



Implementation of *Escherichia coli* (*E. coli*) Water Quality Standards in Wastewater Discharge Permits

New standards require changes to E. coli limits in some Ohio wastewater discharge permits. Ohio EPA is also beginning to implement E. coli limits during the summer recreation season for wastewater plants that discharge directly to the Ohio River.

Ohio EPA adopted revisions to its water quality standards that protect primary contact recreation on Jan. 4, 2016. U.S. EPA approved these revisions on April 8, 2016.

What changes are in the new standards?

- The Class A, B and C Primary Contact Recreation stream use designations have been deleted and replaced with Primary Contact Recreation.
- Permit limits will be lower for discharges to former Class B and Class C Primary Contact waters. Limits will be the same for discharges to Bathing Waters, former Class A Primary Contact waters and Secondary Contact waters.
- The criteria include two components: a 90-day geometric mean and a statistical threshold value.

Table 1 summarizes the requirements for each recreation use category.

Table 1. Summary of recreation uses and *E. coli* standards

Recreation Use	Description	<i>E. coli</i> (colony counts / 100 mL)	
		90-day Geometric Mean	Statistical Threshold Value ¹
<i>Bathing Waters</i>	Waters heavily used for swimming. Applies to all waters where a lifeguard or bathhouse is present, and waters designated Bathing Waters. Applies to Lake Erie and the Ohio River.	126	410 ^a
<i>Primary Contact</i>	Waters suitable for one or more full-body contact activities such as wading, swimming, boating, water skiing, canoeing, etc. All waters of the state are designated primary contact unless otherwise designated as bathing waters or secondary contact.	126	410
<i>Secondary Contact</i>	Waters that for reasons of insufficient depth and limited access result in minimal exposure to pathogens. These waters are designated in rules 3745-1-08 through 3745-1-30.	1,030	1,030

¹ These criteria shall not be exceeded in more than 10 percent of the samples taken during any 90-day period.

^a A beach action value of 235 *E. coli* colony counts per 100 ml shall be used for the purpose of issuing beach and bathing water advisories.

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Implementation Questions

1) What limits will be used in wastewater discharge permits? The rules include criteria for a 90-day geometric mean and a statistical threshold value. For use in National Pollutant Discharge Elimination System (NPDES) permits, which are wastewater discharge permits, these criteria must be translated into monthly average limits and weekly average limits. U.S. EPA’s frequently asked questions document on setting water quality based effluent limits using the criteria (4/18/2014) identifies two approaches for setting permit limits: direct application of criteria values at end-of-pipe; and procedures described in U.S. EPA’s document, “Technical Support Document for Water Quality-Based Toxics Control” (the TSD approach).

As Ohio EPA did in 2010 when *E. coli* limits were first used in Ohio NPDES permits, monthly average limits are set equal to the 90-day geometric mean criteria at the end-of-pipe. Weekly average limits are derived from the monthly average limits using the TSD approach.

The limits that will be used in NPDES permits are shown in Table 2.

Table 2. *E. coli* limits used in NPDES permits

Recreation Use	<i>E. coli</i> (colony counts per 100 mL)	
	Monthly average	Weekly average ¹
Bathing Waters ^a	126	284
Primary Contact	126	284
Secondary Contact ^a	1,030	2,318

¹ The weekly average limits are derived from the monthly average limits using U.S. EPA’s “Technical Support Document for Water Quality-Based Toxics Control” (EPA-505-2-90-001, March 1991). The procedures in Section 5.4.4 of this document employ statistical methodologies designed to derive weekly limits which will ensure a very high probability of meeting the monthly limits.

^a No change

2) How do you determine the recreation use of a receiving stream? The recreation uses of streams listed in Ohio’s water quality standards are in rules 3745-1-08 through 3745-1-30 of the Ohio Administrative Code. Streams that are not listed in the standards are designated Primary Contact. The Ohio River and Lake Erie are designated as Bathing Waters. These rules are available at the following website: epa.ohio.gov/dsw/rules/3745_1.aspx. Use the *Water Body Use Designation Index* to look up streams by name.

3) Will compliance schedules be available for meeting new limits? Facilities discharging to streams that were designated Class B or Class C Primary Contact Recreation will have to meet more stringent permit limits for *E. coli*. Whether to include a compliance schedule or not will be a case-by-case decision as will the length of the schedule. Compliance with lower limits must be “as soon as possible” allowing reasonable time for system evaluation, design, installation and startup of plant upgrades.

There are approximately 1,450 permittees with *E. coli* limits that discharge to streams formerly designated Class B or Class C Primary Contact Recreation. A review of *E. coli* monitoring data reported by these facilities for the 2014 recreation season showed that there were about 70 dischargers that would not be able to immediately comply with the lower limits.

4) Will *E. coli* limits be included in permits for direct discharges to the Ohio River? Yes, for the May – October recreation season. The 2015 Ohio River Valley Water Sanitation Commission (ORSANCO) Pollution Control Standards no longer include fecal coliform criteria for the summer recreation season. While Ohio’s standards still include fecal coliform standards in addition to *E. coli* standards, the move in Ohio and nationally is to *E. coli* for the protection of human health. This will complete Ohio’s transition to using *E. coli* for the protection of human health during the summer recreation season.

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Table 3 is a comparison of the ORSANCO and Ohio EPA *E. coli* standards for the Ohio River.

Table 3. Recreation season *E. coli* standards for the Ohio River

Agency	<i>E. coli</i> (colony counts / 100 mL)	
	Geometric Mean	Maximum
ORSANCO ^a	130 ^c	240 ^e
Ohio EPA Ohio River Standards ^{b,g}	130 ^d	240 ^f
Ohio EPA Bathing Waters ^{b,h}	126 ^d	410 ^h

^a Summer recreation season is April through October.

^b Summer recreation season is May through October.

^c 90-day geometric mean

^d Monthly geometric mean

^e Criteria shall not be exceeded in more than 25 percent of the samples taken during a 90-day period.

^f Criteria shall not be exceeded in any sample.

^g based on 3745-1-32 Table 32-1

^h These criteria shall not be exceeded in more than 10 percent of the samples taken during any 90-day period

The May – October *E. coli* limits that will be used in NPDES permits for sanitary discharges that go directly to the Ohio River are shown in Table 4.

Table 4. May – October *E. coli* limits for Ohio River discharges

<i>E. coli</i> (colony counts per 100 mL)	
Monthly average	Weekly average
126	240

In this case, the Agency is applying criteria values as the end-of-pipe limits for monthly and weekly averages. This is consistent with U.S. EPA's recommendations, and it will ensure that Ohio permits are protective of both sets of standards even though there are differences in how the standards are expressed.

Once *E. coli* limits are in place, permits will no longer include fecal coliform limits during the summer recreation season.

During the months of November – April, Ohio EPA will continue its current practice of having fecal coliform limits of 1,000 counts per 100 mL (monthly average) and 2,000 counts per 100 mL (weekly average) for sanitary discharges that go directly to the Ohio River. Neither the Agency nor ORSANCO have *E. coli* standards that apply during the winter months. For Ohio River discharger permits with the summer recreation season currently expressed as beginning in April, it is recommended to switch this to May, unless justification can be given otherwise.

5) Will compliance schedules be available for Ohio River dischargers? The Agency will determine the need for a compliance schedule, as well as the length of the schedule, on a case-by-case basis. Providing the permittee time to monitor *E. coli* levels, train employees on measuring *E. coli*, obtain additional equipment, switch contract labs, and adjust their disinfection system is a reasonable approach prior to the imposition of limits. Past experience has shown that schedules ranging from six months to two years are usually sufficient for meeting new *E. coli* limits, with the longer schedules providing time for monitoring, securing funds for additional equipment, and installing plant improvements.

Permits will include interim limits for fecal coliform along with *E. coli* monitoring until the *E. coli* limits become effective.

6) How are downstream uses protected? Ohio EPA's practice is to protect the downstream use up to a distance of five river miles. For example, if a discharge occurs in secondary contact waters, but the receiving stream or the stream network becomes primary contact less than five miles downstream from the discharge location, the permit would include *E. coli* limits associated with primary contact waters. Since this five-mile cutoff is not specified in rule, dischargers have the opportunity to justify that a smaller distance is protective of the downstream use.

Contact

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