



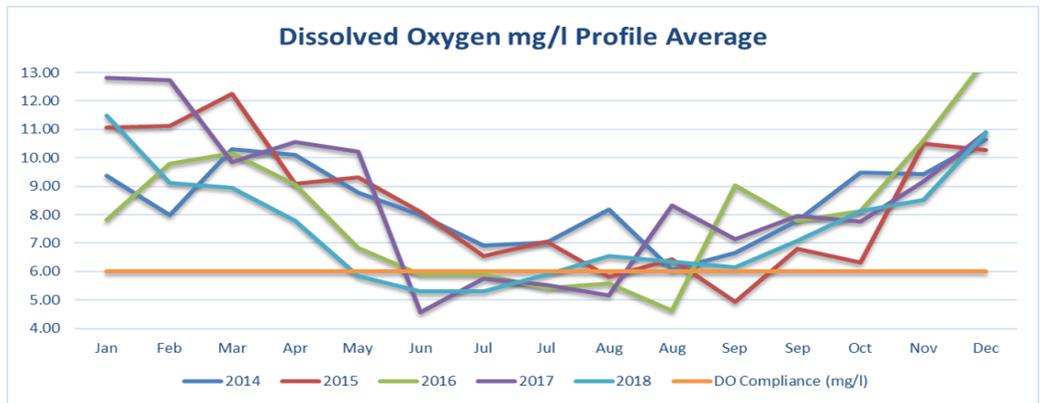
# BEAR CREEK RESERVOIR

## Fact Sheet 63 BCR Aeration System Evaluation June 2019

The Bear Creek Watershed Association protects and restores water and environmental quality within the Bear Creek Watershed from the effects of land use.

- Clear Creek County
- Jefferson County
- City of Lakewood
- Town of Morrison
- Aspen Park Metropolitan District
- Conifer Sanitation Association
- Conifer Metropolitan District
- Denver Water Department
- Evergreen Metropolitan District
- Forrest Hills Metropolitan District
- Genesee Sanitation & Water District
- Geneva Glen
- Jefferson County School District
- Kittredge Water & Sanitation District
- West Jefferson County Metropolitan District
- Evergreen Trout Unlimited
- U.S. Army Corps of Engineers

The BCWA has established that an in-reservoir aeration system is a necessary long-term *smart management practice* to protect and enhance the reservoir fishery (BCWA Policy 8 BCR Aeration). In November 2014, six fine bubble Quad Duraplate Diffusers and weighted line (BCWA Fact Sheet 47 New 2014 BCR Aeration System) were installed. This was a minimum number of aerators to meet reservoir oxygen standards. The diffusers are supplied air by a 15 hp variable compressor. The six modules can't consistently meet the reservoir dissolved oxygen standard of 6.0 mg/l from 2014-2018. Lower dissolved oxygen concentrations (below standards) occurs in summer months for all monitored years. Low oxygen levels contribute to algal blooms caused by internal loading of nutrients, which occur under low oxygen levels.



Line	Air Line (ft)	Depth (ft)
11/1/2014		
Line 1	850	36
Line 2	1,300	36
Line 3	600	19
Line 4	900	32
Line 5	1,650	29
Line 6	1,500	33
6/1/2019		
Line 7	800	35
Line 8	1,500	35
Line 9	750	30
Average Depth		32

Required air flow from the compressor is 36 standard cubic feet per minute (SCFM) at the average installed depth of the diffuser modules (9.5 m or 32 feet). The variable speed 15 HP rotary screw compressor can deliver 36 SCFM at 125 psi., which emits fine bubbles in a size range of 1-1.5 mm. The compressor delivers about 26 pounds per square inch (psi) to each disc (24 total). The line air pressure to diffuser array ranges from 105-125 psi. The compressor can effectively deliver the needed air psi to, at least, an additional six modules (12 total modules, 48 discs). The BCWA and Lakewood installed 3 new modules (Lines/Aerators 7, 8, and 9) in June 2019. Ongoing monitoring will determine if nine modules is sufficient to maintain the dissolved oxygen concentrations above the 6.0 mg/l standard for the eastern end of the reservoir for the 2019-2020 growing seasons. The expanded aeration system needs to operate from mid-April through October.

