Massachusetts Department of Environmental Protection - Drinking Water Program

Stage 2 Disinfection By-Products Rule (DBPR) Quarterly Compliance Worksheet

PWSID:	PWS Name:	City/Town:
1113003	Housatonic Water Works Company	Great Barrington

◉ COM ○ NTNC

Monitoring Frequency: ◉ Quarterly ○ Annual or less

Monitoring Type: ◉ Routine ○ Reduced ○ Increased

CERTIFICATION: I certify under penalties of law that I am the person authorized to fill out this form and the information contained herein is true, accurate and complete to the

YEAR: 2023 **QUARTER:** ◉ Q1: Jan-Mar ○ Q2: Apr-Jun ○ Q3: Jul-Sep ○ Q4: Oct-Dec

James J Mercier — Primary Operator Signature:

March 15, 2023 — Date:

SYSTEMS USING CHLORINATION or CHLORAMINATION - COMPLETE TABLES A, B & C

A. CHLORINE RESIDUAL COMPLIANCE

	Month	Year	# Samples	Monthly Avg (ppm)
Q1	January	2023	2	0.70
	February	2023	2	0.71
	March	2022	2	0.51
Q2	April	2022	2	0.57
	May	2022	2	0.66
	June	2022	2	0.43
Q3	July	2022	2	0.24
	August	2022	2	0.62
	September	2022	2	0.47
Q4	October	2022	2	0.55
	November	2022	2	0.84
	December	2022	2	0.61

Chlorine Running Annual Average (RAA): (Average of 12 Monthly Averages)	**0.58**
Chlorine MRDL (ppm):	**4.0**
Was Chlorine MRDL exceeded? If Yes, then MRDL violation for period.	**NO**

[1]Note that you are required to notify MassDEP within 10 days of the end of the quarter of any DBPR MCL or MRDL violation. Tier 2 (30 day) Public Notification must also be

B. TTHM COMPLIANCE

Sample Location	Q1 (Jan - Mar)		Q2 (Apr - Jun)		Q3 (Jul - Sep)		Q4 (Oct - Dec)		OEL [1] Q1	LRAA
	Date	ppb	Date	ppb	Date	ppb	Date	ppb		
10 Depot St. (#10003)	2/8/2023	52	5/11/2022	44	8/8/2022	100	11/10/2022	76	70	68
314 N. Plain Rd. (#10004)	2/8/2023	46	5/11/2022	43	8/8/2022	96	11/10/2022	68	64	63
	MCL = 80 (ppb)		Was OEL exceeded?[2]		NO		Was MCL exceeded?[1]		NO	

C. HAA5 COMPLIANCE

Sample Location	Q1 (Jan - Mar)		Q2 (Apr - Jun)		Q3 (Jul - Sep)		Q4 (Oct - Dec)		OEL [1] Q1	LRAA
	Date	ppb	Date	ppb	Date	ppb	Date	ppb		
10 Depot St. (#10003)	2/8/2023	53	5/11/2022	50	8/8/2022	32	11/10/2022	71	52	52
314 N. Plain Rd. (#10004)	2/8/2023	48	5/11/2022	54	8/8/2022	86	11/10/2022	69	63	64
	MCL = 60 (ppb)		Was OEL exceeded?[2]		YES		Was MCL exceeded?[1]		YES	

D. IMPORTANT COMPLIANCE NOTES

[2]OELs apply to systems sampling quarterly only.

- ☐ PWS has exceeded the OEL for TTHM and/OR HAA5 but is authorized to limit the scope of the OEL evaluation to reporting only. (Refer to letter regarding seasonal OEL exceedances)
- ☑ PWS has exceeded the OEL for TTHM and/OR HAA5 and must **complete and submit an Operational Evaluation Report** within 90 days of receipt of the analytical results (systems sampling quarterly only).
- ☐ PWS continues to qualify for reduced monitoring based on LRAAs of TTHM and HAA5 (and TOC if applicable)
- ☐ PWS **NO LONGER QUALIFIES** for reduced monitoring based on average concentrations of TTHM, HAA5 and/or TOC. *(Refer to quarterly monitoring criteria on "Instructions" Tab)*
- ☐ PWS has exdeeded the MCL for TTHM or HAA5 during ANNUAL monitoring and therefore will be subject to **INCREASED monitoring** (quarterly dual sample sets at each location) until further notice.

Massachusetts Department of Environmental Protection - Drinking Water Program

Stage 2 Disinfection By-Products Rule (DBPR) Quarterly Compliance Worksheet

PWSID:	PWS Name:	City/Town:
1113003	Housatonic Water Works Company	Great Barrington

SURFACE OR GWUDI SYSTEMS >499 SEEKING OR ON REDUCED TTHM/HAA5 MONITORING - COMPLETE TABLE E

E.	Plant Name:		Plant 1		Plant 2		Plant 3		Plant 4	
	MONTH	YEAR	Monthly Avg (ppm)	Quarterly Avg (ppm)	Monthly Avg (ppm)	Quarterly Avg (ppm)	Monthly Avg (ppm)	Quarterly Avg (ppm)	Monthly Avg (ppm)	Quarterly Avg (ppm)
TOC (raw water)	Q1 January									
	Q1 February									
	Q1 March									
	Q2 April									
	Q2 May									
	Q2 June									
	Q3 July									
	Q3 August									
	Q3 September									
	Q4 October									
	Q4 November									
	Q4 December									
	Running Annual Average: (Average of last 4 quarterly averages)									

SYSTEMS USING OZONATION - COMPLETE TABLE F

F.	Plant Name:		Plant 1	Plant 2	Plant 3	Plant 4
	MONTH	YEAR	Monthly Avg (ppm)	Monthly Avg (ppm)	Monthly Avg (ppm)	Monthly Avg (ppm)
BROMATE (finished water)	Q1 January					
	Q1 February					
	Q1 March					
	Q2 April					
	Q2 May					
	Q2 June					
	Q3 July					
	Q3 August					
	Q3 September					
	Q4 October					
	Q4 November					
	Q4 December					
	Running Annual Average: (Average of last 12 monthly averages)					
	Was Bromate MCL Exceeded? [1] (MCL = 0.010 ppm)					
	Qualify for Reduced Bromate Monitoring? (RAA<0.0025 ppm)					

DEFINITIONS	
Monthly Average:	Average of all results within the current month.
Quarterly Average:	Average of three monthly averages.
Running Annual Average (RAA):	Average of one year of consecutive compliance periods, including the current one. 4 quarters (THM/HAA5 and TOC) or 12 months (Cl and Bromate).
Total # of Samples:	Total number of samples collected during the monitoring period.
Locational Running Annual Average (LRAA):	RAA from the same sample location. *Average of this quarter and three prior consecutive quarterly averages at the same location.*
Operational Evaluation Level (OEL):	Average of the two previous quarter's results and twice the current quarter's results

Note: Record and calculate all ND or < MDL results as the number 0 (zero).

COMMENTS:	

Version 6 - Web Version 3/2016

Massachusetts Department of Environmental Protection - Drinking Water Program

Stage 2 Disinfection By-Product Rule Operational Evaluation Report

For use with the DBPR Quarterly Compliance Worksheet

I. GENERAL INFORMATION

PWSID: 1113003 **PWS Name:** Housatonic Water Works Company **Town:** Great Barrington

CERTIFICATION: I certify under penalties of law that I am the person authorized to fill out this form and the information contained herein is true, accurate and complete to the best extent of my knowledge.

Monitoring Period: **Year:** 2023 **Quarter:** 1 - Jan-Mar

James J Mern — **Primary Operator Signature:**

March 15, 2023 — **Date:**

II. MONITORING RESULTS

Refer to Stage 2 DBPR Quarterly Compliance Worksheet for complete results summary.

Location #	1	2	3	4
Enter Sample Location Code(s) where OELs were exceeded:	10004			
Has an OEL exceedance occurred at this location in the past?	Yes			
If YES, when did the exceedance occur? (Year/Quarter)	2022Q3-4			
Was the cause determined for the previous exceedance?	No			
Are the previous evaluations applicable to the current OEL exceedance?	Yes			

Notes: 1st Quarter 2023 is the second quarter that the LRAA applies at the 314 N. Plain Rd. location

III. OPERATIONAL EVALUATION FINDINGS

A. seasonal exemption indicated on Section D of the Quarterly Compliance Worksheet? ☐ Yes ☑ No
If NO proceed to Item B. If YES, attach a copy of written approval from MassDEP including approved scope.

B. Did you confirm that proper Data Collection and Analysis Protocols Were Followed? ☑ Yes ☐ No
Refer to Page 2-6 in the OEL Guidance Manual for more information on evaluating these protocols.

C. Did **the distribution system** cause or contribute to your OEL exceedance(s)? ☐ Yes ☑ No ☐ Possibly
If YES or POSSIBLY explain (expand cell or attach additional pages if necessary)

There was no extensive flushing or other large hydraulic disturbances in early February 2023 that could have contributed to the observed HAA5 levels.

D. Did **the treatment system** cause or contribute to your OEL exceedance(s)? ☐ Yes ☑ No ☐ Possibly
If YES or POSSIBLY explain (expand cell or attach additional pages if necessary)

There were no large variations in treatment plant performance. See attached plots for chlorine residual data.

There is no treatment system for removing natural organic matter from the raw water, other than the slow sand filtration process which typically would be expected to provide about 15% removal of total organic carbon (TOC). However, recent test results indicate much greater removal by HWWC's slow sand filters, with an average of ~48% TOC removal (range of 33% in winter up to 55% in warmer weather).

E. Did **source water quality** cause or contribute to your OEL exceedance(s)? ☑ Yes ☐ No

If YES or POSSIBLY explain (expand cell or attach additional pages if necessary)

☐ Possibly

Probably yes, given the treatment system, distribution system and their operation were unchanged around the time of sampling for 1st Quarter 2023.

TOC data from 2/8/23 (the day of HAA5 sampling) showed 3.0 mg/L in the raw water and 2.1 mg/L for the finished water (a reduction of 30%). The TOC level that was exposed to chlorine is not particularly high at ~2.1 mg/L. Regardless, the reservoir is the source of the natural organic matter.

F. Attach all supporting operational or other data that support the determination of the cause(s) of your OEL exceedance(s).

G. If you are unable to determine the cause(s) of the OEL exceedance(s), list the steps that you can use to better identify the cause(s) in the future. *(attach additional pages if necessary)*

Additional data obtained from future samplings will help provide further information.

H. List steps that could be considered to minimize future OEL exceedances *(attach additional pages if necessary)*

HWWC completed and submitted to MassDEP an engineering study to identify the causes of DBP formation and recommend means of lowering DBP levels. On 3/1/23 MassDEP approved HWWC's proposal to implement a two-stage chlorination process by reducing the chlorine dose applied for primary disinfection, and then adding a second chlorine feed to boost the residual for secondary disinfection just prior to the point of entry (POE) to the distribution system. The second chlorine feed would be located between the storage tank and the POE, and after the storage tank's existing effluent chlorine monitor.

This approach will substantially reduce the exposure of natural organic matter to chlorine during the long contact times of the HWWC contact basin and storage tank, decreasing the overall CT by nearly two-thirds (nearly 67%). This should also provide for a more controlled and consistent chlorine residual in the distribution system, as the final dosing would be applied just before the water enters the distribution system instead of ~9 days earlier as part of the single dose now being fed before the contact basin.

I. Total Number of Pages Submitted, including attachments and checklists: 16

Housatonic Water Works Company
March 12, 2023

Supporting Data for the 1st Quarter 2023
HAA5 Operational Evaluation Level (OEL) report

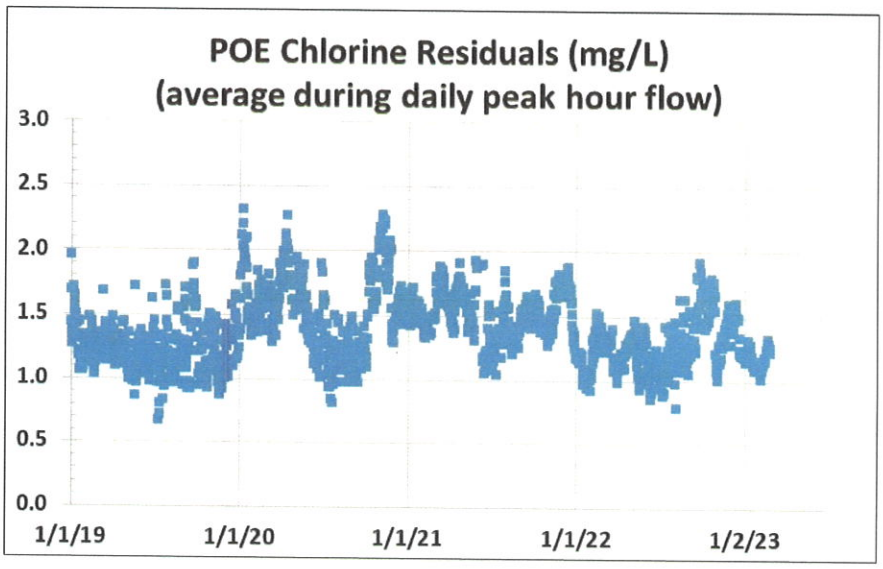

Figure 1. Point of Entry chlorine residuals levels for HWWC in 2019 – 2023

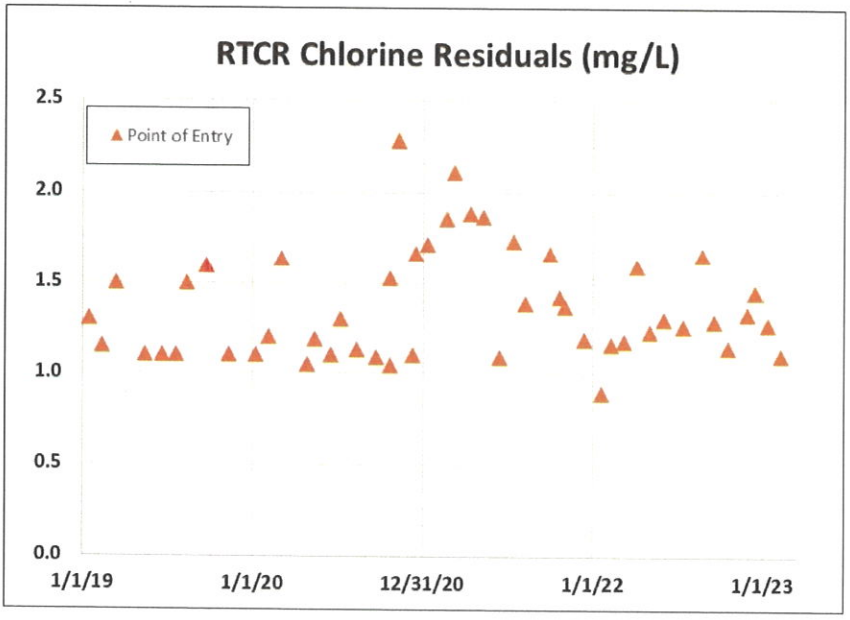

Figure 2. Point of Entry chlorine residuals levels for HWWC in 2019 – 2023, sampled for the Revised Total Coliform Rule

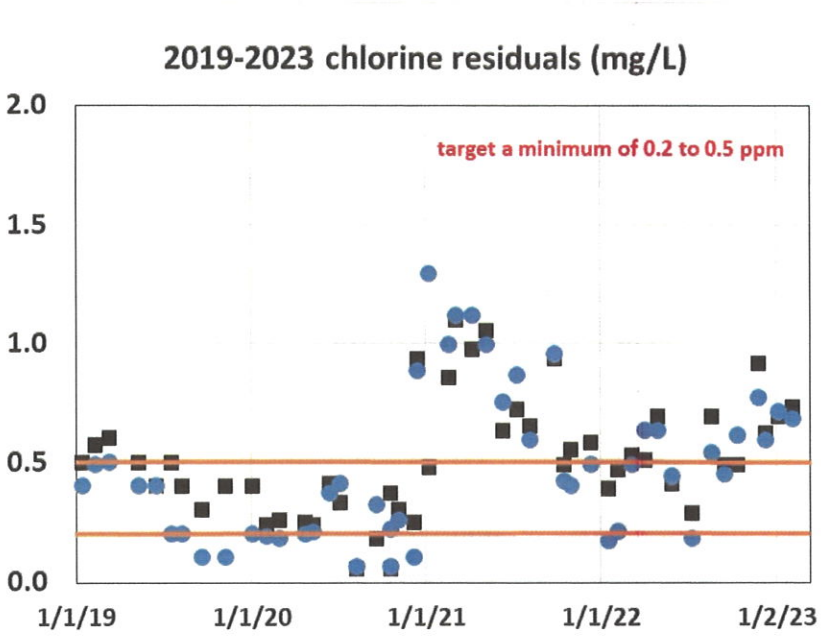

Figure 3. Distribution System chlorine residual levels for HWWC in 2019 – 2023, sampled for the Revised Total Coliform Rule

TTHM and HAA5 Sample Collection and Handling Checklist

Facility Name: Housatonic Water Works

Checklist Completed by: Nick Bruzzi Date: March 13, 2023

Yes	No	
☒	☐	Did you obtain appropriate sample collection vials provided from the laboratory?
☒	☐	Did the sample vials contain the proper preservative and dechlorinating agents?
☒	☐	Was each vial labeled using waterproof labels and indelible ink?
☒	☐	Did each vial contain the following information on the label?
☒	☐	Unique sample ID
☒	☐	System name
☒	☐	Sample location
☒	☐	Sample date and time
☒	☐	Analysis required, if not already on label
☒	☐	Did you remove the aerator from the tap if there was one present?
☒	☐	Did you open the water tap and allow the system to flush until the water temperature had stabilized (usually about 3-5 minutes)?
☒	☐	Did you adjust the flow so that no air bubbles were visually detected in the flowing stream?
☒	☐	Did you slowly fill the sample vial almost to the top without overflowing?
☒	☐	Were you careful not to rinse out any of the preservative/dechlorinating agent during this process?
☒	☐	After the bottle was filled, did you invert it three or four times to mix the sample with the preservative and dechlorinating agents?
☐	☐	If you collected a TTHM sample that requires acidification, did you: - N/A
☐	☐	Let the sample set for about 1 minute, allowing the dechlorinating chemical to take effect? - N/A
☐	☐	Carefully open the vial and adjust the pH of the TTHM sample to < 2 by adding approximately 4 drops of hydrochloric acid for every 40 mL of sample (amount of acid needed will depend on buffering capacity of sample)? - N/A
☐	☐	Recap the vial, and invert three or four times? - N/A

TTHM and HAA5 Sample Collection and Handling Checklist

Yes	No	
☒	☐	Did you invert the vial and tap it to check for air bubbles?
☐	☐	If bubbles were detected, did you carefully open the vial and add more sample water using the cap to achieve a headspace-free sample? *Note that air bubbles would more likely lead to a lower level of THMs or HAAs.* No bubbles were observed/detected
☒	☐	Did you immediately cool the samples to 4°C by placing them in a cooler with frozen refrigerant packs or ice, or in a refrigerator? Samples should be maintained at this temperature during shipping to the laboratory.
☒	☐	Did you complete the Sample Chain of Custody provided by the laboratory and include it with the sample shipment?
☐	☒	Was the sample holding time of 14 days exceeded?
☐	☒	Was the extract holding time exceeded? *EPA Method 551.1: 14 days at a temperature less than -10°C* *EPA Method 552.1: 48 hours at 4°C or less* *EPA Method 552.2: 7 days at 4°C or 14 days at a temperature less than -10°C* *EPA Method 552.3: 21 days for MTBE extraction solvent at -10°C or less* *OR 28 days for TAME extraction solvent at -10°C or less* *Standard Method 6251 B: 21 days at* -11°C
☐	☒	Did the laboratory invalidate the sample?

Notes/Comments

Distribution System Evaluation Checklist

System Name: Housatonic Water Works Company, Inc.

Checklist Completed by: Richard W. Bullock, PhD Date: 3/12/2023

A. Do you have disinfectant residual or temperature data for the monitoring location where you experienced the OEL exceedance? ☒ Yes ☐ No

If NO, proceed to item B. If YES, answer the following questions for the period in which an OEL exceedance occurred:

not exactly there, but data are available for nearby

Yes	No	
☐	☒	Was the water temperature higher than normal for that time of the year at that location?
☐	☒	Was the disinfectant residual lower than normal for that time of the year at that location?
☐	☒	Was the disinfectant residual higher than normal for that time of the year at that location?

B. Do you have maintenance records available for the time period just prior to the OEL exceedance? ☒ Yes ☐ No

If NO, proceed to item C. If YES, answer the following questions:

Yes	No	
☐	☒	Did any line breaks or replacements occur in the vicinity of the exceedance?
☐	☒	Were any storage tanks or reservoirs taken off-line and cleaned?
☐	☒	Did flushing or other hydraulic disturbances (e.g., fires) occur in the vicinity of the exceedance?
☐	☒	Were any valves operated in the vicinity of the OEL exceedances?

C. If your system is metered, do you have access to historical records showing water use at individual service connections? ☒ Yes ☐ No

If NO, proceed to item D. If YES, was overall water use in your system unusually low, indicating higher than normal water age? ☐ Yes ☒ No

D. Do you have high-volume customers in your system (e.g., an industrial processing plant)? ☐ Yes ☒ No

If NO, proceed to item E. If YES, was there a change in water use by a high-volume customer? ☐ Yes ☐ No

E. Is there a finished water storage facility hydraulically upstream from the monitoring location where you experienced the OEL exceedance? ☒ Yes ☐ No

If NO, proceed to item F. If YES, review storage facility operations and water quality data to answer the following questions for the period in which the OEL exceedance occurred:

Yes	No	
☒	☐	Was a disinfectant residual detected in the stored water or at the tank outlet?
☐	☒	Do you know of any mixing problems with the tank or reservoir?
☐	☒	Does the facility operate in "last in-first out" mode?
☐	☒	Was the tank or reservoir drawn down more than usual prior to OEL exceedance, indicating a possible discharge of stagnant water?
☐	☒	Was there a change in water level fluctuations that would have resulted in increased water age within the tank or reservoir?

Distribution System Evaluation Checklist

F. Does your system practice booster chlorination? ☐ Yes ☒ No

If NO, proceed to item G. If YES, was there an increase in booster chlorination feed rates? ☐ Yes ☐ No

G. Did you have customer complaints in the vicinity of the OEL exceedance? ☐ Yes ☒ No

If NO, proceed to item H. If YES, explain.

H. Did concern about complying with a rule other than Stage 2 DBPR, such as the Lead and Copper rule, the TCR, or any other rule constrain your options to reduce the DBP levels at this site? For example, are you limited by the need to maintain a detectable disinfectant residual in your ability to control DBP levels in the distribution system? ☐ Yes ☒ No

If NO, proceed to item I. If YES, explain below and consult EPA's *Simultaneous Compliance Guidance Manual* for alternative compliance approaches.

There is of course a balance - more chlorine for SWTR and TCR, and less chlorine for DBPR and LCR.

I. Conclusion

Did the distribution system cause or contribute to the OEL exceedance(s)? ☐ Yes ☒ No ☐ Possibly

If NO, proceed to evaluations of treatment systems and source water. If YES or POSSIBLY, explain below.

Treatment Process Evaluation Checklist

☐ NO DATA AVAILABLE

Facility Name: Housatonic Water Works Company, Inc.
Checklist Completed by: Richard W. Gullick, PhD Date: 3/12/2003

A. Review finished water data for the time period prior to the OEL exceedance(s) and compare to historical finished water data using the following questions:

Were DBP precursors (TOC, DOC, SUVA, bromide, etc.) higher than normal?	☐ Yes	☒ No
Was finished water pH higher or lower than normal?	☐ Yes	☒ No
Was the finished water temperature higher than normal?	☐ Yes	☒ No
Was finished water turbidity higher than normal?	☐ Yes	☒ No
Was the disinfectant concentration leaving the plant(s) higher than normal?	☐ Yes	☒ No
Were finished water TTHM/HAA5 levels higher than normal?	☒ Yes	☐ No
Were operational and water quality data available to the system operator for effective decision making?	☒ Yes	☐ No

B. Does the treatment process include predisinfection? ☐ Yes ☒ No

If NO, proceed to item C. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☐	Was disinfected raw water stored for an unusually long time?
☐	☐	Were treatment plant flows lower than normal?
☐	☐	Were treatment plant flows equally distributed among different trains?
☐	☐	Were water temperatures high or warmer than usual?
☐	☐	Were chlorine feed rates outside the normal range?
☐	☐	Was a disinfectant residual present in the treatment train following predisinfection?
☐	☐	Were online instruments utilized for process control?
☐	☐	Did you switch to free chlorine as the oxidant?
☐	☐	Was there a recent change (or addition) of pre-oxidant?
☐	☐	Did you change the location of the predisinfection application?

C. Does your treatment process include presedimentation? ☐ Yes ☒ No

If NO, proceed to item D. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☐	Were flows low?
☐	☐	Were flows high?
☐	☐	Were online instruments utilized for process control?
☐	☐	Was sludge removed from the presedimentation basin?
☐	☐	Was sludge allowed to accumulate for an excessively long time?
☐	☐	Do you add a coagulant to your presedimentation basin?
☐	☐	Was there a problem with the coagulant feed?

Treatment Process Evaluation Checklist

D. Does your treatment process include coagulation and/or flocculation? ☐ Yes ☒ No

If NO, proceed to item E. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☐	Were there any feed pump failures or were feed pumps operating at improper feed rates?
☐	☐	Were chemical feed systems controlled by flow pacing?
☐	☐	Were there changes in coagulation practices or the feed point?
☐	☐	Did you change the type or manufacturer of the coagulant?
☐	☐	Do you suspect that the coagulant in use at the time of the OEL exceedance did not meet industry standards?
☐	☐	Did the pH or alkalinity change at the point of coagulant addition?
☐	☐	Were there broken or plugged mixers?
☐	☐	Were flow rates above the design rate or was there short-circuiting?

E. Does your treatment process include sedimentation or clarification? ☐ Yes ☒ No

If NO, proceed to item F. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☐	Were there changes in plant flow rate that may have resulted in a decrease in settling time or carry-over of process solids?
☐	☐	Were settled water turbidities higher than normal?
☐	☐	Was there any disruption in the sludge blanket that may have resulted in carryover to the point of disinfection?
☐	☐	Was there any maintenance in the basin that may have stirred sludge from the bottom of the basin and caused it to carry over to the point of disinfectant addition?
☐	☐	Was sludge allowed to accumulate for an excessively long time or was there a malfunction in the sludge removal equipment?

Treatment Process Evaluation Checklist

F. Does your treatment process include filtration? two slow sand filters ☒ Yes ☐ No

If NO, proceed to item G. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☒	Was there an increase in individual or combined filter effluent turbidity or particle counts?
☐	☒	Was there an increase in turbidity or particle loading onto the filters?
☐	☒	Was there an increase in flow onto the filters or malfunction of the rate of flow controllers?
☐	☒	Were any filters taken off-line for an extended period of time that caused the other filters to operate near maximum design capacity and created the conditions for possible breakthrough?
☐	☒	Were any filters operated beyond their normal filter run time?
☐	☒	Were there any unusual spikes in individual filter effluent turbidity (which may indicate particulate or colloidal TOC breakthrough) in the days leading to the excursion?
☐	☒	Were all filters run in a filter-to-waste mode during initial filter ripening?
☐	☐	If GAC filters are used, is it possible the adsorptive capacity of the GAC bed was reached before reactivation occurred (leave blank if not applicable)?
☐	☐	If biological filtration is used, were there any process upsets that may have resulted in the breakthrough of TOC (leave blank if not applicable)?

G. Does your treatment process include primary disinfection by injecting chlorine prior to a clearwell? ☒ Yes ☐ No

If NO, proceed to item H. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☒	Was there a sudden increase in the amount of chlorine fed or an increase in the chlorine residual?
☐	☒	Was there an increase in clearwell holding time?
☐	☒	Was the plant shut down or were plant flows low?
☐	☒	Was there an increase in clearwell water temperature?
☐	☒	Did you switch to free chlorine recently as the primary disinfectant?
☐	☒	Was the inactivation of *Giardia* and/or viruses exceptionally high?
☐	☒	Was there a change in the mixing strategy (i.e., mixers not used, adjustment of tank level)?

H. Does your plant recycle spent filter backwash or other streams? ☐ Yes ☒ No

If NO, proceed to item I. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☐	Did a change in the recycle stream quality contribute to increased DBP precursor loading that was not addressed by treatment plant processes?
☐	☐	Did a recycle event result in flows in excess of typical or design flows?

Treatment Process Evaluation Checklist

I. Do you inject a disinfectant after your clearwell to maintain a distribution system residual? ☐ Yes ☒ No

If NO, proceed to item J. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☐	Was there a sudden increase in the amount of chlorine fed?
☐	☐	Was there a switch from chloramines to free chlorine for a burnout period?
☐	☐	If using chloramines, was the chlorine to ammonia ratio in the proper range?
☐	☐	Was there a problem with either chlorine or ammonia mixing?

J. Did concern about complying with a rule other than Stage 2 DBPR, such as the Lead and Copper rule, the LT2ESWTR, or any other rule constrain your options to reduce the DBP levels at this site? For example, are you limited by other treatment targets/requirements in your ability to control precursors in coagulation/flocculation? ☐ Yes ☒ No

If NO, proceed to item K. If YES, explain below and consult EPA's *Simultaneous Compliance Guidance Manual* for alternative compliance approaches.

There is of course a balance – more chlorine for SWTR and TCR compliance, and less chlorine for D/DBPR + LCR.

K. **Conclusion**

Did treatment factors and/or variations in the plant performance contribute to the OEL exceedance(s)? ☐ Yes ☒ No ☐ Possibly

If YES or POSSIBLY, explain below.

There were no significant variations in treatment plant performance. At the time of sampling 2/8/23 the slow sand filters were removing ~48% of the TOC, reducing it from 3.0 mg/L down to 2.1 mg/L.

Source Water Evaluation Checklist

☐ **NO DATA AVAILABLE**

System Name: Housatonic Water Works Company, Inc.

Checklist Completed by: Richard W. Gullick, PhD Date: 3/12/2023

A. Do you have source water temperature data? – not directly, but at locations in plant ☒ Yes ☐ No

If NO, proceed to item B. If YES, was the source water temperature high? ☐ Yes ☒ No

If NO, proceed to item B. If YES, answer the following questions for the time period prior to the OEL exceedance.

Yes	No	
☐	☒	Was the raw water storage time longer than usual?
☐	☒	Did you place another water source on-line?
☐	☒	Were river/reservoir flow rates lower than usual? If yes, indicate the location of lower flow rates and the anticipated impact on the OEL exceedance.
☒	☐	Did point or non-point sources in the watershed contribute to the OEL exceedance? There are no point sources, but the watershed contributes organic matter

B. Do you have data that characterizes organic matter in your source water (e.g., TOC, DOC, SUVA, color, THM formation potential)? ☒ Yes ☐ No

If NO, proceed to item C. If YES, were these values higher than normal? Raw water TOC = 3.0 mg/L, Finished water = 2.1 mg/L ☐ Yes ☐ No

If NO, proceed to item C. If YES, answer the following questions for the time period prior to the OEL exceedance.

Yes	No	
☐	☒	Did heavy rainfall or snowmelt occur in the watershed?
☐	☒	Did you place another water source on-line?
☐	☒	Did lake or reservoir turnover occur?
☒	☐	Did point or non-point sources in the watershed contribute to the OEL exceedance? Natural sources
☐	☒	Did an algal bloom occur in the source water?
☐	☐	If algal blooms were present, were appropriate algae control measures employed (e.g., addition of copper sulfate)?
☐	☒	Did a taste and odor incident occur?

C. Do you have source water bromide data? ☐ Yes ☒ No

If NO, proceed to item D. If YES, were the bromide levels higher or lower than normal? ☐ Yes ☐ No

If NO, proceed to item D. If YES, answer the following questions for the time period prior to the OEL exceedance.

Yes	No	
☐	☐	Has saltwater intrusion occurred?
☐	☐	Are you experiencing a long-term drought?
☐	☐	Did heavy rainfall or snowmelt occur in the watershed?
☐	☐	Did you place another water source on-line?
☐	☐	Are you aware of any industrial spills in the watershed?

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D. Do you have source water turbidity or particle count data? – turbidity ☒ Yes ☐ No

If NO, proceed to item E. If YES, were the turbidity values or particle counts higher than normal? ☐ Yes ☒ No

If NO, proceed to item E. If YES, answer the following questions for the time period prior to the OEL exceedance.

Yes	No	
☐	☒	Did lake or reservoir turnover occur?
☐	☒	Did heavy rainfall or snowmelt occur in the watershed?
☐	☒	Did logging, fires, or landslides occur in the watershed?
☐	☒	Were river/reservoir flow rates higher than normal?

E. Do you have source water pH or alkalinity data? both ☒ Yes ☐ No

If NO, proceed to item F. If YES, was the pH or alkalinity different from normal values? ☐ Yes ☒ No

If NO, proceed to item F. If YES, answer the following questions for the time period prior to the OEL exceedance.

Yes	No	
☐	☒	Was there an algal bloom in the source water? – not observed
☐	☐	If algal blooms were present, were algae control measures employed? – NA
☐	☒	Did heavy rainfall or snowmelt occur in the watershed?
☐	☐	Has the PWS experienced diurnal pH changes in source water? not known

F. Conclusion

Did source water quality factors contribute to your OEL exceedance? ☒ Yes ☐ No ☐ Possibly

If YES or POSSIBLY, explain below.

The natural organic matter present in the source water serves as a precursor to DBP formation.