

RCAP Assistance and Small Community Wastewater Challenges

OWEA Conference
Columbus, Ohio
June 15, 2010

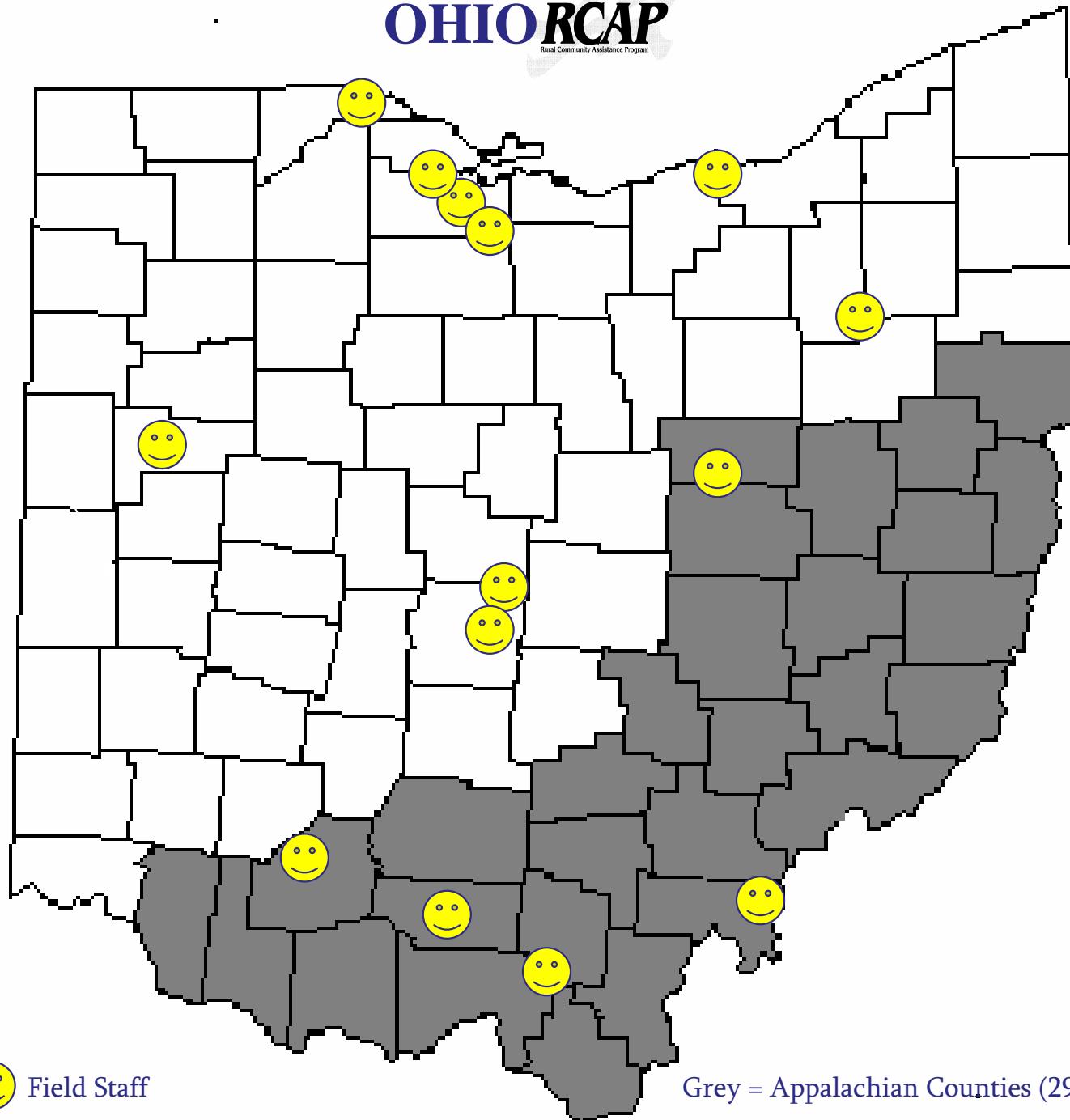


RCAP- Rural Community Assistance Partnership

- A national, non-profit organization incorporated in 1972 that provides technical assistance to help solve water and wastewater problems
- Field staff in all 50 states and Puerto Rico
- Six regions (Great Lakes, Northeast, Southeast, Southern, Midwest, and Western)
- Ohio is one of seven states that make up the Great Lakes RCAP region
- Funding for Ohio RCAP comes from Ohio EPA, Federal EPA, USDA and Department of Health and Human Services
- RCAP services are provided free of charge to communities or community projects that serve a population of 10,000 or less

OHIO RCAP

Rural Community Assistance Program



Ohio RCAP Services

- Program Planning
- Facility Development
- Operation and Maintenance
- Management and Finance
- Source Water/Wellhead Protection Planning

Program Planning

(Initial concern to design phase)

- Assess available financing resources
- Review plans for appropriate content for funding agency requirements
- Provide information on alternative systems
- Conduct income surveys
- Conduct community wide surveys on environmental issues
- Assist in procuring other professional services
- Coordination/facilitation among funders, regulators, consultants, community
- Write grant/loan applications for funding of planning
- Prepare environmental reports *

Services are provided at no cost unless indicated by *

Facility Development

(from the design phase onward)

- Coordination/facilitation among funders, regulators, consultants, community
- Assist in procuring other professional services
- Write grant/loan applications for funding
- Conduct appropriate public hearing and meetings
- Maintain file depository for all required project records
- Package financing for project
- Administration of grants *



Services are provided at no cost unless indicated by *

Operation and Maintenance

(after construction and during operation)

- Assist in meeting NPDES requirements
- Coordination/facilitation among funders, regulators, consultants, community
- Developing and implementing compliance action plans
- Developing system policies and procedures
- Assist in procuring other professional services

Services are provided at no cost unless indicated by *



Management and Finance

(financial management of the system)

- Perform rate studies
- Assist in procuring other professional services
- Completing financial reports to funder
- Assist with bookkeeping and accounting
- Coordination/facilitation among funders, regulators, consultants, community

Services are provided at no cost unless indicated by *



Source Water Protection Planning *

- Complete Potential Contaminant Source Inventory (PCSI)
- Assist and train community volunteers to complete PCSI
- Facilitate/coordinate WP planning stake holder's committee
- Assist in development/delivery of public involvement strategies
- Prepare public education materials
- Present public education information
- Complete the management plan
- Coordinate activities with OEPA, consultants, community, funders
- Assist in procuring other professional services



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Acquiring Funding For Projects

Ohio RCAP specializes in helping communities obtain financing for water and wastewater projects. The list below reveals the amount of funds Ohio RCAP has obtained for communities from 1998-2007.

<u>Program Year</u>	<u>Amount</u>
1998-1999	\$42,129,824
1999-2000	\$17,612,957
2000-2001	\$18,432,637
2001-2002	\$31,791,170
2002-2003	\$28,368,299
2003-2004	\$43,010,103
2004-2005	\$29,867,053
2005-2006	\$66,574,789
2006-2007	\$70,712,367

Ohio RCAP has led the nation in leveraged funds since 2001.

Wastewater Problems In Small Communities

- Septic system failures
- Drinking water well contamination
- Recreational water quality impairments
- Aesthetic (odor, mosquitoes, etc)
- Water quantity shortages



Small Community Wastewater Challenges

- #1 The EPA is focusing on smaller and smaller communities
- #2 Existing unsewered communities are difficult ones
- #3 Financial issues



Challenge #1

- EPA is focusing on smaller communities and unincorporated areas
 - Small number of customers to spread debt and operation/maintenance costs over
 - \$30,000 annual operating cost for 100 customers equals \$25 per month before debt
 - Debt typically is same amount or more, so \$50 per month

Challenge #2

- Easy communities have been sewerered
 - Unsewered communities cannot regionalize because of distance
 - Unsewered communities are located in floodplain or have difficult terrain
 - Unsewered communities are in no-growth areas, therefore no potential for future customers to help pay the bill

Challenge #3

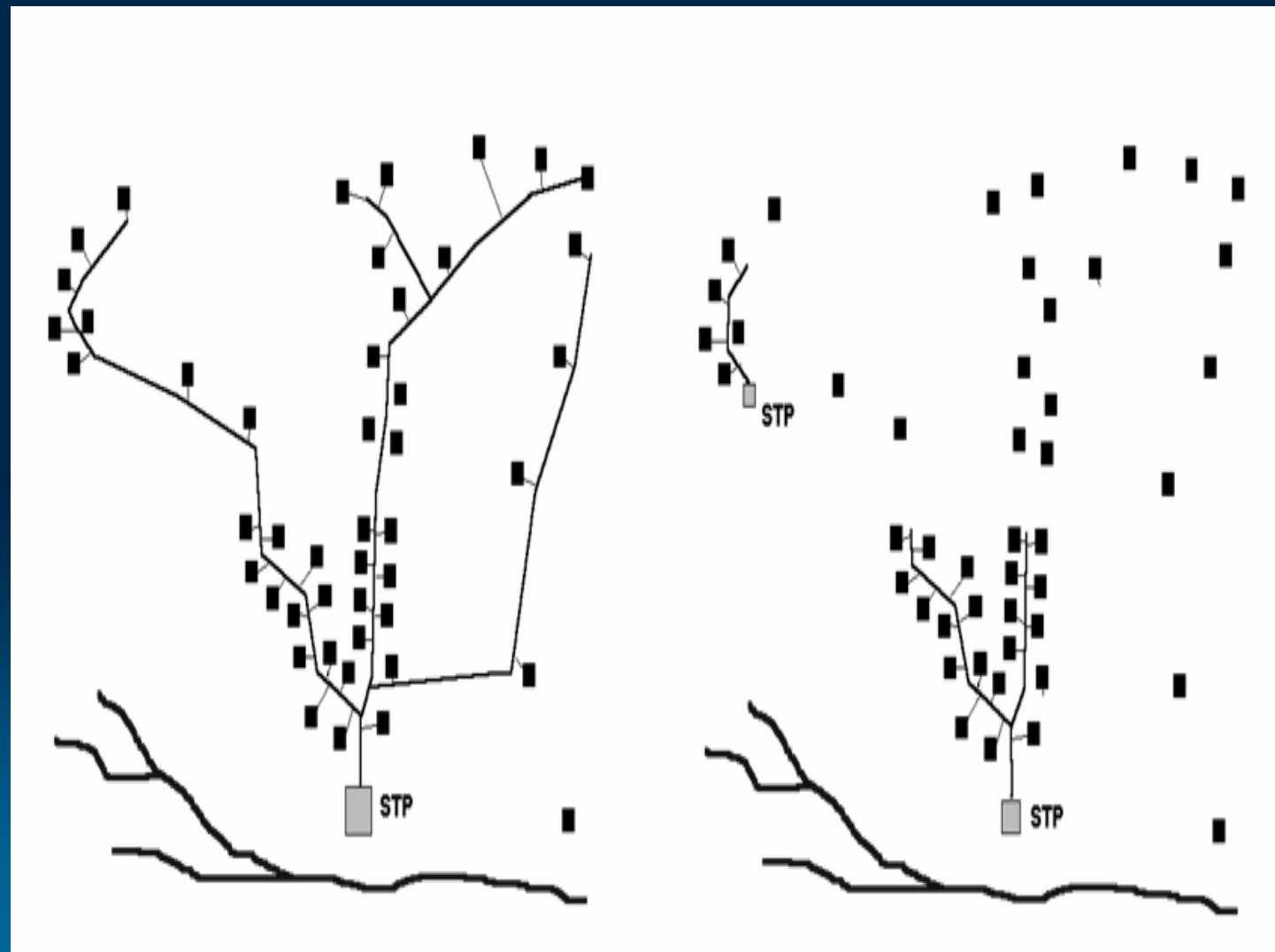
➤ Financial issues

- No grants if customers will not pay their fair share
- What are customers willing to pay?
- How much (capital and operational costs) would a conventional solution cost?
- What would one or more decentralized solutions cost?
- What funding is available in grants and loans?
- How will customers pay (user fees, startup assessments, etc) -- tax assessments favored because collection is easier

Centralized Versus Decentralized

Centralized

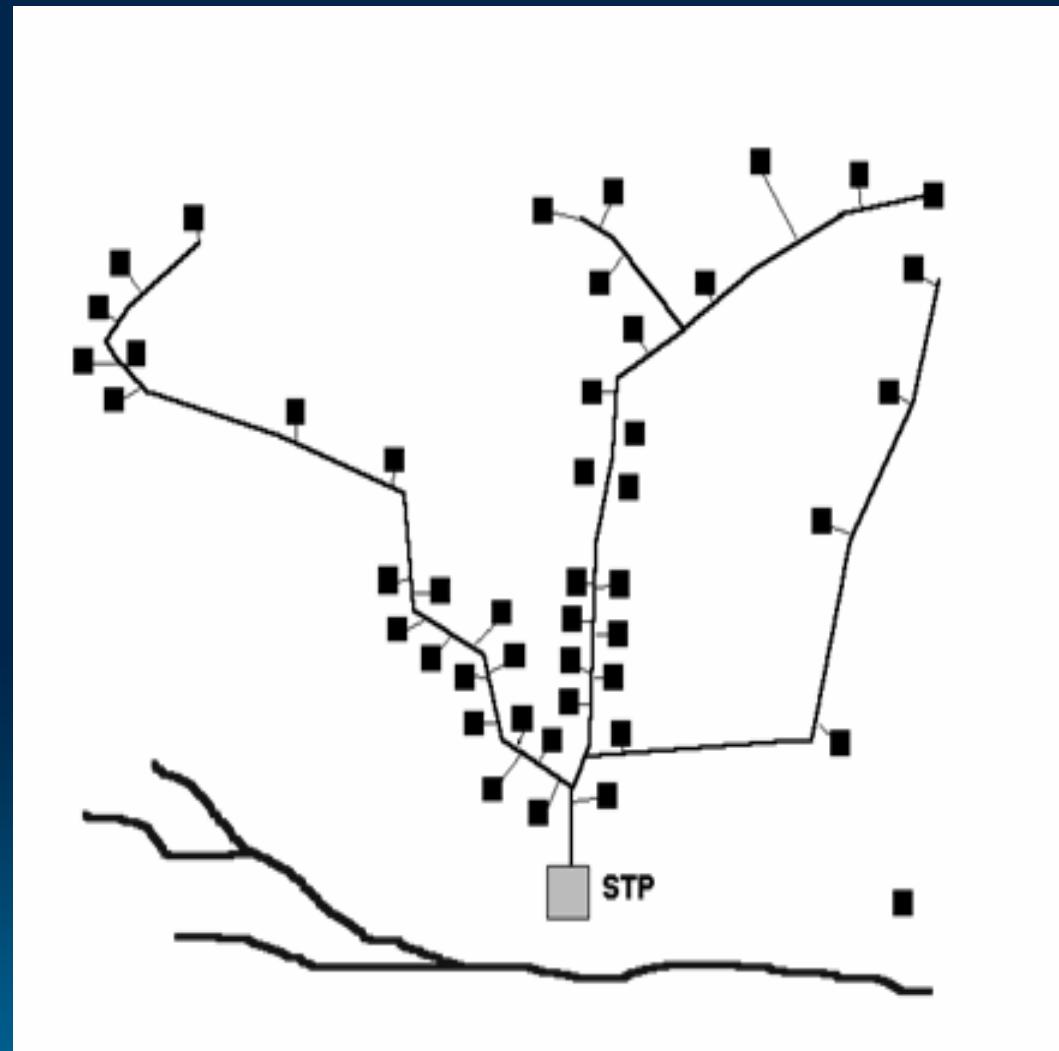
Decentralized



Centralized Sewer

- One collector sewer moving wastewater to single treatment plant that discharges into receiving stream
- Conventional gravity sewers that require regular manholes and frequent lift stations
- Generally employs complex activated sludge treatment
- This approach is very expensive (capital and operating costs), can upset basin water balances, and creates ill will among affected residents with functioning onsite systems

Centralized Sewer



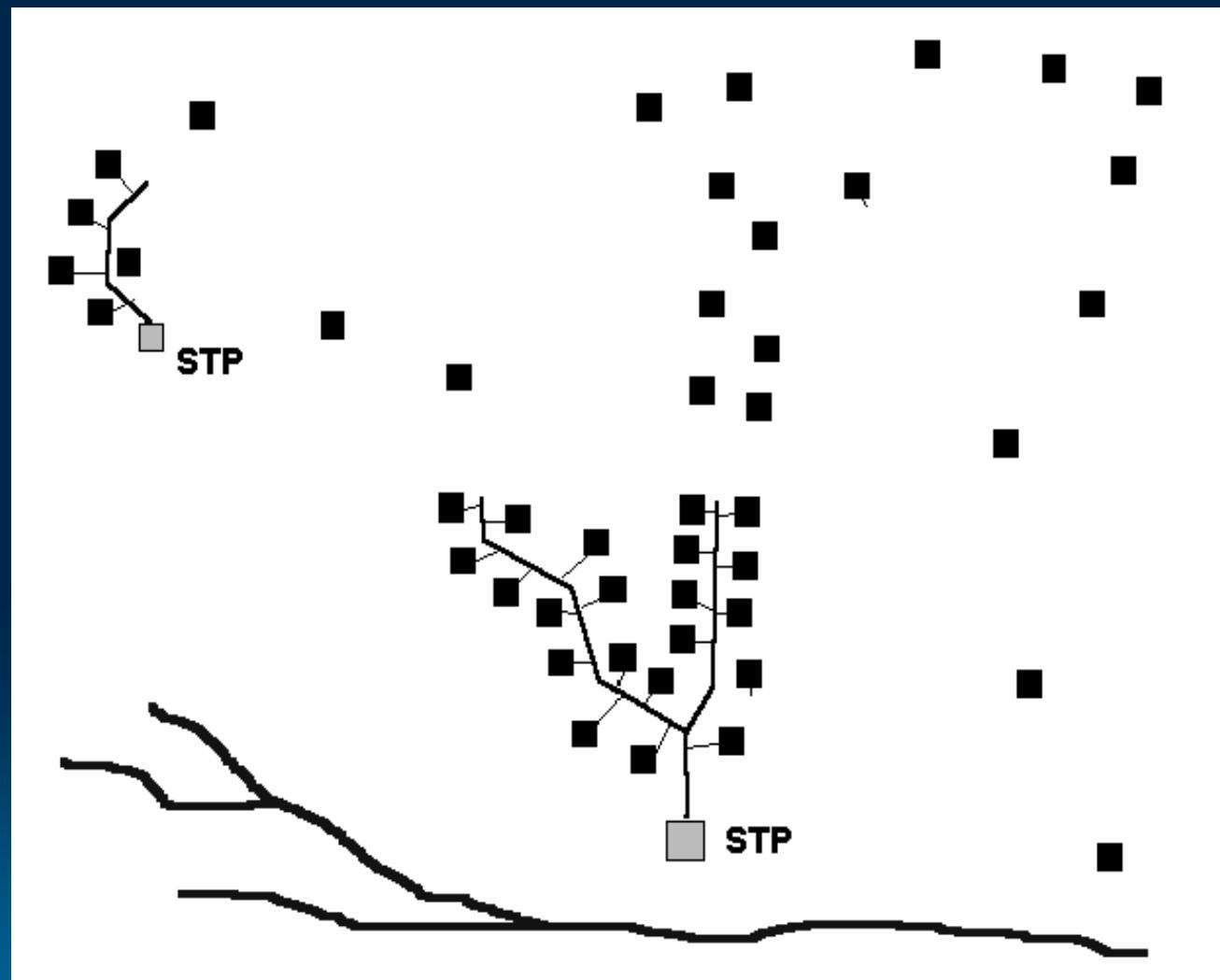
Sample Project Costs- Centralized Sewer Projects

SAMPLE PROJECT COSTS										
EDU	Type	Cost	Cost/EDU	OMR	OMR/EDU	Grant	Loan	Total	Monthly Rate	
86	CP	\$ 1,770,232	\$ 20,584	\$ 31,100	\$ 362	\$ 1,099,999	\$ 670,233	\$ 1,770,232	\$ 62.61	
113	CF	\$ 2,042,389	\$ 18,074	\$ 36,612	\$ 324	\$ 1,461,955	\$ 580,434	\$ 2,042,389	\$ 51.43	
123	CP	\$ 2,200,000	\$ 17,886	\$ 30,000	\$ 244	\$ 1,460,000	\$ 740,000	\$ 2,200,000	\$ 51.65	
146	CP	\$ 3,681,196	\$ 25,214	\$ 47,550	\$ 326	\$ 2,843,900	\$ 837,296	\$ 3,681,196	\$ 49.25	
167	CP	\$ 2,873,900	\$ 17,209	\$ 42,000	\$ 251	\$ 2,180,900	\$ 693,000	\$ 2,873,900	\$ 42.04	
200	CP	\$ 3,262,275	\$ 16,311	\$ 26,400	\$ 132	\$ 1,562,275	\$ 1,700,000	\$ 3,262,275	\$ 46.82	
220	CF	\$ 5,000,000	\$ 22,727	\$ 70,000	\$ 318	\$ 2,250,000	\$ 2,750,000	\$ 5,000,000	\$ 55.00	
229	CP	\$ 2,800,000	\$ 12,227	\$ 41,000	\$ 179	\$ 1,668,000	\$ 1,132,000	\$ 2,800,000	\$ 40.00	
232	CP	\$ 3,711,000	\$ 15,996	\$ 63,700	\$ 275	\$ 1,850,000	\$ 1,861,000	\$ 3,711,000	\$ 60.00	
239	CF	\$ 2,415,276	\$ 10,106	\$ 89,085	\$ 373	\$ 1,551,109	\$ 864,167	\$ 2,415,276	\$ 47.60	
264	CF	\$ 3,610,820	\$ 13,677	\$ 50,074	\$ 190	\$ 1,783,246	\$ 1,827,574	\$ 3,610,820	\$ 49.07	
300	CP	\$ 5,300,000	\$ 17,667	\$ 64,000	\$ 213	\$ 2,730,000	\$ 2,570,000	\$ 5,300,000	\$ 59.00	
375	CF	\$ 6,441,566	\$ 17,178	\$ 125,000	\$ 333	\$ 2,824,966	\$ 3,616,600	\$ 6,441,566	\$ 80.00	
378	CP	\$ 4,900,000	\$ 12,963	\$ 100,000	\$ 265	\$ 1,140,000	\$ 3,760,000	\$ 4,900,000	\$ 57.00	

Decentralized Sewer

- Existing onsite systems that work are generally salvaged
- Problem areas are addressed by either cluster systems or better onsite systems
- Soil dispersal and reuse opportunities are the highest priority (surface discharge is last)
- Cluster collection systems service only the problem areas, resulting in a number of more passive treatment facilities

Decentralized Sewer



Why Decentralized Sewer?

- Lower project costs
- Much lower operation/maintenance costs
- Less environmental impacts
- Easier to operate
- Cost-efficient method of solving water quality and quantity problems
- Requires an effective and sustainable management program
- Targets the biggest problem areas and minimizes infrastructure investment
- Employs the most passive technologies
- Maximizes soil dispersal and reuse opportunities (where possible)

Why Is Decentralized Good?

- Existing Communities – Solves wastewater and possibly other water quality problems with minimal investment
- Developers – Allows more (smaller) lots and greater open space which also serves as dispersal and/or reuse sites than would be allowed for individual septic system service, thus increasing profits/aesthetics
- Environment/watershed – Water stays near its source, and potential for catastrophic damage is reduced

Debunking Decentralized Rumors

- Decentralized does not always mean replacing septic tanks with new septic tanks
- Decentralized systems can meet EPA discharge requirements
- Decentralized systems can be permitted, you just need to work closely with EPA
- Decentralized systems are not a short-term solution, they will last as long as conventional systems if properly operated and maintained

Decentralized Examples

- Septic systems
- Fixed film/media filters
- Recirculating media filters
- Constructed wetlands
- Low pressure distribution
- Drip dispersal
- Cluster systems
- Small diameter effluent collection systems

Issues To Be Addressed Early In The Planning Process

- At the earliest point in planning a community sparkplug (person or organization) should be identified that all parties trust to lead what could be a multi-year process
- What will be the boundaries of the district? Do nearby jurisdictions have similar problems? Should they be included?
- What future goals should be established for the district
- Maximize the involvement of the local decision-makers and regulators in the process

Subsequent Issues To Be Addressed

Do land-use plans exist? Are they still viable?
Involve planners in process

- Are there suitable available lands for soil-based dispersal systems or treatment sites?
- Can an effective management program be implemented and is it affordable?
- When and for what tasks should professional assistance be retained?

RCAP Is Leading The Charge For Decentralized Projects In Ohio

- RCAP organized the Decentralized Wastewater Workgroup (DWWG)
- DWWG includes representatives from OEPA, Ohio Dept of Health, RCAP, and USDA
- Two projects have been completed
 - Amesville
 - Shenandoah

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Questions?



Alternative Wastewater System Case Studies

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DWWG

- Mission:

“Provide information, advice and education to build the capacity of existing small, rural communities and wastewater professionals in the pursuit of alternative wastewater solutions.”

Decentralized Wastewater Work Group (DWWG)

Goals

- Examine decentralized issues
- Promote decentralized alternatives
- Educate and disseminate information
- Facilitate and provide resources
- Work with Ohio EPA regarding permitting
- Develop pilot projects in Ohio

DWWG Continued

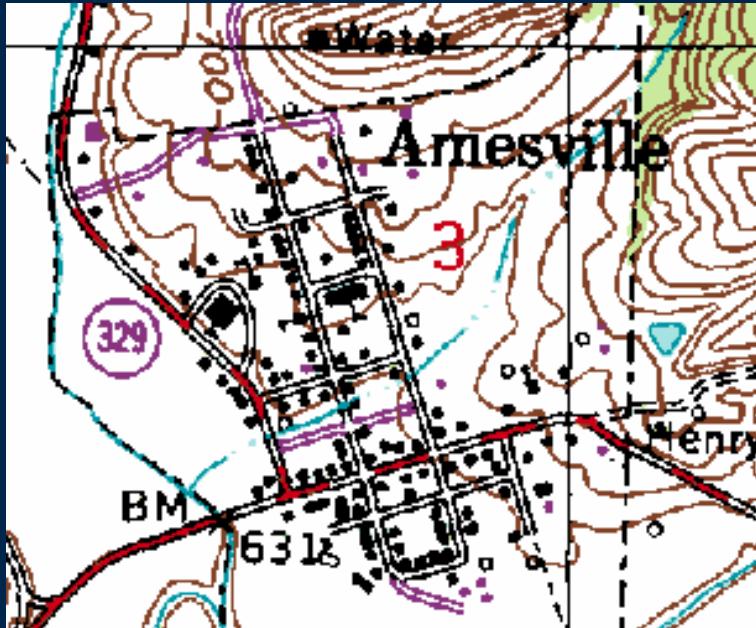
- Communities seeking assistance must be willing to:
 - Form a local stakeholder group
 - Conduct public meetings
 - Use the Qualifications Based Selection (QBS) process when hiring consultants
 - Engage regulatory contacts early to explore options and creative solutions
 - Commit to management and a sufficient fee structure for a sustainable solution

DWWG Continued

➤ Upcoming Trainings

- Planning for Engineers
 - Sponsored by OEPA
 - August 10, 2010 @OEPA NEDO
- Community Training
 - September 21, 2010 in Caldwell

Village of Amesville



*84 existing systems

*Approximately 17,785 gallons of potentially untreated sewage discharges from residential structures in Amesville each day

Problems

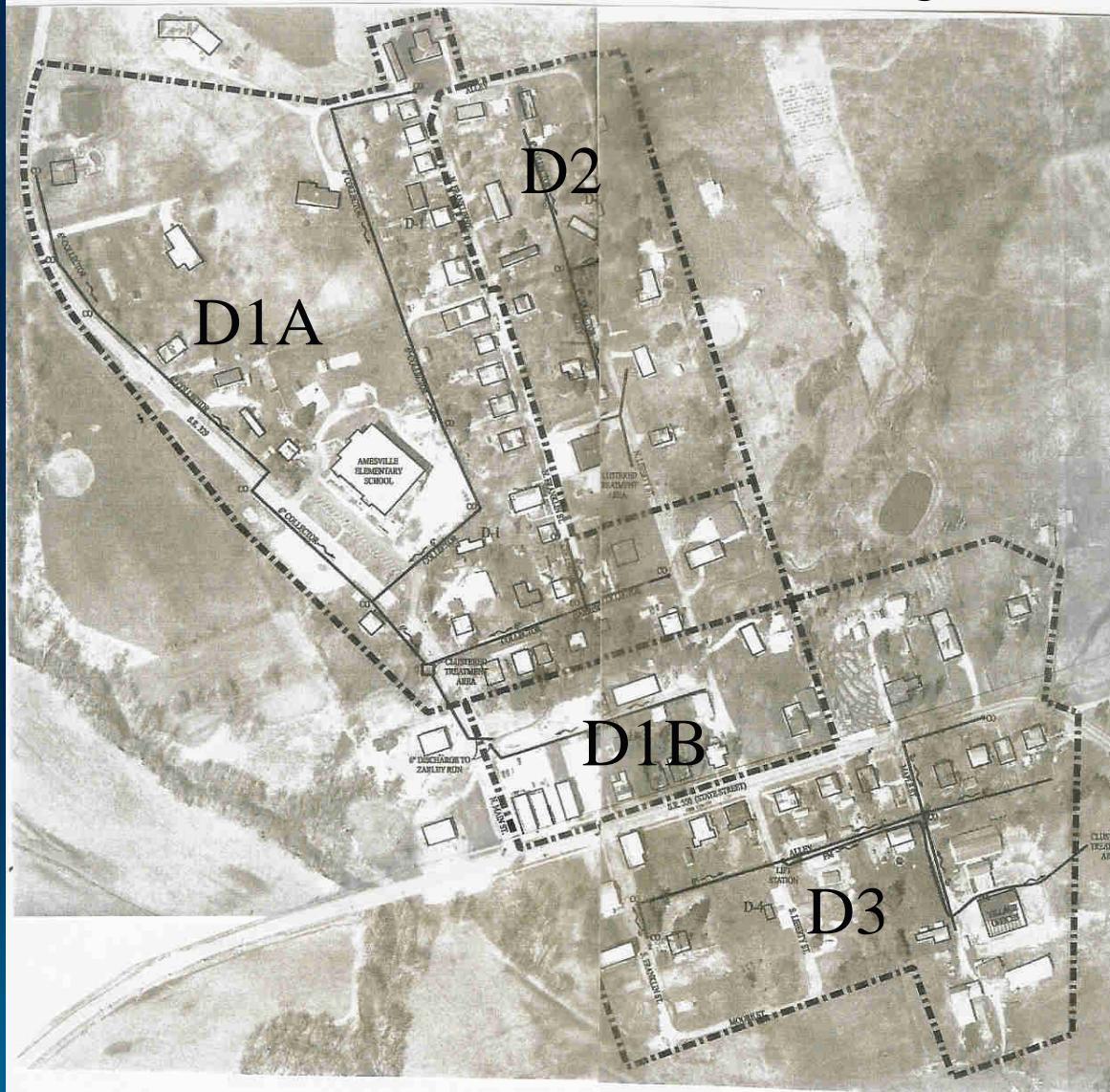
Poor soils
Small lot sizes
Inadequate/improper maintenance of onsite systems

Results

Odor
Opportunities for direct contact with sewage
Mosquitoes



Amesville Decentralized Wastewater Project



Rather than designing one large collection system, Amesville was divided into four drainage areas.

Each drainage area was numbered and called a district (Districts 1A, 1B, 2 and 3).



Amesville Decentralized Wastewater Project

- Small diameter gravity lines transport sewage from existing structures to septic tanks (individual and clustered)
- Septic tank effluent is transported by septic tank effluent gravity (STEG) collection lines and conventional force main lines to clustered AdvanTex® treatment units
- Treatment units discharge the final effluent to Federal Creek or Zarley Run



Amesville Decentralized Wastewater Project

- Two of four collection systems designed to use existing storm sewers to transport final effluent from the treatment units to streams
- This eliminates cost of constructing an effluent discharge line to the creeks from each clustered treatment system
- To accomplish this each clustered treatment site is located in close proximity to existing storm sewers
- Sampling is completed at the point where the effluent from the treatment unit enters the storm sewer

Treatment Systems in Amesville

- The AdvanTex® Treatment System is a recirculating packed bed filter that uses a highly absorbent engineered textile for the treatment media.



Amesville's Operator

- Sewer operator is current resident and former carpenter/horticulturist, she had no previous water/wastewater experience
- Backup operator is council member
- Both obtained their Class A Certification



Amesville - Project Costs

Item	Cost
Construction, Bond, Mobilization (Bid)	\$ 1,089,859
Contingency	\$ 13,491
Design & Survey	\$ 140,000
Construction Inspection/ Management	\$ 105,799
Additional Engineering	\$ 46,600
Fencing	\$ 25,000
Design Loan Fee	\$ 400
Startup Operator	\$ 11,700
CDBG Administration	\$ 10,000
Ohio EPA Permit-To-Install	\$ 5,513
Environmental Review Advertisements	\$ 400
AEP Electric Installation	\$ 1,640
Auditing Expenses (Federal Funds)	\$ 9,000
Low-Income Hookups	\$ 100,000
TOTAL PROJECT COST	\$ 1,549,303

Amesville - Annual Operating Costs

Item	Cost
Village Operator (\$15/hr x 5 hrs/wk)	\$ 4,000
Sampling & Monitoring	\$ 800
Energy Costs	\$ 1,200
Pump Replacement	\$ 785
Bulb Replacement	\$ 250
Septic Sludge Removal	\$ 4,800
Clerical, Office Equipment, Billing	\$ 2,000
Audit Fees	\$ 1,500
TOTAL OPERATING COSTS	\$ 15,355



Amesville - Monthly Sewer Rate

Annual Operating Costs	\$15,335
OPWC Loan Payment	\$ 4,500
<u>EPA Loan Payment</u>	<u>\$21,950</u>
Total Operating & Debt	\$41,785
Divided By	96 (EDUs)
Annual Cost/Customer	\$435.26
<u>Divided By</u>	<u>12 (months)</u>
Av. Mo. Cost/Customer	\$36.27
Actual Sewer Rate	\$40.00

Amesville - Comparison of Decentralized Versus Centralized

Alternative	Decentralized	Centralized
Total Cost	\$ 1,549,402	\$ 2,205,823
Total Operating Cost	\$ 15,335	\$ 33,100
Average Monthly Sewer Rate	\$ 40.00	\$ 84.98



Amesville - Keys To Success

- Established project team
- Showed impact of existing systems
- Conducted routine public meetings
- Worked closely with the Ohio EPA regarding permitting
- Excellent community leadership
- Selected the right engineer

Amesville - Significance of Project

- First existing, incorporated community in Ohio to use a decentralized wastewater system that is publicly owned and operated
- First time the Ohio EPA has issued an NPDES permit for multiple small treatment units with multiple discharge outfalls/locations
- The project will serve as a case study for other small communities where conventional centralized wastewater alternatives are not financially feasible
- Small communities across Ohio will be able to use the Amesville model

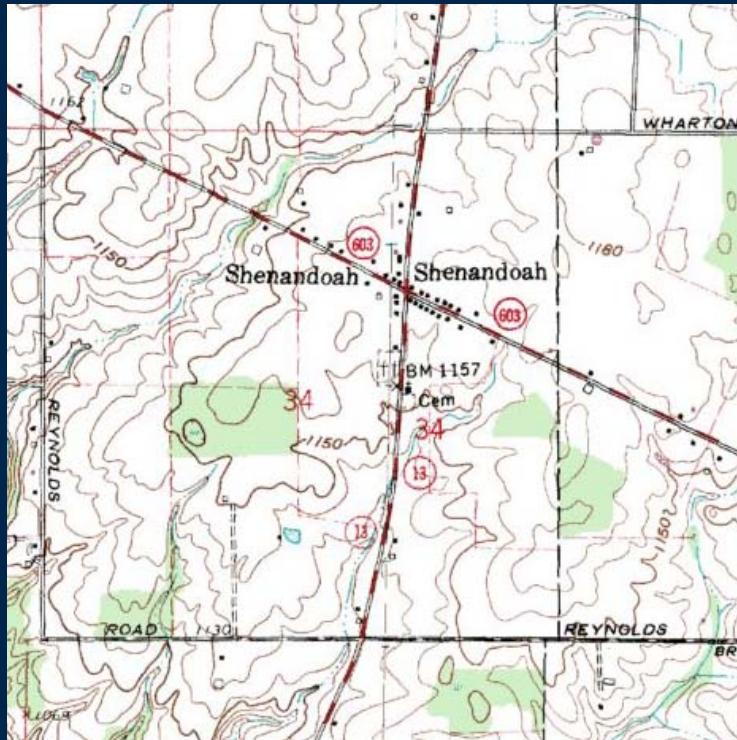
Amesville- How Is It Working?

- Operating very well
- Village is considering less dosing to treatment units to save energy since all samples have been well below EPA limits
- Operator pleased with simplicity, ease of operation, cost effectiveness

Amesville- End Result

- Project demonstrates that wastewater problems can be dealt with through unique but basic means where village officials as well as village residents are directly involved in decision-making, planning, and management of a publicly-owned and operated decentralized wastewater system

Village of Shenandoah



*39 existing systems

*Approximately 9,000 gallons of potentially untreated sewage discharges from residential structures in the Shenandoah each day

Problems

Poor soils
Small lot sizes
Inadequate/improper maintenance of onsite systems

Results

Odor
Opportunities for direct contact with sewage
Mosquitoes

Shenandoah Decentralized Wastewater Project



Rather than designing one large collection and treatment system in Shenandoah, the County installed on large cluster system to serve 33 residents and 6 individual systems.

Shenandoah Decentralized Wastewater Project

- A combination of conventional gravity sewer lines and grinder transport sewage from existing structures to a main settling tank site of the treatment units.
- Septic tank effluent is transported by septic tank effluent gravity (STEG) collection lines and conventional force main lines to clustered Pura-Flo Peat Biofilters
- Treatment units discharge the final effluent into sand mounds.

Treatment Systems in Shenandoah

- The Puraflo Wastewater Treatment System is a natural system for onsite and cluster systems that utilizes a unique biofibrous peat filter media for treatment



RCAP Resources

- Ten Tips To Help Communities Hire An Engineer
- Ten Tips To Help Communities Plan A Successful Water/Wastewater Project
- Financial Tools
- Board Training
- Decentralized Central website - Ohio's Source for Decentralized Wastewater Initiatives and Information!

Ten Tips to Help Communities Hire an Engineer

1. Define your project
2. Establish qualified selection committee
3. Develop unique RFQ
4. Request references from all projects
5. Insist that firms visit community
6. Ask project specific questions
7. Conduct effective interviews
8. Interview the project manager
9. Advertise RFQ, send to firms with experience
10. Negotiate with short-listed firms

Ten Tips to Help Communities Plan a Successful Water/Wastewater Project

1. Coordinate with Ohio EPA
2. Identify local sparkplug
3. Use resources knowledgeable of financing in Ohio
4. Stay focused on the project originally identified
5. Make sure costs are based on year the project will bid
6. Don't be afraid to question your engineering firm
7. Keep the public involved
8. Maintain a project schedule
9. Be open to new ideas and alternatives
10. Establish an OMR plan

RCAP Financial Tools

- Determining the number of customers
- Fiscal years- the difference between state and federal
- Funding sources for public entities
- Funding sources for private entities
- Financing scenarios spreadsheet
- Amortization schedule for loans
- What are affordable utility rates
- Developing a project schedule
- Financial tracking spreadsheet

RCAP Board Training

- Utility Management For Local Officials (101)
- Financial Management For Local Officials (201)
- Asset Management, Budgeting, and Rate Setting For Local Officials (301)
- Asset Management for Local Officials (401)
- Project Planning Short Course
- Project Design Short Course
- Project Construction Short Course

Go to <http://www.gllrcap.org/ohio/> for our training schedule.

Decentralized Central Website

- Ohio's Source for Decentralized Wastewater Initiatives and Information!
- www.decentralizedcentral.org



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Questions?

