Monitoring Plan
Disinfectants and Disinfection Byproduct Rule

_____ Public Water Supply

_____, Iowa

_____ (Date prepared or revised)

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NOTE: This sampling plan template is for use by groundwater systems and consecutive systems with populations less than 10,000 persons.

INSERT THE PAGE PROVIDED BY DNR FOR YOUR WATER SUPPLY

I. _____ Public Water Supply General Information

System Name: _____

PWS ID number: _____

Address: _____

_____

_____

_____

Contact Person: _____

Phone: _____

System Type: (circle one) Community Nontransient Noncommunity

Population Served: _____

Source Water Type: Ground Water

Consecutive System: (circle one) Yes No

If yes, supplying system: _____

Source Entry Point: _____

Treatment Provided: (Provide brief description of treatment)

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

II. Plant Description and Summary of Normal Operating Characteristics

Briefly describe normal operating conditions including source rotation, treatment, alternative sources, storage, seasonal operation, etc. Consecutive systems list system providing the water and any additional treatment provided within your system.

III. Sampling Plan

Sampling is required for disinfection byproducts (TTHMs and HAA5) and residual chlorine in the distribution system.

III A. Disinfection Byproducts (TTHMs/HAA5)

As this system uses chlorine or chloramines for oxidation and/or disinfection, the Disinfection Byproducts (DBP) compliance is based on the Total Trihalomethane (TTHM) and Haloacetic Acid (HAA5) levels at the maximum residence time location in the distribution system. The sample type for this location is MRT. One TTHM and HAA5 sample must be collected for each treatment plant. TTHM and HAA5 will be sampled annually and samples will be taken during the month of _____ as required in this system's operation permit. Table 1 summarizes the location and frequency of sampling for TTHMs and HAA5. Additional lines must be added for additional treatment plants.

Table 1. TTHM and HAA5 Sampling Locations and Schedule

Treatment Plant Description	Treatment Plant Facility ID	Maximum Residence Time Sample Location	Sample Type	Sample Frequency
FOR EXAMPLE: Vine St. Water Treatment Plant	TP01	112 Main St	MRT	Annually during the month of August
_____ _____ _____	_____	_____ _____ _____	MRT	Annually during the month of _____
_____ _____ _____	_____	_____ _____ _____	MRT	Annually during the month of _____

The results of the TTHM and HAA5 samples will be compared to the respective MCLs of 0.080 and 0.060 mg/L. If either the TTHM or the HAA5 MCL is exceeded, the system shall begin quarterly sampling during the months of _____, _____, _____ (or three-month intervals from the initial sample month).

All samples will be collected in laboratory supplied bottles. Samples will be placed in coolers and shipped to a certified laboratory as soon as practicable. The laboratory currently used for analysis is:

_____
_____
_____
_____

The lab phone number is _____

Our contact person at the lab is _____

III B. Maximum Residual Disinfectant Level (Residual Chlorine)

As this system uses chlorine or chloramines for oxidation and/or disinfection, the Maximum Residual Disinfectant Level (MRDL) compliance is based on the chlorine residual measured in the distribution system. Systems using chlorine must measure the total chlorine residual and systems using chloramines must measure either the total or combined chlorine residual. The residual chlorine level must be measured when coliform samples are collected at locations specified by the bacterial sampling plan. This includes any additional repeat or routine coliform samples required by the department. These chlorine residual results must be reported on the laboratory sheet.

Some systems switch between chlorine and chloramines throughout the year. You must record which disinfectant is being used on any particular day. The calculation for the running annual average includes all chlorine and chloramine data collected during the year according to your monitoring plan.

IV Calculations for Determining Compliance

IV A. DBPs

For systems collecting one sample per year, the running annual average (RAA) is the value of that one sample. If the MCL for either TTHM or HAA5 is exceeded in that single sample, it is not a violation but it does trigger more sampling. Beginning in the following quarter, the system must collect one sample at the maximum residence time location each quarter for both TTHM and HAA5.

For systems collecting one sample each quarter, the running annual average (RAA) is calculated by adding the results of each of the four most recent quarters and dividing the sum by four. This value is the RAA. For each new quarter, the oldest quarterly value is dropped and the most recent quarterly value is included in the sum. If a sample was not collected in one quarter, the data for the most recent three quarters is used and the sum divided by 3.

For example: add each quarterly result and divide by 4.

$$\frac{(Q1 + Q2 + Q3 + Q4)}{4} = RAA$$

Next quarter:

$$\frac{(Q2 + Q3 + Q4 + Q1)}{4} = RAA$$

The RAA will be compared to the MCL value and compliance determined.

IV B. Residual Chlorine or Chloramine MRDL

The appropriate chlorine residual results for each month must be averaged to determine the monthly average for each month. At the end of each calendar quarter, the Running Annual Average (RAA) must be calculated. To do this, add the monthly averages of the last 12 months and divide this sum by 12. This value is the running annual average. This calculation must be done at the end of each calendar quarter and reported to the department on the Monthly Operation Report.

For example: add each monthly average and divide by 12.

$$\frac{M1 + M2 + M3 + M4 + M5 + M6 + M7 + M8 + M9 + M10 + M11 + M12}{12} = RAA$$

Next quarter:

$$\frac{M4 + M5 + M6 + M7 + M8 + M9 + M10 + M11 + M12 + M1 + M2 + M3}{12} = RAA$$

V. Reporting Requirements and Forms

The Monthly Operation Reports (MORs) must be submitted to the Field Office by the 10th of the following month.

All required self-monitoring must be included on the MOR.

VI. Sampling Procedure for TTHM and HAA5

Samples for TTHM and HAA5 must be collected at the maximum residence time location. The laboratory instructions should be followed for each sample. These samples are collected in 40 or 60 mL vials with no headspace (air). These bottles will contain a preservative which may appear as a drop of liquid, powder, or may not be apparent. Some labs may require additional preservative to be added after collection.

General sample collection instructions:

1. Run water for at least two minutes or until water is cool.
2. Carefully fill each vial by allowing the water to slowly run down the inside of the vial.
3. Overfill each vial so that a bead of water forms above the lip of the vial so there are no air bubbles in the sample vial.
4. Add preservative if required.
5. Carefully screw on the cap.
6. Tip the vials upside down to check that no air bubble remains in the vial. If an air bubble does appear, unscrew the cap and add more water (DO NOT DUMP out the sample and start over).
7. Fill out the sample information forms.
8. Carefully pack the samples and ship or delivery to the lab.

VII. Violations

Listed below are the types of violations that can be incurred for TTHM, HAA5, chlorine, or chloramines. Each violation requires public notification and must be included in the annual Consumer Confidence Report.

MCL — A violation of the MCL for the TTHM or HAA5 occurs when the running annual average exceeds 0.080 mg/L for TTHM or 0.060 mg/L for HAA5.

MRDL — A violation of the MRDL for chlorine/chloramines occurs when the running annual average exceeds 4.0 mg/L.

Monitoring — A monitoring violation for TTHM or HAA5 occurs when the sample is not collected according to the operation permit (examples: sample never collected, not collected from the maximum residence time location, or not collected in the correct time period).

A monitoring violation for MRDL occurs when the sampling plan is not followed (examples: samples not collected in accordance with the sampling plan, samples not collected from the correct locations, samples not collected when a repeat total coliform set of samples is required)

Reporting — A reporting violation occurs when the monthly operation report is either not sent to the department by the 10^{th} of the following month, or is sent but is incomplete.