Compliance Monitoring Plan – Long Form
for the Stage 2 Disinfectants and Disinfection Byproducts Rule
Instructions

Under the Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBPR), all community water systems (CWS) and non-transient non-community water systems (NTNC) that use a primary or residual disinfectant other than ultraviolet light or that deliver water that has been treated with a primary or residual disinfectant other than ultraviolet light shall develop and implement a Stage 2 DBPR Compliance Monitoring Plan (Plan). A public water system must submit a copy of its Stage 2 DBPR Compliance Monitoring Plan to the Public Water Supply (PWS) Section before beginning monitoring for DBPs. Also, the system must keep the Plan on file for State and public review.

After submittal and approval, a water system may revise its Stage 2 Compliance Monitoring Plan to reflect changes in the population served, treatment, distribution system operations and layout (including new service areas), or other factors that may affect Total Trihalomethanes (TTHM) or Haloacetic Acids (HAA5) formation, or for PWS Section-approved reasons, after consultation with the PWS Section regarding the need for changes and the appropriateness of changes. The public water system shall submit a copy of its modified Plan to the PWS Section for approval before the next required sampling event

Complete and Submit PARTs 1, 2, 3 and 4 of the Compliance Monitoring Plan template.
(The template is available on the Web at https://deq.nc.gov/about/divisions/water-resources/drinking-water/compliance-services#dbp)

PART 1 – General System Information

Please complete the general information including water system name, 7-digit Public Water System Identification Number (PWSID#), mailing address, and the system contact person with their telephone number and email address. In the space provided indicate the population served by your system.

Please check the box for the type of untreated raw-water source(s) used by your system. In the treatment section, check the treatment(s) that YOUR system uses and provide the number of each source type that use the treatment.

PART 2 – Sample Site Information

In the first Sample Site Information table entitled "*Sample Site Information - Chlorine Dioxide, Chlorite, Total Organic Carbon, Alkalinity, Specific Ultraviolet Absorption, Bromate*," please list each parameter, by code (see Parameter Code Key table), that your system is required to monitor, along with the following information:

- Sample Type (see Sample Type Key table)
- Treatment Plant (Facility) ID (3-digit, if applicable)
- Sample Point ID for each sample location (3-digit)
- Location or address for each sample site

In the second Sample Site Information table entitled "*Sample Site Information - TTHM/HAA5*," enter the following information for each Sample Point ID (B01-BXX) for the number of routine monitoring samples your system is required to collect:

- Location or address for each distribution system sample site
- The type of sampling location (High TTHM or High HAA5).
- The justification for selecting a sample location as a High TTHM or High HAA5 site.
- Indicate whether the site is a reduced monitoring location. (Remember, *even if a system qualifies for reduced compliance monitoring under the Stage 2 DBPR, the monitoring plan **must** include*

the required number of routine monitoring sites and identify which locations will be used for reduced monitoring.)

PART 3 - Proposed Schedule & Compliance Calculations

You only need to submit proposed schedules for the parameters you are required to monitor, and for those parameters you choose to monitor as an option for reduced monitoring or to meet an Alternative Compliance Criteria (ACC) for Total Organic Carbon (TOC) removal. For instance, all systems will be required to monitor for TTHM/HAA5, while only systems using conventional filtration will be required to monitor for TOC and alkalinity. However, any system with surface water (SW) or ground water under the direct influence of surface water (GWUDI) sources may choose to monitor for TOC.

You do not need to submit compliance calculations to the State. Official compliance calculations will be performed on the data submitted by certified laboratories. The "Compliance Calculations" provided are for your reference, however, your system should still calculate each locational running annual average (LRAA) with each new sample result so that your system can be aware of and take steps to address any violations. These calculations fulfill the requirements of the Stage 2 DBPR and may be submitted "as is" for each required parameter. Systems are required to perform Operational Evaluation Level (OEL) calculations to determine the need to conduct an operational evaluation and submit a written report to the State within 90 days.

For each parameter section, provide the information denoted below. Note: For any parameter section in Part 3 that does not pertain to your water system, check the "N/A - Not Applicable" box.

TTHM/HAA5

Please check the appropriate monitoring frequency and fill in the number of sample locations per monitoring period. Denote whether the samples are individual samples (TTHM or HAA5) or dual sample sets (both TTHM and HAA5) at each sample site location. In the space provided, indicate the anticipated sample schedule (*i.e.,* 1stWk/Jul, 1stWk/Oct, etc.). It is important to note that Stage 2 DBPR TTHM/HAA5 compliance monitoring must take place during the peak historical month and then, if conducting quarterly monitoring, at 90 day intervals before and after the peak historical month. Purchase systems should use the same peak month as their wholesaler. Systems that do not purchase their water should use the month during which the highest TTHM and HAA5 concentrations have historically occurred. If the peak historical month for TTHM and HAA5 concentrations is different, contact the PWS Section for guidance. (Routine monitoring requirements are provided in Appendix A.)

DBP Precursors

Please fill in the number of samples collected per period. List the dates that you anticipate collecting samples (*i.e.,* 1st Tues. of month). Also, list the associated 3-digit treatment plant (facility) ID or associated 3-digit SW / GWUDI source (facility) ID.

Optional TOC

Please fill in the number of samples collected per period. List the dates that you anticipate collecting samples (*i.e.,* 1st Tues. of month). Also, list the associated 3-digit SW / GWUDI source (facility) ID.

Chlorine Dioxide, Chlorite and Bromate

For chlorine dioxide (ClO_2), chlorite and bromate, please indicate whether the treatment (ClO_2 or ozone) is used year round or seasonally by checking the appropriate box. If seasonal, please indicate the months the treatment is normally used on the line provided. Please fill in the number of samples collected per period. Provide the anticipated sample schedule (*i.e.,* 1st Tues. of month). Also, list the associated 3-digit treatment plant (facility) ID.

PART 4 – System Schematic and System Changes

Attach a map or drawing of your current distribution system. Include the location of any interconnections with other public water systems. Also, where applicable, designate on the map the locations of the following facilities and their 3-digit location code:

- Sources
- Treatment Plants
- Entry Points
- Storage Facilities, including volume
- Booster Stations
- All compliance sample sites that are required under the Stage 2 DBPR

Completed Compliance Monitoring Plans should be mailed or emailed to:

D/DBP Rule Manager
Public Water Supply Section
1634 Mail Service Center
Raleigh, NC 27699-1634

Katherine.Richardson@ncdenr.gov

If you have any questions regarding the completion of the Compliance Monitoring Plan template, please contact: Katie Richardson at (919) 707-9087 or by email at Katherine.Richardson@ncdenr.gov

Appendix A

STAGE 2 DBPR - MONITORING REQUIREMENTS

TTHM/HAA5 monitoring is required for all CWS and NTNC water systems that use a primary or residual disinfectant other than ultraviolet light or that deliver water that has been treated with a primary or residual disinfectant other than ultraviolet light (includes consecutive water systems that purchase treated water). TTHM/HAA5 samples are collected in the distribution system as a sample set unless otherwise noted. Stage 2 DBPR compliance monitoring must take place during the peak historical month and then, if conducting quarterly monitoring, at 90 day intervals before and after the peak historical month. If the peak historical month for TTHM and HAA5 concentrations is different, contact the PWS Section for guidance. Sample locations represent areas within the distribution system with the highest TTHM/HAA5 concentrations as determined by historical DBP sampling results or as justified using other criteria such as the month of warmest water temperature. All TTHM/HAA5 samples must be analyzed by an NC certified laboratory.

ROUTINE MONITORING (§ 141.621)

CWS and NTNC systems using Surface Water (SW) or GWUDI sources shall monitor as follows:

Population Size	Monitoring Frequency	Sample Set Type*	Total Monitoring Locations Per Monitoring Period
< 500	Annually	Individual	1 TTHM and 1 HAA5
500 – 3,300	Quarterly	Individual	1 TTHM and 1 HAA5
3,301 – 9,999	Quarterly	Dual	2
10,000 – 49,999	Quarterly	Dual	4
50,000 – 249,999	Quarterly	Dual	8
250,000 – 999,999	Quarterly	Dual	12
1,000,000 – 4,999,999	Quarterly	Dual	16
≥ 5,000,000	Quarterly	Dual	20

CWS and NTNC systems using Ground Water (GW) sources shall monitor as follows:

Population Size	Monitoring Frequency	Sample Set Type*	Total Monitoring Locations Per Monitoring Period
< 500	Annually	Individual	1 TTHM and 1 HAA5
500 – 9,999	Annually	Dual	2
10,000 – 99,999	Quarterly	Dual	4
100,000 – 499,999	Quarterly	Dual	6
≥ 500,000	Quarterly	Dual	8

*Systems on quarterly monitoring must take dual sample sets (both TTHM and HAA5) every 90 days at each monitoring location, except for systems with SW or GWUDI sources serving 500-3,300 people. Systems with ground water sources serving 500-9,999 people on annual monitoring must take dual sample sets at each monitoring location. All other systems on annual monitoring and systems with SW or GWUDI sources serving 500-3,300 people are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. For systems serving fewer than 500 people, only one location with a dual sample set per monitoring period is needed if the highest TTHM and HAA5 concentrations occur at the same location and month.

REDUCED MONITORING (§141.623)

CWS and NTNC systems using Surface Water (SW) or GWUDI sources which qualify for reduced monitoring shall monitor as follows:

Population Size	Monitoring Frequency	Distribution System Monitoring Locations per Monitoring Period
< 500		Monitoring may not be reduced.
500 – 3,300	Annually	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
3,301 – 9,999	Annually	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.
10,000 – 49,999	Quarterly	2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs.
50,000 – 249,999	Quarterly	4 dual sample sets - at the locations with the two highest TTHM and two highest HAA5 LRAAs.
250,000 – 999,999	Quarterly	6 dual sample sets - at the locations with the three highest TTHM and three highest HAA5 LRAAs.
1,000,000 – 4,999,999	Quarterly	8 dual sample sets - at the locations with the four highest TTHM and four highest HAA5 LRAAs.
≥ 5,000,000	Quarterly	10 dual sample sets - at the locations with the five highest TTHM and five highest HAA5 LRAAs.

CWS and NTNC systems using Ground Water (GW) sources which qualify for reduced monitoring shall monitor as follows:

Population Size	Monitoring Frequency	Sample Set Type* Total Monitoring Locations Per Monitoring Period
< 500	Triennially	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter
500 – 9,999	Annually	1 TTHM and 1 HAA5 sample: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement; 1 dual

		sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter
10,000 – 99,999	Annually	2 dual sample sets: one at the location and during the quarter with the highest TTHM single measurement, one at the location and during the quarter with the highest HAA5 single measurement.
100,000 – 499,999	Quarterly	2 dual sample sets; at the locations with the highest TTHM and highest HAA5 LRAAs.
≥ 500,000	Quarterly	4 dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs.

*Systems on quarterly monitoring must take dual sample sets (both TTHM and HAA5) every 90 days.

STAGE 2 DBPR - SITE SELECTION INFORMATION

To select DBP sample sites, start with the expected highest TTHM site, then alternate site selection between locations representing expected high TTHM levels and high HAA5 levels until the required number of Stage 2 DBPR compliance monitoring locations have been identified. New systems should work with the appropriate PWS Section regional office to identify Stage 2 DBPR monitoring locations.

- ***High TTHM sites:*** In general, higher water temperatures and increased water age lead to higher TTHM concentrations. Storage facilities in a distribution system typically increase water age. Therefore, if your system has storage tanks or reservoirs, locate high TTHM sites downstream of those tanks. In addition, sites near dead ends and sparsely populated residential areas can be likely sites for high TTHM. Other possible areas of high TTHM levels include hydraulic dead ends (where water flow is low or stagnant) and prior to the last fire hydrant. However, be sure to locate TTHM sites before or at the last group of customers on a dead end line. Samples taken at the very end of a dead end line are not representative of the water received by customers. Additionally, if your system practices booster disinfection, TTHM sites should not be located just before booster chlorination is applied.

- ***High HAA5 Sites:*** As with TTHM, higher temperatures and increased residence time can lead to higher HAA5 concentrations. However, HAA5 can biodegrade where biological activity is present and disinfectant residual levels are low or non-existent. Therefore, consider locating high HAA5 sites where disinfectant residuals are significantly less than the system average (indicating a long residence time), but avoid areas that have very low or no residual. When booster disinfection is applied, the disinfectant residual will increase despite advanced water age. HAA5 levels are likely to increase after a booster disinfectant is applied due to the greater concentration of disinfectant available to react with DBP precursors and the lack of biological activity in these areas. Therefore, if your system practices booster disinfection, locate high HAA5 sites after booster disinfection is applied. Do *not* select high HAA5 sites in locations that regularly or in the summer months have free chlorine residuals less than 0.2 mg/L or with chloramine residuals less than 0.5 mg/L.

- ***Final Site Selection:*** Consider the following issues when making the final site selections:
  1. Select sites that provide the best geographic and hydraulic representation.
  2. Locate sites in as many key areas as possible, including isolated portions of the distribution system, areas downstream of tanks, areas downstream of booster chlorination, and within each pressure zone.
  3. Consider site access issues as each selected site must remain accessible over the long term.