

Dear Surface Water Treatment Plant Operator:

Enclosed you will find a newly revised *Monthly Operations Report*, and instructions for filling out this report. The Enhanced Surface Water Treatment Rule, which goes into effect on January 14, 2005, for surface water systems serving less than 10,000 people, has many new monitoring requirements, and thus the need for the new form.

I am sure that most of you, by now, are aware of these requirements, but I will briefly summarize them.

1. Each individual filter must be monitored continuously for turbidity, and the results recorded, at a minimum, every fifteen minutes. If you have only two filters, the combined filter effluent can be monitored continuously, and recorded every fifteen minutes. If you have slow sand, or some alternate technologies, exceptions can be made for this rule. For any system greater than 500 people, combined effluent must be analyzed for turbidity every four hours, or continuously.
2. The MCL for turbidity, for rapid sand filtration plants, is lowered from 0.5 ntu to 0.3 ntu. That is, 95% of the monthly samples must be below this level. Slow sand turbidity MCL remains at 1.0 ntu. Alternate technologies are required to demonstrate a 2 log reduction of *Cryptosporidium oocysts*.
3. The Vermont Target Turbidity Limits stay in effect. These limits deal with raw waters below 1 ntu. For raw waters between 0.5 and 1.0 ntu, a 70% reduction of turbidity is required. For raw water below 0.5 ntu, effective coagulation must be shown. These limits do not apply to systems using slow sand and alternate technologies.
4. Combined filter effluent must not, at any time exceed 1.0 ntu for all rapid sand filtration plants.
5. Certain follow up actions are required if individual filter effluent turbidity at rapid sand filtration exceed 1.0 ntu for more than 15 minutes.

If you are currently not using a standard reporting form, you may continue to customize, but be sure to contact us to make sure that all requirements are met with your customized form.

By far, the most important part of this new rule is the requirement for individual filter monitoring. This supplies a wealth of new data, which reveals much more than current requirement of only monitoring combined filter effluent. Please call me with any questions or comments that you have. I can be reached in Montpelier at 585-4895. You might be more successful calling me at home, at 635- 2647. I will be looking at these reports carefully, and will call you if I have any questions.

Sincerely,

Ray Solomon- Environmental Scientist- DWGPD/DEC

INSTRUCTIONS Fill in the form using the following guidelines:

Credited volume for disinfection before the first service - VO

This number, in gallons, is the volume of water in storage that is used to compute CT. The State has supplied you with this Credited Contact Volume. If in doubt, contact us.

Production

Report the quantity of finished water that enters the distribution system in gallons per day. Exclude water used for filter backwashing and other in plant, non-domestic purposes.

Peak Hourly Flow- Q

Compute the actual quantity of water leaving storage during the peak hour of flow (the 60 minute period of the day when total flow of water to the distribution system is highest.) This number is then divided by 60 to obtain the flow in gallons per minute, and recorded in the column. Contact DWGPD if flow to the distribution system is not metered.

Turbidity- Raw

This is the daily average of raw water turbidity. The raw water turbidity sample must be taken at a point before coagulant injection, but it may be taken at a point after pre oxidation or recycled backwash supernatant injection. Please make a note of what your raw water turbidity sample is actually measuring.

Turbidity- Combined Filtered

This is the combined average of all water exiting the filters and entering the clearwell. There are different methods for computing this average. If this data is continuously fed to a computer, it may calculate it for you. Report this number. If you continuously record this data on a chart recorder, pick a minimum of six points during the day, equally spaced (four hours, maximum), and compute the average turbidity from these readings. You must use the same times each day. For example, you might choose 12:00am, 4:00am, 8:00am, 12:00pm, 4:00pm and 8:00pm. Add the turbidity results at these six points on the chart and divide by six to obtain your daily average. You may take an actual grab sample every four hours and compute the average from turbidity of these samples. If your plant operates on a non continuous basis, use the turbidity reading taken 10 minutes after the filters begin operation and every two hours subsequent to this point that the filters are in operation. Add together all these data points to compute the daily average. For example, your filters begin operation at 11:20 am and cease operation at 3:50 pm. They then start up at 6:00 pm and cease operation at 11:50 pm. Take readings at 11:30 am, 1:30 pm, 3:30 pm, 6:10 pm, 8:10 pm, and 10:10 pm. Average these readings to produce your daily average. We will consider other methods of computing daily averages. Please contact us if you wish to use a different method.

Turbidity- Individual filter daily high

This measurement is obtained by looking at continuous turbidity measurements from each individual filter, or the combined effluent from two filters, if you are not measuring each individual filter. Record in this column the highest reading that you see during the entire day. In parentheses, note which filter it was, by filter number. If you have only one filter, this number is not necessary. For example, if the highest reading was 0.93 ntu from filter #3, record 0.93 (3) in the column. Do not include turbidity record during

periods when the filter unit is in filter to waste mode (when filtered water is not going into the clearwell.) Do not include readings when the turbidimeter is cleaned, calibrated, or otherwise fooled around with. Do not include readings when the filter is off line. If you can document that air bubbles caused a spurious spike, do not include this reading. Otherwise, report the highest spike, including backwash and startup spikes.

Disinfection- Plant-C

Report the lowest free chlorine residual measured during the entire day, taken at the entry point to the distribution system. If you measure continuously, pick this number from the chart or computer. If you grab sample, use the lowest grab sample of the day.

Disinfection- Distribution system

Report the average disinfectant residual measured in the distribution system that day. If no samples were taken, leave the box blank. If anything besides free chlorine was measured, note it on the form.

Fluoride-Entering distribution system

If you fluoridate, enter the highest concentration of fluoride entering the distribution during the day.

pH- finished

Report the average pH of the water entering the distribution system, after all pH adjustment has taken place.

Temperature- Finished

Measure the temperature of the water at the entry point to the distribution system. Report it in Centigrade.

CT- (VO/Q) X C

Calculate the daily CT value achieved by your plant. This calculation may be complex and will not be dealt with in these instructions. If you are unsure of the calculation, contact DWGPD.

At the bottom of the page is the following statement:

My filtration plant has met all State requirements for turbidity, disinfection and monitoring during the month.

Before you check yes, and sign the form, make **certain** that you have, in fact met these requirements. If there is any doubt, check first with DWGPD. If you check no, explain why you checked no on the back of the form. On the next page is a summary of the requirements.

1. The disinfectant residual entering the distribution system must be maintained above 0.2 mg/l. If the residual fell below 0.2 mg/l, report when, and for how long this occurred. Check the box "No".
2. A one log (90%) reduction of Giardia cysts must be achieved during the disinfection process. By comparing your daily "CT" value to the tables which list CT values required for one log inactivation of Giardia cysts, at various pH and temperature, and free chlorine residuals, you will

be able to ascertain whether you have met the one log goal. For example, Your CT for January 21 was 90. The water temperature was 0 degrees centigrade, the pH was 7.5, and the free chlorine residual was 1.0. Consulting the tables, the “CT” value needed for a one log reduction is 84. Since your CT is greater than 84, you have achieved the one log removal goal. If you do not achieve this goal during any day of the month, check “No” and explain it on the back of the form.

3. The disinfectant residual must be monitored at the entry point to the distribution system. It must be monitored continuously, or grab samples may be taken if the population served is less than 3300. The number of grab samples required depends on population. If you did not properly monitor the disinfectant residual, the pH, or the temperature, check “No” and explain.
4. If you employ rapid sand filtration, 95% of the combined filter effluent turbidity readings must be below the MCL of 0.3 ntu, or the Target Turbidity Limits. If less than 95% of your monthly readings for combined filter effluent are below these standards, check “No” and explain on the back.
5. For rapid sand filtration, the combined filter effluent turbidity must not exceed 1 ntu at any time during the month. If it did, check “No” and explain.
6. For slow sand filtration plants, the combined filter effluent must be below 1.0 ntu for 95% of all readings, and the reading cannot be above 5 ntu at any time. Check “No” if you did not meet this requirement.
7. Consult DWGPD for turbidity requirements if you filter using an alternate technology.
8. For rapid sand filtration plants, you must monitor combined filter effluent turbidity continuously, or at least every four hours by grab sampling. If you have less than 500 persons served by the plant, or use slow sand or an alternate technology you may monitor once per day, at the discretion of the State. If you did not comply with these monitoring provisions, check “No” and explain.
9. If you use rapid sand filtration, you must continuously monitor each individual filter for turbidity. If you have only two filters, you may continuously monitor the combined effluent of the two filters. If an individual filter exceeds 1.0 ntu for 15 or more minutes certain follow up activities may be required. Contact us for more details. If you did not meet this monitoring requirement, check “No”. Explain it on the back. If an on line turbidimeter malfunctions, you may use grab sampling, for a limited time, as a substitute. Check with