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# Contamination of Cape Cod Aquifer

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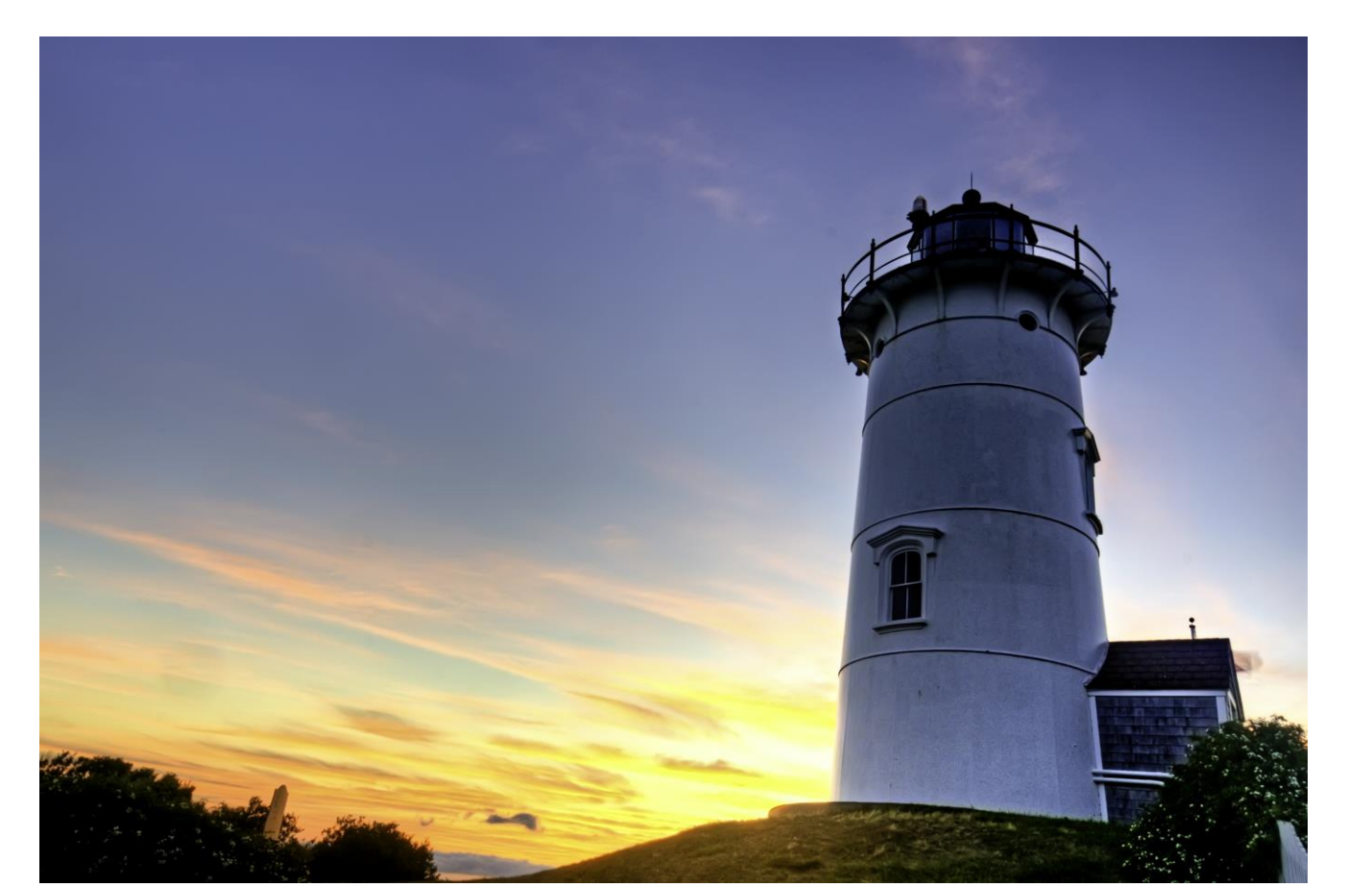
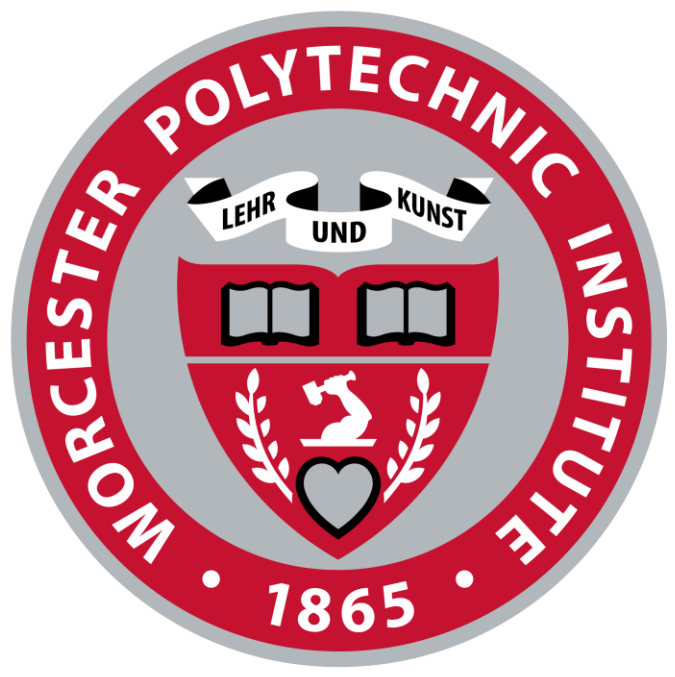
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## Objectives

- Research the contamination of the Cape Cod Aquifer
- Analyze information and consider multiple solutions
- Choose best solution and create an organized proposal

## Abstract

The problem is that the Cape Cod Aquifer is contaminated with Organic Wastewater Compounds (OWCs), from the overuse of septic tanks. We analyzed a case study in New Jersey and compared that solution with other solutions. After evaluating them, we have decided that a sewage treatment system similar to the one in New Jersey would be the best solution to reduce the concentration of these OWCs in Cape Cod.

## Background

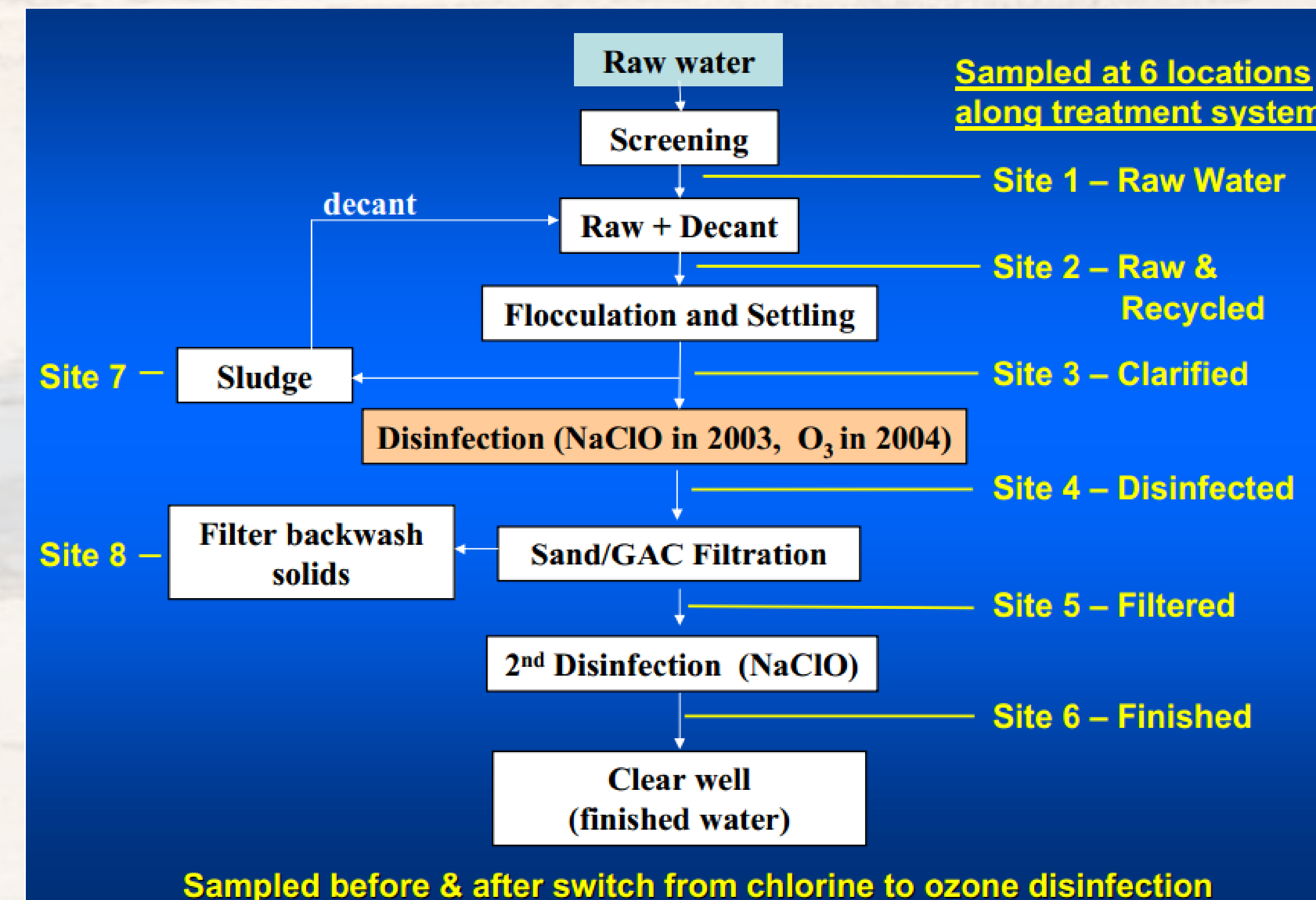
An over-reliance on private septic systems has led to contamination of the Cape Cod Aquifer with OWCs. Beyond the 216,000 people that live there year round, the cape is visited by about 5 million people every summer, meaning any water contamination poses a serious problem not only to residents but to visitors as well. The soil on the cape is very sandy, making it very easy for sewage and other wastewater sources to permeate the water table. Eighty-five percent of the properties on Cape Cod have an on premise septic system, which are a major contributor to groundwater contamination. A recent study found that 15 of 20 tested wells contained at least one organic wastewater compound.

## Process

We researched four different methods of stopping the Cape Cod Aquifer from getting further polluted with Organic Wastewater Compounds (OWC).

- Carbon Water Filtration
- Slow Sand Filtration
- Aerobic Treatment System
- Sewage Treatment System

We analyzed the case study in New Jersey where a similar transition took place. The sewer system New Jersey implemented removed 80% of detected OWCs using ozone, chlorine, and carbon filters.



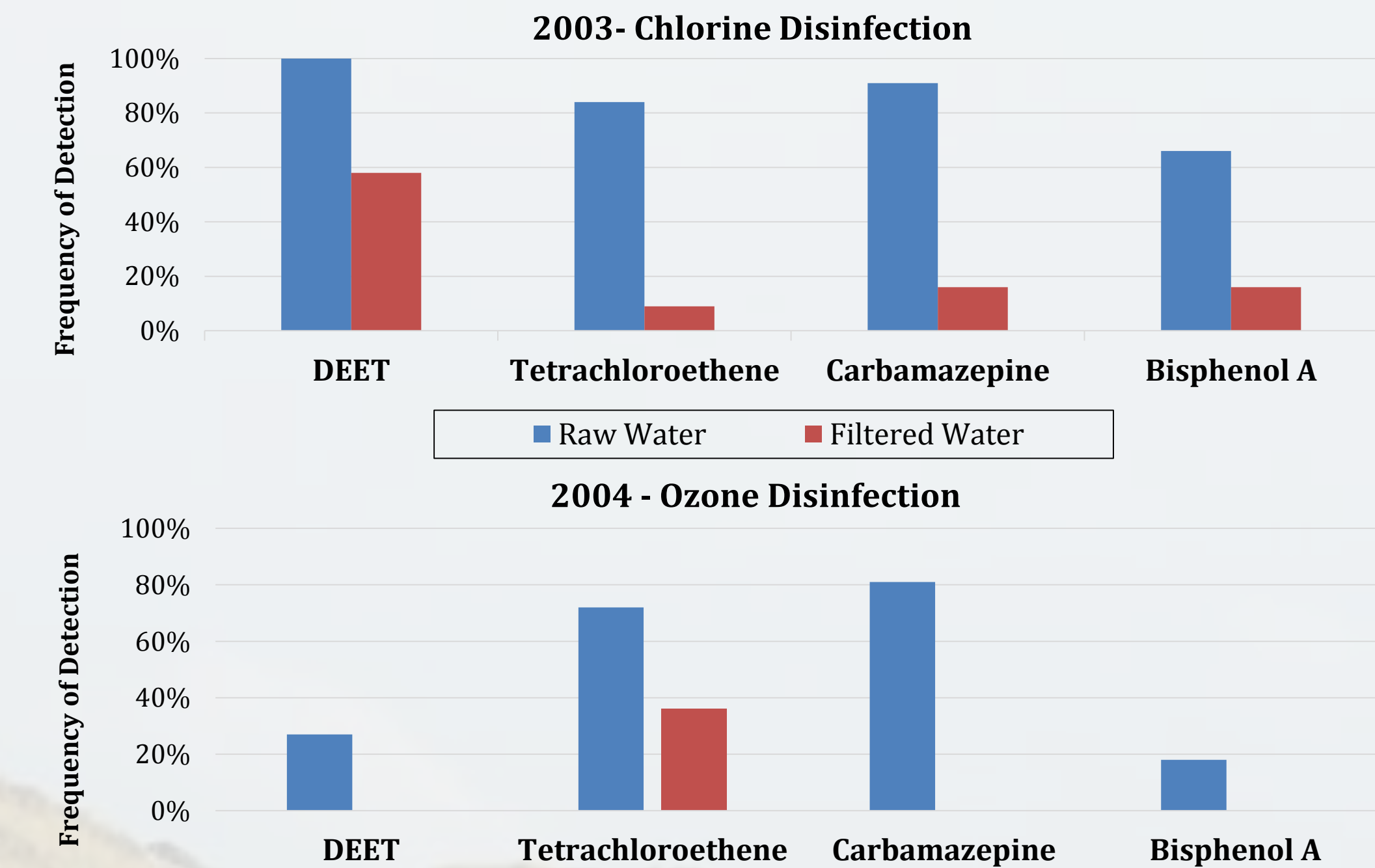
Process to treat OWCs in a sewage treatment center

<http://www.state.nj.us/dep/wms/Emerging%20contaminants%20project%20-%20USGS.pdf>

## Results

We found that a sewage treatment plant would almost eliminate specific OWCs from entering the aquifer. Additionally, we would implement a carbon water filtration system before human consumption to improve the quality of the water for the residents.

## Frequency of Detection of OWCs in New Jersey's Groundwater



Graph of frequency of detection of various OWCs before and after treatment using chlorine and ozone for disinfecting.

<http://www.state.nj.us/dep/wms/Emerging%20contaminants%20project%20-%20USGS.pdf>

## Conclusions

- Eliminate the use of septic tanks
- Implement a town sewage system with addition water filtering

## Recommendations

- Provide incentives for landowners to switch to the sewage system such as tax breaks
- Require all new buildings to be on the system
- Spread information about the contamination of Cape Cod groundwater

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