

ELGIN SEPARATION SOLUTIONS CASE STUDY

Low Head, Low Problems: An inexpensive retrofit to low head dams

Debris handling is expensive. Side intakes at low head dams are the most common application for raw water intakes, most of which require a significant amount of debris handling. The majority of debris handling at these sites is done by mechanically driven equipment, including: traveling screens and raking devices. These equipment options require significant maintenance costs. Elgin has introduced a passive intake screen alternative that utilizes the natural flow of the water to handle debris issues. Coanda screens are a run-of-river application that are designed to shear off the super critical layer of flow as debris and marine life pass over the screen down the river. Coanda screens capitalize on water's natural tendency to adhere to whatever surface it's traveling on. With an ogee shape spillway water is directed to tilted wedge wires that perform the actual shearing component of the intake. Coanda screens have existed for some time but new advances in capacity approximation from the US Bureau of Reclamation along with diligent analytical processes from Elgin have made this a viable solution for low head retrofits.

The Coanda screen design was used in a recent water treatment plant installation in Georgia called Line Creek. Line Creek retrofitted an existing low head dam by installing a Coanda screen on half the structure. The system has an 18 MGD capacity and the screen panels themselves have a footprint of approximately 100 square feet. Elgin used its sizing model to design an accurate screen by analyzing the flow elevations above the crest, velocities inside collections chamber, and elevations in the pump station at different flow patterns. These details have allowed the Coanda screen a smooth implementation with the entire system. The screens are not completely self-cleaning. Line Creek will have debris lines at flows less than 18 MGD but this debris will pass over the screen at higher flow volumes. Coanda screens have less moving parts than traditional designs making it a viable alternative in the raw water intake market.