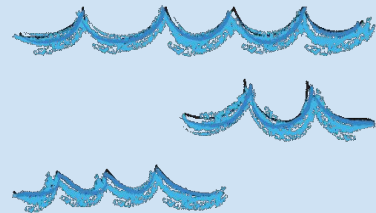


Importance of Safe Drinking Water

- **Safe and readily available water is extremely essential to everyone. Public health is highly dependant on water whether it be for drinking, domestic usage, the production of food and even recreational purposes.**
- **The World Health Organization states improved water supply, sanitation, and better management of our water resources are all key elements that can contribute to economic boost and even contributes to poverty reduction.**



What is a Water Contaminant?

Under SDWA, a water contaminant is *any physical, chemical, biological, or radiological substance or matter in water.*

Example of why assessment is necessary:

A source that may be considered is mountainous stream water, but even though it may appear to be fresh, it is important to weigh in the contributions of existing life in that area; There may be animals that excrete giardia and cryptosporidium (parasites). Overall, whether or not they may appear to be a good option, the water quality cannot be ensured without some sort of intervention.

Effects of contaminants on the body

BRAIN-EATING AMOEBA

Rare organism that infects the brain if contaminated water goes up the nose

LEGIONELLA

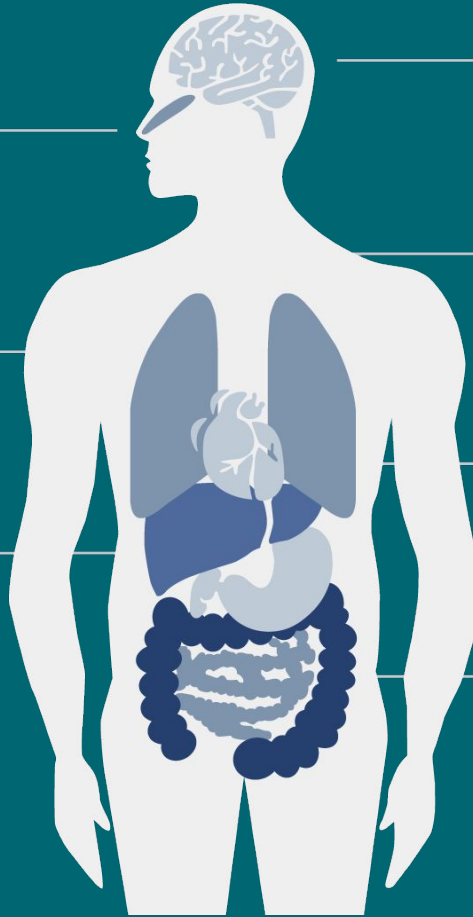
Bacteria that causes Legionnaires' disease, a severe form of pneumonia

1,2,3-TRICHLOROPROPANE

Man-made toxic chemical that causes liver and kidney damage

SOURCES

ENVIRONMENTAL PROTECTION AGENCY
CENTERS FOR DISEASE CONTROL
AND PREVENTION
CANADIAN CANCER SOCIETY



LEAD

Heavy metal that can cause developmental and learning disabilities

CHLORINE

Chemical used to treat water that can cause skin and breathing problems and has been linked to cancer

ARSENIC

Naturally occurring poison that can cause high blood pressure and has been linked to cancer

CRYPTOSPORIDIUM

Parasite that can cause diarrhea, nausea and cramps

WHO Informational

- **In 2017, 71% of the global population (5.3 billion people) used a safely managed drinking-water service – that is, one located on premises, available when needed, and free from contamination.**
- **90% of the global population (6.8 billion people) used at least a basic service. A basic service is an improved drinking-water source within a round trip of 30 minutes to collect water.**
- **785 million people lack even a basic drinking-water service, including 144 million people who are dependent on surface water.**
- **Globally, at least 2 billion people use a drinking water source contaminated with faeces.**
- **Contaminated water can transmit diseases such diarrhoea, cholera, dysentery, typhoid, and polio. Contaminated drinking water is estimated to cause 485 000 diarrhoeal deaths each year.**
- **By 2025, half of the world’s population will be living in water-stressed areas.**
- **In least developed countries, 22% of health care facilities have no water service, 21% no sanitation service, and 22% no waste management service.**

2.1 billion people

globally lack safe water at home (2015)

Of those people...

263 million •
spend more than 30 minutes per
round trip collecting water



159 million
drink water directly from surface
sources, such as streams or lakes



844 million
do not have basic drinking
water services



UNIVERSAL AND EQUITABLE ACCESS TO SAFE WATER FOR ALL BY 2030



**GIVE
SAFE
WATER**

Water Contaminants in Flint, Michigan

It took an absurd amount of time for Flint to make the switch back to the Detroit Water System but even with that change, the water pipes need time to rebuild and reconstructive to provide a protective scale that had been stripped during that time. The study shows that almost half of Flint homes were exposed to elevated lead levels and thousands of children were exposed to the contaminated water. This was all because of the state's lack of compliance to regulation, and the disregard that was flagrantly used against the community of Flint. It was apparent to all members involved yet the community still suffered because of loopholes that the state created to dismiss the health crisis in Flint.

Water Contaminants in Flint, Michigan

The outbreak of legionnaires disease in flint was proven to be the highest outbreak in the history of the United States.

The need for the corrosion control was clear as the chlorine was meant to kill off any legionella but with the rusty iron within the pipes which reacted with the chlorine and used up, the legionella was well and thriving and unfortunately, affecting the individuals who used the water.

Prelude

- **Nixon oversaw the consolidation of the federal government's environmental responsibilities through the creation of what we all know and recognize as the EPA.**

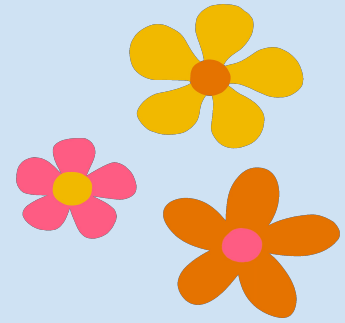
“Additional federal oversight of interstate transportation waters would be launched in the following decades to limit microbes and chemical, organic, and radioactive materials in water, to monitor and test water supply systems”

Prelude Continued

- **Prior to any water policies established to regulate contaminants, the Public Health Service had drinking standards in 1912.**
- **These standards were merely recommendations as they were not enforceable, they were only later voluntarily accepted by municipal utilities.**

Drinking standards only applied to interstate common carriers, therefore were not mandated for anyone else. One example of where it was applied to was railroads.

Prelude Continued



- **SDWA belonged to a group of federal legislation during the 70's.**
- **Introduced based on scientifically based standards.**
- **Congress had sought out to prevent any communicable diseases from being either transmitted or introduced via water.**

Example:

Eradicating typhoid which is waterborne, through chlorination treatment.

Clean Water Act

- **The Federal Water Pollution Control Act of 1948 was the first major U.S. law to address water pollution which generally promotes public awareness and concern for controlling water pollution.**

“Revisions in 1981 streamlined the municipal construction grants process, improving the capabilities of treatment plants built under the program. Changes in 1987 phased out the construction grants program, replacing it with the State Water Pollution Control Revolving Fund, more commonly known as the Clean Water State Revolving Fund. This new funding strategy addressed water quality needs by building on EPA-state partnerships.”

Environmental Protection Agency

- **The EPA is what set the standards for the Safe Drinking Water Act in 1974.**



Goal:

Regulate and standardize maximum contaminant levels and treatment requirements for over 90 contaminants.

Environmental Protection Agency

- After 1974, there were additional amendments added in 1986 and 1996.
- The amendments were made to enhance the existing law by recognizing source water protection, operator training, funding water system improvements and public information and regarding those as primary and significant components of safe drinking water.



Environmental Protection Agency

- **The EPA has a contract with the National Academy of Sciences (NAS) to study contaminants of drinking water.**
- **The study is essential in assessing the health significance and other related issues that come with drinking water.**



Standards and Regulations

- Each standard includes requirements for water systems in order to test for contaminants.
- It protects water but also the sourcing including rivers, lakes, reservoirs, springs, and groundwater wells.
- Additionally protects against naturally-occurring and man made contaminants.

Main Focus:

Treatment as the means of providing safe drinking water from the tap.

Standards and Regulations

- **CCL is the Contaminant Candidate List that the EPA needs to publish.**

Unregulated Contaminants:

Every five years and decide whether to regulate at least five or more of the contaminants on the list (called “Regulatory Determinations”)

<https://www.epa.gov/ccl/chemical-contaminants-ccl-4>

Compliance

- **Getting states and water systems to abide by the regulations is always a challenge.**
- **In efforts to maintain compliance, US EPA and States issue administrative orders, take legal action, or fine utilities.**
- **Before any action is taken, the EPA may also work with water systems.**
- **Direct oversight of water systems is conducted by state drinking water programs.**

KAMALA D. HARRIS

U.S. Senator for California



Water Justice Act

U.S. Senator Kamala D. Harris (D-CA) is introducing the *Water Justice Act* as a comprehensive approach to the nation's water crisis that is based in fairness and equity, paying particular attention to the water needs of historically at-risk communities and individuals. The *Water Justice Act* consists of three main planks, each of which addresses a specific threat to our ability to ensure America's water supply is safe, affordable, and sustainable. The *Water Justice Act* will make a \$250 billion critical investment in:

- **Safe Water:** Recognize the ongoing national emergency of unsafe drinking water and invest nearly \$220 billion in clean and safe drinking water initiatives with priority given to high-risk and

Funding

- **With compliance also comes funding:**
 - **Each state has their own special fund in order to assist the public water systems.**
 - **This is known as the drinking water revolving fund, which was amended with 1996 to provide financial support**
 - **Also includes state safe water programs**

Secondary Concerns

When it comes to water, we know the only issue is not related to public health.

National Secondary Drinking Regulation:

- **Purely related to taste, color and smell.**
- **Water systems are NOT required to follow this regulations but typically do.**
- **Does not touch on harmful contaminants but is useful for aesthetic reasons.**

Public Health Focus

There are many different subjects that go into treatment including mathematics, physics, chemistry, microbiology. There are a variety of non-traditional methods and simple methods of disinfecting water but still emphasizes that intervention is necessary for the sake of human consumption, safe discharge in the environment, the economic eye in water treatment and just how important it is in terms of public health. The importance of treating water through technological means and supervision of developments made in water systems so that we may have safe drinking water and do not have to face any health related issues due to water contamination.