Equalization Basin Sizing and Design Considerations

Presented by
David J. Delia, P.E.
AECOM Water Engineer
Overview

• Cost Effective Sizing
• Operational Options
• Design Features
Cost Effective?

STORAGE AND/OR TREATMENT

I/I ELIMINATION
Sanitary Sewer Evaluation Study (SSES)

SMOKE TESTING  DYE TESTING

FLOW MONITORING  TV & CLEANING

STRESS TESTING
Two Approaches

Approach 1

Approach 2
Cost per Gallon

Equivalent Annual Cost (EAC)

Gallon of I/I Removed
Finding the Benchmark Flow Rate
Finding the Benchmark Flow Rate
Finding the Benchmark Flow Rate

City of Monroe
Monroe, Michigan
Incorporated in 1837

Storm Factor

Treatment

Effectiveness %
“Sum of RDII Source Correction Efforts Multiplied by Unit Reduction Rates” Method
Benchmark Flow Rate

29.61 gpm

0.025 – 0.55 gpm/ft (based on diameter)

4.73 gpm
Calculation of Cost Effective Removal Potential

\[ \sum \frac{I}{I} \]

- Clean outs
- Sewers
- Manholes
- Direct Connections (Downspouts, Catch Basins)
Cost Effective?

STORAGE AND/OR TREATMENT

I/I ELIMINATION
Treat or Store?

Approach 1

Approach 2
Estimated MG of I/I Removed

Cumulative Present Worth of I/I Removal
Present Worth of R/R vs. Estimated I/I Removal with Detention Basins

Cost Effective Removal 13.7 MG
Flow Analysis for Monroe WWTP

Q (MGD)

* Area under graph does not equal the required storage volume, but represents the change in capacity to achieve a 10-year return period.
Log Pearson III
Flow Analysis for Monroe WWTP

* Area under graph does not equal the required storage volume, but represents the change in capacity to achieve a 10-year return period.
Flow (MGD) vs. Hours

Volume between the blue line and the plant capacity = 14 MG

Volume between the green line and the plant capacity = 7.0 MG
Design Features

Throttling Valves > VFDs
Flushing Gates
Trench Type Wet Well Design

S.S. Baffle Refer to Detail P-17
12" Long Rad. Elbow
S.S. Flow Splitter See Detail Sheet P-17

Wet Well Sluice Gate

Pressure Relief Supply

LWL ELEV. 565.58

Vane Cone to be Provided by Pump manufacture

Full Penetration

Fill Grout

½" S.S. Plate

½"x3"x8" S.S.

½"x8" S.S. Stud

REVISED THIRD EDITION

Pumping Station Design

Editor-in-Chief
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GEORGE TCHOBANOGLOUS
BAYARD E. BOSERMAN II
Water Cannons, Smooth Walls, Mixer Aerator, & Fiberglass Stairs
Commissioning Day
Lessons Learned

• Take the lid off
• Gravity flow
• Pump selection
• Inside stairs
Questions?
Riddle

Question: You have been given the task of transporting 3,000 apples 1,000 miles from Appleland to Bananaville. Your truck can carry 1,000 apples at a time. Every time you travel a mile towards Bananaville you must pay a tax of 1 apple but you pay nothing when going in the other direction (towards Appleland).