LONG TERM 1 - ENHANCED SURFACE WATER TREATMENT RULE SUMMARY

North Dakota Department of Health
Division of Municipal Facilities
SFN 54272 (1/2009)

Public Water System (PWS) Name	PWS Number ND ___ ___ ___ ___ ___ ___ ___
Report for the Month of	Operator's Signature

Treatment Plant Performance (Section A)

Subsection 1 - *Combined Filter Effluent Turbidity*

1. Maximum allowable turbidity level: _____ NTU
2. Total number of daily turbidity samples required during the month: _____
3. Total number of daily turbidity samples taken during the month: _____
4. **Percentage of readings that met allowable turbidity level**: _____%
5. **Number of days with readings above 1.0 NTU**: _____Day(s)
   (Conventional and Direct Filtration Technology)
6. **Number of days with readings above 5.0 NTU**: _____Day(s)
   (Slow sand and Diatomaceous Earth Filtration Technology)
7. Highest single turbidity reading recorded during the month: _____NTU

Exceedance of Maximum Turbidity

Date	Time	Turbidity (NTU)

Write "**NONE**" in box if no exceedance

Subsection 2 - *Individual Filter Monitoring Data*

1. Exception Report(s) for Individual Filter Monitoring: N/A ☐ Filter Profile ☐ Filter Self-Assessment ☐ CPE ☐
2. Exception Report(s) for Individual Filter Monitoring submitted: N/A ☐ Filter Profile ☐ Filter Self-Assessment ☐ CPE ☐
3. Is a written explanation describing that an exceedance was caused by an obvious reason required in lieu of a filter profile? Yes____N/A____

Subsection 3 - *Total Organic Carbon (TOC) Removal Monitoring Data*

1. Is system on reduced monitoring? Yes_____ No_____
2. Required TOC removal: _____% (column D from "TOC Removal Worksheet")
3. Actual TOC removed by the plant: _____% (column E from "TOC Removal Worksheet")
4. Ratio of TOC removed to required TOC removal: _____ (column F from "TOC Removal Worksheet")

Subsection 4 - *Point-of-Entry (POE) Disinfectant Residual Monitoring Data*

1. Type of final disinfectant used. _____
2. Total number of daily POE disinfectant residual samples required for the month: _____
3. Total number of POE disinfectant residual samples taken during the month: _____
4. **Total number of POE disinfectant residual samples under 0.2 mg/L measured during the month**: _____
5. Range of POE disinfectant residual entering the distribution system each month: Low _____mg/L High _____mg/L
6. Average of the lowest POE disinfectant residual measurements entering the distribution system each month is: _____mg/L

Summary of Low Point-of-Entry Residual Events

Date	Duration of Low Residual Event (Hours)	Date/Time Division Contacted Regarding Low Residual Event	Date/Time Residual Restored	Date/Time Division Contacted Regarding Restoration of Residual

Distribution System (Section B)

1. Minimum disinfectant residual required in the distribution system at each bacteriological site = Trace as: Free Chlorine ☐ Total Chlorine ☐
2. Total number of distribution system disinfectant residual readings required during the month: _____
3. Total number of distribution system disinfectant residual readings taken during the month: _____
4. Total number of readings taken during the month that showed no detectable residual: _____
5. **Percentage of readings with no residual detected this month**: _____%
6. **Percentage of readings with no residual detected last month**: _____%

Public Notification (Section C)

Treatment Technique Violation	Yes/No	If yes, dates when notice was given to:	
		This Department*	Customers**
Were the percentages of readings that met allowable turbidity level less than 95.0% - **Line 4 subsection 1 Treatment Plant Performance Summary Section A**	Yes ☐ No ☐		
Were there any days with turbidity readings above 1.0 NTU (conventional or direct filtration)? - **Line 5 subsection 1 Treatment Plant Performance Summary Section A**	Yes ☐ No ☐		
Were there any days with turbidity readings above 5.0 NTU (diatomaceous earth or slow sand filtration)? - **Line 6 subsection 1 Treatment Plant Performance Summary Section A**	Yes ☐ No ☐		
Were there any periods when the residuals leaving the plant fell below the acceptable level for more than 4 consecutive hours? - **Line 4 subsection 4 Treatment Plant Performance Summary Section A**	Yes ☐ No ☐		
Were there more than 5.0% of the residuals in the distribution system below the acceptable level for any two consecutive months in a row? - **lines 5 & 6 Distribution System Section B**	Yes ☐ No ☐		

***Due by the end of the next business day**

****Copies of each public notice must accompany this report**

NOTE: When issuing notice to the Department about the exceedance of maximum turbidity limits, or low point-of-entry residual events, systems must include: date(s), time(s), value(s), and duration(s) for **ALL MEASUREMENTS** (see Instructions For Completing The Enhanced Surface Water Treatment Rule Data Recording Forms - Sections 1 and 4).

Submit Enhanced Surface Water Treatment Rule-Summary Form along with Combined Filter Effluent Turbidity, Individual Filter Turbidity Monitoring Data-Summary Form, Exceptions Report for Individual Filter Monitoring (if required), Point-of-Entry Disinfectant Residual Monitoring Data, and Distribution System Disinfectant Residual Monitoring Data by the 10th of the following month to:

Division of Municipal Facilities
918 East Divide Avenue, 3rd Floor
Bismarck, ND 58501-1947
Telephone number (701) 328-5211
Fax number (701) 328-5200

INSTRUCTIONS FOR COMPLETING THE LONG TERM 1-ENHANCED SURFACE WATER TREATMENT RULE (LT1-ESWTR) DATA RECORDING FORMS

NOTE: The **BOLDED** section and subsection letters and numbers correspond to the LT1-ESWTR Summary Form. The *italicized* and *underlined* titles refer to the individual recording forms. Information recorded daily on these forms will be calculated at the end of each month and transferred the LT1-ESWTR Summary Form. The numbers under each form title (on this document) correspond to the numbers within parenthesis on the respective data recording forms.

Section A Subsection 1 *Combined Filter Effluent Turbidity*

1. Identify the filtration technology used as follows: C (conventional = coagulation, flocculation, sedimentation, filtration); D (direct = coagulation, filtration, no sedimentation); SS (slow sand); DE (diatomaceous earth); or OTHER (specify).

2. For compliance purposes, systems may monitor plant reservoir effluent, clearwell effluent, or combined filter effluent. Identify combined filter turbidity sampling location as follows:

   PRE = plant reservoir effluent (all filters contribute to a common reservoir).
   PRE-FILTER NOS. (specify) = plant reservoir effluent (covers only certain filters).

   CE = clearwell effluent (all filters contribute to a common clearwell).
   CE-FILTER NOS. (specify) = combined filter effluent (covers only certain filters).

   CFE = combined filter effluent prior to clearwell entry (covers all filters)
   CFE-FILTER NOS. = (specify) combined filter effluent prior to clearwell entry (covers only certain filters).

   Systems choosing to monitor PRE or CE need sample only one location if the effluent from all filters contributes to a common plant reservoir or clearwell. Likewise, systems choosing to monitor CFE need sample from only one location if the effluent from all filters contributes to a common line prior to clearwell entry. Please remember that the sampling tap must be located on the common line downstream of all individual filter effluent lines. If it is not, multiple monitoring sites will be required.

3. Systems that operate continuously may monitor filtered water turbidity by grab sample or utilize continuous monitoring-recording equipment. Continuous recording is recommended but not required for monitoring of PRE, CE, and CFE. Continuous operation means nonstop operation (for any number of hours up to and including 24 hours) with no sporadic or intermittent operation during any part of the day based strictly on demand. Systems conducting grab sample monitoring must measure the finished water turbidity every 4 hours that the plant is in operation.

   Systems utilizing continuous monitoring-recording equipment must report the actual reading (from the continuous monitor or recorder) every 4 hours that the plant is in operation. All systems that operate continuously, regardless of the monitoring method, must measure (or read) and report the final filtered water turbidity just prior to plant shutdown. This final turbidity reading is not required if shutdown occurs within 30 minutes after a 4-hour reading.

   Systems that operate intermittently (i.e., sporadically during any part of the day based on demand) must continuously monitor and record the filtered water turbidity. Remember, continuous recording is required in this situation. Such systems must report the actual reading (from the continuous recorder) every 4 hours that the plant is in operation. The closest reading (in time) to the required 4-hour reading must be reported for each 4-hour interval that the plant did not run continuously.

All systems utilizing continuous monitoring equipment must calibrate the continuous turbidity monitor(s) at least once per week according to the procedures established in Method 2130 B of the 17th edition of Standard Methods for the Examination of Water and Wastewater. ***For more information, see the Department's general policy regarding the calibration of turbidimeters and chlorine residual monitoring equipment for the Safe Drinking Water Act's Surface Water Treatment Rule.***

Record the time of day under the appropriate time slot that the filtered water turbidity was measured or read from the continuous monitor or recorder. Include an "-F" after the time for final turbidity readings just prior to plant shutdown (i.e., 5:00-F). Shutdown readings may be recorded in the next available time slot as long as an "-F" follows the time for clarity (i.e., if 4-hour and shutdown readings are taken at 4:15 PM and 7:00 PM, respectively, record the 4-hour reading under the 4 PM to 8 PM slot and the shutdown reading, 7:00-F, under the 8 PM to 12:00 M time slot). If a plant did not operate during the 4-hour interval, record "NO" for no operation under the appropriate time slot. For clarity, include a zero in front of the decimal point for all turbidity readings less than 1.0 NTU (i.e., 0.5, 0.4, etc.). Each turbidity reading must be followed (in the space provided) by the initials of the person who performed the measurement.

4. Record the total number of turbidity measurements required to be taken during each day of operation.

5. For each day of operation, record the total number of turbidity measurements that were less than or equal to 0.3 NTU if conventional or direct filtration is used, or 1 NTU if slow sand, diatomaceous earth filtration, or alternate filtration technology approved by the Department is used. At least 95% of the measurements taken each month must be less than or equal to the applicable limit. The Department may specify alternate turbidity limits, in which case the number of turbidity measurements meeting these limits must be recorded.

   Record the maximum allowable turbidity limit allowed for the type of filtration technology used by your water treatment plant on the LT1-ESWTR Summary Form **Section A, subsection 1** *(Combined Filter Effluent Turbidity)* line 1.

   Record the number of CFE turbidity reading that were required of your system based on monthly filter runs on the LT1-ESWTR Summary Form **Section A, subsection 1** *(Combined Filter Effluent Turbidity)* line 2.

   The calculation at the bottom of the *Combined Filter Effluent Turbidity* recording form must be performed monthly for each monitoring site. The calculation is performed as follows:

   - For the entire month, determine the total number of filtered water turbidity measurements that were taken (add up column entitled No. of Daily Turbidity Measurments). **This number equals A.** Transfer this number onto the LT1-ESWTR Summary Form **Section A, subsection 1** *(Combined Filter Effluent Turbidity)* line 3.

   - For the entire month, determine the total number of filtered water turbidity measurements taken that were less than or equal to the limit specified for the filtration technology used (add up column entitled No. of Daily Turbidity Measurements That are Less than or Equal to Specified Limits). **This number equals B**.

   - Divide B by A and multiply the result by 100 to determine the percentage of turbidity measurements for the month that did not exceed the specified limit. Transfer this result onto the LT1-ESWTR Summary Form **Section A, subsection 1** (*Combined Filter Effluent Turbidity)* line 4.

6. Based on grab sample measurements, or actual readings from the continuous monitor or recorder, record the total number of turbidity measurements that exceed 1 NTU during each day of operation and their values if conventional or direct filtration is used. At the end of each month, add the numbers in this column and transfer the sum to LT1-ESWTR Summary Form **Section A, subsection 1** (*Combined Filter Effluent Turbidity)* line 5.

   If slow sand, diatomaceous earth, or other technology approved by the Department is used for filtration, record the total number of turbidity measurements that exceed 5 NTU and their values. At the end of each month, add the numbers in this column and transfer the sum to LT1-ESWTR Summary Form

Section A, subsection 1 (*Combined Filter Effluent Turbidity)* line 6.

If more than one exceedance occurs on a given day, the number of exceedances and their values must be recorded (i.e., 1=5.2, or 2=5.1, & 5.6, etc.). Enter these values onto the LT1-ESWTR Summary Form **Section A, subsection 1** *(Combined Filter Effluent Turbidity*) Exceedance of Maximum Turbidity Limit box. If no exceedances occurred during the month, write NONE in the box.

- Systems using conventional and direct filtration must contact the Division of Municipal Facilities as soon as possible, but no later than the end of the next business day, whenever the turbidity of the finished water **EXCEEDS 1 NTU** for systems.

- Systems using slow sand, diatomaceous earth or alternative filtration technologies approved by this Department must contact the Division of Municipal Facilities as soon as possible, but no later than the end of the next business day, whenever the turbidity of the finished water **EXCEEDS 5 NTU.**

- The **single highest** CFE turbidity reading that was recorded at your plant during the month must be recorded on the LT1-ESWTR Summary Form **Section A, subsection 1** (*Combined Filter Effluent Turbidity)* line 7.

Section A Subsection 2 *Individual Filter Turbidity Monitoring Data Summary Form*

1. Individual filter turbidimeters that operate continuously, must be calibrated weekly in strict accordance with the manufacturer's instructions using EPA-approved primary standards or calibration modules (see general policy for the Calibration Requirements of Turbidimeters Under the Surface Water Treatment Rule). Circle whether or not turbidimeters were calibrated weekly during the month.

2. The person(s) responsible for checking individual filter data during the month from strip charts or computer readouts should be the same person who fills out the ESWTR monthly compliance forms.

3. All systems, regardless of how they operate (i.e., continuous or intermittently), must monitor individual filtered water turbidity by utilizing continuous monitoring - recording equipment. Systems must record the actual reading (from each individual filter's turbidimeter) **at least once every 15 minutes** anytime an individual filter is producing water to a clearwell. The measurements must be stored in such a way, so that the data can be easily retrieved. This retrievable data can then be used to complete the Enhanced Surface Water Treatment Rule reports, or for review by the Department for at least the next 3 years.

   Data recording devices will have to be programed so that the monitoring system will allow individual filter turbidity measurements to be recorded **at least every 15 minutes from the time that the water from each individual filter passes through a turbidimeter on its way to the clearwell**. This point where the water first enters a turbidimeter will be 00 on a time scale, anytime that the system is started, or a filter is placed back on-line after it has been backwashed. The plant's first measurement would be taken at 00 + 15 (the point where the water first enters the turbidimeter, plus 15 minutes). The second measurement is at 00 + 30, the third 00 + 45, the fourth 00 + 60, the fifth 00 + 75, and so on. If a public water system is monitoring turbidity more frequently then every 15 minutes, they must be sure that the intervals set between measurements allow for a turbidity analysis at the 15-minute and 30-minute marks (i.e., every 3, 5, 7.5 or 15 minutes). Also, the month, date and local time must be expressed with each measurement. For the purpose of reading measurements, 12:00 midnight will be the point where one day ends and the next begins.

   Systems must list all filters that exceeded a turbidity level of 0.5 NTU after the 4-hour (00 + 240) and 4-hour and 15-minute readings (00 + 255) anytime a plant starts up for the day, or places a filter back on-line after filter backwash.

Example 1: After backwashing filter number 3, a water system places it back on-line at 9:15 AM. Turbidity measurements **must** be taken on this filter at 1:15 PM and 1:30 PM. In this case, the turbidity measurements read 0.6 NTU at 1:15 PM, and 0.7 NTU at 1:30 PM. To fill out the Individual Filter Turbidity Monitoring Data - Summary Form, the filter number and NTU values would be recorded as: 3- 0.6, 0.7 under the appropriate date.

Example 2: A water plant has a total of 8 individual filters and starts its day at 6:00 AM. At this time, only 6 of the 8 filters are placed into production. At 10:00 and 10:15, the 6 filters that were started at 6:00 AM will have to be evaluated. Filter number 2 has a 10:00 measurement of 0.5 NTU and a 10:15 measurement of 0.7 NTU. Filter 5 has a 10:00 measurement of 0.7 NTU and a 10:15 reading of 0.6 NTU. At 2:39 PM, filter number 7 was put into production. At 6:39 and 6:54, measurements of 0.3 and 0.2 NTU were recorded respectively. At 10:20 PM, filter number 8 was brought on-line because of increased summertime plant operations. At 2:20 AM, the measurement reading was 0.6 NTU and at 2:35 the reading was still 0.6 NTU.

To fill out the Individual Filter Turbidity Monitoring Data - Summary Form, the filter number and NTU values would be recorded as: 5-0.7, 0.6 & 8 - 0.6, 0.6 under the appropriate date. If any individual filters during the month exceed 0.5 NTU at the 4-hour and 4-hour and 15- minute measurements, the back of the Individual Filter Turbidity Monitoring Data - Summary Form under trigger B **MUST** be filled out.

4. Systems must list all filters that exceed 1.0 NTU in two consecutive readings taken 15 minutes apart, following plant start-up, or anytime a filter has been placed back into production after filter backwash. To fill out the Individual Filter Turbidity Monitoring Data - Summary Form, the filter number and NTU values would be recorded using the same format as the above examples: filter number(s), followed by the NTU values of the measurements, under the appropriate date(s). Also, the back of the Individual Filter Turbidity Monitoring Data - Summary Form, trigger C must be filled out.

5. Systems must list all filters that exceed 2.0 NTU in two consecutive readings taken 15 minutes apart, following plant start-up, or anytime the filter has been placed back into production after filter backwash. To fill out the Individual Filter Turbidity Monitoring Data - Summary Form, the filter number and NTU values would be recorded using the same format as the above examples: filter number(s), followed by the NTU values of the measurements, under the appropriate date(s). Also, the back of the Individual Filter Turbidity Monitoring Data - Summary Form, trigger D must be filled out.

If at any time during the month, a water system has more than one trigger tripped (any combination of 3, 4 or 5 above), the system must complete all parts of the Individual Filter Turbidity Monitoring Data - Summary Form that have been triggered.

At the end of each month, after monitoring data for all filters has been evaluated, complete LT1-ESWRT Summary Form **Section A, subsection 2** *(Individual Filter Monitoring Data)* lines 1 & 2. If a water system has answered "none" to both lines on the exception report, then the system can proceed to fill out Treatment Plant Performance (Section A) subsection 3, (*Total Organic Carbon Removal Monitoring Data*).

If a water system has determined that a filter profile, filter self-assessment or CPE is required (based on individual filter triggers listed on the back of the form), then the results of the filter profile and/or filter self-assessment must accompany these forms at the end of each month. However, a schedule for a CPE to be conducted may be submitted at the end of the month, in lieu of the results if more time is necessary to finish the CPE.

If a water system has determined that a trigger has been exceeded by something other than turbidity (i.e., valve malfunction), then a written explanation describing the events that caused the problem must be reported on the Exceptions Report For Individual Filter Monitoring Section A, subsection 2-Part B. This form must be attached to the Enhanced Surface Water Treatment Rule Summary Form that is required to be sent to this Department at the end of each month.

The Division of Municipal Facilities must be contacted **no later than the end of the next business day** anytime any individual filter(s):

- exceeds 0.5 NTU after the 4-hour, and 4-hour and 15-minute measurement following plant start-up, or after a filter has been placed back into production following filter backwash.
- exceeds 1.0 NTU in two consecutive measurements taken 15 minutes apart.
- exceeds 2.0 NTU in two consecutive measurements taken 15 minutes apart.

Section A Subsection 3 *Total Organic Carbon (TOC) Monitoring Data*

Public Water Systems that utilize conventional treatment (see **Section 1** *Combined Filter Effluent Turbidity* Instructions for Completing the LT1-ESWTR Data Recording Forms) must meet TOC ratio removal requirements to be in compliance with the Stage 1 Disinfectants and Disinfection Byproducts Rule.

To qualify for reduced monitoring, a system must meet one of the following conditions:

- Average treated water TOC must be less 2.0 mg/L for two consecutive years.
- Average treated water TOC must be less 1.0 mg/L for one year.

If your system meets one of the above stated conditions, circle yes on the LT1-ESWTR Summary Form **Section A, subsection 3** *(TOC Monitoring Data)* line 1. If a system does qualify for reduced TOC monitoring, quarterly TOC sampling by the system will still be required and lines 2,3 and 4 filled out.

If the answer in no, or you need to do quarterly TOC sampling, than transfer (from the TOC removal worksheet) the required TOC removal (column D), the actual TOC removed by the plant (column E), and the ratio removed to required TOC removal (column F) information to LT1-ESWTR Summary Form **Section A, subsection 3** *(TOC Monitoring Data)* lines 2, 3 & 4.

Section A Subsection 4 *Point-Of-Entry Disinfectant Residual Monitoring Data*

NOTE: LT1-ESWTR Summary Form **Section A, subsection 4** *(Point-Of-Entry Disinfectant Residual Monitoring Data)* must be completed monthly, for ***EACH*** point-of-entry disinfectant residual monitoring site.

1. Disinfectant residual measurements must be taken of the water entering the distribution system (i.e., clearwell or plant reservoir effluent). Only one monitoring point is required if all of the filtered water, following final disinfection, is combined and contributes to a common clearwell or plant reservoir. If not, multiple monitoring sites will be required.

2. Specify the type of final disinfectant used (i.e., chlorine, chlorine/ammonia, etc.) LT1-ESWTR - Summary Form **Section A, subsection 4** *(POE Disinfectant Residual Monitoring Data)* line 1.

3. Systems serving more than 3,300 persons **must** continuously monitor and record the point-of-entry disinfectant residual concentration. Such systems must report the actual disinfectant residual reading from the continuous recorder every 4 hours that the plant is in operation. The actual reading closest (in time) to the required 4-hour reading must be reported for any 4-hour interval that the plant did not run continuously.

Systems serving 3,300 or fewer persons that operate continuously may monitor the point-of-entry disinfectant residual concentration by grab sampling or utilize continuous monitoring-recording equipment. Systems conducting grab sample monitoring must measure the point-of-entry-disinfectant residual concentration every 4 hours that the plant is in operation. Systems utilizing continuous monitoring-recording equipment must report the actual reading (from the continuous recorder) every 4 hours that the plant is in operation. All systems that operate continuously, regardless of the monitoring method, **must** measure (or read) and report the final disinfectant residual concentration just prior to shutdown. This final reading is not required if shutdown occurs within 30 minutes after a required 4-hour reading.

Systems serving 3,300 or fewer persons that operate intermittently **must** continuously monitor and record the point-of-entry disinfectant residual concentration. Such systems must report the actual reading from the continuous recorder every 4 hours that the plant is in operation. The closest reading (in time) to the required 4-hour reading must be reported for each 4-hour interval that the plant did not run continuously.

All systems that utilize continuous monitoring-recording equipment (for monitoring the point-of-entry disinfectant residual concentration) must calibrate the equipment on a regular basis as recommended by the manufacturer. For more information, see the Department's general policy regarding the calibration of turbidimeters and chlorine residual monitoring equipment for the Safe Drinking Water Act's Surface Water Treatment Rule.

If there is a failure in the continuous monitoring-recording equipment, grab sampling may be conducted every 4 hours for up to 5 days following the equipment failure. Failure to use continuous monitoring-recording equipment after the 5-day period (if use of such equipment is required) constitutes a monitoring violation for which public notification is required.

Record the time of day under the appropriate time slot that the point-of-entry disinfectant residual concentration was measured (or read from the continuous recorder). Include an "-F" after final point-of-entry disinfectant residual concentration readings just prior to plant shutdown (i.e., 5:00 - F). As with turbidity, shutdown readings may be recorded in the next available time slot as long as an "-F" follows the time for clarity (i.e., if 4-hour and shutdown readings are taken at 4:15 PM and 7:00 PM, respectively, record the 4-hour reading under the 4 PM to 8 PM time slot and the shutdown reading, 7:00-F, under the 8 PM to 12:00 M time slot). If the plant did not operate during the 4-hour interval, record "NO" for no operation under the appropriate time slot. For clarity, include a zero in front of the decimal point for all residual readings less than 1.0 mg/L. Each point-of-entry disinfectant residual concentration reading must be followed (in the space provided) by the initials of the person who performed the measurement.

4. For each day of operation, record the lowest point-of-entry disinfectant residual concentration based on the actual readings from the continuous recorder or grab sample measurement, whichever applies.

5. For each day of operation, record the duration of each event that the point-of-entry disinfectant residual concentration was less than 0.2 mg/L.

   All systems must report the duration (in hours) of each low-residual event based on the actual readings from the continuous recorder or the grab sample measurement (whichever applies). All durations that exceed a whole number must be preceded by a greater than (>) sign. A duration of 4 hours and 20 minutes would be reported as > 4 hours. If more than one event occurs on a given day, the number and duration of each event must be reported (i.e., No. 1 = > 3 hours, No. 2 = > 4 hours, etc.).

   Systems monitoring by grab sample must report the duration of each low-residual event based upon the results of the 4-hour and final measurements as follows:

   - Report "0" if all measurements are greater than or equal to 0.2 mg/L.

   - Report " < 4 hours" if only one measurement is less than 0.2 mg/L.

- Report "> (insert No. of hours) hours" if two or more consecutive measurements are less than 0.2mg/L. The number of hours to be inserted equals the number of continuous hours between the first and last measurements that were less than 0.2 mg/L.

  Example 1: A water treatment plant operates continuously for 9 hours a certain day (8:00 AM-5:00 PM). The 4-hour, 8-hour, and final grab sample readings were 12:00 noon = 0.1mg/L, 4:00 PM = 0.3 mg/L, 5:00 PM = 0.3 mg/L . *What is the duration of the low-residual event?* Answer: < 4 hours. Only the one reading was less than 0.2 mg/L.

  Example 2: A water treatment plant operates continuously for 15 hours on a certain day (8:00 AM-11:00 PM). The 4-hour, 8-hour, 12-hour, and final grab sample readings were: 12:00 noon = 0.1 mg/L, 4:00 PM = Trace, 8:00 PM = 0.1 mg/L, 11:00 PM = 0.1/L. *What is the duration of the low residual event?* Answer: > 11 hours (a greater sign followed by the number of continuous hours between the first and last readings that were less than 0.2 mg/L).

Record the total number of POE disinfectant residual reading that were required of your system based on high service pump activity for the month, under LT1-ESWTR Summary Form **Section A**, **subsection 4** (*POE disinfection residual monitoring data)* line 2

Determine the actual number of POE disinfectant residual reading that were taken of your system during the month. Record this number under LT1-ESWTR Summary Form **Section A**, **subsection 4** (*POE disinfection residual monitoring data)* line 3.

For the month, determine the number of POE disinfectant residual readings that were less than 0.2mg/L. Record this number under LT1-ESWTR Summary Form **Section A**, **subsection 4** (*POE disinfection residual monitoring data)* line 4.

All systems must report the range of the POE disinfectant residual entering the distribution system.

- Systems that continuously monitor and record the disinfectant entering the distribution system, must report (from the continuous monitoring recording equipment in mg/L) both the lowest and highest measurements leaving the plant that were recorded during the month.

- Systems that grab sample need to report (in mg/L) both the lowest and highest measurement leaving the plant that took place during the month, based on the 4-hour grab samples required for monitoring under the Surface Water Treatment Rule.

Enter these numbers under LT1-ESWTR Summary Form **Section A**, **subsection 4** (*POE disinfection residual monitoring data)* line 5.

For the entire month, determine the average POE disinfectant residual entering the distribution system (i.e., add up the results of the column entitled "Lowest Disinfectant Residual Concentration At POE to Distribution System" and divide by the number of days in the month that your system operated). Transfer this result to LT1-ESWTR Summary Form **Section A**, **subsection 4** (*POE disinfection residual monitoring data)* line 6.

The Division of Municipal Facilities must be notified as soon as possible, but no later than the end of the next business day, whenever the point-of-entry disinfectant residual concentration falls below 0.2 mg/L. Likewise, the Division must be informed by the end of the next business day whether or not the residual was restored to 0.2 mg/L or greater within 4 hours. Systems may contact the Division only once IF the residual is restored to at least 0.2 mg/L by the end of the next business day. Failure to restore a low point-of-entry disinfectant residual concentration to at least 0.2 mg/L within 4 hours constitutes a treatment technique violation which requires public

notification.

If during the month a system has problems with its POE disinfectant residual entering the distribution system, then the system must document on the LT1-ESWTR Summary Form under **Section A, subsection 4** (*POE disinfectant Residual Monitoring Data*) Summary Of Low Point-Of-Entry Residual Events table the following:

- Date(s) the event(s) happened.
- Duration of the low residual event(s) in hours.
- Time(s) and date(s) the Division was contacted.
- Date(s) and time(s) the residual was restored.

Section B *Distribution System*

1. Specify wether free of total chlorine was measured when taking the disinfectant residual concentration in the distribution system. LT1-ESWTR Summary Form **Section B,** *(Distribution System Disinfectant Residual Monitoring Data)* line 1.

2. The disinfectant residual concentration in the distribution system must be measured at the same frequency and locations as routine bacteriological samples are collected under the Total Coliform Rule. Systems that are required to collect more bacteriological samples per month than there are available lines on the form may use two forms to record the required data, attach a supplemental sheet to the form, or record two site measurements on one line as needed.

3. If chlorine is used as a disinfectant, record the concentration (in mg/L) measured at each site, and specify whether free (F) or total (T) chlorine was measured.

4. The disinfectant residual concentration within the distribution system cannot be undetectable in more than 5 percent of the measurements taken each month for any two consecutive months.

   The calculation on the back of the *Distribution System Disinfectant Residual Monitoring Data* form (at the bottom of the form) must be performed monthly. In addition, the previous month's calculation result must be recorded. The calculation is performed as follows:

   - Record the number of distribution system disinfectant residual measurements your system was required to take for the month based on sampling required by your syatem under the Total Coliform Rule. Enter the number on LT1-ESWTR Summary Form **Section B** *(Distribution System Disinfectant Residual Monitoring Data)* line 2.

   - For the entire month, determine the total number of distribution system disinfectant residual measurements that were taken (this equals C). Transfer this number to LT1-ESWTR Summary Form **Section B** *(Distribution System Disinfectant Residual Monitoring Data)* line 3.

   - For the entire month, determine the total number of distribution system measurements taken that showed no detectable residual (this equals D). Transfer this number LT1-ESWTR Summary Form **Section B** *(Distribution System Disinfectant Residual Monitoring Data)* line 4.

   - Divide D by C and multiply the result by 100 to determine the percentage of monthly distribution system disinfectant residual measurements that showed no detectable residual. Transfer this number to LT1-ESWTR Summary Form **Section B** *(Distribution System Disinfectant Residual Monitoring Data)* line 5. Systems will have to look at last month's LT1-ESWTR Summary Form **Section B** *(Distribution System Disinfectant Residual Monitoring Data)* line 5, and transfer this result to this month's LT1-ESWTR Summary Form **Section B** *(Distribution System Disinfectant Residual Monitoring Data)* line 6.

NOTE: Heterotrophic plate count (HPC) may be substituted for distribution system disinfectant residual concentration. An HPC of less than or equal to 500 microorganisms may be considered equivalent to a detectable disinfectant residual concentration. HPC measurements must be conducted by a certified laboratory and meet strict temperature and holding time requirements.

Public Notification (Section C)

ESWTR Summary Form-Public Notification, Treatment Technique Violation(s) are determined from Section A (subsections 1-4 Treatment Plant Performance) and Section B (Distribution System) of the ESWTR Summary Form . Information required for filling out the Public Notification section is **bolded** in these sections.

If systems can answer **NO** to all corresponding questions associated with the letters in the Treatment Technique Violation section, then no further action is necessary. If a system answers **YES** to any of the questions in the Public Notification's Treatment Technique Violation section, then public notice is required to be given to your customers.

If public notification is required to be given for a treatment technique violation, then the dates that notice was given to them must be filled out, **and** copies of each public notice (if more than one is required) must accompany this report. The date that the Department was informed of the treatment technique violation(s) is also to be filled out. Remember, it is the policy of the Department that systems **must contact us by the end of the next business day**, anytime a treatment technique violation(s) occurs.

NOTE: **Reporting and Record Keeping Requirements**

The completed Long Term Enhanced Surface Water Treatment Rule Data Recording Forms (*LT1-ESWTR Summary Form*, *Individual Filter Turbidity Monitoring Data-Summary Form and Exceptions Report* {if needed},*Combined Filter Effluent Turbidity*, *Point-Of-Entry Disinfectant Residual Monitoring Data*, and *Distribution System Disinfectant Residual Monitoring Data*) must be returned to the Division of Municipal Facilities (address below) within 10 days after the end of each month that drinking water is provided to the public. Systems are required to retain copies of the above-listed data, as well as the Individual Filter Monitoring data that is required to be monitored every 15 minutes that each filter at the treatment plant is in operation, for at least 10 years.

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