28 June 2019

To: Students
Parents
Faculty
Staff

From: Tim Jennings
Director of Facilities

Subj: 2019 Campus Water Quality Report

Attached you will find a report on the quality of the drinking water supplied to the campus. This annual report is required by the NH Department of Environmental Services and the US Environmental Protection Agency and is fully supported by the American Water Works Association and other water industry trade groups. It is commonly known as a "Consumer Confidence Report," and we trust that it helps serve the purpose suggested.

Much of the language of the report is mandated by State and Federal rules. The water quality data is taken from the results of tests done from 2000 through June of this year.

Please do not hesitate to call me at 523-3536 if you have any questions or comments about the report.

(Note: off campus housing is not served by the campus water supply. Contact me for information about non-campus water sources)

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Cardigan Mountain School
2019
Drinking Water Quality Report

Is my drinking water safe? We are pleased to report that the drinking water supplied to the campus is safe and meets Federal and State requirements.

What is the source of my water? Our drinking water is supplied from four, deep bedrock, artesian wells. The wells pump water to a 100,000 gallon concrete storage tank. Our average daily consumption of water while school is in session is 16,000 to 18,000 gallons. The water is treated with sodium hypochlorite (NaOCl, commonly referred to as chlorine) at the tank, then distributed throughout the campus via iron, PVC plastic, PEP plastic, and copper water piping. Chlorine is added only as a precautionary measure. We maintain a very slight chlorine presence in the water to prevent the formation of bacteria within the water distribution piping. The source water is naturally filtered by the soils, sand, gravel, and bedrock overlying the wells. No man made filtration, additives, or other treatment techniques are indicated or required.

The water system is maintained by trained and licensed operators approved by the State of NH:

Tim Jennings, Water Works Operator Class IA, certificate Nr 840
Steve Muszynski, Water Works Operator Class IA, certificate Nr 3241

Why are there contaminants in my water? Drinking water, including bottled water, may reasonably be expected to contain at least a small amount of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (1-800-426-4791).

How can I get involved? The water supply system is maintained by the Facilities Department. Questions about your water should first be referred to the Director, Tim Jennings, at 523-3536. Further inquiries may be made to the Director of Business Operations, Stephen Solberg, at 523-3518, the Headmaster, Chris Day, at 523-3512, or to the Board of Trustees via Jeremy Crigler, President, at 62 Alumni Drive, Canaan, NH 03741. Detailed water sample test reports, which include sampling dates, locations, analysis methods, etc., are available for inspection at any time.

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

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

Contaminants that may be present in source water include:

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

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

Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

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

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

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. The United States Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Source Water Assessment Summary:

The NH Department of Environmental Services has prepared a Source Water Assessment Report for the source(s) serving this community water system, assessing the sources' vulnerability to contamination. The results of the assessment, prepared on 12 September 2001, are as follows:

Well number one (003), received (3) high susceptibility ratings, (1) medium susceptibility ratings, and (8) low susceptibility ratings.

Well number two (004), received (3) high susceptibility ratings, (1) medium susceptibility ratings, and (8) low susceptibility ratings.

Wells three and four have not yet been rated.

The complete Assessment Report is available for review at the director's office, Facilities Department. For more information call Tim Jennings at 603-523-3536, or visit the DES Drinking Water Source Assessment website at:

http://des.nh.gov/organization/divisions/water/dwgb/dwspp/dwsap.htm

System Name: Cardigan Mountain School
PWS ID: 0354010

2019 Report of Water Sample Test Results
2000-2019
(most current data is shown)

Definitions:

AGQS = Ambient Groundwater Quality Standard: the maximum concentration levels for contaminants in groundwater that are established under RSA 485-C, the Groundwater Protection Act.

AL = Action Level: the concentration of a contaminant which, when exceeded, triggers treatment or other requirements which a water system must follow

MCL = Maximum Contaminant Level: the highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the MCLG's as is feasible using the best available treatment technology.

MCLG = Maximum Contaminant Level Goal: the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety.

MRDLG = Maximum residual disinfectant level goal: the level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.

TT: Treatment Technique or a required process intended to reduce the level of a contaminant in drinking water.

MRDL: Maximum Residual Disinfectant Level or the highest level of a disinfectant allowed in drinking water. There is convincing evidence that the addition of a disinfectant is necessary for control of microbial contaminants.

Abbreviations:

BDL: below detection limits

ppb: parts per billion

ppm: parts per million

ppt: part per trillion

Note: Parts-per notation is often used describing dilute solutions in chemistry, for instance, the relative abundance of dissolved minerals or pollutants in water. The unit "1 ppm" can be used for a mass fraction if a water-borne pollutant is present at one-millionth of a gram per gram of sample solution. When working with aqueous solutions, it is common to assume that the density of water is 1.00 g/mL. Therefore, it is common to equate 1 kilogram of water with 1 L of water. Consequently, 1 ppm corresponds to 1 mg/L and 1 ppb corresponds to 1 µg/L.

NA: not applicable

ntu: nephelometric turbidity unit

mfl: million fibers per liter

nd: not detectable at testing limits.

pci/l: pico curies per liter, a measurement of radioactivity

RAA: Running Annual Average

TTHM: Total Trihalomethanes

UCMR: Unregulated Contaminant Monitoring Rule

ug/L: micrograms per Liter

Sample Dates: The results for detected contaminants listed below are from the most recent monitoring done in compliance with regulations through June of 2019. The State of New Hampshire allows water systems to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Thus some of the data present, though representative, may be more than one year old.

Microbiological Contaminants

Contaminant (Units)	**Level Detected***	**MCL**	**MCLG**	**Violation YES/NO**	**Likely Source of Contamination**	**Health Effects of Contaminant**
Total Coliform Bacteria	None – sampled for monthly	Present or absent	0	No	Naturally present in the environment	
E. coli Bacteria	0 – sampled for monthly	0	0	No	Human and animal fecal waste	*E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems.

Radioactive Contaminants

Contaminant (Units)	**Level Detected***	**MCL**	**MCLG**	**Violation YES/NO**	**Likely Source of Contamination**	**Health Effects of Contaminant**
Radon (pCi/L)	1100 4-19-00	None		No	Erosion of natural deposits	Radon is a radioactive gas that you can't see, taste or smell. It can move up through the ground and into a home through cracks and holes in the foundation. Radon can also get into indoor air when released from tap water from showering, washing dishes, and other household activities. It is a known human carcinogen. Breathing radon can lead to lung cancer. Drinking water containing radon may cause an increased risk of stomach cancer.

Contaminant (Units)	Level Detected*	MCL	MCLG	Violation YES/NO	Likely Source of Contamination	Health Effects of Contaminant
Compliance Gross Alpha (pCi/L)	2.65 +/- 1.52 9-8-17	15	0	No	Erosion of natural deposits	Certain minerals are radioactive and may emit a form of radiation know as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.
Uranium (ug/L)	3.4 8-24-17	30	0	No	Erosion of natural deposits	Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.
Combined Radium 226 + 228 (pCi/L)	0.227 +/- 0.314 0..585 +/- 0.372 9-5-17	5	0	No	Erosion of natural deposits	Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.

Inorganic Contaminants

Contaminant (Units)	Level Detected*	MCL	MCLG	Violation YES/NO	Likely Source of Contamination	Health Effects of Contaminant
Barium (ppm)	0.024 4-5-19	2	2	No	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
Chloride (ppm)	33 4-8-19	NA	NA	NA		Information only - not EPA regulated.

Contaminant (Units)	Level Detected*	MCL	MCLG	Violation YES/NO	Likely Source of Contamination	Health Effects of Contaminant
Fluoride (ppm) Naturally occurring – we do not fluoridate our water	0.56 4-8-19	4	4	No	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.
Iron (ppm)	.060 4-8-19	NA	NA	NA	Erosion of natural deposits	Information only - not EPA regulated.
Nitrate (as Nitrogen) (ppm)	0.2 4-3-19	10	10	No	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	(5 ppm through 10ppm) Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you should ask for advice from your health care provider. (Above 10 ppm) Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Nitrite (as Nitrogen) (ppm)	<0.01 4-3-19	1	1	No	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill, and if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Sodium (ppm)	10 4-8-19	NA	NA	NA	Erosion of natural deposits	Information only - not EPA regulated.
Sulfate (ppm)	22 4-8-19	NA	NA	NA	Erosion of natural deposits	Information only - not EPA regulated.
Zinc (ppm)	.11 4-8-19	NA	NA	NA	Erosion of natural deposits	Information only - not EPA regulated.

We routinely test for the following additional inorganic contaminants (IOC's), but to date the level of each has been below detectable limits (last tested April of 2019):

Aluminum
Antimony
Arsenic
Asbestos
Beryllium
Cadmium
Chromium
Copper (source water)
Cyanide
Lead (source water)
Manganese
Mercury (inorganic)
Selenium
Silver
Thallium

Synthetic Organic Contaminants including Pesticides and Herbicides

We have tested for the following synthetic organic contaminants (SOC's) and pesticides and herbicides, but the level of each was below detectable limits. Since we don't use these or any other SOC's or pesticides, herbicides, or fertilizers on the Back 40 sports fields where our wells are located, we have qualified for a waiver from further testing for these contaminants. The waiver must be renewed every six years.

2,4,5-TP (Silvex)
2,4-D
3-Hydroxycarbofuran
Acrylamid
Alachlor
Aldicarb
Aldicarb Sulfone
Aldicarb Sulfoxide
Aldrin
Atrazine
Benzo(a)pyrene (PAH)
Butachlor
Carbaryl
Carborfuran
Chlordane
Dalapon
Di(2-ethylhexyl) adipate
Di(2-ethylhexyl) phthalate
Dibromochloropropane
Dicamba
Dinoseb
Dioxin [2,3,7,8-TCDD]
Diquat Methomyl
Endothall
Endrin Metribuzin
Epichlorohydrin
Ethylene dibromide (EDB)
Glyphosate
Heptachlor
Heptachlor epoxide
Hexachlorocyclo-
Hexochlorobenzene
Lindane
Methoxychlor
Metolachlor
Oxamyl [Vydate]
PCBs [Polychlorinated biphenyls]
Pentachlorophenol
Pentadiene
Picloram
Propachlor
Simazine
Toxaphene

Volatile Organic Contaminants

Contaminant	Violation Yes (Y) Or No (N)	Level Detected and Range of Detection	Unit of Measure	MCLG	MCL	Likely Source of Contamination
Chlorine	No -	.05 to .48 Sampled monthly	ppm	MRDL=4	MRDLG=4	Water additive used to control microbes.
TTHM (total tri-halo-methanes	No	6.4 7-12-16	ppb	0	100	By-product of drinking water chlorination

We routinely test for the following additional volatile organic contaminants (VOC's), but to date the level of each has been below detectable limits (last tested April 2017):

1,1,2-Trichloroethane
1,1-Dichloroethylene
1,2-Dichlorethane
1,2-Dichloropropane
Benzene
Bromate
Carbon tetrachloride
Chloramines
Chlorine Dioxide
Chlorobenzene
cis-1,2-Dichloroethylene
Dichloromethane
Ethylbenzene
Chlorite
Haloacetic Acids
M/P-Xylenes
Methyl tertiary-butyl ether (MtBE)
o-Dichlorobenzene
O-Xylene
p-Dichlorobenzene
Toluene
trans-1,2-Dichloroethylene
Trichloroethylene
Vinyl Chloride
Xylenes

Lead and Copper at the Tap

Contaminant (Units)	Action Level	90th percentile sample value *	Date	# of sites above AL	Violation Yes/No	Likely Source of Contamination
Copper (ppm)	1.3	0.126	4-23-18	0	No	Corrosion of household plumbing systems; erosion of natural deposits; **leaching from wood preservatives**
Lead (ppb)	15	0.001	4-23-18	0	No	Corrosion of household plumbing systems, erosion of natural deposits

Special Lead Sampling and Testing Effort. In compliance with a separate NH Department of Environmental Services program, in the winter of 2018/2019 we sampled tap water at all locations within our dormitory, classroom, dining, and athletic buildings where water is available for consumption by students. We are pleased to report that none of the samples indicated lead contamination.

Copper Health Effects Information

Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal doctor.

Lead Health Effects Information

(Up to 15 ppb in more than 5% of samples) Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline (800-426-4791).

(Above 15 ppb) Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

Other Water Quality Parameters

The following data is provided for your further information:

Parameter	Level Detected and Range of Detection	Unit of Measure
Alkalinity	76 6-4-09	ppm
Conductivity	290 6-4-09	umho/cm
Hardness	120 6-4-09	ppm
pH	7.7 6-12-12	S.U.

SPECIAL NOTE, UNREGULATED CONTAMINANTS:

Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted. Such contaminants include:

2,4-dinitrotoluene
2,6-dinitrotoluene
DCPA mono-acid degradate
DCPA di-acid degradate
4,4'-DDE
EPTC
Terbacil
Acetochlor
Perchlorate
Nitrobenzene
Molinate

The State of NH has not required that we test for the above contaminants. Given our location and land use history, it's not likely that we would encounter these contaminants in our water supply.