



Marion Utilities

Combined Sewer Overflows & Long-Term Control Plan

Combined Sewer Overflows & Long-Term Control Plan

Almost every time it rains, raw sewage mixed with storm water from combined sewers overflows into the Mississinewa River. Marion Utilities is currently addressing this problem. However, meeting Federal mandates may require significant financial expenditures that will affect the city in its entirety.

WHAT IS A COMBINED SEWER & HOW DOES IT AFFECT THE NATION'S RIVERS?

The sewer collection system consists of three kinds of sewers:

1. **Storm sewers** that carry only storm water runoff.
2. **Sanitary sewers** that carry only sanitary waste.
3. **Combined sewers** that carry sanitary waste and storm water runoff.

The theory behind the combination sewer was that during dry weather, it could transport sanitary waste to the treatment plant. During wet weather, the sanitary waste would be flushed to the treatment plant by the influx of stormwater, and as the sewer reached capacity, the stormwater would overflow to the river. However, a large amount of sanitary waste also discharges to the river. This discharge is called a Combined Sewer Overflow (CSO).

Sanitary waste discharged to the river can have a drastic impact on the water quality of the river. High concentrations of metals from industrial discharges such as zinc, lead, copper, nickel, chromium, cadmium and mercury, low levels of dissolved oxygen due to the biological breakdown of organic waste and high levels of bacteria and pathogens can make the river unfit for recreational use, impair the rivers ecology, and in extreme cases, cause fish kills.

HISTORY OF COMBINED SEWER OVERFLOW CONTROLS

The US EPA recognized the potential danger that CSO's and other discharges posed to the nations water ways and passed the "Clean Water Act" in 1972. This Act no longer made it legal to construct combined sewer systems. However, this Act did not require CSO communities to reduce the number of combined sewers contained in their system. Therefore communities continued to maintain and operate existing combined sewer systems.

Realizing that more needed to be done to improve the water quality of the nations streams and rivers, the US EPA developed a national CSO Policy in 1989. With revisions in 1994, this policy set forth 9 controls which every CSO community must follow. These nine minimum controls are:

1. Proper operation and maintenance of the collection system

This insures that each community has a preventative maintenance program to keep the system operating efficiently.

2. Maximum use of the system for storage of excess flows

The more sewage that can be stored in the sewer pipes, the less that will be discharged to the rivers.

3. Review and modification of industrial pretreatment programs

This involves working with the industries to reduce discharge volume and/or metal concentrations.

Combined Sewer Overflows & Long-Term Control Plan (cont.)

4. Maximization of flow through the wastewater treatment plant

Most treatment plants are capable of handling more than their design capacity for short periods of time without affecting the quality of the effluent or harming plant operations. The more flow that can be brought through the treatment plant, the less that will be discharged to the river through a CSO.

5. Prohibition of CSO discharges during dry weather

Some communities have combined sewer systems that are so hydraulically overloaded that overflows would occur without a rain event.

6. Control of solid and floatable material in CSO discharge

This is mainly for aesthetic reasons to reduce the amount of trash and debris discharging to the river.

7. Establishment of pollution prevention programs

Recycling, street sweeping, trash pick-up, and programs such as “Tox-away Day” all reduce the amount of trash that can eventually end up in the sewer system, cause maintenance problems, or be discharged to the river.

8. Public notification of CSO occurrences/impacts

This involves public education on CSO impacts and possible dangers. Signage is placed at each CSO for identification with phone numbers to call if discharging is noticed during dry weather.

9. Submission of a Stream Reach Characterization Evaluation Report (SRCER) to the Indiana Department of Environmental Management.

This study measures the effectiveness of the first eight minimum controls, and identifies the impacts that a community’s CSO’s have on the river. After submission of the SRCER, each community must submit a Long-Term Control Plan (LTCP) designed to reduce/eliminate the CSO’s.

WHAT ARE THE EXISTING CONDITIONS OF THE CITY OF MARION’S WATERWAYS & SEWER SYSTEM?

Marion’s sanitary waste collection system consists of approximately 80% combined sewers with 38 miles of sanitary sewer and 133 miles of combined sewers. Some of these sewers are over 100 years old. It should be noted that previous to the 1940’s, there was no Wastewater Treatment Plant in Marion and all sewers eventually discharged directly to the river. At one time the system contained over 15 CSO’s. Now, through a program of regular maintenance and sewer separation, the collection system contains only seven combined sewer overflows. It is estimated that, on average, less than 182 million gallons of raw sewage mixed with stormwater discharges from these on an annual basis.

Sampling along the Mississinewa River has indicated that the metal concentrations and other water quality parameters are within the normal standards with the exception of the E-coli levels. E-coli levels are higher than the acceptable standard (235 colonies/100mL) during dry weather, and climb even higher during storm events.

Combined Sewer Overflows & Long-Term Control Plan (cont.)

WHAT IS BEING DONE TO REDUCE CSO EVENTS IN MARION?

A study completed in 1988 showed that Marion discharged an average of over 1.1 Billion gallons of raw sewage mixed with stormwater runoff on an annual basis. With improved maintenance focusing of storage within the system and over \$10 million in sewer separation and system improvements, it is estimated that Marion now overflows less than 182 million gallons in an average year.

As required, Marion submitted a Long-Term Control Plan in December 2002. By July 2005, the Indiana Department of Environmental Management (IDEM) had yet to approve the plan. Recognizing that the economic climate had changed since the original submittal, Marion asked IDEM for permission to revise the plan. Permission was granted and the revised plan was submitted to IDEM in September 2009. IDEM rejected that plan because it allowed too many CSO events per year. The MUSB is currently working with IDEM to come to an agreement on how many overflows per year will be acceptable and how much the community can afford to spend to reach that number.

THE LONG-TERM CONTROL PLAN

The LTCP is basically a master plan to reduce or eliminate CSO's. This is to be accomplished taking into account the following criteria:

1. Sensitive/recreational areas

Recreational areas where the public can come into contact with contaminated water will require elimination of CSO's in and upstream of that area and are given the highest priority.

2. Public Participation

The community is to be involved in the prioritization and selection of possible controls through public meetings and citizens advisory groups.

3. Evaluation of an array of alternatives

A variety of alternatives will be evaluated from "no action" to complete elimination of all CSO's taking into account "cost vs. performance" considerations.

4. Affordability analysis

Using federal guidelines, the ability of the community to pay for the controls and over what period of time will be determined.

Combined Sewer Overflows & Long-Term Control Plan (cont.)

OPTIONS FOR IMPROVING THE WATER QUALITY OF THE MISSISSINEWA RIVER

There are 4 basic strategies a city can take to address sewage overflows:

1. Using the existing sewer system to store more sewage during wet weather.

In most instances, the sewer pipes are not completely full before starting to overflow to the river. CSO weirs can be raised or other mechanical devices may be used to ensure these pipes are full before they overflow. However, caution must be taken not to allow the pipes to get too full, which would allow sewer back-ups into basements or on streets.

2. Expanding the Wastewater Treatment Plant to treat more flow during wet weather.

Marion's treatment plant has a design capacity of 12.0 MGD. However, it can handle over 20 MGD for a short period of time. Expanding the plant's capacity will allow more sewage to be treated and allow less overflow to the river.

3. Build storage facilities throughout the collection system.

Underground tanks can be constructed to store sewage during rain events then release it after the rain is over.

4. Separation of storm and sanitary sewers.

Treatment of "clear" stormwater at the wastewater treatment plant can be very expensive and uses up valuable capacity in the sewer collection system. Separating combined sewers into a sanitary system and a storm system is an effective way of reducing or eliminating CSO's. However, it is important to remember that in the future there may be stormwater regulations that could require cities the size of Marion to address pollution concerns with these stormwater discharges.

Marion's Long-Term Control Plan will most likely involve three, if not all four of these strategies. Completing the goals outlined in Marion's Long-Term Control Plan will require significant financial investments.

However, this will be necessary to improve our water ways, enhance the river's recreational uses, and follow the US EPA's Regulatory Guidance.

For more information, contact:

Bill Glessner
Assistant Engineer
bglessner@marionutilities.com

Brittany Riner
Communications Specialist
briner@marionutilities.com

1540 N. Washington St. • Marion, IN 46952 • www.marionutilities.com • 765.664.2391