

# Disinfection Byproducts – Overview and Current Status



Safe Water Advisory Group

# Disinfection Byproducts (DBPs) - Overview

- **What are Disinfection Byproducts?**
  - Chemical compounds that form when chlorine, used to disinfect drinking water, reacts with naturally occurring organic matter found in source water (specifically surface water supplies).
  - Total Trihalomethanes (TTHMs) and Haloacetic Acids (HAA5s)
- **Why do public water systems monitor for DBPs?**
  - Regulated contaminants – concentrations vary over time with respect to source water quality.
- **How often do we collect and test for DBPs?**
  - Quarterly: 4 sample locations throughout the Portsmouth Water System
  - Annually: 2 sample locations in the Pease Tradeport Water System

## Disinfection Byproduct (DBP) Formation

WHEN CHLORINE REACTS WITH NATURALLY-OCCURRING ORGANIC MATTER IN WATER



Total organic carbon (TOC) from decomposing of plants and animals washes into rivers and reservoirs used as community water supplies



Water treatment plants filter water drawn from these community water supplies, but some TOC can remain after this process.



At the water treatment plant, chlorine is added to the water during a process known as disinfection and reacts with the leftover TOC to create DBPs.



A chlorine residual is maintained throughout the distribution system. This State mandated procedure can also cause DBPs to form and grow.

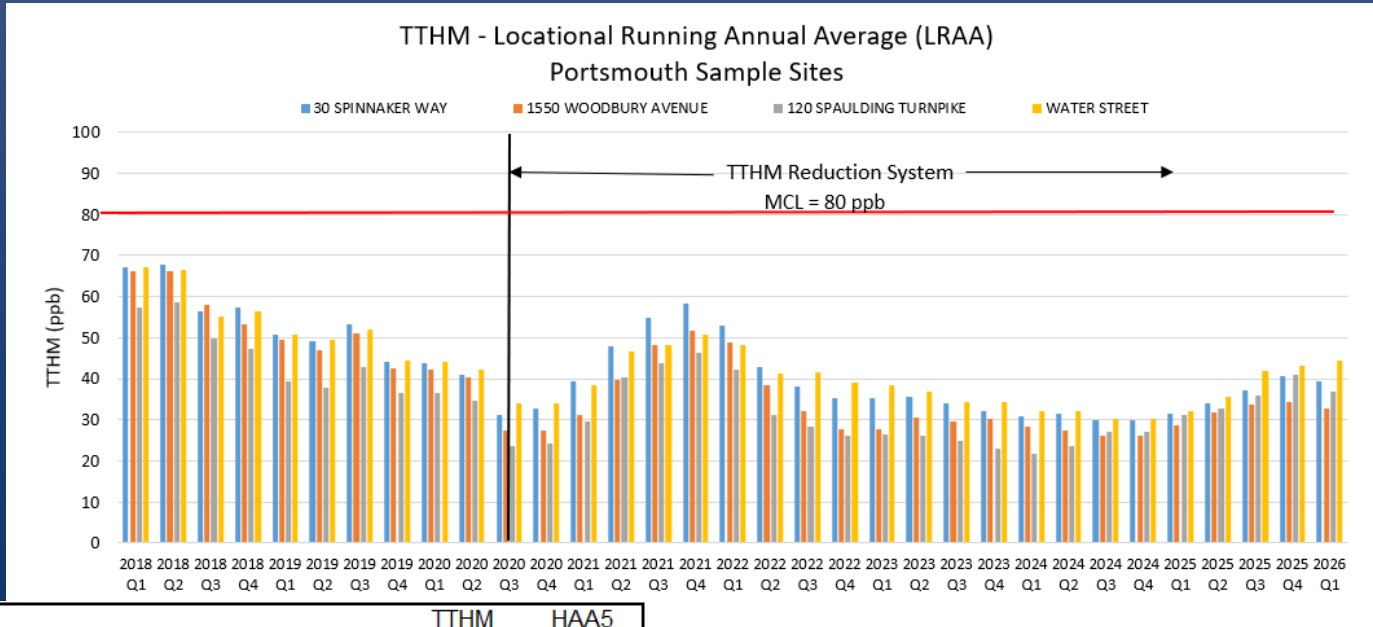


# Regulatory Info. - Disinfection Byproduct Rule

- **Both HAAs & TTHMs are regulated using a Locational Running Annual Average (LRAA).**
  - LRAA definition: average of sample results taken at a particular monitoring location during the previous four calendar quarters. Averages must stay below the 60ppb and 80ppb maximum contaminant levels (MCLs) to avoid potential health effects and water system violation.
- **How can DBP formation be controlled?**
  - Source Management (minimize nutrient loading)
  - Treatment Optimization (pretreatment, pH control, chlorine control, filtration media)
  - Distribution System Management (flushing program, water age reduction)

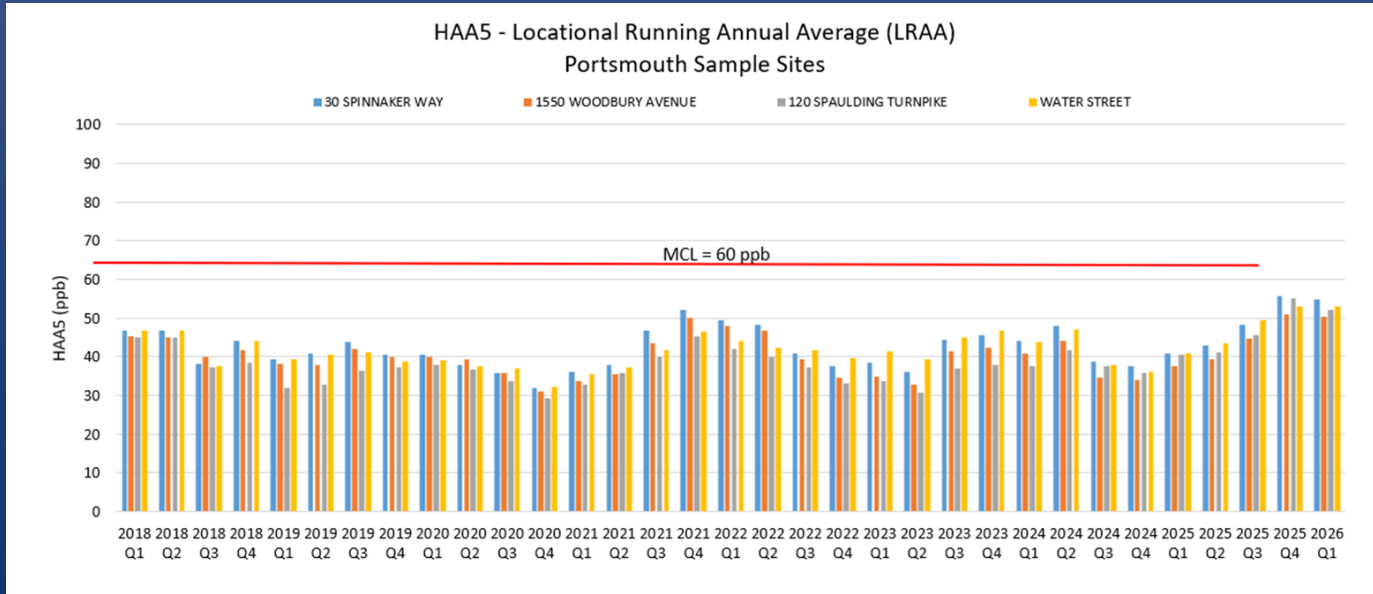
Regulated Contaminants	MCL (mg/L)
TTHM	0.080
Chloroform	
Bromodichloromethane	
Dibromochloromethane	
Bromoform	
HAA5	0.060
Monochloroacetic acid	
Dichloroacetic acid	
Trichloroacetic acid	
Bromoacetic acid	
Dibromoacetic acid	
Bromate (plants that use ozone) <sup>1</sup>	0.010
Chlorite (plants that use chlorine dioxide)	1.0
Regulated Disinfectants	MRDL <sup>3</sup> (mg/L)
Chlorine	4.0 as Cl <sub>2</sub>
Chloramines	4.0 as Cl <sub>2</sub>
Chlorine dioxide	0.8

# TTHM Results – Portsmouth Water System



DATE	SITE	TTHM	HAA5
<b>Quarter I 2026</b>		80	60
ID #	Reference	ppb	ppb
<b>Q1</b>	<b>Locational Running Average</b>	<b>Locational Running Average</b>	<b>Locational Running Average</b>
321	30 SPINNAKER WAY	40	55
325	1550 WOODBURY PLAZA	33	51
323	120 SPAULDING TURNPIKE	37	52
324	WATER STREET	45	53

# HAA5 Results – Portsmouth Water System



DATE	SITE	TTHM	HAA5
<b>Quarter I 2026</b>		80	60
ID #	Reference	ppb	ppb
<b>Q1</b>	<b>Locational Running Average</b>	Locational Running Average	Locational Running Average
321	30 SPINNAKER WAY	<b>40</b>	<b>55</b>
325	1550 WOODBURY PLAZA	<b>33</b>	<b>51</b>
323	120 SPAULDING TURNPIKE	<b>37</b>	<b>52</b>
324	WATER STREET	<b>45</b>	<b>53</b>