



Fact Sheet

U.S. Army Corps of Engineers
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Project Title: Spreadsheet DESTRA TIFICATION

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The thermal stratification that occurs at most lakes and reservoirs during the summer results from solar radiation heating of the surface waters. This stratification inhibits the transfer and circulation of oxygen-rich surface waters with the bottom waters. As the summer progresses and the stratification becomes more pronounced, the natural chemical and biological reactions in the bottom waters deplete the dissolved oxygen (DO), leaving the lower layers void of oxygen. Under these conditions many undesirable reactions, such as the resuspension of dissolved iron and manganese, nutrient cycling, and hydrogen sulfide gas production are possible.

One way to improve reservoir quality is to prevent or reduce thermal destratification through some form of destratification system that continually mixes epilimnetic and hypolimnetic waters. This action prevents the reservoir from setting up density gradients that inhibit vertical mixing and allows DO from the surface and epilimnion to be circulated throughout the water column. The design that has been the most thoroughly investigated and tested in reservoir applications is destratification by a continuous bubble column. For this design, a steady flow of bubbles is introduced into the water column from a linear diffuser located along the bottom of a lake or reservoir. As the bubbles rise to the surface, they entrain water at depth and create a flow of water from the hypolimnion to the surface. The plume reaches the surface and spreads out horizontally until it plunges and reaches a neutral density level where it then continues to spread horizontally.

Spreadsheet program DESTRA TIFICATION makes these calculations. It is run using Microsoft Excel spreadsheet software. The complete documentation of this spreadsheet program can be found in the US Army Engineer Waterways Experiment Station WOTS Information Exchange Bulletin E-91-1, *Pneumatic Destratification System Design Using a Spreadsheet Program*.

[Download Spreadsheet DESTRA TIFICATION](#)

Corresponding documentation: [WOTS Information Exchange Bulletin E-91-1](#)