Chapter 8

Conclusion

Concluding remarks for those who are interested in implementing US EPA Method 1611.

Chicago, 2010

Real-time quantitative qPCR is a rapid, laboratory-based method for enumerating fecal indicator bacteria (FIB) in recreational surface waters and has been included, subject to site-specific suitability, in the recently released revised national Recreational Water Quality Criteria (USEPA 2012). This method shows promise for detecting FIB as part of routine recreational water quality monitoring programs, a function of many certified water and local public health laboratories. Before these methods can be approved for use (in lieu of or in addition to culture-based methods) feasibility studies, validation, and side-by-side comparative testing must take place. This will ensure accurate result reporting and also provide information on implementation considerations at the individual laboratory level including, but not limited to: physical space requirements, appropriate indicator (target), approved product sourcing, costs, staffing training needs, turnaround-time, and the ability of the method to accurately characterize water quality.

This guidance manual has been assembled to aid those interested in implementation through the steps of US EPA Method 1611 based on the personal experiences of the Directors and staff of the Michigan State University Center for Water Sciences and City of Racine Health Department Laboratory. In 2011 the City of Racine became the first entity nationally to receive US EPA approval for regulatory monitoring of recreational water using rapid molecular methods. This came about after several years of method implementation and comparative culture/qPCR studies.

What is the way forward for broader implementation from our perspective? The performance of site-specific culture/qPCR comparative studies, an intimate knowledge of your beach via the use of the US EPA beach sanitary survey tool, predictive modeling (e.g. US EPA Virtual Beach), or quantitative microbial risk assessment. These tools will not only help end user laboratories characterize the beach environment and potential human health hazards but also interpret the results of analytical method correlation studies, provide insight on the relationship between inhibition and ambient conditions and help make sense of false positive/negative analytical results in the presence of environmental condition triggers.

Additional information on troubleshooting and result interpretation, as well as guidance for laboratories new to these methods, is being developed. In the future, laboratory certification and proficiency testing programs will be necessary for standardization and laboratory examination officers will be trained to evaluate molecular laboratories for consistency and accuracy in result reporting. Commercial calibration materials will soon be available and should reduce assay variability within and between laboratories. This is a living document which will be updated to reflect the availability of these and

other method-related support materials as they become available.

This project was funded through a grant from Great Lakes Restoration Initiative with support from the Michigan State University, Center for Water Sciences.