

## **Title: Sanitary Sewer Installation Lowers Bacteria in County Drain**

Waterbody Improved: County Drain No. 70 (AUID 041000020306-02), a tributary to the River Raisin near the town of Palmyra in Lenawee County, Michigan.

GRTS Numbers: Monitoring in 2001 = 98502301, Project 08; in 2013 = 98502313, Project 01.

Problem: Failing septic systems in the Lenawee County Drain No. 70 watershed resulted in elevated *Escherichia coli* (*E. coli*) concentrations that exceeded Michigan's water quality standards for both partial and total body recreation. A 1 mile reach of the drain is on the Michigan 303(d) list.

Project Highlights: Installation of a sanitary sewer in the Manor Farms Subdivision substantially reduced the concentrations of *E. coli* bacteria.

Results: The Michigan water quality standard for partial body contact is a daily geometric mean of 1,000 *E. coli*/100 mL, and the standard for total body contact is a daily geometric mean of 300 *E. coli*/100 mL and a 30-day geometric mean of 130 colonies/100 mL. Installation of the sanitary sewer decreased the average daily geometric mean by 98 percent (20,202 *E. coli*/100 mL to 503 *E. coli*/100 mL [n = 5]), and the 30-day geometric mean by 95 percent (8,204 colonies/100 mL to 441 colonies/100 mL). Lenawee County Drain No. 70 now meets Michigan water quality standards for partial body contact recreation. The drain still exceeds the water quality standard for total body contact.

Partners, Funding, and Congressional District: The Lenawee County Drain Commission coordinated construction of the sanitary sewer and currently operates the wastewater treatment facility. The pre and post-construction monitoring was performed by DEQ and partially funded with Section 319 base funds. This project is located in Michigan's 7<sup>th</sup> Congressional District.

Photographs:

None.

Data table/graph/chart:

Table 1. *E. coli* concentrations in County Drain No. 70, Before and After Installation of a Sanitary Sewer.

Lenawee Drain No. 70 - Humphrey Hwy - Downstream of Manor Farms Subdivision (Palmyra Twp)									
2001 - Before Sanitary Sewer					2013- After installation of Sanitary Sewer				
Date		Sample Results	Daily Geometric Mean	30-day Geometric mean	Date	Time	Sample Results	Daily Geometric Mean	30-day Geometric mean
7/17/2001	L	73,000			7/18/2013	L 8:40	690		
	C	68,000				C 8:40	950		
	R	112,000	82,227			R 8:40	920	845	
7/24/2001	L	3,700			7/25/2013	L 10:20	340		
	C	3,200				C 10:20	440		
	R	3,600	3,493			R 10:20	640	457	
7/31/2001	L	4,600			8/1/2013	L 8:45	290		
	C	4,700				C 8:45	290		
	R	4,400	4,565			R 8:45	350	309	
8/6/2001	L	3,900			8/8/2013	L 8:05	1,000		
	C	5,200				C 8:05	900		
	R	5,200	4,725			R 8:05	390	705	
8/14/2001	L	6,000			8/15/2013	L 8:00	250		
	C	5,800				C 8:00	220		
	R	6,200	5,998	8,204		R 8:00	140	197	441

Partial Body Contact Exceedances  
 Total Body Contact Exceedances

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