

# Pine and Mill Creek *E. coli* Stakeholder Meeting



Michigan Department of Environmental Quality, Water Bureau

May 29, 2007

# Meeting Objectives:

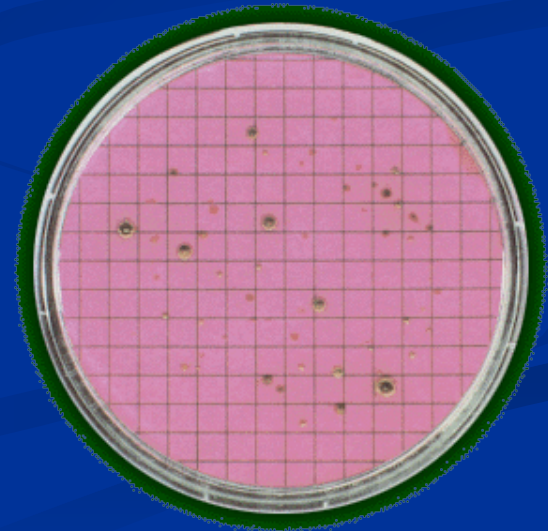
- Introductions
- *E. coli* 101
  - Michigan's Water Quality Standard
- 2005 *E. coli* sampling data review
- Section 303(d) impaired listing for Pine and Mill Creeks
  - TMDL development schedule
- Proposed DEQ sampling plan for Pine and Mill Creeks

# What is *E. coli*?



# The Basics...

- *Escherichia coli* is a subset of fecal coliforms whose presence indicates fecal contamination.
- It is associated with the fecal material of warm-blooded animals and is an indicator organism used to predict the presence of other harmful microorganisms.

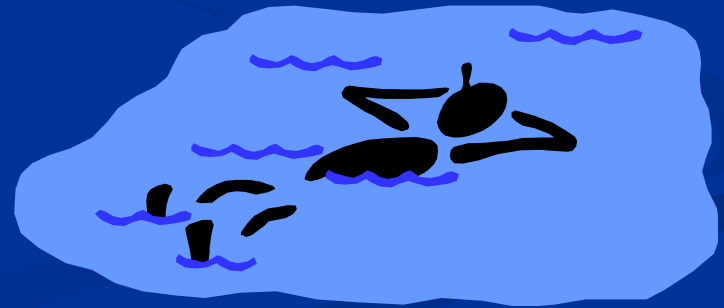


# What are the impacts associated with *E. coli*?

- *E. coli* and associated microorganisms when taken into the body can cause severe sickness.
  - Bacterial infections - Cholera, salmonellosis
  - Viral infections - hepatitis, gastroenteritis
  - Protozoa infections - cryptosporidiosis, giardiasis
- Once these pathogens are in a stream or lake, they can infect humans through ingestion, skin contact or contaminated fish.

# How much is too much?

- Michigan's WQS for total body contact for *E. coli* is 130 *E. coli* per 100 ml (as a 30-day geometric mean) or 300 *E. coli* per 100 ml (during the same sampling event)
- Total body contact recreation May 1 to October 31
- Risk based number



# What are the sources of *E. coli*?

- Two major ones: Point and non-point sources.
- Point sources directly discharge to a waterbody via a pipe (WWTP or CSO).



- Non-point sources:
  - illicit connections





# • Run-off

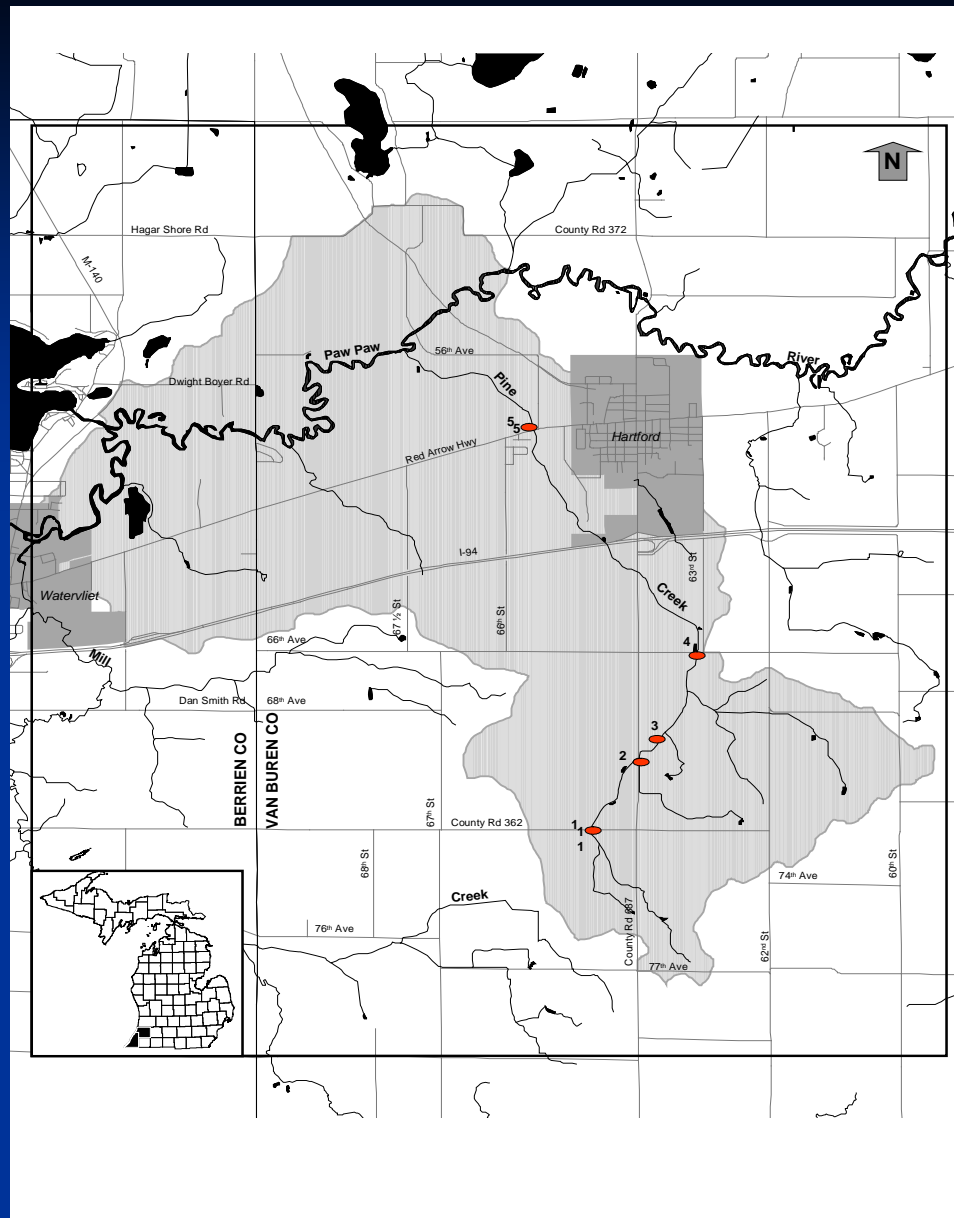


- Agricultural inputs



# 2005 Monitoring - Pine Creek

- Sampled 5 locations weekly from July - September
  - 12 weeks of data



**Figure 1. Pine Creek *E. coli* sampling locations, vicinity of Hartford, Michigan, 2005.**

# Data Summary

## ■ Pine Creek

- With exception of one day, *E. coli* concentrations exceeded daily maximum and 30-geometric mean 100% of the time
- Daily maximums ranged from 290 *E. coli* per 100 ml at 64<sup>th</sup> St. to > 3 million *E. coli* per 100 ml at Red Arrow Hwy.
- 30-day geometric mean *E. coli* concentrations ranged from 386 *E. coli* per 100 ml at 64<sup>th</sup> St. to >6,000 *E. coli* per 100 ml at Red Arrow Hwy.

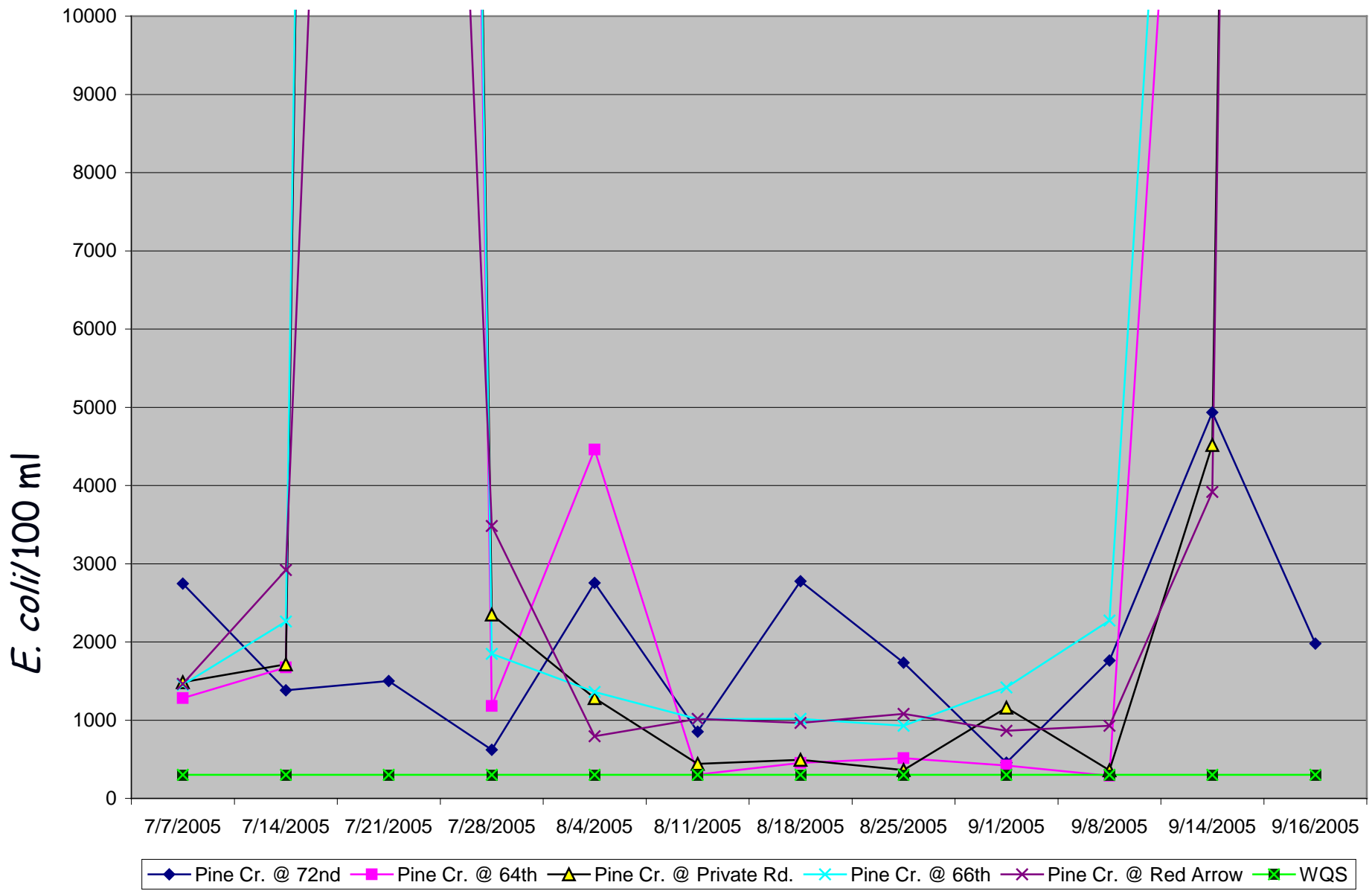
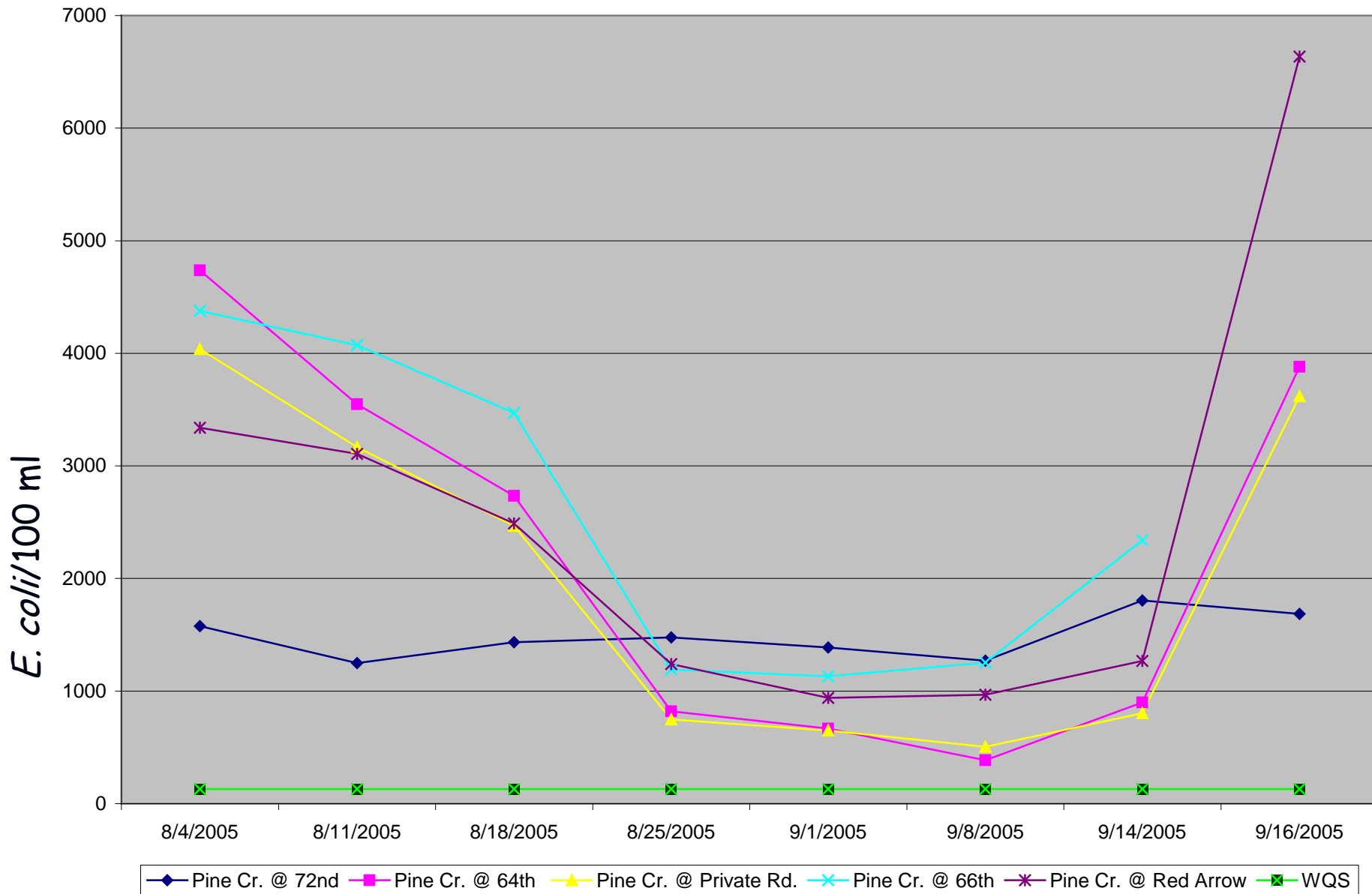


Figure 2. Daily maximum *E. coli* in Pine Creek, Van Buren County, Michigan, 2005.



**Figure 3. 30-day Geometric mean *E. coli* Pine Creek, Van Buren County, Michigan, 2005.**

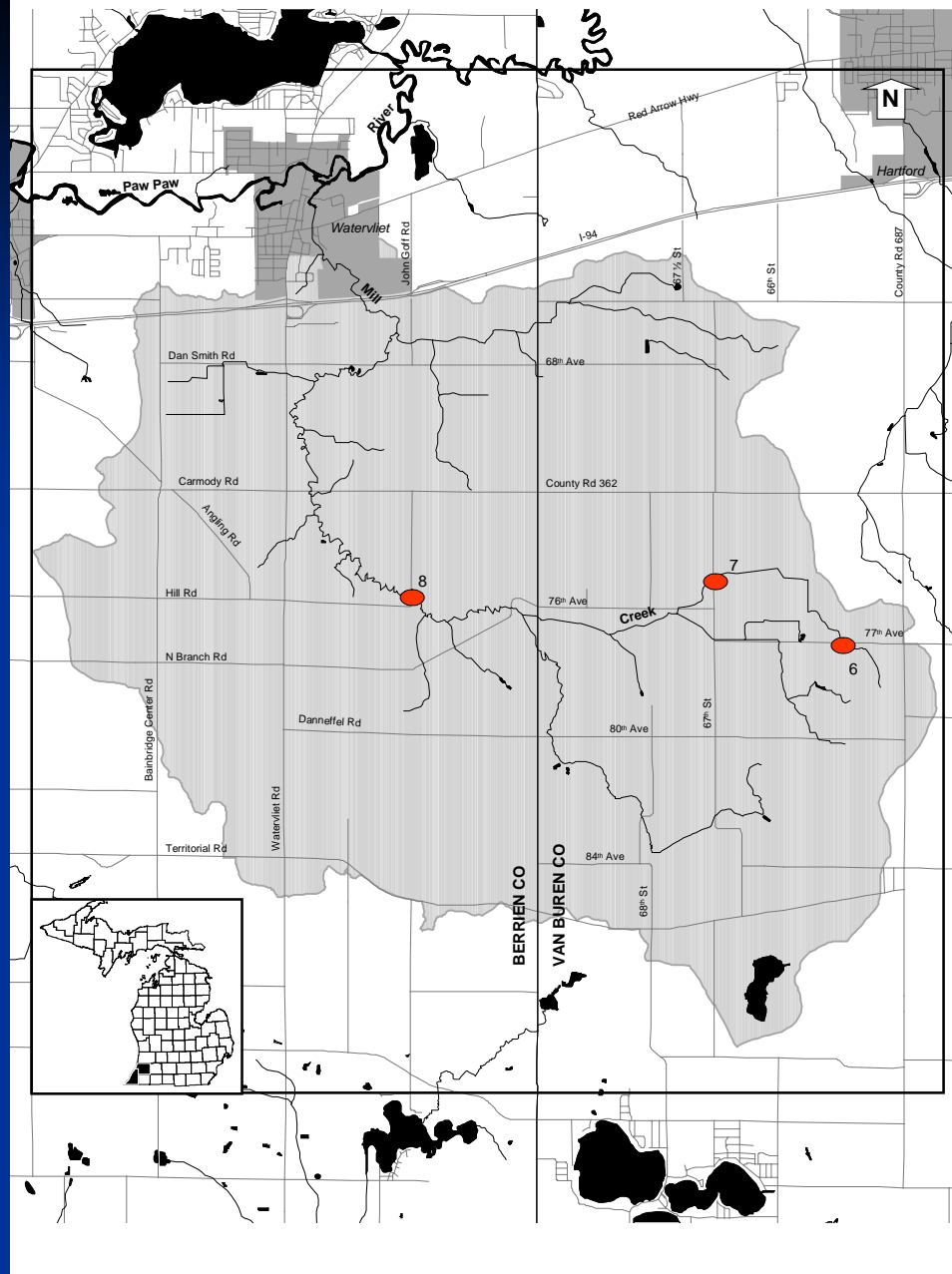


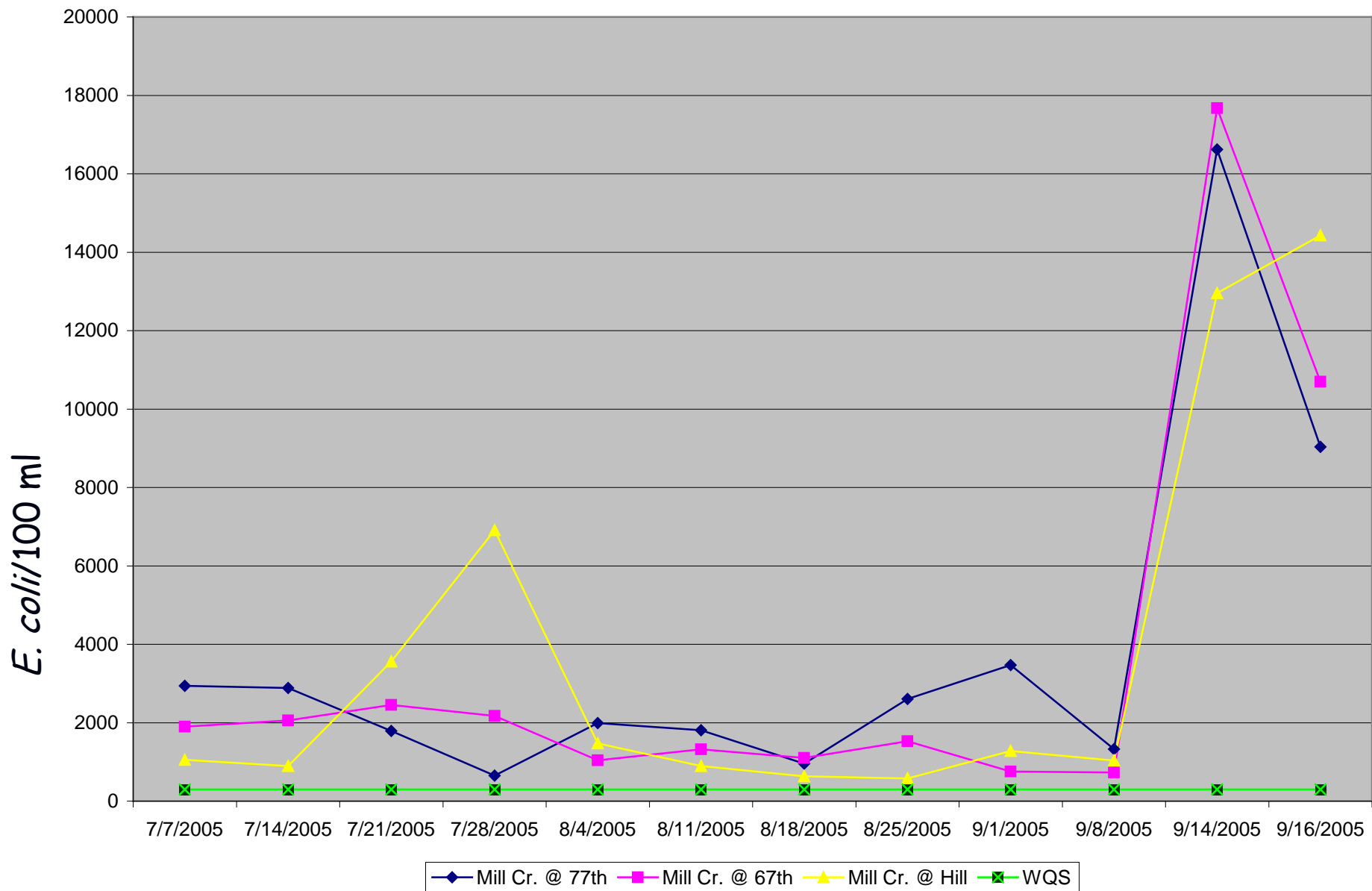
Figure 4. Mill Creek *E. coli* sampling locations, vicinity of Watervliet, Michigan, 2005.



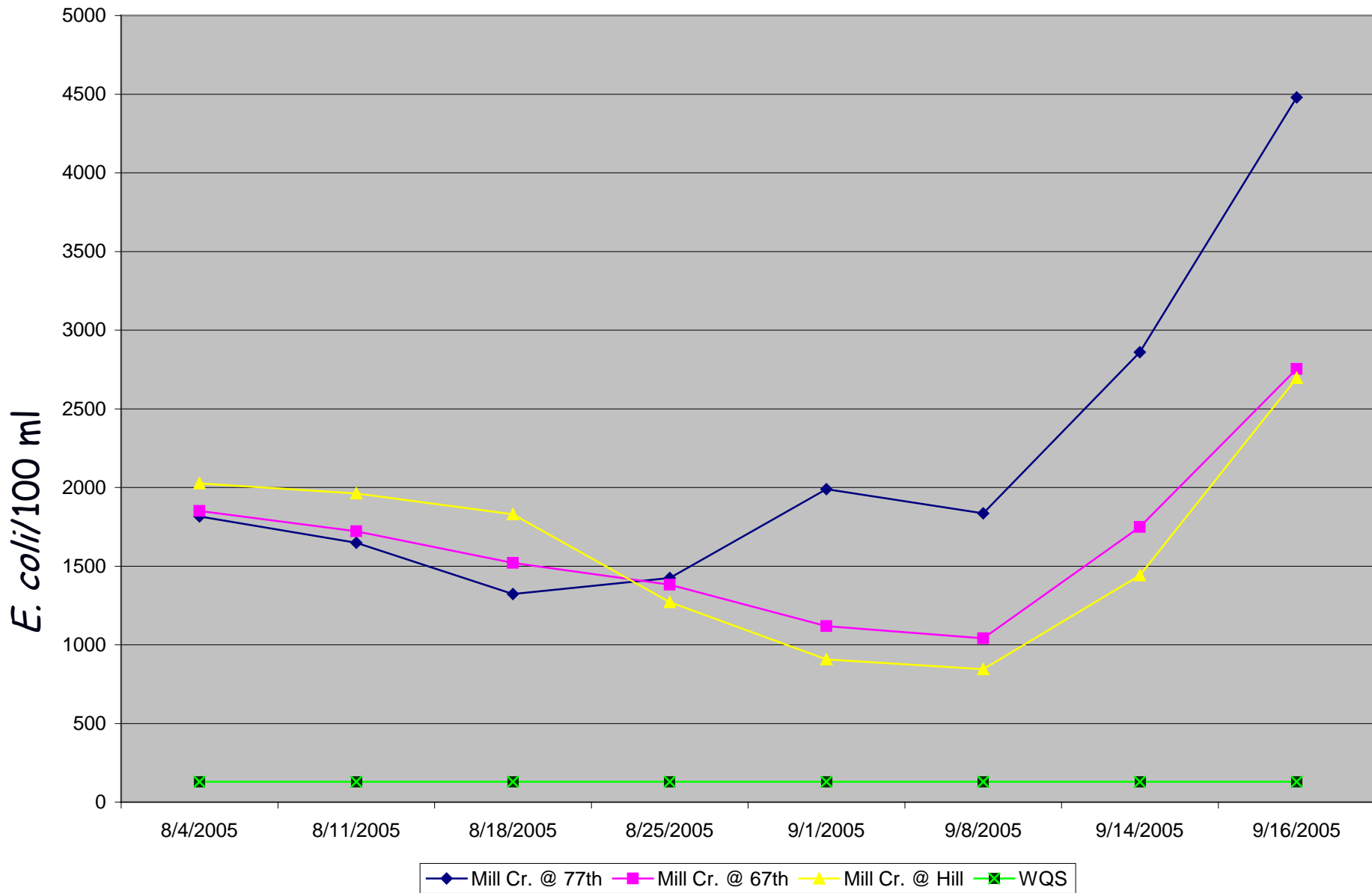
# Data Summary

## ■ Mill Creek

- *E. coli* concentrations exceeded the daily maximum and 30-geometric means 100% of the time
- Daily maximums ranged from 576 *E. coli* per 100 ml at Hill Rd. to > 17,000 *E. coli* per 100 ml at 67<sup>th</sup> Ave.
- 30-day geometric mean *E. coli* concentrations ranged from 845 *E. coli* per 100 ml at Hill Rd. to 4,480 *E. coli* per 100 ml at 77<sup>th</sup> Ave..



**Figure 5. Daily Maximum *E. coli* in Mill Creek, Van Buren/Berrien Counties, Michigan, 2005.**

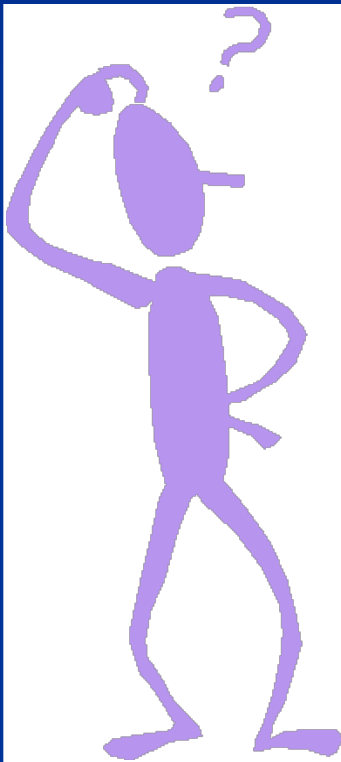


**Figure 6. 30-day Geometric mean *E. coli* in Mill Creek, Van Buren/Berrien Counties, Michigan, 2005.**

# Section 303(d) listing

- DEQ determined there was enough data to justify listing both water bodies as impaired for total body contact
  - Requires the development of a Total Maximum Daily Load
- TMDL currently scheduled for development in 2008
  - Schedule may be adjusted due to budget situation

# What is a Total Maximum Daily Load (TMDL)?



- Section 303(d) of the Clean Water Act requires development of TMDLs for waterbodies that are not meeting designated uses.
- TMDLs can cover variety of pollutants.

# How will the TMDL process work?



- The TMDL establishes allowable loading of pollutants to meet WQS based on pollution sources and in-stream conditions.
- The process allows the DEQ to establish controls to reduce pollution and restore the quality of the resource.

# Proposed DEQ study

- Extensive field reconnaissance of watersheds
  - Recognized multiple sources of *E. coli*
  - Use field information to aid in sampling location ID
- *E. coli* sampling
  - ambient (routine) monitoring
  - wet weather
  - TMDL
    - Bacterial source tracking sampling
  - collecting continuous flow data



# Status of the Study

- On hold due to State budget problems
- Study design may change depending on financial resources available



# MDEQ Information

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