

CASE STUDY

An Affordable Wastewater Collection and Treatment Solution for Municipalities

AMESVILLE, OHIO

Low-Cost Treatment System Meets Strict NPDES Limits

Problem

Amesville — a rural, low-income Ohio village of fewer than 200 people — was discharging thousands of gallons of partially-treated sewage into its watershed because of failing onsite systems.

Solution

Amesville installed an Orenco Effluent Sewer with three cluster AdvanTex® Treatment Systems because of the system's affordable capital costs and low operating costs. This decentralized wastewater system — the first in Ohio — is now meeting strict NPDES discharge requirements of 10/12/1 (BOD₅, TSS, NH₃-N).

The village of Amesville, Ohio, had a significant pollution problem. Nearly half its properties were served by questionable septic systems or failing aerobic treatment units. As a result, untreated or partially treated sewage was finding its way into the village's storm sewer system. Village staff estimated that, on average, more than 17,000 gallons of untreated or under-treated wastewater was discharged to the storm sewer every day. A watershed group performed water quality testing on nearby Federal Creek, and three out of four sampling points tested positive for fecal coliform.

Although the need for new wastewater infrastructure was evident, the Village couldn't afford a conventional solution. Half the residents had low-to-moderate income, and the median household income was \$35,000. The village desperately sought an affordable solution.

In August 2004, the village selected ADR & Associates (Newark, Ohio) to prepare a soil and landscape analysis, preliminary engineering report, facility plan, and management plan.

By January of 2005, soil analyses showed that most lots were unsuitable for traditional septic systems. Consequently, ADR focused on village-wide collection and treatment solutions, rather than on-site upgrades.

Although several technologies were evaluated, three were reviewed in detail: conventional gravity, individual on-site treatment units, and cluster decentralized options. Capital and O&M cost estimates for the various options are summarized below:

Technology / Solution	Capital Cost	20 Year O&M
Conventional Solution	\$1,770,232.00	\$755,419.00
Individual On-site Treatment	\$1,402,888.00	\$950,139.00
Preferred Decentralized Option	\$1,188,332.00	\$291,844.00

Municipal Market

Project Overview

AMESVILLE, OHIO



Design Parameters

- 184 people (2000 census)
- 71 residences
- 5 businesses

Installation Date

- November 2007

Residential Rate

- \$32.74 / month

Funding Sources

- Ohio Water Development Authority
- Ohio Environment Infrastructure Grant
- Ohio Department of Development (CDBG)
- Ohio Environmental Protection Agency Loan

Primary Treatment

- STEG collection including numerous 1,500 to 5,000 gallon clustered septic tanks fitted with effluent filters

Secondary Treatment

- 14 AX100s (three sites)
- TCOM® telemetry control panel

Dispersal

- Surface discharge with NPDES permit

Operation

- One part-time operator

AdvanTex Effluent Quality

- < 10 mg/L BOD₅
- < 12 mg/L TSS
- < 1 mg/L NH₃-N

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AMESVILLE, OHIO

**Municipal
Market**

Funding was secured through the Ohio Water Development Authority, an Ohio Environment Infrastructure Grant, the Ohio Department of Development (CDBG), and an Ohio Environmental Protection Agency loan. Because of the loans and grants, residential rates are a very affordable \$32.74/month.

Amesville is now served by a septic tank effluent gravity (STEG) collection system in which clusters of homes and businesses are served by collection tanks equipped with effluent filters. Effluent flows from the tanks to three commercial AdvanTex® Treatment Systems using a total of 14 AX100 units. Following secondary treatment, the effluent undergoes UV disinfection and is discharged to Federal Creek or Zarley Run under an NPDES discharge permit. Two of the treatment systems discharge their effluent to the streams via the storm sewer system. All the systems were installed by TAM Construction (Lancaster, Ohio).

The community selected a management approach that followed the EPA's Level 5 RME (Responsible Management Entity) guidelines, with the Village owning and operating the infrastructure. Amesville is now the first village in Ohio to use a publicly owned and operated decentralized wastewater system. Amesville also received Ohio EPA's first single discharge permit for multiple small treatment systems with independent discharge outfalls.

Two village residents with no previous wastewater experience were recruited as operators of the system and trained to Class A certification. With minimal operator input, the AdvanTex treatment process consistently produces less than 10/12 mg/L BOD₅/TSS. Moreover, AdvanTex's stable biological nitrification process routinely meets the strict ammonia discharge limits of 1 mg/L NH₃-N.

For more information about Orenco Effluent Sewers and AdvanTex® Treatment Systems, contact Orenco Systems®, Inc., at 800-348-9843.



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