Beyond RTCR Assessment Requirements: Identifying Microbial Contaminants to Suggest Corrective Actions

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Revised Total Coliform Rule

- Positive tests indicate the potential for fecal contamination, but do not identify contamination sources
Well Assessments

• Assessments are triggered when a PWS has repeated total coliform presence in routine samples

• Goal: Identify potential contamination sources to determine need for further testing or to inform corrective action
Tier 1 Assessment - Processing Steps

- Sample
- Indicator Tests for Total Coliform, E. coli, Enterococcus, ATP
  - Positive Results
  - Negative Results
  - Biofilm Issues
- No further testing
- Tier 2
Tier 2 Assessment - Large Volume Sampling

100 L Sample Water

Dead-end Hollow-Fiber Ultrafiltration (HFUF)

1 L Concentrated Microbial Biomass

Waste Water (99 L)
Tier 2 Assessment - Processing Steps

1. Sample
2. qPCR for organism of concern (Tier 1 API)
3. Indicator Tests for Total Coliform, E. coli, Enterococcus, ATP
4. IDENTIFY SOURCES OF FECAL CONTAMINATION:
   - Human Adenovirus
   - Bifidobacteria spp.
   - Rhodococcus coprophilus
   - Bacteroides spp.
   - Toxigenic E. coli (STEC)
   - E. coli O157:H7
5. Results to WDNR
6. well owners
Corrective Action

• Once a contamination source is identified, well owners work with WDNR to come up with a plan for corrective action
Future Directions - Biofilms

Tier 1 Assessment

Sample

Indicator Tests for Total Coliform, E. coli, Enterococcus, ATP

Positive Results

Negative Results

API 20E

organism of concern

Biofilm Issues

No further testing

Tier 2
Future Directions - Biofilms

Tier 1 Assessment

- Sample
  - Indicator Tests for Total Coliform, E. coli, Enterococcus, ATP
  - Positive Results
  - Negative Results
  - Biofilm Issues
    - Public Health Concern
      - Difficult to Remove
    - No further testing

API 20E
organism of concern
Tier 2
Future Directions – *Mycobacterium spp.*

Nontuberculous *Mycobacterium spp.* (NTM) Lung Disease

Common in Environment

Common in Household Water
Future Directions – *Mycobacterium* spp.

- Nontuberculous *Mycobacterium* spp. (NTM) Lung Disease
- Common in Environment
- Common in Household Water
- Biofilms
  - Difficult to Remove
Future Directions – *Mycobacterium* *spp.*

- Nontuberculous *Mycobacterium* *spp.* (NTM) Lung Disease
- Common in Environment
- Common in Household Water
- Biofilms Difficult to Remove
- Next-generation Sequencing

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