

Quality Assurance Program Plan

for

Environmentally Concerned Citizens of South Central Michigan  
(ECCSCM)

Water Monitoring Project

2017-2020 Cyanobacteria Stream Study

Raisin & Bean Creek Watersheds - Lenawee County, Michigan

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## I. Project Description

Environmentally Concerned Citizens of South Central Michigan regularly conducts surface water monitoring for *E. coli* bacteria, temperature, dissolved oxygen, nitrate, nitrite, orthophosphate, and ammonia at sites near Confined Animal Feed Operations west and south of Adrian in Lenawee and Hillsdale Counties in Michigan. For this particular project, we added DNA analysis of different genera of Cyanobacteria and their toxins, along with Bacteroides from which source species DNA was extracted.

The purpose of the Project was to determine if Cyanobacteria and cyanotoxins exist at selected surface water sites in addition to the parameters above, and also to see if there was evidence of domesticated livestock or human fecal contamination. Further, we sought to educate the public about water quality and watershed issues here. Sampling took place in July, once per year from 2017 through 2020.

## II. Project Organization and Responsibilities

ECCSCM Water Monitoring Project Coordinator is ECCSCM member Pam Taylor. Dissolved Oxygen/water temperature results were taken in the field with a YSI DO meter. *E. coli* samples, in sterile bottles supplied by the DEQ Laboratory, were delivered on ice within 6 hours to the DEQ Lab in Lansing, MI when possible, or mailed overnight. Nitrate, Nitrite, Phosphate and Ammonia were tested using standard Hach test strips for 2017, 2018, and 2019. For 2020, those nutrients were tested using an Exact iDIP 570 nm photometer. This change was made because of the difficulty in getting precise numeric readings with test strips. It is important to note that the orthophosphate (PO<sub>4</sub>) levels <.01 ppm are not read with this photometer, and eutrophication in natural streams begins when orthophosphate levels rise above .005 ppm.

### Project Coordinator:

Pam Taylor, ECCSCM

### Project Coordinator Responsibilities:

Pam Taylor, as Project Coordinator, is responsible for the overall quality of the monitoring, including adherence to schedules, budgets, data preparation, reports, summaries. She is also responsible for overseeing all field-related activities, including scheduling, sampling, and making sure *E. coli* samples are transported for analysis.

### Field Responsibilities/Techniques/Quality Assurance:

YSI DO meter will be used for Dissolved Oxygen/water temperature; meter will be calibrated as per YSI instructions. *E. coli* samples will be collected as grab samples following clean technique and appropriate QA/QC procedures.

Field volunteers assist with sampling, recording observations, and transporting samples. Volunteer work allows citizens to gain knowledge of correct sampling techniques and

familiarizes them with the watershed and water quality issues.

Laboratory Responsibilities/Quality Assurance Quality Control:

All *E. coli* analysis and data reporting was conducted by the MDEQ/EGLE Laboratory, Lansing, MI. All DNA analysis (Cyanobacteria, cyanotoxin, Bacteroides) was conducted by Helix Biological Laboratory, Wayne State University, Detroit, MI. Analysis was performed in accordance with standard methods, under an appropriate quality assurance/quality control plan.

### III. Data Management, Analysis, and Reporting Procedures

All data gathered in the field was recorded on log sheets—dates and times of sampling, weather and water conditions, DO/water temp readings. The Project Coordinator maintains copies of original log sheets. *E. coli* data generated in the DEQ Laboratory and Cyanobacteria/cyanotoxin/Bacteroides data was also added to log sheets and entered into a total data spreadsheet. All reports on findings are released by the Project Coordinator.

Water test results are sent to the Michigan Department of the Environment, Great Lakes, and Energy, Region 5 EPA, appropriate local government entities, and the Lenawee County Health Department. Reports are also published on the ECCSCM website.