



# BLUE PAPER

## Water Quality Testing 101

Summer, 2018  
Blue Paper No. 1<sub>a</sub>

### THE ISSUE:

Use a Watershed-level approach to achieve and maintain an overall Water Quality Index (WQI) rating of Excellent (90-100) for water entering Clear Lake (CL), using the Hoosier Riverwatch Testing protocols and rating system.

### THE PLAYERS:

Trained Water Quality Committee (WQC) members and other volunteers conduct water testing 4X/yr and also test for macroinvertebrates.

### THE TOOLS:

- Testing is done in inlets of the four county-regulated ditches that flow into CL and in one exit.
- Ditches supplying water into CL (in order of flow level into Lake): Cyrus Brouse (south shore), Harry Teeters (southeast shore), Peter Smith (west shore) and Alvin Patterson (northeast shore).
- Exit location is Round Lake
- Water sample results are reported to the Hoosier Riverwatch and CLTLC Board.
- Trends over multiple tests are more important than a single test result. Acceptance criteria has been established to evaluate test results and trends.

### THE MEASUREMENTS: (CT = *Clear Thinking* article):

- Dissolved oxygen: Key parameter. Oxygen is essential for life. Presence = healthy system. Lack = pollution. Higher is better. (CT 11/2016)
- E. coli: Fecal coliform bacteria enters through animal waste (pets, waterfowl, livestock), faulty septic systems and manure runoff from fields. Health risk for humans and animals. Lower or absence is better. (CT 3/2016)
- Biological Oxygen Demand: Measure of quantity of oxygen used by aerobic bacteria as they break down organic matter entering the lake from surface runoff. High levels rob fish and macroinvertebrates of oxygen needed to thrive. Lower is better. (CT 7/2016)
- pH: Measures range 0-14 between alkalinity (basic) (14), neutral (7) and acidity (0). Aquatic organisms reproduce and survive best between 6.5 and 8.2. Algal blooms raise pH levels. Neutral is best. (CT 1/2017)
- Water temperature: Lower is better. Colder water holds more dissolved oxygen and supports higher macroinvertebrate diversity. (CT 8/2015)
- Phosphorous: Testing is for dissolved form, orthophosphate. High levels contribute to weed growth and algal blooms. Lower is better. (CT 11/2015)
- Nitrogen: Testing covers nitrates and nitrites. It comes to CL from human and animal waste, decomposing organic matter, and fertilizer runoff from lawns and ag fields. High levels contribute to weed growth and algal blooms. Lower is better. (CT 1/2016)
- Turbidity: Measure of Water Clarity. Cloudy lake water comes from suspended matter such as clay, silt, organic and inorganic matter, and from high algae levels. Results from erosion (soil, construction sites, urban or ag runoff), algal blooms and lake bottom disturbances from boat traffic. Lower is better. (CT 5/2016)

### Hoosier River Watch WQI Ratings (weighted average of testing parameters):

Excellent	—	90-100	—	CLTLC Goal
Good	—	70-89	—	Observe for negative trends (possible action required)
Medium	—	50-69	—	Calls for corrective action
Bad	—	25-49	—	Calls for corrective action
Very Bad	—	00-24	—	Calls for corrective action

### SUCCESS SO FAR:

	<u>2016</u>	<u>2017</u>
Brouse	74 (Good)	74 (Good)
Teeters	59 (Medium)	67 (Medium)
Smith	71 (Good)	84 (Good)
Patterson	59 (Medium)	67 (Medium)

*Note: Some results from 2016 vary from earlier CT reports due to errors in reading HRW database. Results above reflect original CLTLC data.*

### Actions Taken:

- Kasota Island Shoreline Restoration Project (2017-present)
- Koeneman Lake dredging project (2016)
- Glacial stone installation along concrete seawalls of 17 lake lots (2015)
- Eichler property wetland restoration (2013)
- Marbo Farms bank erosion project (2011)
- DeWitt property grass waterway project (2011)

### NEXT STEPS:

- Increase watershed-filtering capacity by strategic land acquisitions, restoration and preservation of wetlands, and increased installation of grass waterways and buffer strips (ongoing).
- Update CLTLC formal watershed assessment (2018-19).
- Work collaboratively with stakeholders to implement recommended corrective actions from the watershed assessment (ongoing).

