



Chlorine Contact Basin

## Is Disinfection in Your Future?

### New Standards Will Affect Montana Communities

Does your community currently discharge treated wastewater to a body of water, such as a stream, lake, or wetland? If so, then your next discharge permit may require changes to your treatment process. Newly adopted changes to the Montana Water Quality Standards, as applied to disinfection of treated wastewater, have the potential to affect every Montana community.

### Why should you be concerned about effluent disinfection?

Historically, fecal coliform bacteria limitations specified in wastewater treatment facility discharge permits have been based on the dilution capacity within a mixing zone of the receiving stream. The permit limit was set to ensure the State standard limit of 200/400 organisms per 100 milliliters (org/100ml) could be met downstream of the mixing zone after dilution of the effluent in the receiving water (see side box).

Changes to Water Quality Standards have resulted in elimination of the mixing zone for setting fecal coliform limits. As a result, the mixing zone, and therefore dilution, can no longer be considered. Therefore, the 200/400 limit must be met at the point of discharge. In contrast, most existing permits have had limits between 450 and 55,000 org/100ml at the point of discharge, reflecting the range of dilution effects from small streams to large rivers.

### Montana Water Quality Standards

require when the daily maximum water temperature is greater than 60°F:

- Geometric mean of fecal coliform organisms in wastewater effluent must not exceed 200 organisms per 100 milliliters (org/100 ml)
- Ten percent of the total samples during any 30-day period may not exceed 400 organisms per 100 milliliters (org/100 ml)

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### Who will be affected?

Simply, every discharge permit could be affected. Treatment systems ranging from the smallest lagoon system to multi-million-gallon-a-day mechanical treatment plants could be affected by this change in regulation. It is the classification of the receiving water, not the size of the receiving stream or facility, that will dictate whether a treatment facility must meet a 200/400 limit. These limits apply to receiving waters classified as A, B, and C. The amended standards also establish new stream classifications for constructed ditches, seasonal and semi-permanent lakes, and ephemeral (intermittent) streams, classified as D, E, and F respectively. These new classes of state waters carry less stringent discharge limits of 1,000/2,000 org/100 ml.

State law stipulates that a mixing zone may not be considered when setting fecal coliform limits. Standards must be met at the point of discharge.

State discharge permits will be written to require disinfection compliance during the months when instream water temperatures normally exceed 60 degrees Fahrenheit, typically April through October. It may be possible to reduce this window if adequate temperature data is available with which to document a more definable period.

## **When is it going to affect you?**

During the renewal period of your next discharge permit. Facilities currently in the renewal process may see new limits in the “draft” permit. A compliance schedule will be included as part of the final discharge permit. The time granted for compliance will be reviewed on a case-by-case basis, but will likely be the length of the permit cycle.

## **What are your options to achieve compliance?**

Some communities will not require action. Certain facilities may already produce a treated effluent that is capable of meeting the 200/400 limit. For some lagoons, improving Mother Nature, by enhancing exposure of effluent in a lagoon to natural ultraviolet light from the sun, may be all that’s needed to achieve the limits. This can be accomplished by adding wind/solar type mixers to the pond to enhance vertical circulation, a process that brings water from the bottom of the lagoon and distributes it evenly on the surface, increasing the exposure to the sun and achieving natural ultraviolet light disinfection. For other facilities, chemical/physical disinfection such as chlorination (gas, liquid, tablet, on-site generation), ultraviolet light, or other forms of disinfection may have to be evaluated and incorporated into the treatment process.



Solar Mixer “Enhancing”  
Mother Nature’s Natural  
Ultraviolet Light Disinfection

## **What should you do now?**

Start collecting information to establish and document the condition of your receiving waters and the performance of your treatment facility. Collect temperature data on your receiving waters to determine the period when the water is above 60 degrees. This could require several years of data to establish a baseline. If you currently do not have a fecal coliform limit in your discharge permit, initiate effluent sampling, at least from April through October. If you currently disinfect, evaluate the performance of your system and its ability to achieve the 200/400 limit. Increase chemical dosage, increase contact time, or otherwise experiment to see if your existing facility can meet the new limit.

Starting today,  
establish the baseline  
conditions for your  
facility.

## **In Conclusion:**

The new fecal coliform bacteria limitations for your facility’s effluent are being implemented to protect public health and safety. This point of discharge requirement is consistent with most other states.

The rule change may affect every facility that currently discharges. Some will have to do nothing to comply with the permit limit. Others will have to invest in chemical/physical disinfection equipment in order to achieve the new limit. In the next six years, every facility will have to address this issue. Start planning now and gather as much data as you can to establish your specific situation and needs.

Morrison-Maierle is working with communities today to help them comply with this new limit. Let us put our knowledge to work for you. Contact any of the engineers listed below to learn more about disinfection and how this limit will affect your facility.



Ultraviolet Disinfection is Often the  
Best Approach for High-Quality  
Effluents.