4	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Cycloate	1134-23-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Cyfluthrin	68359-37-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Cyhalothrin	68085-85-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Cypermethrin	52315-07-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Cyproconazole	94361-06-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Cyprodinil	121552-61-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Dacthal (DCPA)	1861-32-1	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Deltamethrin	52918-63-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Diazinon	333-41-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Diazinon oxon (diazoxon)	962-58-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Dibromoacetonitrile	3252-43-5	Disinfectant by-product/haloacetonitrile	2016	Organic Chemistry Research Laboratory, California
Dibromochloroacetonitrile	144772-39-4	Disinfectant by-product/haloacetonitrile	2016	Organic Chemistry Research Laboratory, California
Dibromochloromethane	124-48-1	Disinfectant by-product/trihalomethane	2016	Organic Chemistry Research Laboratory, California
Dibromochloronitromethane	1184-89-0	Disinfectant by-product/halonitromethane	2016	Organic Chemistry Research Laboratory, California

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
NA	GC/MS	NA	3.30	ng/L	MDL	Hladik and others, 2008 (additional compound)
65071	GC/MS	4.1	4.1	ng/L	MDL	Hladik and others, 2008
65072	GC/MS	2.10	2.10	ng/L	MDL	Hladik and others, 2008
68216	GC/MS	5.0	5.0	ng/L	MDL	Hladik and others, 2008 (additional compound)
67562	GC/MS	2.50	2.50	ng/L	MDL	Hladik and others, 2008
51836	GC/MS	3.1	3.1	ng/L	MDL	Hladik and others, 2008 (additional compound)
65073	GC/MS	1.10	1.10	ng/L	MDL	Hladik and others, 2008
65074	GC/MS	5.20	5.20	ng/L	MDL	Hladik and others, 2008
68354	GC/MS	2.00	2.00	ng/L	MDL	Hladik and others, 2008
65075	GC/MS	5.60	5.60	ng/L	MDL	Hladik and others, 2008
66593	GC/MS	4.7	4.7	ng/L	MDL	Hladik and others, 2008
67574	GC/MS	7.40	7.40	ng/L	MDL	Hladik and others, 2008
65076	GC/MS	2.00	2.00	ng/L	MDL	Hladik and others, 2008
65077	GC/MS	3.50	3.50	ng/L	MDL	Hladik and others, 2008
65078	GC/MS	0.900	0.900	ng/L	MDL	Hladik and others, 2008
68236	GC/MS	5.00	5.00	ng/L	MDL	Hladik and others, 2008 (additional compound)
51323	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
51324	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
34307	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
51316	GC/MS	0.100	NA	ng/L	MDL	Hladik and others, 2014

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Dibromoiodomethane	563-94-2	Disinfectant by-product/trihalomethane	2016	Organic Chemistry Research Laboratory, California
Dibromonitromethane	598-91-4	Disinfectant by-product/halonitromethane	2016	Organic Chemistry Research Laboratory, California
Dichloroacetonitrile	107-14-2	Disinfectant by-product/haloacetonitrile	2016	Organic Chemistry Research Laboratory, California
Dichloroiodomethane	594-04-7	Disinfectant by-product/trihalomethane	2016	Organic Chemistry Research Laboratory, California
Dichloronitromethane	7119-89-3	Disinfectant by-product/halonitromethane	2016	Organic Chemistry Research Laboratory, California
Dichlorvos	62-73-7	Pesticide	2017	Organic Chemistry Research Laboratory, California
Difenoconazole	119446-68-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Dimethomorph	110488-70-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Dinotefuran	165252-70-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Dithiopyr	97886-45-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Eptam (EPTC)	759-94-4	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Esfenvalerate	66230-04-4	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Ethalfluralin	55283-68-6	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Etofenprox	80844-07-1	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Etoxazole	153233-91-1	Pesticide	2017	Organic Chemistry Research Laboratory, California
Famoxadone	131807-57-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fenamidone	161326-34-7	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fenarimol	60168-88-9	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fenbuconazole	114369-43-6	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fenhexamid	35554-44-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
51310	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
51317	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
51325	GC/MS	0.100	NA	ng/L	MDL	Hladik and others, 2014
51311	GC/MS	0.040	NA	ng/L	MDL	Hladik and others, 2014
51318	GC/MS	0.100	NA	ng/L	MDL	Hladik and others, 2014
68572	GC/MS	NA	5.1	ng/L	MDL	Hladik and others, 2008
67582	GC/MS	10.5	10.5	ng/L	MDL	Hladik and others, 2008
68373	GC/MS	6.00	6.00	ng/L	MDL	Hladik and others, 2008
68379	GC/MS	5.50	5.50	ng/L	MDL	Hladik and others, 2008
51837	GC/MS	1.6	1.6	ng/L	MDL	Hladik and others, 2008 (additional compound)
65080	GC/MS	1.50	1.50	ng/L	MDL	Hladik and others, 2008
65081	GC/MS	3.90	3.90	ng/L	MDL	Hladik and others, 2008
65082	GC/MS	3.00	3.00	ng/L	MDL	Hladik and others, 2008
67604	GC/MS	2.20	2.20	ng/L	MDL	Hladik and others, 2008
68598	GC/MS	NA	4.20	ng/L	MDL	Hladik and others, 2008 (additional compound)
67609	GC/MS	2.50	2.50	ng/L	MDL	Hladik and others, 2008
51848	GC/MS	5.10	5.10	ng/L	MDL	Hladik and others, 2008 (additional compound)
67613	GC/MS	6.50	6.50	ng/L	MDL	Hladik and others, 2008
67618	GC/MS	5.20	5.20	ng/L	MDL	Hladik and others, 2008
67622	GC/MS	7.60	7.60	ng/L	MDL	Hladik and others, 2008

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Fenpropathrin	39515-41-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fenpryroximate	39515-41-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fenthion	55-38-9	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fipronil	120068-37-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fipronil desulfinyl	205650-65-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fipronil desulfinyl amide	1115248-09-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fipronil sulfide	120067-83-6	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fipronil sulfone	120068-36-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fluazinam	79622-59-6	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Flubendiamide	272451-65-7	Pesticide	2017	Organic Chemistry Research Laboratory, California
Fludioxonil	131341-86-1	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Flufenacet	142459-58-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Flumetralin	62924-70-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fluopicolide	239110-15-7	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fluopyram	658066-35-4	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fluoxastrobin	193740-76-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Flusilazole	85509-19-9	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Flutolanil	66332-96-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Flutriafol	76674-21-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Fluxapyroxad	907204-31-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
65083	GC/MS	4.10	4.10	ng/L	MDL	Hladik and others, 2008
51838	GC/MS	5.20	5.20	ng/L	MDL	Hladik and others, 2008 (additional compound)
51839	GC/MS	5.50	5.50	ng/L	MDL	Hladik and others, 2008 (additional compound)
66604	GC/MS	2.10	2.90	ng/L	MDL	Hladik and others, 2008
67781	GC/MS	1.60	1.60	ng/L	MDL	Hladik and others, 2008 (additional compound)
68570	GC/MS	3.20	3.20	ng/L	MDL	Hladik and others, 2008 (additional compound)
66610	GC/MS	1.80	1.80	ng/L	MDL	Hladik and others, 2008
66613	GC/MS	3.50	3.50	ng/L	MDL	Hladik and others, 2008
67636	GC/MS	4.40	4.40	ng/L	MDL	Hladik and others, 2008
68606	GC/MS	NA	6.20	ng/L	MDL	Hladik and others, 2008 (additional compound)
67640	GC/MS	7.30	7.30	ng/L	MDL	Hladik and others, 2008
51840	GC/MS	4.70	4.70	ng/L	MDL	Hladik and others, 2008 (additional compound)
51841	GC/MS	5.80	5.80	ng/L	MDL	Hladik and others, 2008 (additional compound)
51852	GC/MS	3.90	3.90	ng/L	MDL	Hladik and others, 2008 (additional compound)
52646	GC/MS	3.80	3.80	ng/L	MDL	Hladik and others, 2008 (additional compound)
67645	GC/MS	9.50	9.50	ng/L	MDL	Hladik and others, 2008
67649	GC/MS	4.50	4.50	ng/L	MDL	Hladik and others, 2008
51842	GC/MS	4.40	4.40	ng/L	MDL	Hladik and others, 2008 (additional compound)
67653	GC/MS	4.20	4.20	ng/L	MDL	Hladik and others, 2008
51851	GC/MS	4.80	4.80	ng/L	MDL	Hladik and others, 2008 (additional compound)

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Hexazinone	51235-04-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Imazalil	35554-44-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Imidacloprid	138261-41-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Indoxacarb	173584-44-6	Pesticide	2017	Organic Chemistry Research Laboratory, California
Ipconazole	125225-28-7	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Iprodione	36734-19-7	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Isofetamid	875915-78-9	Pesticide	2017	Organic Chemistry Research Laboratory, California
Kresoxim-methyl	143390-89-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Malathion	121-75-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Malathion OA (malaoxon)	1634-78-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Metalaxyl	57837-19-1	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Metconazole	125116-23-6	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Methidathion	950-37-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Methoprene	40596-69-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Methylparathion	298-00-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Metolachlor	51218-45-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Molinate	2212-67-1	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Myclobutanil	88671-89-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Napropamide	15299-99-7	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Novaluron	116714-46-6	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
65085	GC/MS	8.40	8.40	ng/L	MDL	Hladik and others, 2008
67662	GC/MS	10.5	10.5	ng/L	MDL	Hladik and others, 2008
68426	GC/MS	4.90	4.90	ng/L	MDL	Hladik and others, 2008
68627	GC/MS	NA	4.90	ng/L	MDL	Hladik and others, 2008 (additional compound)
52762	GC/MS	7.80	7.80	ng/L	MDL	Hladik and others, 2008 (additional compound)
66617	GC/MS	4.40	4.40	ng/L	MDL	Hladik and others, 2008
NA	GC/MS	NA	2.00	ng/L	MDL	Hladik and others, 2008 (additional compound)
67670	GC/MS	4.00	4.00	ng/L	MDL	Hladik and others, 2008
65087	GC/MS	3.70	3.70	ng/L	MDL	Hladik and others, 2008
68240	GC/MS	5.00	5.00	ng/L	MDL	Hladik and others, 2008 (additional compound)
68437	GC/MS	5.10	5.10	ng/L	MDL	Hladik and others, 2008
66620	GC/MS	5.20	5.20	ng/L	MDL	Hladik and others, 2008
65088	GC/MS	7.20	7.20	ng/L	MDL	Hladik and others, 2008
66623	GC/MS	6.40	6.40	ng/L	MDL	Hladik and others, 2008
65089	GC/MS	3.40	3.40	ng/L	MDL	Hladik and others, 2008
65090	GC/MS	1.50	1.50	ng/L	MDL	Hladik and others, 2008
65091	GC/MS	3.20	3.20	ng/L	MDL	Hladik and others, 2008
66632	GC/MS	6.00	6.00	ng/L	MDL	Hladik and others, 2008
65092	GC/MS	8.20	8.20	ng/L	MDL	Hladik and others, 2008
68655	GC/MS	2.90	2.90	ng/L	MDL	Hladik and others, 2008 (additional compound)

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Oxadiazon	19666-30-9	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Oxyfluorfen	42874-03-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
p p' DDD	72-54-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
p p' DDE	72-55-9	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
p p' DDT	50-29-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Paclobutrazol	76738-62-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Pebulate	1114-71-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Pendimethalin	40487-42-1	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Pentachloroanisole (PCA)	1825-21-4	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Pentachloronitrobenzene (PCNB)	82-68-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Permethrin	52645-53-1	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Phenothrin	26002-80-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Phosmet	732-11-6	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Picoxystrobin	117428-22-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Piperonyl butoxide	51-03-6	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Prodiamine	29091-21-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Prometon	1610-18-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Prometryn	7287-19-6	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Propanil	709-98-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Propargite	2312-35-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
51843	GC/MS	2.10	2.10	ng/L	MDL	Hladik and others, 2008 (additional compound)
65093	GC/MS	3.10	3.10	ng/L	MDL	Hladik and others, 2008
65094	GC/MS	4.10	4.10	ng/L	MDL	Hladik and others, 2008
65095	GC/MS	3.60	3.60	ng/L	MDL	Hladik and others, 2008
65096	GC/MS	4.00	4.00	ng/L	MDL	Hladik and others, 2008
51846	GC/MS	6.20	6.20	ng/L	MDL	Hladik and others, 2008 (additional compound)
65097	GC/MS	2.30	2.30	ng/L	MDL	Hladik and others, 2008
65098	GC/MS	2.30	2.30	ng/L	MDL	Hladik and others, 2008
66637	GC/MS	4.70	4.70	ng/L	MDL	Hladik and others, 2008
66639	GC/MS	3.10	3.10	ng/L	MDL	Hladik and others, 2008
65099	GC/MS	3.40	3.40	ng/L	MDL	Hladik and others, 2008
65100	GC/MS	5.10	5.10	ng/L	MDL	Hladik and others, 2008
65101	GC/MS	4.40	4.40	ng/L	MDL	Hladik and others, 2008
51850	GC/MS	4.20	4.20	ng/L	MDL	Hladik and others, 2008 (additional compound)
65102	GC/MS	2.30	2.30	ng/L	MDL	Hladik and others, 2008
51844	GC/MS	5.20	5.20	ng/L	MDL	Hladik and others, 2008 (additional compound)
67702	GC/MS	2.50	2.50	ng/L	MDL	Hladik and others, 2008
65103	GC/MS	1.80	1.80	ng/L	MDL	Hladik and others, 2008
66641	GC/MS	10.1	10.1	ng/L	MDL	Hladik and others, 2008
68677	GC/MS	6.10	6.10	ng/L	MDL	Hladik and others, 2008 (additional compound)

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Propiconazole	60207-90-1	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Propyzamide	23950-58-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Pyraclostrobin	175013-18-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Pyridaben	96489-71-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Pyrimethanil	53112-28-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Pyriproxfen	95737-68-1	Pesticide	2017	Organic Chemistry Research Laboratory, California
Quinoxyfen	124495-18-7	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Resmethrin	10453-86-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Sedaxane	874967-67-6	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Simazine	122-34-9	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
tau Fluvalinate	102851-06-9	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Tebuconazole	107534-96-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Tebupirimfos	96182-53-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Tebupirimfos OA (Tebupirimfos oxon)	NA	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Tefluthrin	79538-32-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Tetraconazole	112281-77-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Tetradifon	116-29-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Tetramethrin	7696-12-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Thiazopyr	117718-60-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Thiobencarb	28249-77-6	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
66643	GC/MS	5.00	8.80	ng/L	MDL	Hladik and others, 2008
67706	GC/MS	5.00	5.00	ng/L	MDL	Hladik and others, 2008
66646	GC/MS	2.90	2.90	ng/L	MDL	Hladik and others, 2008
68682	GC/MS	5.40	5.40	ng/L	MDL	Hladik and others, 2008 (additional compound)
67717	GC/MS	4.10	4.10	ng/L	MDL	Hladik and others, 2008
68683	GC/MS	NA	5.20	ng/L	MDL	Hladik and others, 2008 (additional compound)
51847	GC/MS	3.30	3.30	ng/L	MDL	Hladik and others, 2008 (additional compound)
65104	GC/MS	5.70	5.70	ng/L	MDL	Hladik and others, 2008
52648	GC/MS	5.20	5.20	ng/L	MDL	Hladik and others, 2008 (additional compound)
65105	GC/MS	5.00	5.00	ng/L	MDL	Hladik and others, 2008
65106	GC/MS	5.30	5.30	ng/L	MDL	Hladik and others, 2008
66649	GC/MS	3.70	3.70	ng/L	MDL	Hladik and others, 2008
68693	GC/MS	1.90	1.90	ng/L	MDL	Hladik and others, 2008 (additional compound)
68694	GC/MS	2.80	2.80	ng/L	MDL	Hladik and others, 2008 (additional compound)
67731	GC/MS	4.20	4.20	ng/L	MDL	Hladik and others, 2008
66654	GC/MS	5.60	5.60	ng/L	MDL	Hladik and others, 2008
51651	GC/MS	3.80	3.80	ng/L	MDL	Hladik and others, 2008 (additional compound)
66657	GC/MS	2.90	2.90	ng/L	MDL	Hladik and others, 2008
51845	GC/MS	4.10	4.10	ng/L	MDL	Hladik and others, 2008 (additional compound)
65107	GC/MS	1.90	1.90	ng/L	MDL	Hladik and others, 2008

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Triadimefon	43121-43-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Triadimenol	55219-65-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Triallate	2303-17-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Tribromoacetaldehyde	115-17-3	Disinfectant by-product/haloacetaldehyde	2016	Organic Chemistry Research Laboratory, California
Tribromoacetonitrile	75519-19-6	Disinfectant by-product/haloacetonitrile	2016	Organic Chemistry Research Laboratory, California
Tribromomethane	75-25-2	Disinfectant by-product/trihalomethane	2016	Organic Chemistry Research Laboratory, California
Tribromonitromethane	464-10-8	Disinfectant by-product/halonitromethane	2016	Organic Chemistry Research Laboratory, California
Tribufos	78-48-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Trichloroacetaldehyde	75-87-6	Disinfectant by-product/haloacetaldehyde	2016	Organic Chemistry Research Laboratory, California
Trichloroacetonitrile	545-06-2	Disinfectant by-product/haloacetonitrile	2016	Organic Chemistry Research Laboratory, California
Trichloromethane	67-66-3	Disinfectant by-product/trihalomethane	2016	Organic Chemistry Research Laboratory, California
Trifloxystrobin	141517-21-7	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Triflumizole	68694-11-1	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Trifluralin	1582-09-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Triiodomethane	75-47-8	Disinfectant by-product/trihalomethane	2016	Organic Chemistry Research Laboratory, California
Triticonazole	131983-72-7	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Zoxamide	156052-68-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
3,4-Dichloroaniline (duiron degradate)	95-76-1	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Acetamiprid	135410-20-7	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Carbendazim	10605-21-7	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
67741	GC/MS	8.90	8.90	ng/L	MDL	Hladik and others, 2008
67746	GC/MS	8.00	8.00	ng/L	MDL	Hladik and others, 2008
68710	GC/MS	2.40	2.40	ng/L	MDL	Hladik and others, 2008 (additional compound)
51328	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
51326	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
34288	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
51319	GC/MS	0.100	NA	ng/L	MDL	Hladik and others, 2014
68711	GC/MS	3.10	3.10	ng/L	MDL	Hladik and others, 2008 (additional compound)
51329	GC/MS	0.200	NA	ng/L	MDL	Hladik and others, 2014
51327	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
34316	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
66660	GC/MS	4.70	4.70	ng/L	MDL	Hladik and others, 2008
67753	GC/MS	6.10	6.10	ng/L	MDL	Hladik and others, 2008
65108	GC/MS	2.10	2.10	ng/L	MDL	Hladik and others, 2008
51312	GC/MS	0.020	NA	ng/L	MDL	Hladik and others, 2014
67758	GC/MS	6.90	6.90	ng/L	MDL	Hladik and others, 2008
67768	GC/MS	3.50	3.50	ng/L	MDL	Hladik and others, 2008
66584	LC/MS-MS	3.20	3.20	ng/L	MDL	Hladik and Calhoun, 2012
68302	LC/MS-MS	3.30	3.30	ng/L	MDL	Hladik and Calhoun, 2012
68548	LC/MS-MS	4.20	4.20	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Chlorantraniliprole	500008-45-7	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Clothianidin	210880-92-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Cyantraniliprole	736994-63-1	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Cyazofamid	120116-88-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Cymoxanil	57966-95-7	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
DCPMU (diuron degradate)	3567-62-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
DCPU (diuron degradate)	155998	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Desthio-prothioconazole	120983-64-4	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Dinotefuran	165252-70-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Diuron	330-54-1	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Ethaboxam	162650-77-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Flonicamid	158062-67-0	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Flupyradifurone	951659-40-8	Pesticide	2017	Organic Chemistry Research Laboratory, California
Fluridone	59756-60-4	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Imidacloprid	138261-41-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Imidacloprid urea	120868-66-8	Pesticide	2017	Organic Chemistry Research Laboratory, California
Mandipropamid	374726-62-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Methoxyfenozide	161050-58-4	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Oryzalin	19044-88-3	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Oxathiapiprolin	1003318-67-9	Pesticide	2017	Organic Chemistry Research Laboratory, California

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
51856	LC/MS-MS	4.00	4.00	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
68221	LC/MS-MS	3.90	3.90	ng/L	MDL	Hladik and Calhoun, 2012
51862	LC/MS-MS	4.20	4.20	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
51853	LC/MS-MS	4.10	4.10	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
51861	LC/MS-MS	3.90	3.90	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
68231	LC/MS-MS	3.50	3.50	ng/L	MDL	Hladik and Calhoun, 2012
68226	LC/MS-MS	3.40	3.40	ng/L	MDL	Hladik and Calhoun, 2012
51865	LC/MS-MS	3.00	3.00	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
68379	LC/MS-MS	4.50	4.50	ng/L	MDL	Hladik and Calhoun, 2012
66598	LC/MS-MS	3.20	3.20	ng/L	MDL	Hladik and Calhoun, 2012
51855	LC/MS-MS	3.80	3.80	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
51858	LC/MS-MS	3.40	3.40	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
52764	LC/MS-MS	NA	3.00	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
51864	LC/MS-MS	3.70	3.70	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
68426	LC/MS-MS	3.80	3.80	ng/L	MDL	Hladik and Calhoun, 2012
51859	LC/MS-MS	NA	4.00	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
51854	LC/MS-MS	3.30	3.30	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
68647	LC/MS-MS	2.70	2.70	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
68663	LC/MS-MS	5.00	5.00	ng/L	MDL	Hladik and Calhoun, 2012
52766	LC/MS-MS	NA	3.20	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Penoxsulam	219714-96-2	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Penthiopyrad	183675-82-3	Pesticide	2017	Organic Chemistry Research Laboratory, California
Sulfoxaflor	946578-00-3	Pesticide	2017	Organic Chemistry Research Laboratory, California
Tebufenozide	112410-23-8	Pesticide	2017	Organic Chemistry Research Laboratory, California
Thiabendazole	148-79-8	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Thiacloprid	111988-49-9	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Thiamethoxam	153719-23-4	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Tolfenpyrad	129558-76-5	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
Tricyclazole	41814-78-2	Pesticide	2017	Organic Chemistry Research Laboratory, California
Carbathiin (carboxin)	5234-68-4	Pesticide	2017	Organic Chemistry Research Laboratory, California
Cyhalofop-butyl	122008-85-9	Pesticide	2016 and 2017	Organic Chemistry Research Laboratory, California
1,7-Dimethylxanthine (p-Xanthine)	611-59-6	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
10-Hydroxy-amitriptyline	64520-05-4	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Abacavir	136470-78-5	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Acetaminophen	103-90-2	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Acyclovir	59277-89-3	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Albuterol	18559-94-9	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Alprazolam	28981-97-7	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Amitriptyline	50-48-6	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Amphetamine	300-62-9	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Antipyrine	60-80-0	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Atenolol	29122-68-7	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Atrazine	1912-24-9	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Benztropine	86-13-5	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Betamethasone	378-44-9	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Bupropion	34911-55-2	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
51863	LC/MS-MS	3.50	3.50	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
52769	LC/MS-MS	NA	3.20	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
52657	LC/MS-MS	NA	4.40	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
68692	LC/MS-MS	NA	3.00	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
67161	LC/MS-MS	3.60	3.60	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
68485	LC/MS-MS	3.20	3.20	ng/L	MDL	Hladik and Calhoun, 2012
68245	LC/MS-MS	3.40	3.40	ng/L	MDL	Hladik and Calhoun, 2012
51866	LC/MS-MS	2.90	2.90	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
52768	LC/MS-MS	NA	4.10	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
52765	LC/MS-MS	NA	4.50	ng/L	MDL	Hladik and Calhoun, 2012 (additional compound)
68360	GC/MS	1.9	1.9	ng/L	MDL	Hladik and others, 2008 (additional compound)
67446	LC/MS-MS	87.7	88.0	ng/L	RLDQC	Furlong and others, 2014
67995	LC/MS-MS	8.30	8.30	ng/L	RLDQC	Furlong and others, 2014
68022	LC/MS-MS	8.21	8.20	ng/L	RLDQC	Furlong and others, 2014
67436	LC/MS-MS	7.13	20.0	ng/L	RLDQC	Furlong and others, 2014
67484	LC/MS-MS	22.2	22.0	ng/L	RLDQC	Furlong and others, 2014
67437	LC/MS-MS	6.70	6.70	ng/L	RLDQC	Furlong and others, 2014
68250	LC/MS-MS	21.3	21.0	ng/L	RLDQC	Furlong and others, 2014
67522	LC/MS-MS	37.2	37.0	ng/L	RLDQC	Furlong and others, 2014
67461	LC/MS-MS	8.14	8.10	ng/L	RLDQC	Furlong and others, 2014
67477	LC/MS-MS	116	116	ng/L	RLDQC	Furlong and others, 2014
67502	LC/MS-MS	13.3	13.0	ng/L	RLDQC	Furlong and others, 2014
65065	LC/MS-MS	19.4	19.0	ng/L	RLDQC	Furlong and others, 2014
67997	LC/MS-MS	24.0	44.0	ng/L	RLDQC	Furlong and others, 2014
67485	LC/MS-MS	114	114	ng/L	RLDQC	Furlong and others, 2014
67439	LC/MS-MS	17.8	18.0	ng/L	RLDQC	Furlong and others, 2014

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Caffeine	58-08-2	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Carbamazepine	298-46-4	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Carisoprodol	78-44-4	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Chlorpheniramine	132-22-9	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Cimetidine	51481-61-9	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Citalopram	59729-33-8	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Clonidine	4205-90-7	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Codeine	76-57-3	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Cotinine	486-56-6	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Dehydronifedipine	67035-22-7	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Desmethyldiltiazem	NA	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Desvenlafaxine	93413-62-8	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Dextromethorphan	125-71-3	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Diazepam (valium)	439-14-5	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Diltiazem	42399-41-7	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Diphenhydramine	147-24-0	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Duloxetine	116539-59-4	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Erythromycin	114-07-8	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Ezetimibe	163222-33-1	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Fadrozole	102676-47-1	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Famotidine	76824-35-6	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Fenofibrate	49562-28-9	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Fexofenadine	83799-24-0	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Fluconazole	86386-73-4	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Fluoxetine	54910-89-3	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Fluticasone propionate	80474-14-2	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Fluvoxamine	54739-18-3	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Gabapentin	60142-96-3	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Glipizide	29094-61-9	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Glyburide	10238-21-8	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Guanylurea	141-83-3	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Hexamethylenetetramine	100-97-0	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Hydrocodone	125-29-1	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Hydrocortisone	50-23-7	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Hydroxyzine	68-88-2	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
67440	LC/MS-MS	90.7	91.0	ng/L	RLDQC	Furlong and others, 2014
67441	LC/MS-MS	11.0	11.0	ng/L	RLDQC	Furlong and others, 2014
67498	LC/MS-MS	12.5	50.0	ng/L	RLDQC	Furlong and others, 2014
67497	LC/MS-MS	4.68	54.0	ng/L	RLDQC	Furlong and others, 2014
67442	LC/MS-MS	27.8	42.0	ng/L	RLDQC	Furlong and others, 2014
67505	LC/MS-MS	6.58	6.60	ng/L	RLDQC	Furlong and others, 2014
67518	LC/MS-MS	60.8	61.0	ng/L	RLDQC	Furlong and others, 2014
67443	LC/MS-MS	88.3	88.0	ng/L	RLDQC	Furlong and others, 2014
67444	LC/MS-MS	6.37	6.40	ng/L	RLDQC	Furlong and others, 2014
67445	LC/MS-MS	24.5	30.0	ng/L	RLDQC	Furlong and others, 2014
67999	LC/MS-MS	12.4	70.0	ng/L	RLDQC	Furlong and others, 2014
68251	LC/MS-MS	7.49	84.0	ng/L	RLDQC	Furlong and others, 2014
67468	LC/MS-MS	8.20	8.20	ng/L	RLDQC	Furlong and others, 2014
67499	LC/MS-MS	2.24	4.00	ng/L	RLDQC	Furlong and others, 2014
67519	LC/MS-MS	10.2	10.0	ng/L	RLDQC	Furlong and others, 2014
67447	LC/MS-MS	5.79	19.0	ng/L	RLDQC	Furlong and others, 2014
67448	LC/MS-MS	36.6	37.0	ng/L	RLDQC	Furlong and others, 2014
67449	LC/MS-MS	53.1	80.0	ng/L	RLDQC	Furlong and others, 2014
67487	LC/MS-MS	63.5	205	ng/L	RLDQC	Furlong and others, 2014
68012	LC/MS-MS	7.32	13.0	ng/L	RLDQC	Furlong and others, 2014
68000	LC/MS-MS	10.7	34.0	ng/L	RLDQC	Furlong and others, 2014
67489	LC/MS-MS	6.28	14.0	ng/L	RLDQC	Furlong and others, 2014
67510	LC/MS-MS	19.9	96.0	ng/L	RLDQC	Furlong and others, 2014
67478	LC/MS-MS	71.0	71.0	ng/L	RLDQC	Furlong and others, 2014
67450	LC/MS-MS	26.9	27.0	ng/L	RLDQC	Furlong and others, 2014
67529	LC/MS-MS	4.62	4.60	ng/L	RLDQC	Furlong and others, 2014
67521	LC/MS-MS	53.8	80.0	ng/L	RLDQC	Furlong and others, 2014
52817	LC/MS-MS	400	400	ng/L	RLDQC	Furlong and others, 2014
68001	LC/MS-MS	148	80.0	ng/L	RLDQC	Furlong and others, 2014
68002	LC/MS-MS	3.95	58.0	ng/L	RLDQC	Furlong and others, 2014
52816	LC/MS-MS	400	400	ng/L	RLDQC	Furlong and others, 2014
52815	LC/MS-MS	40.0	40.0	ng/L	RLDQC	Furlong and others, 2014
67506	LC/MS-MS	10.5	100	ng/L	RLDQC	Furlong and others, 2014
67459	LC/MS-MS	147	147	ng/L	RLDQC	Furlong and others, 2014
68005	LC/MS-MS	7.43	7.40	ng/L	RLDQC	Furlong and others, 2014

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Iminostilbene	256-96-2	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Ketoconazole	65277-42-1	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Lamivudine	134678-17-4	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Lidocaine	137-58-6	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Loperamide	53179-11-6	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Loratadine	79794-75-5	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Lorazepam	846-49-1	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Meprobamate	57-53-4	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Metaxalone	1665-48-1	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Metformin	657-24-9	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Methadone	76-99-3	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Methocarbamol	532-03-6	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Methotrexate	59-05-2	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
methyl-1H-Benzotriazole	29385-43-1	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Metoprolol	51384-51-1	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Morphine	57-27-2	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Nadalol	42200-33-9	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Nevirapine	129618-40-2	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
nicotine	54-11-5	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Nizatidine	76963-41-2	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Nordiazepam	1088-11-5	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Norethindrone	68-22-4	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Norfluoxetine	56161-73-0	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Norsertraline	87857-41-8	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Norverapamil	67018-85-3	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Omeprazole + Esomprazole	NA	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Oseltamivir	196618-13-0	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Oxazepam	604-75-1	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Oxycodone	76-42-6	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Paroxetine	61869-08-7	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Penciclovir	39809-25-1	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Pentoxifylline	6493-05-6	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Phenazopyridine	94-78-0	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Phendimetrazine	634-03-7	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Phenytoin	57-41-0	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
67481	LC/MS-MS	145	145	ng/L	RLDQC	Furlong and others, 2014
68014	LC/MS-MS	113	113	ng/L	RLDQC	Furlong and others, 2014
68018	LC/MS-MS	16.1	16.0	ng/L	RLDQC	Furlong and others, 2014
67462	LC/MS-MS	15.2	38.0	ng/L	RLDQC	Furlong and others, 2014
67515	LC/MS-MS	11.5	80.0	ng/L	RLDQC	Furlong and others, 2014
67488	LC/MS-MS	6.95	7.00	ng/L	RLDQC	Furlong and others, 2014
67470	LC/MS-MS	116	202	ng/L	RLDQC	Furlong and others, 2014
67464	LC/MS-MS	86.0	86.0	ng/L	RLDQC	Furlong and others, 2014
67504	LC/MS-MS	15.6	16.0	ng/L	RLDQC	Furlong and others, 2014
67492	LC/MS-MS	13.1	13.0	ng/L	RLDQC	Furlong and others, 2014
67500	LC/MS-MS	7.61	7.60	ng/L	RLDQC	Furlong and others, 2014
67501	LC/MS-MS	8.72	11.0	ng/L	RLDQC	Furlong and others, 2014
67525	LC/MS-MS	52.4	52.0	ng/L	RLDQC	Furlong and others, 2014
67514	LC/MS-MS	141	80.0	ng/L	RLDQC	Furlong and others, 2014
67523	LC/MS-MS	27.5	27.0	ng/L	RLDQC	Furlong and others, 2014
67458	LC/MS-MS	14.0	80.0	ng/L	RLDQC	Furlong and others, 2014
68006	LC/MS-MS	80.8	20.0	ng/L	RLDQC	Furlong and others, 2014
68017	LC/MS-MS	15.1	290	ng/L	RLDQC	Furlong and others, 2014
67493	LC/MS-MS	57.8	58.0	ng/L	RLDQC	Furlong and others, 2014
67479	LC/MS-MS	19.0	80.0	ng/L	RLDQC	Furlong and others, 2014
68252	LC/MS-MS	41.4	20.0	ng/L	RLDQC	Furlong and others, 2014
67434	LC/MS-MS	10.9	20.0	ng/L	RLDQC	Furlong and others, 2014
67451	LC/MS-MS	199	80.0	ng/L	RLDQC	Furlong and others, 2014
67532	LC/MS-MS	192	80.0	ng/L	RLDQC	Furlong and others, 2014
68007	LC/MS-MS	8.58	8.60	ng/L	RLDQC	Furlong and others, 2014
67512	LC/MS-MS	5.62	16.0	ng/L	RLDQC	Furlong and others, 2014
67511	LC/MS-MS	14.6	15.0	ng/L	RLDQC	Furlong and others, 2014
67469	LC/MS-MS	140	226	ng/L	RLDQC	Furlong and others, 2014
67495	LC/MS-MS	24.9	25.0	ng/L	RLDQC	Furlong and others, 2014
67527	LC/MS-MS	20.6	264	ng/L	RLDQC	Furlong and others, 2014
68021	LC/MS-MS	40.2	80.0	ng/L	RLDQC	Furlong and others, 2014
67480	LC/MS-MS	9.35	9.40	ng/L	RLDQC	Furlong and others, 2014
68008	LC/MS-MS	13.3	13.0	ng/L	RLDQC	Furlong and others, 2014
67496	LC/MS-MS	31.1	310	ng/L	RLDQC	Furlong and others, 2014
67466	LC/MS-MS	188	188	ng/L	RLDQC	Furlong and others, 2014

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

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Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Piperonyl butoxide	51-03-6	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Prednisolone	50-24-8	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Prednisone	53-03-2	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Promethazine	60-87-7	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Propoxyphene	469-62-5	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Propranolol	525-66-6	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Pseudoephedrine + Ephedrine	NA	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Quinine	130-95-0	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Ractopamine	97825-25-7	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Raloxifene	84449-90-1	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Ranitidine	66357-35-5	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Sertraline	79617-96-2	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Sitagliptin	486460-32-6	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Sulfadimethoxine	122-11-2	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Sulfamethizole	144-82-1	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Sulfamethoxazole	723-46-6	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Tamoxifen	10540-29-1	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Temazepam	846-50-4	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
theophylline	58-55-9	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Thiabendazole	148-79-8	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Tiotropium	186691-13-4	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Tramadol	27203-92-5	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Triamterene	396-01-0	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Trimethoprim	738-70-5	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Valacyclovir	124832-26-4	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Venlafaxine	93413-69-5	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Verapamil	52-53-9	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Warfarin	81-81-2	Pharmaceutically active and other	2016 and 2017	National Water Quality Laboratory
Aluminum	7429-90-5	Trace element	2016 and 2017	National Water Quality Laboratory
Antimony	7440-36-0	Trace element	2016 and 2017	National Water Quality Laboratory
Arsenic	7440-38-2	Trace element	2017	National Water Quality Laboratory
Barium	7440-39-3	Trace element	2016 and 2017	National Water Quality Laboratory

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

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NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
67435	LC/MS-MS	3.07	20.0	ng/L	RLDQC	Furlong and others, 2014
67483	LC/MS-MS	150	150	ng/L	RLDQC	Furlong and others, 2014
67467	LC/MS-MS	168	168	ng/L	RLDQC	Furlong and others, 2014
67524	LC/MS-MS	50.0	80.0	ng/L	RLDQC	Furlong and others, 2014
68009	LC/MS-MS	17.2	17.0	ng/L	RLDQC	Furlong and others, 2014
67516	LC/MS-MS	26.3	26.0	ng/L	RLDQC	Furlong and others, 2014
67460	LC/MS-MS	11.1	11.0	ng/L	RLDQC	Furlong and others, 2014
68011	LC/MS-MS	79.9	80.0	ng/L	RLDQC	Furlong and others, 2014
52814	LC/MS-MS	40.0	40.0	ng/L	RLDQC	Furlong and others, 2014
67530	LC/MS-MS	9.72	80.0	ng/L	RLDQC	Furlong and others, 2014
67452	LC/MS-MS	192	192	ng/L	RLDQC	Furlong and others, 2014
67528	LC/MS-MS	16.2	16.0	ng/L	RLDQC	Furlong and others, 2014
67531	LC/MS-MS	97.3	97.0	ng/L	RLDQC	Furlong and others, 2014
67503	LC/MS-MS	65.5	65.0	ng/L	RLDQC	Furlong and others, 2014
67476	LC/MS-MS	104	104	ng/L	RLDQC	Furlong and others, 2014
67454	LC/MS-MS	26.1	26.0	ng/L	RLDQC	Furlong and others, 2014
68015	LC/MS-MS	80.0	270	ng/L	MRL	Furlong and others, 2014
67471	LC/MS-MS	18.4	18.0	ng/L	RLDQC	Furlong and others, 2014
67494	LC/MS-MS	41.5	80.0	ng/L	RLDQC	Furlong and others, 2014
67455	LC/MS-MS	4.10	11.0	ng/L	RLDQC	Furlong and others, 2014
67508	LC/MS-MS	43.1	200	ng/L	RLDQC	Furlong and others, 2014
67517	LC/MS-MS	15.1	15.0	ng/L	RLDQC	Furlong and others, 2014
67475	LC/MS-MS	5.25	5.20	ng/L	RLDQC	Furlong and others, 2014
67456	LC/MS-MS	19.0	19.0	ng/L	RLDQC	Furlong and others, 2014
67507	LC/MS-MS	163	163	ng/L	RLDQC	Furlong and others, 2014
67534	LC/MS-MS	4.48	5.20	ng/L	RLDQC	Furlong and others, 2014
67472	LC/MS-MS	15.5	140	ng/L	RLDQC	Furlong and others, 2014
67457	LC/MS-MS	6.03	6.00	ng/L	RLDQC	Furlong and others, 2014
01105	ICP-MS	7.60	6.00	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
01097	ICP-MS	0.360	0.180	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
01002	cICP-MS	NA	0.100	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
01007	ICP-MS	0.500	0.200	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

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Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Beryllium	7440-41-7	Trace element	2016 and 2017	National Water Quality Laboratory
Boron	7440-42-8	Trace element	2017	National Water Quality Laboratory
Cadmium	7440-43-9	Trace element	2016 and 2017	National Water Quality Laboratory
Calcium	7440-70-2	Trace element	2017	National Water Quality Laboratory
Chromium	7440-47-3	Trace element	2016 and 2017	National Water Quality Laboratory
Cobalt	7440-48-4	Trace element	2016 and 2017	National Water Quality Laboratory
Copper	7440-50-8	Trace element	2016 and 2017	National Water Quality Laboratory
Iron	7439-89-6	Trace element	2017	National Water Quality Laboratory
Lead	7439-92-1	Trace element	2016 and 2017	National Water Quality Laboratory
Lithium	7439-93-2	Trace element	2016 and 2017	National Water Quality Laboratory
Magnesium	7439-95-4	Trace element	2017	National Water Quality Laboratory
Manganese	7439-96-5	Trace element	2016 and 2017	National Water Quality Laboratory
Molybdenum	7439-98-7	Trace element	2016 and 2017	National Water Quality Laboratory
Nickel	7440-02-0	Trace element	2016 and 2017	National Water Quality Laboratory
pH, laboratory	NA	NA	2016 and 2017	National Water Quality Laboratory
Selenium	7782-49-2	Trace element	2016 and 2017	National Water Quality Laboratory
Silica	7631-86-9	Trace element	2017	National Water Quality Laboratory
Silver	7440-22-4	Trace element	2016 and 2017	National Water Quality Laboratory
Sodium	7440-23-5	Trace element	2017	National Water Quality Laboratory
specific conductance, laboratory	NA	NA	2016 and 2017	National Water Quality Laboratory

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
01012	ICP-MS	0.040	0.020	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
01022	ICP-MS	NA	10.0	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
01027	ICP-MS	0.060	0.060	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
00916	ICP	NA	0.042	mg/L	DLDQC	Hoffman and others, 1996; Fishman and Friedman, 1989
01034	cICP-MS	0.800	1.00	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
01037	cICP-MS	0.100	0.060	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
01042	cICP-MS	1.60	0.400	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
01045	ICP	NA	20.0	µg/L	DLDQC	Hoffman and others, 1996; Fishman and Friedman, 1989
01051	ICP-MS	0.080	0.040	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
01132	ICP-MS	0.300	0.300	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
00927	ICP	NA	0.020	mg/L	DLDQC	Hoffman and others, 1996; Fishman and Friedman, 1989
01055	ICP-MS	0.800	0.800	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
01062	ICP-MS	0.100	0.100	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
01067	cICP-MS	0.400	0.400	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
00403	EL006	0.100	0.100	Standard units	MRL	Hoffman and others, 1996; Fishman and Friedman, 1989
01147	cICP-MS	0.200	0.100	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
00956	ICP	NA	0.036	mg/L	DLDQC	Hoffman and others, 1996; Fishman and Friedman, 1989
01077	ICP-MS	0.060	0.060	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
00929	ICP	NA	0.120	mg/L	DLDQC	Hoffman and others, 1996; Fishman and Friedman, 1989
90095	WHT03	5.00	5.00	uS/cm	MRL	Hoffman and others, 1996; Fishman and Friedman, 1989

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Strontium	7440-24-6	Trace element	2016 and 2017	National Water Quality Laboratory
Thallium	7440-28-0	Trace element	2016 and 2017	National Water Quality Laboratory
Uranium, natural	7440-61-1	Trace element	2016 and 2017	National Water Quality Laboratory
Vanadium	7440-62-2	Trace element	2017	National Water Quality Laboratory
Zinc	7440-66-6	Trace element	2016 and 2017	National Water Quality Laboratory
pH, field	NA	NA	2016 and 2017	Field personnel
Specific conductance	NA	NA	2016 and 2017	Field personnel
Hexavalent chromium	18540-29-9	Trace element	2017	Redox Chemistry Laboratory
Fluoride	16984-48-8	Anion	2017	Redox Chemistry Laboratory
Chloride	16887-00-6	Anion	2017	Redox Chemistry Laboratory
Sulfate	18785-72-3	Anion	2017	Redox Chemistry Laboratory
Aluminum	7429-90-5	Trace element	2017	Redox Chemistry Laboratory
Arsenic	7440-38-2	Trace element	2017	Redox Chemistry Laboratory
Boron	7440-42-8	Trace element	2017	Redox Chemistry Laboratory
Barium	7440-39-3	Trace element	2017	Redox Chemistry Laboratory
Beryllium	7440-41-7	Trace element	2017	Redox Chemistry Laboratory
Calcium	7440-70-2	Cation	2017	Redox Chemistry Laboratory
Cadmium	7440-43-9	Trace element	2017	Redox Chemistry Laboratory
Cobalt	7440-48-4	Trace element	2017	Redox Chemistry Laboratory
Chromium	7440-47-3	Trace element	2017	Redox Chemistry Laboratory
Copper	7440-50-8	Trace element	2017	Redox Chemistry Laboratory
Iron	7439-89-6	Trace element	2017	Redox Chemistry Laboratory
Potassium	7440-09-7	Cation	2017	Redox Chemistry Laboratory
Lithium	7439-93-2	Trace element	2017	Redox Chemistry Laboratory
Magnesium	7439-95-4	Cation	2017	Redox Chemistry Laboratory
Manganese	7439-96-5	Trace element	2017	Redox Chemistry Laboratory
Molybdenum	7439-98-7	Trace element	2017	Redox Chemistry Laboratory
Sodium	7440-23-5	Cation	2017	Redox Chemistry Laboratory
Nickel	7440-02-0	Trace element	2017	Redox Chemistry Laboratory
Phosphorus	7723-14-0	Nutrient	2017	Redox Chemistry Laboratory
Lead	7439-92-1	Trace element	2017	Redox Chemistry Laboratory
Lead	7439-92-1	Trace element	2017	Redox Chemistry Laboratory

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
01082	ICP-MS	1.60	1.00	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
01059	ICP-MS	0.040	0.040	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
28011	ICP-MS	0.028	0.060	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
01087	cICP-MS	NA	1.00	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
01092	cICP-MS	NA	4.00	µg/L	DLBLK	Hoffman and others, 1996; Fishman and Friedman, 1989
00400	NA	0.100	0.100	Standard units	NA	USGS, National Field Manual
00095	NA	5.00	5.00	µS/cm	NA	USGS, National Field Manual
01032	Cation exchange	NA	0.200	µg/L	MDL	Ball and McCleskey, 2003
00950	IC	NA	0.100	mg/L	MDL	EPA, 2013
00940	IC	NA	0.100	mg/L	MDL	EPA, 2013
00945	IC	NA	0.100	mg/L	MDL	EPA, 2013
01105	ICP-OES	NA	0.001	mg/L	MDL	EPA, 2014
00978	ICP-OES	NA	0.030	mg/L	MDL	EPA, 2014
01022	ICP-OES	NA	0.010	mg/L	MDL	EPA, 2014
01009	ICP-OES	NA	0.0005	mg/L	MDL	EPA, 2014
01012	ICP-OES	NA	0.0001	mg/L	MDL	EPA, 2014
00916	ICP-OES	NA	0.020	mg/L	MDL	EPA, 2014
01113	ICP-OES	NA	0.002	mg/L	MDL	EPA, 2014
01037	ICP-OES	NA	0.002	mg/L	MDL	EPA, 2014
01030	ICP-OES	NA	0.001	mg/L	MDL	EPA, 2014
01042	ICP-OES	NA	0.001	mg/L	MDL	EPA, 2014
01045	ICP-OES	NA	0.002	mg/L	MDL	EPA, 2014
00937	ICP-OES	NA	0.005	mg/L	MDL	EPA, 2014
01132	ICP-OES	NA	0.001	mg/L	MDL	EPA, 2014
00927	ICP-OES	NA	0.003	mg/L	MDL	EPA, 2014
01055	ICP-OES	NA	0.001	mg/L	MDL	EPA, 2014
01062	ICP-OES	NA	0.004	mg/L	MDL	EPA, 2014
00923	ICP-OES	NA	0.050	mg/L	MDL	EPA, 2014
01067	ICP-OES	NA	0.002	mg/L	MDL	EPA, 2014
00665	IC	NA	0.040	mg/L	MDL	EPA, 2014
01051	ICP-OES	NA	0.008	mg/L	MDL	EPA, 2014
01051	GFAAS	NA	0.600	mg/L	MDL	Hergenreder, 2011

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

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Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Rubidium	7440-17-7	Trace element	2017	Redox Chemistry Laboratory
Antimony	7440-36-0	Trace element	2017	Redox Chemistry Laboratory
Selenium	7782-49-2	Trace element	2017	Redox Chemistry Laboratory
Silicate	NA	Cation	2017	Redox Chemistry Laboratory
Strontium	7440-24-6	Trace element	2017	Redox Chemistry Laboratory
Uranium	7440-61-1	Trace element	2017	Redox Chemistry Laboratory
Vanadium	7440-62-2	Trace element	2017	Redox Chemistry Laboratory
Tungsten	7440-33-7	Trace element	2017	Redox Chemistry Laboratory
Zinc	7440-66-6	Trace element	2017	Redox Chemistry Laboratory
Nitrogen, nitrite plus nitrate	NA	Nutrient	2017	National Water Quality Laboratory
11-Ketotestosterone	564-35-2	Hormone	2016	National Water Quality Laboratory
17-alpha-Estradiol	57-91-0	Hormone	2016	National Water Quality Laboratory
17-alpha-Ethynylestradiol	57-63-6	Hormone	2016	National Water Quality Laboratory
17-beta-Estradiol	50-28-2	Hormone	2016	National Water Quality Laboratory
3-beta-Coprostanol	360-68-9	Hormone	2016	National Water Quality Laboratory
4-Androstene-3,17-dione	63-05-8	Hormone	2016	National Water Quality Laboratory
Bisphenol A	80-05-7	Hormone	2016	National Water Quality Laboratory
Cholesterol	57-88-5	Hormone	2016	National Water Quality Laboratory
cis-Androsterone	53-41-8	Hormone	2016	National Water Quality Laboratory
Dihydrotestosterone	521-18-6	Hormone	2016	National Water Quality Laboratory
Epitestosterone	481-30-1	Hormone	2016	National Water Quality Laboratory
Equilenin	517-09-9	Hormone	2016	National Water Quality Laboratory
Equilin	474-86-2	Hormone	2016	National Water Quality Laboratory
Estriol	50-27-1	Hormone	2016	National Water Quality Laboratory
Estrone	53-16-7	Hormone	2016	National Water Quality Laboratory
Mestranol	72-33-3	Hormone	2016	National Water Quality Laboratory
Norethindrone	68-22-4	Hormone	2016	National Water Quality Laboratory
Progesterone	57-83-0	Hormone	2016	National Water Quality Laboratory
Testosterone	58-22-0	Hormone	2016	National Water Quality Laboratory
trans-Diethylstilbestrol	56-53-1	Hormone	2016	National Water Quality Laboratory
1,1,1,2-Tetrachloroethane	630-20-6	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
1,1,1-Trichloroethane	71-55-6	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
1,1,2-Trichloroethane	79-00-5	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
1,1-Dichloroethane	75-34-3	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
1,1-Dichloroethene	75-35-4	Volatile organic compound	2016 and 2017	National Water Quality Laboratory

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
01137	ICP-OES	NA	0.002	mg/L	MDL	EPA, 2014
NA	ICP-OES	NA	0.030	mg/L	MDL	EPA, 2014
01147	ICP-OES	NA	0.030	mg/L	MDL	EPA, 2014
00956	ICP-OES	NA	0.05	mg/L	MDL	EPA, 2014
01082	ICP-OES	NA	0.0005	mg/L	MDL	EPA, 2014
NA	ICP-OES	NA	0.010	mg/L	MDL	EPA, 2014
NA	ICP-OES	NA	0.001	mg/L	MDL	EPA, 2014
NA	ICP-OES	NA	0.005	mg/L	MDL	EPA, 2014
01092	ICP-OES	NA	0.001	mg/L	MDL	EPA, 2014
00631	RED01	NA	0.040	mg/L	DLDQC	Patton and Kryskalla, 2011
64527	GC/MS-MS	2.00	NA	ng/L	MRL	Foreman and others, 2012
64528	GC/MS-MS	0.800	NA	ng/L	IRL	Foreman and others, 2012
64529	GC/MS-MS	0.800	NA	ng/L	IRL	Foreman and others, 2012
64530	GC/MS-MS	0.800	NA	ng/L	IRL	Foreman and others, 2012
64532	GC/MS-MS	200	NA	ng/L	MRL	Foreman and others, 2012
64533	GC/MS-MS	0.800	NA	ng/L	IRL	Foreman and others, 2012
67305	GC/MS-MS	100	NA	ng/L	MRL	Foreman and others, 2012
64534	GC/MS-MS	200	NA	ng/L	MRL	Foreman and others, 2012
64535	GC/MS-MS	0.800	NA	ng/L	IRL	Foreman and others, 2012
64544	GC/MS-MS	4.00	NA	ng/L	IRL	Foreman and others, 2012
64537	GC/MS-MS	2.00	NA	ng/L	IRL	Foreman and others, 2012
64538	GC/MS-MS	2.00	NA	ng/L	IRL	Foreman and others, 2012
64539	GC/MS-MS	8.00	NA	ng/L	IRL	Foreman and others, 2012
64540	GC/MS-MS	2.00	NA	ng/L	IRL	Foreman and others, 2012
64541	GC/MS-MS	0.800	NA	ng/L	IRL	Foreman and others, 2012
64542	GC/MS-MS	0.800	NA	ng/L	IRL	Foreman and others, 2012
64531	GC/MS-MS	0.800	NA	ng/L	IRL	Foreman and others, 2012
64543	GC/MS-MS	8.00	NA	ng/L	IRL	Foreman and others, 2012
64545	GC/MS-MS	1.60	NA	ng/L	IRL	Foreman and others, 2012
64536	GC/MS-MS	0.800	NA	ng/L	MRL	Foreman and others, 2012
77562	GCM66	0.040	0.040	µg/L	RLDQC	Rose and others, 2016
34506	GCM66	0.030	0.030	µg/L	RLDQC	Rose and others, 2016
34511	GCM66	0.046	0.046	µg/L	RLDQC	Rose and others, 2016
34496	GCM66	0.044	0.044	µg/L	RLDQC	Rose and others, 2016
34501	GCM66	0.022	0.025	µg/L	RLDQC	Rose and others, 2016

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
1,1-Difluoroethane	75-37-6	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
1,2,3,4-Tetrahydronapthalene	119-64-2	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
1,2,4-Trichlorobenzene	120-82-1	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
1,2,4-Trimethylbenzene	95-63-6	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
1,2-Dichlorobenzene	95-50-1	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
1,2-Dichloroethane	107-06-2	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
1,3-Butadiene	106-99-0	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
1,4-Dichlorobenzene	106-46-7	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
1-Chloro-1,1-difluoroethane	75-68-3	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
2,2-Dichloro-1,1,1-trifluoroethane	306-83-2	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Benzene	71-43-2	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Bromochloromethane	74-97-5	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Bromodichloromethane	75-27-4	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Bromomethane	74-83-9	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Butane	106-97-8	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Carbon disulfide	75-15-0	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Chlorobenzene	108-90-7	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Chlorodifluoromethane	75-45-6	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Chloromethane	74-87-3	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
cis-1,2-Dichloroethene	156-59-2	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
cis-1,3-Dichloropropene	10061-01-5	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Dibromochloromethane	124-48-1	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Dichlorofluoromethane	75-43-4	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Dichloromethane	75-09-2	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Ethylbenzene	100-41-4	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Hexane	110-54-3	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
m- and p-Xylene	179601-23-1	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Methyl tert-butyl ether	1634-04-4	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
n-Pentane	109-66-0	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
n-Propylbenzene	103-65-1	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Naphthalene	91-20-3	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
o-Xylene	95-47-6	Volatile organic compound	2016 and 2017	National Water Quality Laboratory

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

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NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
49538	GCM66	0.022	0.025	µg/L	RLDQC	Rose and others, 2016
77323	GCM66	0.080	0.080	µg/L	RLDQC	Rose and others, 2016
34551	GCM66	0.080	0.080	µg/L	RLDQC	Rose and others, 2016
77222	GCM66	0.032	0.032	µg/L	RLDQC	Rose and others, 2016
50985	GCM66	0.030	0.030	µg/L	RLDQC	Rose and others, 2016
34536	GCM66	0.0280	0.0280	µg/L	RLDQC	Rose and others, 2016
32103	GCM66	0.080	0.080	µg/L	RLDQC	Rose and others, 2016
68726	GCM66	0.080	0.080	µg/L	RLDQC	Rose and others, 2016
34571	GCM66	0.026	0.026	µg/L	RLDQC	Rose and others, 2016
85668	GCM66	0.034	0.034	µg/L	RLDQC	Rose and others, 2016
62174	GCM66	0.014	0.025	µg/L	RLDQC	Rose and others, 2016
34030	GCM66	0.026	0.026	µg/L	RLDQC	Rose and others, 2016
77297	GCM66	0.060	0.060	µg/L	RLDQC	Rose and others, 2016
32101	GCM66	0.034	0.034	µg/L	RLDQC	Rose and others, 2016
34413	GCM66	0.200	0.200	µg/L	RLDQC	Rose and others, 2016
81563	GCM66	0.038	0.050	µg/L	RLDQC	Rose and others, 2016
77041	GCM66	0.100	0.100	µg/L	RLDQC	Rose and others, 2016
34301	GCM66	0.026	0.026	µg/L	RLDQC	Rose and others, 2016
45028	GCM66	0.180	0.180	µg/L	RLDQC	Rose and others, 2016
34418	GCM66	0.100	0.100	µg/L	MRL	Rose and others, 2016
77093	GCM66	0.022	0.025	µg/L	RLDQC	Rose and others, 2016
34704	GCM66	0.100	0.100	µg/L	RLDQC	Rose and others, 2016
32105	GCM66	0.120	0.120	µg/L	RLDQC	Rose and others, 2016
77119	GCM66	0.050	0.050	µg/L	RLDQC	Rose and others, 2016
34423	GCM66	0.040	0.040	µg/L	MRL	Rose and others, 2016
34371	GCM66	0.036	0.036	µg/L	RLDQC	Rose and others, 2016
81590	GCM66	0.024	0.05	µg/L	RLDQC	Rose and others, 2016
85795	GCM66	0.080	0.080	µg/L	RLDQC	Rose and others, 2016
78032	GCM66	0.100	0.100	µg/L	RLDQC	Rose and others, 2016
81604	GCM66	0.022	0.066	µg/L	RLDQC	Rose and others, 2016
77224	GCM66	0.036	0.036	µg/L	RLDQC	Rose and others, 2016
34696	GCM66	0.260	0.260	µg/L	RLDQC	Rose and others, 2016
77135	GCM66	0.032	0.032	µg/L	RLDQC	Rose and others, 2016

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

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Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
sec-Butylbenzene	135-98-8	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Styrene	100-42-5	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Tetrachloroethylene	127-18-4	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Tetrachloromethane	56-23-5	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Toluene	108-88-3	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
trans-1,2-Dichloroethylene	156-60-5	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
trans-1,3-Dichloropropene	10061-02-6	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Tribromomethane	75-25-2	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Trichloroethylene	79-01-6	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Trichloromethane	67-66-3	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
Vinyl chloride	75-01-4	Volatile organic compound	2016 and 2017	National Water Quality Laboratory
1,1-Dichloro-2-propanone	513-88-2	Volatile organic compound	2017	National Water Quality Laboratory
1,2,3-Trichloropropane	96-18-4	Volatile organic compound	2017	National Water Quality Laboratory
1,2-Dibromo-3-chloropropane	96-12-8	Volatile organic compound	2017	National Water Quality Laboratory
1,2-Dibromoethane	106-93-4	Volatile organic compound	2017	National Water Quality Laboratory
1,2-Dichloropropane	78-87-5	Volatile organic compound	2017	National Water Quality Laboratory
1,3-Dioxolane	646-06-0	Volatile organic compound	2017	National Water Quality Laboratory
1,4-Dioxane	123-91-1	Volatile organic compound	2017	National Water Quality Laboratory
1-octanol	111-87-5	Volatile organic compound	2017	National Water Quality Laboratory
1Methoxy-4(2-propenyl) benzene	140-67-0	Volatile organic compound	2017	National Water Quality Laboratory
2-ethoxyethyl acetate	111-15-9	Volatile organic compound	2017	National Water Quality Laboratory
2-hexanone, 5-methyl-	110-12-3	Volatile organic compound	2017	National Water Quality Laboratory
2-Nitropropane	79-46-9	Volatile organic compound	2017	National Water Quality Laboratory
2-pentanol, 4-methyl-	108-11-2	Volatile organic compound	2017	National Water Quality Laboratory
2-Propen-1-ol	107-18-6	Volatile organic compound	2017	National Water Quality Laboratory
4-heptanone, 2,6-dimethyl-	108-83-8	Volatile organic compound	2017	National Water Quality Laboratory
Acetate, ethyl	141-78-6	Volatile organic compound	2017	National Water Quality Laboratory
Acetate, isobutyl	110-19-0	Volatile organic compound	2017	National Water Quality Laboratory
Acetate, isopropyl	108-21-4	Volatile organic compound	2017	National Water Quality Laboratory
Acetate, propyl	109-60-4	Volatile organic compound	2017	National Water Quality Laboratory
Acetonitrile	75-05-8	Volatile organic compound	2017	National Water Quality Laboratory
alpha-Terpineol	98-55-5	Volatile organic compound	2017	National Water Quality Laboratory
Butanal	123-72-8	Volatile organic compound	2017	National Water Quality Laboratory
Butanol	71-36-3	Volatile organic compound	2017	National Water Quality Laboratory
Chloropicrin	76-06-2	Volatile organic compound	2017	National Water Quality Laboratory

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
77350	GCM66	0.034	0.034	µg/L	RLDQC	Rose and others, 2016
77128	GCM66	0.042	0.042	µg/L	MRL	Rose and others, 2016
34475	GCM66	0.026	0.026	µg/L	RLDQC	Rose and others, 2016
32102	GCM66	0.060	0.060	µg/L	RLDQC	Rose and others, 2016
34010	GCM66	0.020	0.050	µg/L	MRL	Rose and others, 2016
34546	GCM66	0.018	0.025	µg/L	RLDQC	Rose and others, 2016
34699	GCM66	0.240	0.240	µg/L	RLDQC	Rose and others, 2016
32104	GCM66	0.100	0.140	µg/L	RLDQC	Rose and others, 2016
39180	GCM66	0.022	0.025	µg/L	RLDQC	Rose and others, 2016
32106	GCM66	0.030	0.030	µg/L	RLDQC	Rose and others, 2016
39175	GCM66	0.060	0.060	µg/L	RLDQC	Rose and others, 2016
80336	GM016	NA	0.240	µg/L	RLDQC	Rose and others, 2016
77443	GM016	NA	0.006	µg/L	RLDQC	Rose and others, 2016
82625	GM016	NA	0.020	µg/L	RLDQC	Rose and others, 2016
77651	GM016	NA	0.004	µg/L	RLDQC	Rose and others, 2016
34541	GM016	NA	0.004	µg/L	RLDQC	Rose and others, 2016
81583	GM016	NA	0.380	µg/L	RLDQC	Rose and others, 2016
81582	GM016	NA	0.70	µg/L	RLDQC	Rose and others, 2016
77310	GM016	NA	1.80	µg/L	RLDQC	Rose and others, 2016
68066	GM016	NA	0.300	µg/L	RLDQC	Rose and others, 2016
68728	GM016	NA	5.40	µg/L	RLDQC	Rose and others, 2016
77179	GM016	NA	0.022	µg/L	RLDQC	Rose and others, 2016
77076	GM016	NA	0.120	µg/L	RLDQC	Rose and others, 2016
77113	GM016	NA	0.200	µg/L	RLDQC	Rose and others, 2016
68729	GM016	NA	7.80	µg/L	RLDQC	Rose and others, 2016
77419	GM016	NA	0.032	µg/L	RLDQC	Rose and others, 2016
81585	GM016	NA	0.060	µg/L	RLDQC	Rose and others, 2016
77201	GM016	NA	0.028	µg/L	RLDQC	Rose and others, 2016
45013	GM016	NA	0.010	µg/L	RLDQC	Rose and others, 2016
45022	GM016	NA	0.032	µg/L	RLDQC	Rose and others, 2016
76997	GM016	NA	0.800	µg/L	RLDQC	Rose and others, 2016
68730	GM016	NA	6.80	µg/L	RLDQC	Rose and others, 2016
68732	GM016	NA	0.380	µg/L	RLDQC	Rose and others, 2016
77034	GM016	NA	0.800	µg/L	RLDQC	Rose and others, 2016
77548	GM016	NA	0.018	µg/L	RLDQC	Rose and others, 2016

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Cyclohexanone	108-94-1	Volatile organic compound	2017	National Water Quality Laboratory
Diethylamine, n-nitroso-	55-18-5	Volatile organic compound	2017	National Water Quality Laboratory
Dimethoxymethane	109-87-5	Volatile organic compound	2017	National Water Quality Laboratory
Hexachlorocyclopentadiene	77-47-4	Volatile organic compound	2017	National Water Quality Laboratory
Hexanol, 2-ethyl-	104-76-7	Volatile organic compound	2017	National Water Quality Laboratory
Isophorone	78-59-1	Volatile organic compound	2017	National Water Quality Laboratory
Isopropyl alcohol	67-63-0	Volatile organic compound	2017	National Water Quality Laboratory
Methyl acetate	79-20-9	Volatile organic compound	2017	National Water Quality Laboratory
Methyl tert-butyl ether	1634-04-4	Volatile organic compound	2017	National Water Quality Laboratory
n-Pentanal	110-62-3	Volatile organic compound	2017	National Water Quality Laboratory
Nitrobenzene	98-95-3	Volatile organic compound	2017	National Water Quality Laboratory
tert-Butyl alcohol	75-65-0	Volatile organic compound	2017	National Water Quality Laboratory
trans-Crotonaldehyde	123-73-9	Volatile organic compound	2017	National Water Quality Laboratory
11-chloroeicosafluoro-3-oxaundecane-1-sulfonate (CL-O-PFUdS)	NA	Chlorinated perfluoroalkane sulfonate	2016	Colorado School of Mines
8-chloroperfluoro-1-octanesulfonate (CIPFOS)	NA	Chlorinated perfluoroalkane sulfonate	2016	Colorado School of Mines
9-chlorohexadecafluoro-3-oxanonane-1-sulfonate (CI-O-PFNS)	NA	Chlorinated perfluoroalkane sulfonate	2016	Colorado School of Mines
2H-Perfluoro-2-decenoic acid (8:2) (8:2 FTUA)	NA	Fluorotelomer alkanoic acid	2016	Colorado School of Mines
2H-Perfluoro-2-dodecenoic acid (10:2) (10:2 FTUA)	NA	Fluorotelomer alkanoic acid	2016	Colorado School of Mines
2H-Perfluoro-2-octenoic acid (6:2) (6:2 FTUA)	NA	Fluorotelomer alkanoic acid	2016	Colorado School of Mines
2-Perfluorodecyl ethanoic acid (10:2) (10:2 FTA)	NA	Fluorotelomer alkanoic acid	2016	Colorado School of Mines
2-Perfluorohexyl ethanoic acid (6:2) (6:2 FTA)	NA	Fluorotelomer alkanoic acid	2016	Colorado School of Mines
2-Perfluorooctyl ethanoic acid (8:2) (8:2 FTA)	NA	Fluorotelomer alkanoic acid	2016	Colorado School of Mines
3-Perfluoroheptyl propanoic acid (7:3) (7:3 FTA)	NA	Fluorotelomer alkanoic acid	2016	Colorado School of Mines
3-Perfluoropentyl propanoic acid (5:3) (5:3 FTA)	NA	Fluorotelomer alkanoic acid	2016	Colorado School of Mines
3-Perfluoropropyl propanoic acid (3:3) (3:3 FTA)	NA	Fluorotelomer alkanoic acid	2016	Colorado School of Mines

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
77097	GM016	NA	1.20	µg/L	RLDQC	Rose and others, 2016
78200	GM016	NA	6.20	µg/L	RLDQC	Rose and others, 2016
81578	GM016	NA	0.044	µg/L	RLDQC	Rose and others, 2016
34386	GM016	NA	1.60	µg/L	RLDQC	Rose and others, 2016
77311	GM016	NA	2.00	µg/L	MRL	Rose and others, 2016
34408	GM016	NA	5.00	µg/L	RLDQC	Rose and others, 2016
77015	GM016	NA	0.600	µg/L	RLDQC	Rose and others, 2016
77032	GM016	NA	0.140	µg/L	RLDQC	Rose and others, 2016
78032	GM016	NA	0.012	µg/L	RLDQC	Rose and others, 2016
77061	GM016	NA	0.054	µg/L	RLDQC	Rose and others, 2016
34447	GM016	NA	0.600	µg/L	RLDQC	Rose and others, 2016
77035	GM016	NA	0.240	µg/L	RLDQC	Rose and others, 2016
68733	GM016	NA	0.480	µg/L	RLDQC	Rose and others, 2016
NA	HPLC/MS-MS	0.12	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.58	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.12	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	1.2	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	2.3	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.58	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	23.0	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	12.0	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	5.8	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.58	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	1.2	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	12	—	ng/L	LOQ	Current report

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
1H,1H,2H,2H-perfluorohexane sulfonate (10:2) (10:2 FTS)	NA	Fluorotelomer sulfonate	2016	Colorado School of Mines
1H,1H,2H,2H-perfluorohexane sulfonate (4:2) (4:2 FTS)	NA	Fluorotelomer sulfonate	2016	Colorado School of Mines
1H,1H,2H,2H-perfluorohexane sulfonate (6:2) (6:2 FTS)	NA	Fluorotelomer sulfonate	2016	Colorado School of Mines
1H,1H,2H,2H-perfluorohexane sulfonate (8:2) (8:2 FTS)	NA	Fluorotelomer sulfonate	2016	Colorado School of Mines
N-ethylperfluoro-1-octanesulfonamide (Et-FOSA)	NA	Perfluoroaklane sulfonamide	2016	Colorado School of Mines
N-methylperfluoro-1-octanesulfonamide (Me-FOSA)	NA	Perfluoroaklane sulfonamide	2016	Colorado School of Mines
Perfluoro-1-octanesulfonamide (FOSA)	NA	Perfluoroaklane sulfonamide	2017	Colorado School of Mines
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NA	Perfluoroalkane sulfonamido acetic acid	2016	Colorado School of Mines
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NA	Perfluoroalkane sulfonamido acetic acid	2016	Colorado School of Mines
Perfluoro-1-octanesulfonamidoacetic acid (FOSAA)	NA	Perfluoroalkane sulfonamido acetic acid	2016	Colorado School of Mines
perfluoro-1-butanesulfonate (PFBS)	375-73-5	Perfluoroalkane sulfonate	2016	Colorado School of Mines
perfluoro-1-decanesulfonate (PFDS)	NA	Perfluoroalkane sulfonate	2016	Colorado School of Mines
perfluoro-1-dodecanesulfonate (PFDoS)	NA	Perfluoroalkane sulfonate	2016	Colorado School of Mines
perfluoro-1-heptanesulfonate (PFHpS)	NA	Perfluoroalkane sulfonate	2016	Colorado School of Mines
perfluoro-1-hexanesulfonate (PFHxS)	355-46-4	Perfluoroalkane sulfonate	2016	Colorado School of Mines
perfluoro-1-nonanesulfonate (PFNS)	NA	Perfluoroalkane sulfonate	2016	Colorado School of Mines
perfluoro-1-pentanesulfonate (PFPeS)	NA	Perfluoroalkane sulfonate	2016	Colorado School of Mines
perfluoro-1-propanesulfonate (PFPrS)	NA	Perfluoroalkane sulfonate	2016	Colorado School of Mines
perfluorooctanesulfonate (PFOS)	1763-23-1	Perfluoroalkane sulfonate	2016	Colorado School of Mines

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
NA	HPLC/MS-MS	0.12	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	1.2	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	5.8	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	1.2	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	5.80	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	5.80	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	23.0			LOQ	Current report
NA	HPLC/MS-MS	0.58	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	1.2	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.12	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	2.3	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.12	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.12	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.12	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.58	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	1.2	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	23	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.58	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.58	—	ng/L	LOQ	Current report

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Perfluoro-n-decanoic acid (PFDA)	83-89-6	Perfluoroalkanoic acid	2016	Colorado School of Mines
Perfluoro-n-dodecanoic acid (PFDoA)	NA	Perfluoroalkanoic acid	2016	Colorado School of Mines
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	Perfluoroalkanoic acid	2016	Colorado School of Mines
Perfluoro-n-hexadecanoic acid (PFHxDA)	NA	Perfluoroalkanoic acid	2016	Colorado School of Mines
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	Perfluoroalkanoic acid	2016	Colorado School of Mines
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	Perfluoroalkanoic acid	2016	Colorado School of Mines
Perfluoro-n-octanoic acid (PFOA)	335-67-1	Perfluoroalkanoic acid	2016	Colorado School of Mines
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	Perfluoroalkanoic acid	2016	Colorado School of Mines
Perfluoro-n-tetradecanoic acid (PFTeDA)	NA	Perfluoroalkanoic acid	2016	Colorado School of Mines
Perfluoro-n-tridecanoic acid (PFTrDA)	NA	Perfluoroalkanoic acid	2016	Colorado School of Mines
Perfluoro-n-undecanoic acid (PFUda)	NA	Perfluoroalkanoic acid	2016	Colorado School of Mines
perfluorobutanesulfonic acid (PFBS)	375-73-5	Per and Polyfluoroalklyl substance	2016 and 2017	EPA National Exposure Research Laboratory
Perfluorobutyrate (PFBA)	375-22-4	Per and Polyfluoroalklyl substance	2016 and 2017	EPA National Exposure Research Laboratory
Perfluorodecanoic acid (PFDA)	83-89-6	Per and Polyfluoroalklyl substance	2016 and 2017	EPA National Exposure Research Laboratory
Perfluoroheptanoic acid (PFHpA)	375-85-9	Per and Polyfluoroalklyl substance	2016 and 2017	EPA National Exposure Research Laboratory
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Per and Polyfluoroalklyl substance	2016 and 2017	EPA National Exposure Research Laboratory
Perfluorohexanoic acid (PFHxA)	307-24-4	Per and Polyfluoroalklyl substance	2016 and 2017	EPA National Exposure Research Laboratory
Perfluorononanoic acid (PFNA)	375-95-1	Per and Polyfluoroalklyl substance	2016 and 2017	EPA National Exposure Research Laboratory
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	Per and Polyfluoroalklyl substance	2016 and 2017	EPA National Exposure Research Laboratory
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Per and Polyfluoroalklyl substance	2016 and 2017	EPA National Exposure Research Laboratory

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
NA	HPLC/MS-MS	0.58	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.58	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	23	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	5.8	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	2.3	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	2.3	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.58	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	12	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	2.3	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.58	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	0.58	—	ng/L	LOQ	Current report
NA	HPLC/MS-MS	5.00	5.00	ng/L	LOQ	EPA, 2017
NA	HPLC/MS-MS	5.00	5.00	ng/L	LOQ	EPA, 2017
NA	HPLC/MS-MS	5.00	5.00	ng/L	LOQ	EPA, 2017
NA	HPLC/MS-MS	5.00	5.00	ng/L	LOQ	EPA, 2017
NA	HPLC/MS-MS	5.00	5.00	ng/L	LOQ	EPA, 2017
NA	HPLC/MS-MS	5.00	5.00	ng/L	LOQ	EPA, 2017
NA	HPLC/MS-MS	5.00	5.00	ng/L	LOQ	EPA, 2017
NA	HPLC/MS-MS	5.00	5.00	ng/L	LOQ	EPA, 2017
NA	HPLC/MS-MS	5.00	5.00	ng/L	LOQ	EPA, 2017

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17.—Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma-mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography/tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography/tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

Compound	CAS number	Compound class	Year collected (yyyy)	Analyzing laboratory
Perfluorooctanoic acid (PFOA)	335-67-1	Per and Polyfluoroalklyl substance	2016 and 2017	EPA National Exposure Research Laboratory
Perfluorobutyrate (PFBA)	375-22-4	Per and Polyfluoroalklyl substance	2016 and 2017	National Water Quality Laboratory
Perfluorodecanoic acid (PFDA)	83-89-6	Per and Polyfluoroalklyl substance	2022 and 2017	National Water Quality Laboratory
Perfluoroheptanoic acid (PFHpA)	375-85-9	Per and Polyfluoroalklyl substance	2019 and 2017	National Water Quality Laboratory
Perfluorohexanoic acid (PFHxA)	307-24-4	Per and Polyfluoroalklyl substance	2018 and 2017	National Water Quality Laboratory
Perfluorononanoic acid (PFNA)	375-95-1	Per and Polyfluoroalklyl substance	2021 and 2017	National Water Quality Laboratory
Perfluorooctanoic acid (PFOA)	335-67-1	Per and Polyfluoroalklyl substance	2020 and 2017	National Water Quality Laboratory
perfluoro-1-butanesulfonate (PFBS)	375-73-5	Perfluoroalkane sulfonate	2027 and 2017	National Water Quality Laboratory
perfluoro-1-decanesulfonate (PFDS)	NA	Perfluoroalkane sulfonate	2031 and 2017	National Water Quality Laboratory
perfluoro-1-heptanesulfonate (PFHpS)	NA	Perfluoroalkane sulfonate	2029 and 2017	National Water Quality Laboratory
perfluoro-1-hexanesulfonate (PFHxS)	355-46-4	Perfluoroalkane sulfonate	2028 and 2017	National Water Quality Laboratory
perfluorooctanesulfonate (PFOS)	1763-23-1	Perfluoroalkane sulfonate	2030 and 2017	National Water Quality Laboratory
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-14	Perfluoroalkanoic acid	2024 and 2017	National Water Quality Laboratory
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	Perfluoroalkanoic acid	2017 and 2017	National Water Quality Laboratory
Perfluoro-n-tetradecanoic acid (PFTeDA)	NA	Perfluoroalkanoic acid	2026 and 2017	National Water Quality Laboratory
Perfluoro-n-tridecanoic acid (PFTrDA)	NA	Perfluoroalkanoic acid	2025 and 2017	National Water Quality Laboratory
Perfluoro-n-undecanoic acid (PFUda)	NA	Perfluoroalkanoic acid	2023 and 2017	National Water Quality Laboratory

[1] Reporting limit and method detection limits can be found in references cited.

Table 2. Chemical compound information for analyses performed by various laboratories for the U.S. Geological Survey, Environmental Health Mission Area, Infrastructure Project, Tapwater Exposure Pilot Study, 2016–17. —Continued

[NWIS, National Water Information System; CAS, Chemical Abstract Services; y, year; NA, not available; EPA, U.S. Environmental Protection Agency; RED01, enzyme reduction-diazotization; GC, gas chromatograph; LC, liquid chromatography; ICP-MS, inductively coupled plasma- mass spectrometry; cICP-MS, cell inductively coupled plasma-mass spectrometry; HPLC/MS-MS, high performance liquid chromatography-tandem mass spectrometry; HCO3, bicarbonate; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; mg/L, milligrams per liter; ng/L, nanograms per liter; DAI-LC/MS-MS, direct aqueous injection-liquid chromatography/tandem mass spectrometry; ICP-OES, inductively coupled plasma-optical emission spectrometry; IC, ion chromatography; GCM66, ambient purgeable method (GC/MS); GM016, heat purgeable method (GC/MS); GC/MS-MS, gas chromatography, tandem mass spectrometry; LC/MS-MS, liquid chromatography-tandem mass spectrometry; ELISA, enzyme linked immunosorbent assay for algal toxins; MDL, method detection limit; MRL, minimum reporting level; IRL, interim reporting level; LOQ, limit of quantification; RLDQC, reporting limit by (DQCALC)]

NWIS Parameter code	Laboratory method code	Reporting limit[1] (2016)	Reporting limit[1] (2017)	Units	Method of quantitation	Reference cited
NA	HPLC/MS-MS	5.00	5.00	ng/L	LOQ	EPA, 2017
NA	DAI-LC/MS-MS	50.0	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	134	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	5.00	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	5.00	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	35.0	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	10.0	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	74.0	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	50.0	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	16.0	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	5.00	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	50.0	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	500	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	50.0	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	250	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	500	5.00	ng/L	LOQ	NA
NA	DAI-LC/MS-MS	50.0	5.00	ng/L	LOQ	NA

Apendixes 1–3

Appendix 1. Target analytes and internal standards used for quantitation of per- and polyfluorinated alkyl substances analyzed at the Colorado School of Mines, Golden, Colorado.

Chemical name	Acronym	Neutral molecular formula	Internal standard
Perfluoroalkanoic acids			
Perfluoro-n-pentanoic acid	PFPeA	C5HO2F9	13C5-PFPeA
Perfluoro-n-hexanoic acid	PFHxA	C6HO2F11	13C2-PFHxA
Perfluoro-n-heptanoic acid	PFHpA	C7HO2F13	13C4-PFHpA
Perfluoro-n-octanoic acid	PFOA	C8HO2F15	13C4-PFOS
Perfluoro-n-nonanoic acid	PFNA	C9HO2F17	13C5-PFNA
Perfluoro-n-decanoic acid	PFDA	C10HO2F19	13C2-PFDA
Perfluoro-n-undecanoic acid	PFUdA	C11HO2F21	13C2-PFUdA
Perfluoro-n-dodecanoic acid	PFDoA	C12HO2F23	13C2-PFDoA
Perfluoro-n-tridecanoic acid	PFTrDA	C13HO2F25	13C2-PFTeDA
Perfluoro-n-tetradecanoic acid	PFTeDA	C14HO2F27	13C2-PFTeDA
Perfluoro-n-hexadecanoic acid	PFHxDA	C16HO2F31	13C2-PFHxDA
Perfluoroalkane sulfonates			
Perfluoropropanesulfonate	PFPrS	C3HO3SF7	13C3-PFBS
Perfluorobutanesulfonate	PFBS	C4HO3SF9	13C3-PFBS
Perfluoropentanesulfonate	PFPeS	C5HO3SF11	13C4-PFOS
Perfluorohexanesulfonate	PFHxS	C6HO3SF13	18O2-PFHxS
Perfluoroheptanesulfonate	PFHpS	C7HO3SF15	18O2-PFHxS
Perfluorooctanesulfonate	PFOS	C8HO3SF17	13C4-PFOS
Perfluorononanesulfonate	PFNS	C9HO3SF19	13C4-PFOS
Perfluorodecanesulfonate	PFDS	C10HO3SF21	13C4-PFOS
Perfluorododecanesulfonate	PFDoS	C12HO3SF25	13C4-PFOS
Chlorinated perfluoroalkane sulfonates			
8-chloroperfluoro-1-octanesulfonate	Cl-PFOS	C8HO3SClF16	13C4-PFOS
9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	Cl-O-PFNS	C8HO4SClF16	13C4-PFOS
11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	Cl-O-PFUdS	C10HO4SClF20	13C4-PFOS
Perfluoroalkane sulfonamides			
Perfluoro-1-octanesulfonamide	FOSA	C8H2O2NSF17	13C8-FOSA
N-methylperfluoro-1-octanesulfonamide	MeFOSA	C9H4O2NSF17	d3-MeFOSA
N-ethylperfluoro-1-octanesulfonamide	EtFOSA	C10H6O2NSF17	d5-EtFOSA
Perfluoroalkane sulfonamido acetic acids			
Perfluoro-1-octanesulfonamidoacetic acid	FOSAA	C10H4F17NO4S	d3-MeFOSAA
N-methylperfluoro-1-octanesulfonamidoacetic acid	MeFOSAA	C11H6F17NO4S	d3-MeFOSAA
N-ethylperfluoro-1-octanesulfonamidoacetic acid	EtFOSAA	C12H8F17NO4S	d5-EtFOSAA

Appendix 1. Target analytes and internal standards used for quantitation of per- and polyfluorinated alkyl substances analyzed at the Colorado School of Mines, Golden, Colorado.—Continued

Chemical name	Acronym	Neutral molecular formula	Internal standard
Fluorotelomer sulfonates			
4:2 fluorotelomer sulfonate	4:2 FTS	C6H5O3SF9	13C2-4:2 FTS
6:2 fluorotelomer sulfonate	6:2 FTS	C8H5O3SF13	13C4-PFOA
8:2 fluorotelomer sulfonate	8:2 FTS	C10H5O3SF17	13C2-8:2 FTS
10:2 fluorotelomer sulfonate	10:2 FTS	C12H5O3SF21	13C2-8:2 FTS
Fluorotelomer alkanoic acids			
3-Perfluoropropyl propanoic acid (3:3)	3:3 FTA	C6H5F7O2	13C2-6:2 FTA
3-Perfluoropentyl propanoic acid (5:3)	5:3 FTA	C8H5F11O2	13C2-8:2 FTA
3-Perfluoroheptyl propanoic acid (7:3)	7:3 FTA	C10H5F15O2	13C2-10:2 FTA
2-Perfluorohexyl ethanoic acid (6:2)	6:2 FTA	C8H3F13O2	13C2-6:2 FTA
2-Perfluorooctyl ethanoic acid (8:2)	8:2 FTA	C10H3F17O2	13C2-8:2 FTA
2-Perfluorodecyl ethanoic acid (10:2)	10:2 FTA	C12H3F21O2	13C2-10:2 FTA
2H-Perfluoro-2-octenoic acid (6:2)	6:2 FTUA	C8H2F12O2	13C2-6:2FTUA
2H-Perfluoro-2-decenoic acid (8:2)	8:2 FTUA	C10H2F16O2	13C2-8:2 FTUA
2H-Perfluoro-2-dodecenoic acid (10:2)	10:2 FTUA	C12H2F20O2	13C2-10:2 FTUA

Appendix 2. Recoveries of target analytes in 7-milliliter in-vessel spike tests of per- and polyfluorinated alkyl substances analyzed at the Colorado School of Mines, Golden, Colorado.

Compound	Spike_1	Spike_2	Spike_3	Spike_4	Spike_5	Spike_6	Mean	±	Stdev
Perfluoroalkanoic acids									
PFBA	83	88	85	84	83	86	85	±	2
PFPeA	81	80	79	80	80	81	80	±	1
PFHxA	85	89	87	89	89	89	88	±	2
PFHpA	76	80	79	81	79	79	79	±	1
PFOA	81	81	81	82	81	80	81	±	1
PFNA	79	81	79	81	81	80	80	±	1
PFDA	88	91	90	89	89	91	90	±	1
PFUdA	83	83	84	85	86	84	84	±	1
PFDoA	86	88	88	91	88	88	88	±	2
PFTrDA	105	101	126	112	129	106	113	±	12
PFTeDA	89	89	90	90	92	93	90	±	2
PFHxDA	78	77	71	74	68	80	75	±	5
PFODA	22	42	35	31	56	19	34	±	14
Perfluoroalkane sulfonates									
PFPrS	83	87	84	87	83	84	85	±	2
PFBS	84	85	84	86	86	85	85	±	1
PFPeS	84	92	89	87	91	93	89	±	3
PFHxS	83	84	86	87	86	85	85	±	1
PFHpS	88	89	90	84	86	90	88	±	3
PFOS	82	85	83	84	84	83	83	±	1
PFNS	81	86	82	78	84	80	82	±	3
PFDS	92	103	94	92	94	96	95	±	4
PFDoS	96	102	90	101	90	109	98	±	8
Chlorinated perfluoroalkane sulfonates									
Cl-PFOS	85	89	87	86	86	85	86	±	2
Cl-O-PFNS	85	86	82	86	83	86	84	±	2
Cl-O-PFUdS	91	101	95	95	102	100	97	±	4
Perfluoroalkane sulfonamides									
FOSA	79	80	80	80	79	77	79	±	1
Me-FOSA	80	80	81	81	80	79	80	±	1
Et-FOSA	78	83	82	83	80	77	81	±	3

Appendix 2. Recoveries of target analytes in 7-milliliter in-vessel spike tests of per- and polyfluorinated alkyl substances analyzed at the Colorado School of Mines, Golden, Colorado.—Continued

Compound	Spike_1	Spike_2	Spike_3	Spike_4	Spike_5	Spike_6	Mean	±	Stdev
Perfluoroalkane sulfonamido acetic acids									
FOSAA	84	85	82	83	88	90	85	±	3
MeFOSAA	86	88	88	88	89	89	88	±	1
EtFOSAA	91	95	91	90	92	93	92	±	2
Fluorotelomer sulfonates									
4:2 FTS	91	95	92	93	94	91	92	±	2
6:2 FTS	105	98	93	94	94	93	96	±	5
8:2 FTS	89	91	92	93	91	90	91	±	1
10:2 FTS	125	133	134	139	129	137	133	±	5
Fluorotelomer alkanoic acids									
6:2 FTA	98	104	100	102	95	99	100	±	3
8:2 FTA	87	93	89	92	92	88	90	±	3
10:2 FTA	93	94	99	90	92	91	93	±	3
3:3 FTA	101	109	106	108	98	103	104	±	4
5:3 FTA	86	96	88	95	92	94	92	±	4
7:3 FTA	78	80	80	81	89	80	81	±	4
6:2 FTUA	94	96	95	93	93	96	95	±	2
8:2 FTUA	91	93	94	90	92	88	91	±	2
10:2 FTUA	95	88	92	92	91	94	92	±	2

Appendix 3. Calibration range, limit of quantitation, linear fit (r^2), and weighting type of calibration curves for target analytes of per- and polyfluorinated alkyl substances analyzed at the Colorado School of Mines, Golden, Colorado.

[ng/L, nanograms per liter]

Compound acronym	Lower limit of quantitation (ng/L)	Upper limit of quantitation (ng/L)	Linear fit (r^2)	Weighting type (number of calibration points)
		Perfluoroalkanoic acids		
PFPeA	12	2323	0.989	1/x (7)
PFHxA	2.3	2323	0.997	1/x (9)
PFHpA	23	2323	0.974	1/x (6)
PFOA	0.58	2323	0.977	1/x2 (11)
PFNA	2.3	2323	0.993	1/x (9)
PFDA	0.58	2323	0.974	1/x2 (11)
PFUdA	0.58	1161	0.976	1/x2 (10)
PFDoA	0.58	1161	0.979	1/x2 (10)
PFTrDA	0.58	232	0.986	1/x2 (9)
PFTeDA	2.3	1161	0.996	1/x2 (8)
PFHxDA	5.8	232	0.990	1/x (9)
		Perfluoroalkane sulfonates		
PFPrS	0.58	2323	0.997	1/x (11)
PFBS	2.3	1161	0.998	1/x (8)
PFPeS	23	2323	0.996	1/x (6)
PFHxS	0.58	1161	0.997	1/x (10)
PFHpS	0.12	232	0.998	1/x (10)
PFOS	0.58	1161	0.985	1/x2 (7)
PFNS	1.2	2323	0.998	1/x (10)
PFDS	0.12	1161	0.994	1/x2 (9)
PFDoS	0.12	232	0.989	1/x2 (10)
		Chlorinated perfluoroalkane sulfonates		
Cl-PFOS	0.58	2323	0.987	1/x2 (11)
Cl-O-PFNS	0.12	2323	0.992	1/x2 (10)
Cl-O-PFUdS	0.12	1161	0.992	1/x2 (9)
		Perfluoroalkane sulfonamides		
FOSA	23	232	0.985	1/x2 (4)
MeFOSA	5.8	232	0.974	1/x2 (9)
EtFOSA	5.8	232	0.992	1/x2 (9)
		Perfluoroalkane sulfonamido acetic acids		
FOSAA	0.12	232	0.987	1/x2 (10)
MeFOSAA	1.2	232	0.988	1/x2 (8)
EtFOSAA	0.58	232	0.991	1/x2 (9)

Appendix 3. Calibration range, limit of quantitation, linear fit (r^2), and weighting type of calibration curves for target analytes of per- and polyfluorinated alkyl substances analyzed at the Colorado School of Mines, Golden, Colorado.—Continued

[ng/L, nanograms per liter]

Compound acronym	Lower limit of quantitation (ng/L)	Upper limit of quantitation (ng/L)	Linear fit (r^2)	Weighting type (number of calibration points)
		Fluorotelomer sulfonates		
4:2 FTS	1.2	2323	0.999	1/x (10)
6:2 FTS	5.8	1161	0.996	1/x (10)
8:2 FTS	1.2	2323	0.995	1/x2 (10)
10:2 FTS	0.12	232	0.985	1/x2 (10)
		Fluorotelomer alkanoic acids		
3:3 FTA	12	2323	0.996	1/x2 (7)
5:3 FTA	1.2	1161	0.989	1/x2 (9)
7:3 FTA	0.58	232	0.985	1/x2 (9)
6:2 FTA	12	1161	0.999	1/x (7)
8:2 FTA	5.8	2323	0.998	1/x (8)
10:2 FTA	23	2323	0.999	1/x (6)
6:2 FTUA	0.58	2323	0.984	1/x2 (11)
8:2 FTUA	1.2	1161	0.994	1/x2 (9)
10:2 FTUA	2.3	232	0.994	1/x2 (7)

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