

## **Fecal Coliform versus Escherichia Coli**

### **HISTORY**

- 1960 - National Technical Advisory Committee (NTAC) recommends total and Fecal Coliform as indicator organism**
- 1976 - United States Environmental Protection Agency (USEPA) recommends Fecal Coliform as indicator organism**
- 1986 - USEPA recommends Escherichia Coli (E. Coli) be used in place of fecal Coliform bacteria in state recreational water quality standards as an indicator of fecal contamination**
- 2002 - USEPA recommendation of a transition from E. Coli and enterococci, bacterial indicators continues to be an EPA priority. EPA issues guidance regarding the transition steps**
- 2006 - The European Community Council establishes E. Coli as the indicator organism to replace fecal Coliform, indicating that E. Coli is a better indicator in predicting sanitary risk associated with water**
- 2007 - USEPA in March 2007 approves E.Coli as a choice for indicator organism in wastewater treatment plants along with With new test methods for E. Coli.**

### **Information taken from:**

- 1. Comparison of culturable fecal coliforms and Escherichia coli enumeration in freshwaters by Tamara Garcia-Armisen, Josue Prats, and Pierre Servais**
- 2. USGS Water –Resources Investigations Report 93-4083 Escherichia Coli and Fecal-Coliform Bacteria as Indicators in Recreational Water Quality by Donna S. Francy, Donna N. Myers, and Kevin D. Metzker**
- 3. EPA Ambient water Quality Criteria for Bacteria – 1986 (EPA440/5-84-002)**
- 4. EPA Implementation Guidance for Ambient Water Quality Criteria for Bacteria – 2002 Draft (EPA823-B-02-003)**

**Financial Comparison:**

Wisconsin State Laboratory and the University of North Carolina have provided information for costs.

E. Coli is run by the Quanti-Tray method that was approved by the EPA in March 2007. Membrane Filtration (MF) method and Most Probable Number (MPN) method are currently used to determine Fecal Coliform values.

| Method             | Total cost (labor + materials) per sample |  |
|--------------------|---|--|
| MF method          | \$32.00                                   |  |
| MPN method         | \$36.00                                   |  |
| Quanti-Tray method | \$11.70                                   |  |
|                    |   |  |

# Methods Comparison

|                             | Filtration | Tube      | Quant. Tray<br>Enzymatic |
|-----------------------------|------------|-----------|--------------------------|
| Startup Cost*               | \$6,500    | \$4000    | \$4,000 to \$6,000       |
| Sensitivity<br>(per 100 ml) | 10         | 2         | 1                        |
| Setup time<br>(minutes)     | 25         | 45        | 5                        |
| Incubation time<br>(hours)  | 22-26      | 44-66     | 18-28                    |
| Difficulty                  | technical  | technical | simple                   |

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**\*Includes incubator, autoclave, & assay equipment.**