Development of UV Testing Protocol and Recommendations

Jeff Adams[1]

[1] US EPA, Office of Research and Development, National Risk Management Research Laboratory, 26 West Martin Luther King Drive, Cincinnati, OH 45268

The goal of this effort is to develop and present new protocols for UV validation testing and analysis that leverage advances and may help to improve implementation and operation at PWSs. This document also provides for updated clarifications to the UVDGM based on evolving practice in the UV industry since its publication. The new protocols from this effort should not be construed as a replacement to the 2006 UVDGM but rather additional approaches for consideration. This effort focuses on calculated dose approaches. The approach predicts microbe log inactivation as a function of UVT and a combined variable defined as (S/S0)/(Q DL) where DL is the UV dose per log inactivation of the microbe whose log inactivation is being predicted. In theory, the equation can be calibrated using validation conducted with MS2 phage alone and can be used to directly predict the log inactivation of the regulated pathogens, Cryptosporidium, Giardia, and viruses. In practice, we recommend calibrating the equation using validation data sets collected using MS2 and T1UV phage as challenge microorganisms. The validation report should provide an analysis which shows that the equation calibrated using MS2 phage predicts T1UV log inactivation and vice versa. This analysis will provide confidence that the calculated dose approach using the combined variable can directly predict the log inactivation of the targeted or regulated pathogen effectively.