Varied Approaches to Wet Weather SSO & CSO Challenges

Ohio Water Environment Association
Collection Systems Specialty Workshop

May 17, 2018
Two Ohio River Drainage Sewer Utilities
• Village of New Boston
• City of Portsmouth
Village of New Boston, Ohio
Ohio River CSO Community
Population: 2,775
MHI: $14,745
Poverty Level: 45%
Location

Village of New Boston
Sewer System

Village of New Boston
CSO Structures

Village of New Boston
Wastewater Treatment Feasibility Study

- Concluded that constructing a New Boston WWTP resulted in substantial rate increases to users
- Recommended Village renegotiate agreement with Portsmouth for wastewater treatment at Lawson Run WWTP (expires in 2021)
CSO Abatement Facilities Plan

- Authored in July 2015
- Outlines eight phases of work required to separate the Village’s sewer system (not all construction)
CSO Improvements Phase 1

Village of New Boston
West Avenue Cleaning and Televising Work

Village of New Boston
## CSO Improvements Cost Summary

<table>
<thead>
<tr>
<th>Phase</th>
<th>Cost</th>
<th>Grant (Principal Forgiveness and USACOE)</th>
<th>Loan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$3,217,216</td>
<td>$2,000,000</td>
<td>$1,217,216</td>
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<tr>
<td>2</td>
<td>$708,235</td>
<td>$323,409</td>
<td>$384,825</td>
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<tr>
<td>3</td>
<td>$1,283,334</td>
<td>$1,558,000</td>
<td>$0</td>
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<tr>
<td>4</td>
<td>$968,192</td>
<td>$719,000</td>
<td>$249,192</td>
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<tr>
<td>5</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>6</td>
<td>$1,627,000</td>
<td>$1,627,000</td>
<td>$0</td>
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<tr>
<td>7</td>
<td>$1,920,000</td>
<td>$1,920,000</td>
<td>$0</td>
</tr>
<tr>
<td>Total</td>
<td>$9,723,977</td>
<td>$8,147,409</td>
<td>$1,851,233</td>
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</tbody>
</table>

Village of New Boston
• Village encumbered approximately $97,000 in annual loan payments for Phases 1 through 4 of CSO work.

• Annual Average Sewer Rate - $307 (>2% of MHI)
  • Portsmouth may be forced to raise rates
  • New Boston raised rates an average of $6/month during Phase 1
  • New Boston may need to raise rates for future phases

Village of New Boston
Portsmouth
## Portsmouth Residential Customer Demographics

<table>
<thead>
<tr>
<th></th>
<th>Portsmouth</th>
<th>New Boston</th>
<th>Ohio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customers</td>
<td>6722</td>
<td>809</td>
<td></td>
</tr>
<tr>
<td>MHI*</td>
<td>$30,144</td>
<td>$14,745</td>
<td>$48,849</td>
</tr>
<tr>
<td>% Poverty</td>
<td>32.3%</td>
<td>45%</td>
<td>15.8%</td>
</tr>
</tbody>
</table>

*Disparaged Neighborhood Area Income Surveys not accounted for (East End)
Financial Indicators

• Challenges
  o Sewer Rates Recently Raised
  o **Exceptionally** High Utility Bill Delinquency
  o $1+Million Sewer Utility Deficit
  o State Fiscal Watch
    o Greater than one month behind (in deficit) accounts
  o Area Unemployment Twice State Rate June, 2016
  o USEPA Financial Capability Indicator: WEAK
Portsmouth Service Area, Boundaries

...and WWTP’s
Portsmouth System Overview

- Collection and Conveyance System
  - CSO’s – 10
  - Combined Sewers – 171,000 LF
  - Sanitary Sewer – 356,000 LF
  - Sewer Type Unlisted – 30,000 LF
  - Force Mains – 7,300 LF
  - Sewer Pumping Stations – 17
  - Flood Defense Pumping Stations

From 50,000 People in the 1950’s with large industries…
To present day with 20,000 people and no industry.
Portsmouth System History and Overview

- City of Portsmouth, 1819
Portsmouth Focus Areas

• Challenges: Grandview Avenue Area
  • TWO SEPARATE ISSUES
    • Basement flooding
      » Downspouts Tied Directly into Sanitary Laterals and Sanitary Sewer
    • Surface flooding
      » Only occurs during severe rain events
System History and Overview

• Challenges
  • Basement Flooding in Grandview Avenue Area
    • January 2000 (8 residences)
    • May 2001 (3 residences)
    • May 2004 (12 residences)
    • August 2005 (1 residence)
    • July 2011 (2 residences)
System History and Overview

- Challenges
  - Surface Flooding in Grandview Avenue Area
    - June 2008
    - March 1997
LRTS Operation and Telemetry

- Grandview Ave. Neighborhood Elev. 560’
- East End Neighborhood Elev. 525
- Lawson Run WWTP Overflow Gate Elev. 505’

Lawson Run Tunnel Sewer
System History and Overview

• **EPA Compliance**
  - 2006 LTCP Submitted
  - 2009 LTCP Alternatives Costs Updated and Resubmitted
  - 2010 (January) Mayor Jane Murray Takes Office Fires, Water and Sewer Operators Leaving City Out of Operation Compliance
  - 2010 (October) Murray Submitted LTCP, Approved by USEPA
  - 2010 (December) Mayor Jane Murray Recalled
  - **2011 City and USEPA Deem Plan Unaffordable and Did Not Address Basement Backups, 24/7 Needs, SSO’s**
  - 2013 AOC Executed
  - 2013-Present City has Met All AOC Deadlines and Requirements
Negotiated Regulatory Priorities

- Focus on Items that Directly Impact Health and Safety
  - Basement Backups
  - Overland/Unauthorized CSO Releases
  - SSO’s
  - 24/7 WWTP Operations
  - System Maintenance and Operation
  - Wet Weather CSO Mitigation
Negotiated Regulatory Priorities

- Administrative Order on Consent (AOC) Components
  - Overflow Emergency Response Plan
  - Management, Operation, and Maintenance (MOM) Plan
    - Capacity not included
  - Overland/Unauthorized CSO Releases
  - Munns Run SSO
  - Grandview Avenue Area Projects
    - Downspouts
    - Separation
    - Storage
  - LRTS Sewer Separation Feasibility
AOC Projects

- 563 Acre Drainage Basin
AOC Projects – Grandview Avenue Area

- LRTS Tributary Sewers Separated North of 23rd Street
  - Eliminates Overland CS Flooding
    - Flooding Occurring North of 23rd Street is now Storm Flows
- Underground Storage Constructed at Available Space to Maximize $/Gallon Stored, Not Based on Design Storm
- Detention Basin Constructed to Help Reduce Peaking Factor into LRTS
AOC Projects – Grandview Avenue Area

Separation
AOC Projects – Grandview Avenue Area

Surface Detention
AOC Projects – Grandview Avenue Area

Underground Storage
Excellence in Engineering Since 1946