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Abstract: Behind, through, combined transverse dams are widely used as regulation structures to protect riverbanks and regulate river channels. Under the influence of these structures, a redistribution of liquid and solid runoff, including suspended sediments, occurs. This article aims to develop a method for forecasting mud silting of the vortex zone behind the transverse dam. The concept of the coefficients of siltation in width, area, and volume is proposed to assess the degree of siltation. The minimum tail diameter within the reverse branch of the vortex zone depends on the value of inverse velocity, water depth, and the length of the vortex zone. Velocities in reverse currents and relative turbidity of the flow are determined from the equations of conservation of flow rate and conservation of solid runoff. It is assumed that deposits of suspended sediments occur within the reverse branch, and exchange with the main flow occurs in the zone of intense turbulent mixing. Calculated dependences are proposed to determine the volumes of sediments within the vortex zone and the sediments passing through the constraint section. Their ratio makes it possible to determine the portion of settled sediments. An example of the calculations for the conditions of dam No. 30 on the Yul' Darva River is performed, the thickness of the sediment layer along the flood runoff area