

**Title:** CSO Treatment Facilities

**Identification Number:** Water-016

**Date Originally Effective:** April 11, 2008

**Dates Revised:** None

**Other Policies Repealed or Amended:** None

**Brief Description of Subject Matter:** A CSO Treatment Facility may be part of a CSO community's alternatives analysis for controlling CSOs for purposes of long-term control plan development.

**Citations Affected:** U.S. EPA's CSO Policy, Indiana's CSO Policy

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## 1. PURPOSE

Most Combined Sewer Overflow (CSO) communities in Indiana have already analyzed or are in the process of analyzing a range of alternatives for controlling CSOs for purposes of long-term control plan development. The purpose of this document is to inform CSO communities that, in addition to the reasonable range of alternatives described in U.S. EPA's CSO Policy, IDEM is willing to accept, for additional evaluation as part of a community's alternatives analysis, a treatment basin alternative<sup>1</sup> provided that such alternative meets the criteria set forth in this NPD. Consistent with the CSO Policy, IDEM will determine the appropriateness of such an alternative on a case-by-case basis, in the context of evaluating all of the alternatives.

## 2. SCOPE

This policy affects CSO communities that choose to consider a CSO Treatment Facility as part of a broader alternatives analysis in order to be consistent with the 1994 CSO Control Policy.

## 3. SUMMARY

A CSO Treatment Facility designed and operated as discussed in this document provides a prescribed high level of CSO treatment that precludes the need for a use attainability analysis.

## 4. DEFINITIONS

The following definitions apply to the defined term as used in this NPD:

"CSO" means combined sewer overflow and is the combination of sanitary sewage and storm water in the same conduit (sewer pipe).

"CSO Community" means a community (municipality) that has combined sewer overflow discharges.

"Combined Sewer Overflow Control Policy" or "Policy" is the U.S. EPA policy governing the control of combined sewer overflows from CSO communities.

"CSOOP" means combined sewer overflow operational plan.

"LTCP" means long-term control plan, a document required to be prepared by CSO Communities for the elimination or management of combined sewer overflow discharges.

"NPDES" means National Pollutant Discharge Elimination System and is a national program for the issuance of permits to entities that have direct discharge of treated wastewater into receiving waters.

## 5. ROLES

CSO treatment facilities as part of a community's Long-Term Control Plan is reviewed for approval by the Office of Water Quality's Wet Weather Section.

## 6. POLICY

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**CSO Treatment Facilities****6.A. CSO Treatment Facility Design Criteria**

In developing information concerning CSO Treatment Facilities, CSO communities should evaluate facilities designed to meet the following general criteria:

1. Retention, for transportation to and treatment at the wastewater treatment plant (WWTP), of flows generated during storms no smaller than the "One Year, One Hour Storm". These alternatives should also provide for the transport of this entire volume to the WWTP and the full treatment of that same entire volume within 48 hours. (See 6.B.8. below). Inherent in this requirement is the complete transport of this flow within the sewer conveyance system to and adequate treatment of this flow at the WWTP.
2. Treatment of combined sewage flows generated during storms no smaller than the "10 Year, One Hour Storm", which includes, at a minimum, the following:
  - a. The detention of flows for settling that achieves the Total Suspended Solids (TSS) control described in 6.B.10 with the 10 year one hour peak hourly flow retained for no less than 30 minutes.
  - b. Skimming of the detained flows to remove solids and floatables.
  - c. Disposal of the solids and floatables in accordance with any applicable solid waste disposal laws and regulations.
  - d. Disinfection of all detained flows, to the effluent level set forth in 6.B.9.
  - e. Dechlorination, if necessary, so that the effluent from the CSO Treatment Facility does not exceed the Total Residual Chlorine (TRC) level set forth in 6.B.9.
3. Combined sewage flows in excess of the "10 Year One Hour" (or higher) designed storm used for sizing of the CSO Treatment Facility should receive whatever treatment is feasible given capacity limitations at the CSO Treatment Facility and the WWTP.

The discharger may also evaluate alternative facilities that will achieve equivalent or better treatment and control than would a facility that meets the criteria set forth in 6.A.1., 6.A.2., and 6.A.3., above.

For CSOs into waters of the state where pollutants other than E. coli may be causing water quality problems, CSO communities must also evaluate, as part of the alternatives evaluation, the effectiveness of any CSO Treatment Facility alternative in treating those additional pollutants of concern.

**6.B. Other Assumptions and Criteria to Use in Evaluating a CSO Treatment Facility**

The following assumptions and design criteria should be applied when considering inclusion of a CSO Treatment Facility in the alternatives analysis in accordance with this NPD:

1. The 10 Year, One Hour Storm and the One Year, One Hour Storm should be defined in either of the following:
  - a. Bulletin 71, Rainfall Frequency Atlas of the Midwest, which can be found at: [www.sws.uiuc.edu/pubdoc/B/ISWSB-71.pdf](http://www.sws.uiuc.edu/pubdoc/B/ISWSB-71.pdf). The Huff Climatic Regions for Indiana map should be used.
  - b. The HERPICC Storm Water Drainage Manual, July 1995, which can be found on the Purdue University website: <http://www.ecn.purdue.edu/INLTAP/Publications/documents/Stormwater%20Drainage%20manual.pdf>.
2. Rainfall should be assumed to be of uniform intensity and distribution over the entire service area for a duration of exactly one hour. Zero rainfall shall be assumed both before and after the one hour rainfall event.
3. Antecedent conditions should be assumed to be average warm weather conditions.
4. Retention/CSO Treatment Facilities should be sized based on case-specific sewer system response to the two theoretical design storms described in 6.B.1. above. All Primary treatment facilities should be sized for no less than 30 minutes detention time for solids removal and disinfection at no less than the "10 Year, One Hour Storm", and retention of all flow for ultimate transport to the WWTP at no less than the "One Year, One Hour Storm". Where 'equivalent' facilities are proposed, both criteria would be considered.
5. Detention time for solids removal and disinfection should be calculated on the basis of maximum hourly flow.
6. Sewer system response should be estimated using data and appropriate engineering models (SWMM, etc.). Actual characterization data should be used in lieu of strictly model default data. Time of Concentration should not be assumed to be one hour just because the "One Hour" storm is used as a definition.
7. Retention/CSO Treatment Facilities should be configured to optimize solids removal and disinfection.
8. Dewatering times should be less than 48 hours from the time when rainfall ceases. All combined sewage retained in the facility should be transported to the WWTP and receive full treatment at the WWTP, regardless of storm size. Dewatering while a bypass is in progress should not be considered.
9. Disinfection should be controlled to achieve the daily maximum E. coli concentration of 235/100 ml. If disinfection is carried out using chlorine or hypochlorite, dechlorination must be employed to meet a maximum TRC of .06 mg/l.

10. Combined sewage Facilities should be designed and operated to meet an appropriate level of TSS control to ensure effective disinfection.

11. The CSO community should evaluate how any CSO Treatment Facility alternative developed in accordance with this document would perform over the course of a "typical year". This will assist in evaluating the costs, benefits, and effectiveness of such an alternative compared to the other alternatives that are being considered.

### **6.C. Treatment Flows in Excess of the 10 Year, One Hour Storm**

Combined sewage flows in excess of the design storm used for sizing of the CSO Treatment Facility should receive whatever treatment is feasible, given capacity limitations at the CSO Treatment Facility and at the WWTP.

Since most storm and combined sewers are designed to handle the 10 year storm without surcharging, this will probably mean that flows greater than those generated by the "10 Year, One Hour Storm" should be transported to the CSO Treatment Facility, but the degree of treatment may need to be less than 30 minutes detention. The important point here is that no untreated overflows should occur from a CSO Treatment Facility. No untreated overflows means that pump stations should be provided with firm pump capacity to handle all flows transported by the existing collection system, even when it may be more than the 10 year storm flow.

### **6.D. Permitting CSO Treatment Facilities**

If an alternative including a CSO Treatment Facility is ultimately selected as part of the LTCP that is ultimately approved by IDEM, discharges from CSO Treatment Facilities will require effluent grab sampling. Effluent limits shall be imposed for E. coli and monitoring may be required for flow, biochemical oxygen demand (BOD), total suspended solids (TSS), Ammonia Nitrogen (as N), Total Phosphorus (as P), pH, dissolved oxygen (DO), and total residual chlorine (TRC), if applicable. Metals monitoring may also be required on a case-by-case basis.

## **6.E. APPENDICES**

### **6.E.1. ENFORCEMENT DISCRETION LANGUAGE**

The City/Town of \_\_\_\_\_'s approved CSOOP, LTCP, and NPDES permit outline the wet weather operating procedures and design capabilities of the WWTP and CSO Treatment Facility. All CSO Treatment Facility wet weather discharges shall receive the specified treatment to the extent possible. In conditions where wet weather discharges from the CSO Treatment Facility result from a storm event, rainfall amount, or intensity which exceed the design capacity of the facility, the permittee shall provide documentation that all conditions and requirements expressed in its NPDES permit, including Attachment A, were achieved. All documentation regarding performance of the WWTP and CSO Treatment Facility during storm events identified above would be reviewable by IDEM with exercise of enforcement discretion for CSO Treatment Facility discharges accorded to it under [IC 13-30](#) for these storm events.

### **6.E.2. SAMPLING PROTOCOL BASIN DISCHARGE SAMPLING**

The goal of the effluent monitoring program is to collect at least three samples during each discharge event to obtain a representative sample of the discharge, and the samples should be collected at shorter intervals at the onset of the event if the permittee estimates that the event duration may be less than six hours.

Effluent sampling and analyses for all parameters other than E. coli for the discharge from the CSO Treatment Facility should be a flow proportioned composite sample collected by an automatic sampler or by a series of grab samples collected and composited in proportion to the flow, for the duration of a discharge, for each 24-hour period. Sample collection, either by automatic sampler or by grab samples should be initiated within 30 minutes from the beginning of a discharge and should be collected no less frequently than every three hours during the period of discharge, unless the permittee estimates that the event duration could be less than six hours, at which time the sampling interval should be adjusted to every two hours. The maximum daily concentration is the analytical result from the composite sample for each 24-hour period. The average of the maximum daily concentrations is to be reported as the monthly average concentration.

A grab sample collected within 30 minutes from the beginning of the discharge is to be analyzed and the result reported as the daily maximum for E. coli. If more than two grab samples are collected during a discharge period, the daily maximum should be reported as the geometric mean of all samples analyzed during the discharge period (up to 24-hours). The E. coli monthly average shall be the geometric mean of all samples collected during the month, provided that five or more samples are collected.

For purposes of reporting on a discharge event that lasts less than 24 hours but occurs during two calendar days,

the pollutant concentrations for the event shall be reported as daily values on the day when the majority of the discharge occurred.

## 7. REFERENCES

## 8. SIGNATURES

\_\_\_\_\_  
Thomas W. Easterly, Commissioner,  
Indiana Department of Environmental Management

\_\_\_\_\_  
Date

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Bruno Pigott, Assistant Commissioner,  
Office of Water Quality

\_\_\_\_\_  
Date

\_\_\_\_\_  
Robert Keene, Assistant Commissioner,  
Office of Legal Counsel

\_\_\_\_\_  
Date

This policy is consistent with Agency requirements.

\_\_\_\_\_  
Indiana Department of Environmental Management  
Quality Assurance Program  
Planning and Assessment

\_\_\_\_\_  
Date

<sup>1</sup> For technical information concerning one type of CSO treatment basin, see Michigan Combined Sewer Overflow Control Manual, September 26, 1994 and <http://www.rougeriver.com/>.

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An [html](#) version of this document.