

PGO19 Expectations for Total Phosphorus Effluent limits at WWTF

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Internal Working BCWA Program Document



Givens:

- BCWA *Policy 23 System of Wastewater Treatment Works* defines the set of WWTF subject to total phosphorus (TP) effluent limits as defined by the Bear Creek Reservoir Control Regulation #74 (BCWA *Fact Sheet 10 Control Regulation #74*). The BCWA is the designated water quality management agency defined by Regulation #74 responsible for implementation of Regulation #74. BCWA *Policy 34 BCWA Phosphorus WLA Purpose* defines the Colorado Water Quality Control Commission (WQCC) adopted wasteload allocations for all permitted WWTF in the Bear Creek Watershed as adopted in Regulation #74.
- The Bear Creek Reservoir Control Regulation at 5 C.C.R. 1002-74 establishes an annual total wasteload allocation for all wastewater treatment facilities in the Bear Creek Watershed. Each individual discharger in the Bear Creek Watershed is limited to an annual wasteload of total phosphorus which shall not be exceeded, except as provided for through trading provisions. Each discharger is limited to a total phosphorus effluent limit concentration of 1 mg/l, regardless of size or location.
- Total phosphorus wasteload allocations (WLA) are a use limit and not a property right.
- Total phosphorus wasteload allocations contained in the Bear Creek Control Regulation are a water quality protection regulatory limit established and maintained by the WQCC. The Commission can modify or revoke these allocations through a rulemaking process.
- The WQCC Regulation #38 defines the stream standards and classifications for the South Platte River Basin, including the Bear Creek Basin. These standards and classifications are used by the Water Quality Control Division (WQCD) permit section to determine the appropriate effluent limits for all permitted dischargers.
- The WQCC Regulation #85 defines the state nutrient standards that apply to WWTF and Colorado stream segments.
- The WQCC Regulation #31 Basic Standards and Methodologies for surface water (5 CCR 1002-31) is also applicable to the Bear Creek Watershed.
- The control regulation does allow total phosphorus trading among the Association membership. The control regulation allows point source (PS) to point source trades, nonpoint source (NPS) to point source trades, temporary or permanent trades into and out of the reserve pool, and alternative trading subject to Division approval. Trading can be either temporary or permanent. The BCWA does have a total phosphorus trading program (BCWA *Policy #1 Nutrient Trading Program*). Trading policies determine eligibility (BCWA *Policy 19 Nutrient Trading Program Eligibility*) and administration (BCWA *Policy 26 Point to Point Trade Administration*). The BCWA has established Trading Guidelines (*Total Phosphorus Trade Program and Nonpoint Source Trading Guidelines*, Affirmed by

majority vote January 12, 2012). BCWA Trade Credits are not a property right, a discharger does not own them and they may be modified or revoked by the Association, the Division or the Commission.

- The WQCC is the regulatory body required by state law to determine Colorado stream standards and classifications, subject to federal approval by the Environmental Protection Agency.
- The Water Quality Control Division is the Colorado agency responsible for overall state water quality and health; and they are the agency that implements stream standards and issues wastewater permits to dischargers. The WQCD can develop and issue special studies or direct others in Colorado to implement studies. The WQCD is the designated planning agency for the Bear Creek Watershed. The WQCD can develop total maximum daily loads (TMDLs) in response to impaired waters (as defined under federal law) and incorporate new limits into discharge permits. The WQCD makes recommendations to the WQCC through a formal regulatory process to update, modify or create stream standards or classifications to protect state water quality.
- The BCWA reports to the WQCD as an advisory group. The BCWA has no regulatory authority. The BCWA does have limited management agency authorities as defined under federal and state law.

2015 Rulemaking Hearing for Regulation #38 (5 CCR 1002-38).

The BCWA is responsible for watershed management, restoration and implementation within the context of a management agency and the Bear Creek Control Regulation (Control Regulation 74, 5 CCR 1002-74). The BCWA developed and submitted a responsive prehearing statement, a rebuttal statement, and a motion to include additional data in the hearing record. The Association reviewed the standards changes as proposed by the Water Quality Control Division in their WQCD Notice of Rulemaking for Regulation 38 (Exhibit1), WQCD Exhibit 38-1 Rationales and WQCD Exhibit 38-3 Bear Creek Reservoir Site-Specific Standards.

The Association was involved in extensive technical review of the water quality data for Bear Creek Reservoir in 2008, which included numerous presentations and discussions, and supported the recommendation that the narrative standard be replaced with numeric standards for chlorophyll and phosphorus. The Association was not involved with the WQCD staff in the development of the new water quality analyses contained in the WQCD Exhibit 38-3 Bear Creek Reservoir Site-Specific Standards. The Association Board had limited time to understand and discuss the implications of the new proposed standards changes. The Association does assume they will be the primary stakeholder responsible to help implement the new chlorophyll and phosphorus standards in Bear Creek Reservoir. The Association believes the proposed standard changes contained in Regulation #38 will have an economic impact to the Association membership.

The Association supports the temporary modification for chlorophyll and phosphorus due to the uncertainty about the reservoir meeting the proposed standards. Although the Association has some concerns about the WQCD Exhibit 38-3, the Association supported the adopted standards as recommended by the WQCD:

Bear Creek Reservoir standards

- Chlorophyll – 12.2 ug/L
- Total phosphorus – 22.2 ug/L
- Assessed as a summer average concentration at BCWA site 40 (deepest part of reservoir) based on at least three samples representative of the mixed layer in the summer growing season

- Allows one exceedance in five years on average for either standard

Adopt temporary modifications for both standards

- Basis: uncertainty about the underlying standards
- Set expiration for 12/31/2020

The Association provided summary positions in the form of a rebuttal statement on the proposed changes to Regulation #38 as directly related to the Bear Creek Watershed in the Bear Creek Basin. The rebuttal statement contains a “Best Professional Judgment” (BPJ) assessment of possible consequences or implications of having the WQCC adopt the new reservoir standards as proposed by the WQCD.

Expectations for Total Phosphorus Effluent limits

The Association anticipates new significantly lower wasteload allocations and probably lower total phosphorus (TP) effluent limits (concentrations) for all permitted point source dischargers in the Bear Creek Watershed.

Assumptions

The Association assumes the WQCD will proceed on a multi-step process to set new WLA into discharge permits:

1. The adopted total phosphorus standard of 22.2 ug/l (TP) will get translated by the WQCD staff into a proposed annual total phosphorus load allocation (LA) for Bear Creek Reservoir, which will be part of a future total maximum daily load (TMDL).
2. The WQCD presumably in cooperation with the Association needs to determine what this new LA means in terms of individual wasteload allocations (WLA) for dischargers and for the other components of the TMDL.
3. Then a Rulemaking Hearing (RMH) will be needed to adjust Bear Creek Control Regulation #74 to match the new standards established under Regulation #38. This RMH should establish a new total phosphorus LA for BCR. This Hearing could also be used to set new WLA for all dischargers. The earliest this hearing could occur is 2017.
4. Once Regulation #74 is adopted, then the WQCD permit section can begin to incorporate the new WLAs into discharger permits. Presumably, the permit section will open all permits at once to make this new permit change. However, the permit section may work on individual permits or select groupings. This process will take time and presumably the earliest new permit could be issued is 2018-2019.
5. The permit section has options available on determining when the new WLA will take effect within a permit. If the new permit limits will require any operational changes or upgrades to a facility, then the permit can have a delayed effective date for compliance with the new permit limits. A compliance schedule can be built into a discharge permit. Since the new Bear Creek Reservoir total phosphorus standard in Regulation #38 has a temporary modification to delay implementation until 12/31/2020, then this should be the target date for completion of new WLA in permits. Dischargers may be given additional time beyond this date to comply with the new WLA permitted limits. However, there is no guarantee of this longer delay for compliance.

Options for Possible Consideration in Process

- Based on BPJ and previous work by the Association and the WQCD, the proposed reservoir TP standard should be translated into a flow based TP annual load of approximately 2,900 pounds (at 28,900 acre-feet/ year). If the new load allocation is not flow-based, then the annual pounds would be

locked regardless of runoff events. The only way this would work is if it was assumed that the TP load diminished at higher flows, however watershed data record show the opposite is true. Consequently, having a fixed reservoir load for all flows is not reasonable. As such the future reservoir load allocation based on the proposed standard needs to be flow based (if logic prevails).

- The current TP wasteload allocation (WLA) for permitted dischargers is 5,255 pounds per year. So clearly the WLA will need to be reduced significantly to fit within the total annual allocation to the reservoir, even under flow-based allocations or any other allocation method.
- The TMDL process will be very complex and there is significant uncertainty on how the TMDL will be allocated, if the reservoir will respond to watershed load reductions, and if reduced WLA will be effective.
- Based on the Association understanding of the various total phosphorus contribution types and transport mechanisms, the future PS total phosphorus allocation could be reduced from 5,255 pounds per year to as low as 760 pounds per year, but probably no greater than 1,100 pounds per year.
- Since discharge permits don't function well with variable total phosphorus limits that are flow-based, the future WLA will need to be fixed for each discharger.
- There are several options available for the WQCD to consider when establishing the future PS limits:
 1. As under the existing system, all dischargers get an equal reduction in the TP effluent limit. This will result in an equal reduction in annual poundage allocations dependent on the plants effluent flow (either current or some time in future). An equal reduction of effluent limit concentrations and subsequently total annual pounds will not necessarily account for differences in expected growth among dischargers. Requiring certain small WWTFs to reduce effluent limits will be an economic burden.
 2. Establish unequal TP effluent limits in two or possibly three categories. While the current effluent limit is 1.0 mg/l, most dischargers are doing much better than that limit and the median discharged limit (2014) is about 0.4 mg/l. This has resulted in the total annual TP load from dischargers of about 1,100 pounds per year (since 2008). As such, a new discharger TP limits reduced from 1.0 mg/l to 0.4 mg/l could maintain the established annual wasteload TP discharges. The BCWA would suggest this will be the starting point for determining unequal TP limits. To provide the necessary flexibility for smaller dischargers, a lower limit TP concentration of 0.2 mg/l (doable by the larger of the minor WWTFs) should keep the total TP load from all dischargers under 1,000 pounds per year. The Association has previously suggested a TP effluent limit of 0.2 mg/l for certain larger WWTF and a 1.0 mg/l limit for certain small plants. This limit and the operational skills of plant operators should result in an annual TP load from all dischargers between 800-1,000 pounds per year. These limits can be achieved with limited operational changes and reasonable new expenses. Anything lower than a 0.2 mg/l effluent limit could result in very expensive operational improvements or system changes. Any new WWTF should plan for a new lower limit, such as 0.05 - 0.1 mg/l.
 3. Dischargers could get variable TP effluent limits depending on location in the watershed and potential impact to water quality. This would be a very complex option and would not be supportive of smaller dischargers. Since the smaller dischargers have a problem meeting the existing effluent limit of 1.0 mg/l, it is logical that they will be kept at that limit (antibacksliding regulations will not let them go to a higher limit). The discharger limit will define their annual

wasteload allocation. There is a potential for sacrificing watershed level water quality management for segment specific management. This could greatly increase monitoring requirements for individual dischargers.

4. The WQCD has considered having the effluent limits for dischargers be based on Water- Quality Based calculations, which are based in part on the low flow conditions at a discharge site. WWTF would get site-specific effluent limits and eliminate the need for WLA. This option will not be favorable to Morrison. This would mean each discharger has a custom effluent limit subject to mixing zones, low flows and distance between outfalls. However to have a margin of safety for these calculations, it is likely that the limits for some dischargers could be below 0.1 mg/l and as seen for other watersheds, as low as 0.05 mg/l. These low concentrations generally will require significant facility changes and increased costs.

There are no guaranties or assurances to any dischargers on the future WLA, since it will be guided by the WQCD and WQCC, with a close review by EPA. However, the BCWA has positioned itself as a respected and valued advisor for the WQCD and WQCC. The BCWA would suggest (not a given) that dischargers could reasonably plan as follows for lower TP effluent limits by around 2020-2022. However the TMDL will be complex and many decision elements will be introduced throughout the process. There is a likely possibility that the TP WLA will remain for dischargers and the annual total will be less than 1,000 pounds. The BCWA TP trading program will be a benefit to all WWTF in the near future. Active membership is critical.

Bear Creek Watershed Wastewater Treatment Plants by Drainage Basin	Possible TP Effluent Limit (mg/l)
Bear Creek Drainage	
Jefferson County Schools – Mt. Evans Outdoor Lab	1.0
Brook Forest Inn	1.0
Evergreen Metropolitan District	0.2
West Jefferson County Metro District	0.2
Kittredge Sanitation and Water District	0.2
Genesee Water and Sanitation District	0.2
Forest Hills Metropolitan District	0.2
Town of Morrison	0.2
<i>New Discharger</i>	0.1
Turkey Creek Drainage	
Conifer Metropolitan District	0.2
Conifer Sanitation Association	0.2
Aspen Park Metropolitan District	0.2
Jefferson County Schools - Conifer High School	0.2
Geneva Glen	1.0
Bear Creek Development Corp. - Tiny Town	1.0
<i>New Discharger</i>	0.1