Analysis of the Water Quality Report
Baltimore City, MD 2021

Have you ever read your water quality report? If you did read it, did you understand it? This piece was written to help the average consumer understand the contaminants in Baltimore water and how they can affect health . . . and how a Multipure drinking water system can be your "firewall" against those contaminants.

To find your current water quality report, Google: Town, state, water quality report. This **Baltimore Analysis** was taken from the **Annual 2021 Baltimore Water Quality Report,** and the data is from 2021. The City of Baltimore meets all public health requirements for drinking water standards, set by the Maryland Health Authority and the EPA.

All water contains some level of contaminants. The EPA sets an "enforceable" regulation called a **Maximum Contaminant Level (MCL)**. Water utilities must consider the cost, benefits, and the ability of public water systems to detect and reduce contaminants using suitable treatment technologies. ***The MCLs are set on what is realistic for a water utility to achieve, not what is good for your health.*** If it is too expensive to remove contaminants from the water, they may not be removed.

According to the **Environmental Working Group (EWG.ORG),** over 300 pollutants have been identified in US tap water. More than half of these chemicals detected are not subject to health or safety regulations and can be legally present in any amount. Check out the EWG website for contaminant health goals and more information about specific contaminants that may be present in YOUR water. EWG Tap Water Database

The population of Baltimore is 576,498 (2021). Baltimore has good water . . . and it still should be filtered. The Baltimore water supply is surface water from rainfall and snowmelt. There are three major sources: Gunpowder Falls, North Branch Patapsco River, and the Susquehanna River. The water is run through a filter bed of sand media which separates impurities. Water clarity is one indicator of the potential for water to harbor harmful microorganisms—the clearer the water, the better the water.

Because the water is relatively soft, it leaches **Lead** from the pipes in old houses (any home or apartment built before 1986), service lines, and from the city distribution system. **Lead** levels in homes can vary from day to day, depending on the pH, the temperature of the water coming through the pipes, and the routing system used that day. Baltimore tests for lead at 50 customer's taps once every three years.

Lead has no known functions or health benefit for humans. It is considered a metabolic poison and causes damage to the kidneys, liver, and to the nervous, reproductive, cardiovascular, immune, and gastrointestinal systems. **Lead** has a particularly damaging effect in children.

Lime (calcium oxide) is added to the treated water to raise the pH of the water so that it is less corrosive and leaches less **Lead**.

Fluoride is added to the filtered water at each of the plants, maintaining a **Fluoride** level of approximately .06 up to 1.49 parts per million in the treated water. The EPA allows 4 ppm.

Baltimore water is disinfected with **Chlorine** to kill **Microbiological Contaminants**.

Baltimore occasionally has a parasite called **Cryptosporidium** which can cause **Cryptosporidiosis**. In the 2021 report, the Liberty plant had up to 0 Oocyst/liter, the Loch Raven up to .09 Oocyst/liter, and the Susquehanna River up to .33 Oocyst/liter.

The disinfection process does not kill **Cryptosporidium**. It is encapsulated in a little "cyst" and is chlorine resistant. During the past two decades, **Crypto** is recognized as one of the most common causes of waterborne disease (recreational water and drinking water) in humans in the United States.

Symptoms of **Cryptosporidiosis** and **Giardiasis** include stomach cramps and pain, dehydration, nausea, vomiting, fever, weight loss, and watery diarrhea. Symptoms generally begin 1 to 12 days after becoming infected. Immunologically healthy patients usually recover within a few days to weeks. The symptoms may go in cycles, in which you may seem to get better for a few days, then feel worse before the illness ends. However, in an immune compromised individual with persistent symptoms and diarrhea lasting more than two weeks, treatment can be difficult and expensive.

Pregnant women, infants, the elderly, immune compromised people, and anyone with a serious life-threatening illness are at highest risk. Cryptosporidiosis can be fatal.

The Susquehanna River Cryptosporidium results ranged up to .33 Oocysts/liter and the Loch Raven were 09 Oocysts/liter.

One of the most serious contaminants in Baltimore water is a series of chemicals called disinfection by-products—**Trihalomethanes (TTHMs)** and **Haloacetic Acids (HAA5).** They occur in drinking water when organic matter combines with the chlorine.

These compounds have been linked to cancers (breast, bladder, colon, and rectal), miscarriages, low birth weight, still-births, and birth defects. The EPA allows 80 ppb. of TTHMs and 60 ppb. of HAA5s, *but studies show they are causing cancers (breast, bladder, colon, and rectal) and reproductive issues at levels as low as 20 ppb.* ***Baltimore's TTHMs ranged up to 99 ppb. and the HAA5 up to 66 ppb. during 2019!*** These are some of the highest in the nation!

The EPA regulation for these toxic chemicals is based on system-wide annual averages. But the **TTHMs** and **HAA5** fluctuate from day to day, and month to month, frequently rising above the 80 ppb. limit. The only effective protection is to drink water that is filtered by a system certified to reduce these contaminants every day for every drink.

Nitrates are present in the water, up to 2.15. **Nitrates** are often indicators that pesticides and herbicides are in the water, which the utility doesn't test for and can cause health issues.

Baltimore water contains **Arsenic**. **Arsenic** dissolves in water when it contacts the natural deposits in the earth. **Arsenic** is a mineral known to cause cancer in humans and is linked to other health effects such as skin damage and circulatory problems. **The EPA allows 10 ppb of Arsenic and Baltimore water ranges up to 3 ppb.**

Atrazine, a runoff from herbicide use was present at .26 ppb. The EPA allows up to 3 ppb. It is a powerful endocrine disrupter, even at very low levels. It is a man-made systemic herbicide used for broadleaf weeds both before and after they sprout. **Atrazine** has several adverse effects on health—such as tumors, breast, ovarian, and uterine cancers as well as leukemia and lymphoma. It interrupts regular hormone function, causing birth defects, reproductive tumors, and weight loss.

Following years of concern, the US Environmental Protection Agency recently announced the nation's first standards for six "forever chemicals" found in tap water. It's a foreboding and informal name for human-made chemicals that coat nonstick pans, food packaging, and waterproof clothes before ending up in the water you drink. These chemicals, known as **PFAS**, or **per- and polyfluoroalkyl substances**, are pervasive and found in pretty much everyone—even newborn babies. Some **PFAS** accumulate in the food chain and can last a long time in the human body and the environment.

If the EPA rule is finalized, public water companies will need to monitor for the chemicals and keep two widely studied ones, **PFOA** and **PFOS**, below levels of 4 parts per trillion—around the lowest threshold measurable. The rule will also regulate combined amounts of four other types of **PFAS** chemicals.

Baltimore's combined **PFOA** and **PFOS** were at 4.9 ppt at the Ashburton Plant and 1.98 ppt. at the Montebello plant.

Baltimore's aging infrastructure also contributes problems to the drinking water. The plan to upgrade its water infrastructure consists of replacing and rehabilitating 15 miles of mains each year. In 100 years, the 1,500 miles of water mains will be updated. **In January 2018, during the "big freeze", there were 559 water main breaks!**

When pipes break, **Bacteria** and/or **Viruses** can come into the Baltimore water and not be killed by the disinfection process. Biofilm also builds up in the city pipes and can harbor bacteria/viruses which can occasionally be sloughed off and released into a home-owner's water.

All Multipure systems are NSF-certified to reduce 82+ contaminants of health concern. That certification guarantees that the manufacturer's claims are true. Of those contaminants present in Baltimore water, the following lists the % of reduction:

Lead—99.3%
Cryptosporidium (cysts)—99.95%
Trihalomethanes—99.8%
Bacteria and Viruses (Aqualuxe)—Bacteria 99.999%, Viruses 99.99%
Arsenic (Aquaperform and Aqualuxe)— 95.8% to 99.9%, depending on pH
PFOA & PFOS—95.5% (Aquaperform and Aqualuxe)

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