



A Starter's Guide for Community-Based Wastewater Solutions

June 2005



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Hundreds, and possibly thousands of communities in the United States face challenges with managing their wastewater. Expanding demand for wastewater management driven by population and commercial growth coupled with ineffective strategies from the past and increasing attention from regulators have resulted in community residents requiring new solutions for humans' oldest environmental health responsibility.

Every community with wastewater challenges is different: different in the physical environment of soil, groundwater, and topography; different in the built environment of housing density and available infrastructure; and probably most different in the economic and political environments of property rights, growth management, economic development, and affordability.

Despite these differences, there are some common approaches to tackling the community wastewater challenge. This *Guide* is based on the premise that the most effective solution for your community is best identified and implemented with the active participation of community members.

However, community members need help to ensure that their efforts are effective in solving local wastewater problems. Fortunately, there are community assistance providers available to help you go through the steps outlined in this *Guide*. A first and continuing recommendation throughout this document is to find one or more organizations that can help you work through the many steps outlined in completing the implementation of a wastewater sys-

tem. Two places to start the search for community assistance providers in smaller communities are the national networks: Rural Community Assistance Program (www.rcap.org) and Rural Development, a part of the USDA. (www.rurdev.usda.gov)

In addition, there are a growing number of engineers and public works experts that can provide the technical and occasionally the political wisdom for solving your community wastewater problems. Choosing among these experts relies on understanding the evolving knowledge that is necessary to keep up with an expanding range of wastewater solutions beyond the common use of large pipe central sewers and on site septic tank-soil distribution systems. Engineers may or may not be experienced with all of the new technologies. Even with familiarity, matching the best particular solution to a community requires local input. Informed, community involvement is key to helping design and implement the best of the technologies to meet their needs.

One additional set of actors to consider is the regulator. Different localities and states have a wide range of experience in the government agencies that decide upon the appropriate wastewater management system design. In some cases, these regulators can be a part of a community team to design and implement the most effective solution. In other places, building a collaborative relationship with the regulators may be inappropriate due to conflict of interest. However, establishing communication with regulators is still useful to ensure a solution that meets regulatory requirements as well as com-

munity needs. As a team member or information recipient, regulators play an important role in the final decisions related to wastewater system design, construction and operation.

This *Guide* is intended to help community members and local officials work with experts and take some early steps to understand the longer-term requirements for tackling wastewater issues. The authors of this *Guide* recognize that there is a mountain of resources available for each stage of the process that can lead a community from their current challenge to solution. The *Guide* highlights some of the resources and provides a menu of activities that integrate that information with your community decision-making. This *Guide* will be most effective if it is used with a community assistance provider to offer additional experience.

All communities are different, and this *Guide* provides flexibility to help meet each community's need for improving their public involvement strategy, and ultimately, improving their wastewater management and the quality of local water resources.

This *Guide* has many pieces, and you should use the pieces independently or as a package. Feel free to duplicate and/or edit the fact sheets and exercises for use as handouts or on a Web site.

Finding Community Assistance Providers

The Rural Community Assistance Partnership
www.rcap.org

Rural Development
www.rurdev.usda.gov/recd_map.htm

Your University Extension Service
Use your Internet search engine and look for
{Your state} Cooperative Extension

You may be able to find other local sources by searching the Internet for:
[Your state name] wastewater assistance
or
[Your state name] community wastewater

This Guide was prepared by the Green Mountain Institute for Environmental Democracy under a grant from the National Decentralized Water Resources Capacity Development Program.

www.ndwrcdp.org



A Note for Users of *The Starter's Guide*

The solutions for community wastewater problems are almost always complex. Any document titled *A Starter's Guide* will fall short in fully explaining all of the options for wastewater management and will also fall short in providing a simple sequence of steps that will get you to a satisfactory solution. In an ideal world, community members interested in solving their wastewater problems would have access to a panel of experts that have been through each stage of the discovery, design and implementation of solutions under a range of conditions that include any that a single community will face.

And even with such a panel, a community may not be directed to a single best answer. There remain questions in the policies of wastewater technology choices and the design of management systems for implementing wastewater solutions. And, of course, there is no panel that can faithfully represent the physical, economic or political conditions that you will face in your own community.

This *Guide* is a starting point for your project. It introduces several topics that deserve more depth and describes some aspects of wastewater management in ways that you and others may find fault. The *Guide* benefited from the input of many of those experts that would be on your ideal panel, and as we expected, not all of those experts agreed on what was most important and what sequence of steps would be most effective in getting your community to a wastewater solution.

To learn more about some of the policy issues involved with wastewater management, you may want to review the report that went along with the production of this *Guide*. For two years, the partners involved in this project tested some ideas in communities that were struggling with their own wastewater needs. Some of the material in this *Guide* was used in those communities and the review of our experience may help you in ways that can not be captured by reading the *Guide*, alone. To find the accompanying report, check out the Web site for the National Decentralized Water Resources Capacity Development Project www.ndwrcdp.org. You can find the report for this project under the category of activities “Education and Training” and it is titled “Expanding Communication in Communities meeting Wastewater needs.” While you are at that site, you should also explore some of the other reports of experts considering better approaches for wastewater management.

This *Guide* and the accompanying Report may still leave you feeling that you need more, and you will be right—you may need more. Much of the experience in following through on a community wastewater project has yet to be captured in written reports, and you will benefit from seeking out some of the individuals that have worked on this issue at either the community or national level. A major theme in the *Guide* is the need to seek help from those that have done this work before, and if that is the only recommendation you follow, you will be well down the road of finding your own community's wastewater solution.

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A Community Wastewater Project Is...

...a collaborative effort to identify and implement solutions for local problems in managing wastewater.

This effort includes several steps that need to be coordinated and completed. Probably one of the most important is to develop a decision and management process that ensures that each task is accomplished with public support. This page outlines the major stages in a project and will help you consider how decision and management processes can be designed.

What are some of the steps that need to be accomplished in a community wastewater project?

Stage I

- Build community understanding of wastewater issues and needs

Stage II

- Develop a decision making process that incorporates local participation
- Connect local decision makers to technology expertise
- Assess local conditions for current needs and the capacity for future solutions

Stage III

- Structure a management process to implement your solutions

What are the key elements for success?

- Clear goals
- Coordinated strategy development
- Transparent decision making
- Inclusive participation
- Informed stakeholders

What are some of the outcomes possible if we develop our own project?

There are hundreds of communities that have tackled their wastewater needs and the outcomes in each community are different. In some cases, the community may construct a centralized sewage collection and treatment facility. In other cases, the community may identify resources so that home owners have access to funds for correcting their failed onsite systems. In other cases, a community may arrive at a mixed solution, with some households identified for replacement of their systems and others put onto an inspection program so that future failures are avoided.

In general, the outcomes include both the choice of technologies to address wastewater needs and the mechanisms to implement and monitor (i.e. manage) the technologies. Each community wastewater project should keep these two outcomes as the focus of their effort.

Engaging the Community in Wastewater Management

Solving the challenge of effective wastewater management in a community requires facing many obstacles. Some citizens may not want to invest in solutions, some community members may not want to encourage inappropriate new growth and some

citizens don't care about wastewater. In order for the wastewater situation to be resolved, it is probably necessary to gain support from a broad range of citizens. This support may be critical to get a local bond issue passed or to get agreement from enough of the wastewater generators (i.e., homeowners, renters, and business owners) to change their behaviors so that a wastewater solution can work. In communities with new development, building contractors will be key players in ensuring that the design and implementation of solutions accomplishes community goals. And, the support of each group can only be developed by engaging their interest, building their understanding, and including the interested individuals in a decision process that leads to the most effective solution.

All phases of a project require attention; from a clear description of the goals, through the identification of strategies, decision making and project management. Working with a community that does not have wastewater as a high priority requires progressing from the goals discussion, through technology identification to more detailed design work to management.

This *Guide* focuses on the early stages of project development describing some activities to help communities engage community members and begin the consideration of the best technology to meet their needs. At the same time, seeing a project through to completion requires a long range view that recognizes the importance for completing all of the steps of solution choice, system design and management.

Stage One: Building general awareness

Wastewater and the impact of failing septic systems are not the highest priority for most community members. However, there may be some very good reasons to get involved and take the steps to reduce the risks from ineffective systems. Stage One activities recognize that people will not actively seek out information on wastewater and will not necessarily participate in public meetings focusing on wastewater. Therefore, this Guide includes a number of activities that can be used at events and occasions when people are already gathered together. These

events are based on fun and capturing the attention of non-attentive individuals.

Stage Two: Deciding on a particular wastewater technology

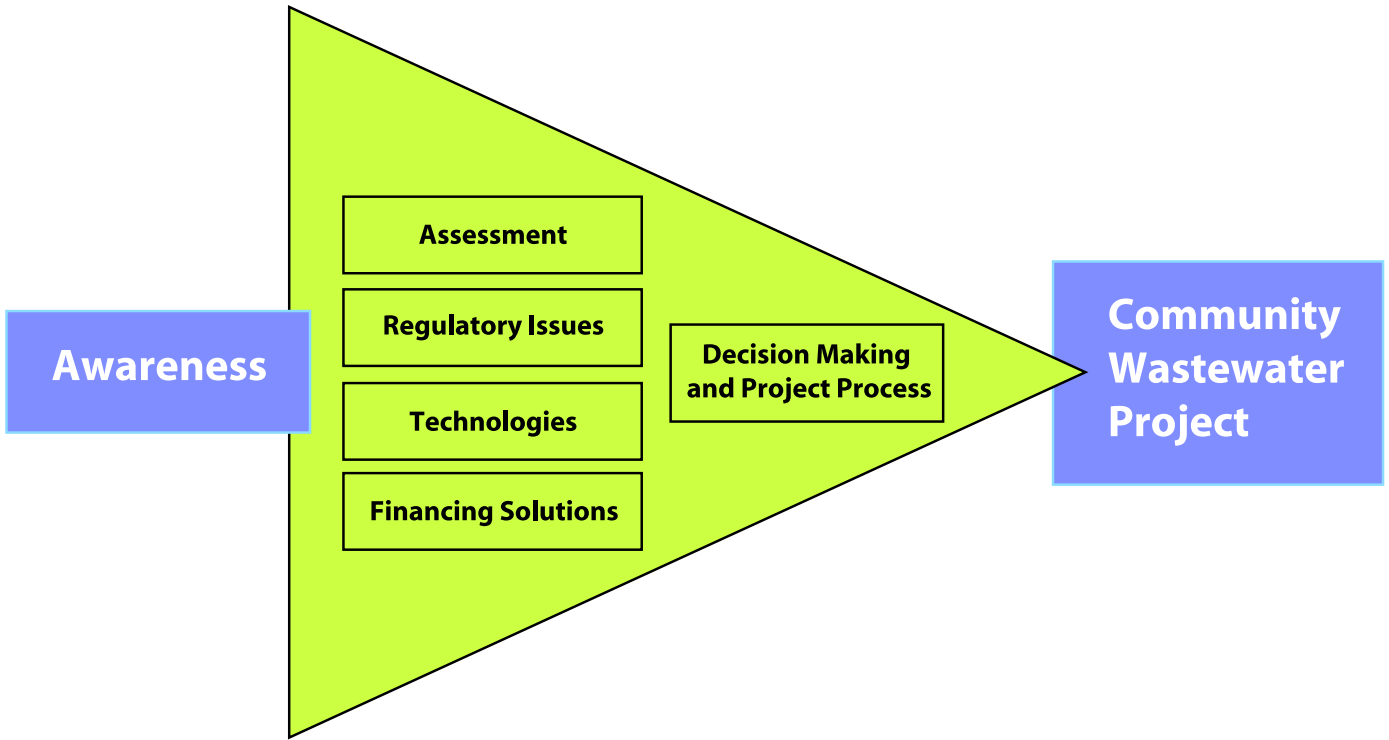
Once a community has a general interest and nucleus of engaged citizens to address wastewater issues, there is a need to develop a systematic approach for designing and implementing a solution. The choice of technologies and solutions requires skills that are probably beyond the capacity of local citizens. Therefore, the focus of this *Guide* is to build local capacity to participate in the choice of technologies, together with the engineers and other advisors who have sufficient experience to consider all of the possibilities. Several guides exist that describe the procedural and technical tasks leading to community solutions. This *Guide* provides a checklist of activities and descriptions for carrying out a process that leads to wastewater decisions. The following sections are intended to provide concise information that will build towards a stronger local assessment of conditions and a public process that facilitates the most effective solution.


Stage Three: Managing the solution

After a community decides upon a particular strategy for addressing wastewater, there is the need to manage the solution in a way that ensures the long term effectiveness of its operation. For individual septic systems, just as for centralized systems, there are benefits to a regular inspection, pumping and maintenance process. For cluster systems, an organized management approach makes sure that some specific inspection and maintenance tasks are accomplished, even if there is no single system "owner." More advanced technologies require more monitoring and preventive maintenance. When evaluating technology options, project decision makers should consider the management requirements.

The first two stages are the focus of this *Starter's Guide*. To learn more about managing wastewater systems, we suggest you review an EPA handbook available on the Internet:

www.epa.gov/owm/septic/pubs/septic_management_handbook.pdf





Getting Started to Address Your Community Wastewater Needs

An Introduction for Individuals

If you feel that your community has a wastewater problem, you are not alone. There are hundreds and maybe, thousands of locations in this country that are not effectively managing their wastewater, and each of them faces some common challenges as well as some unique issues to address.

Where do I start?

First, the prospects for solving local wastewater problems will be more promising if you find community assistance providers that can share their experience and help you carry out some of the tasks. While finding and cultivating a working relationship with a community assistance provider, you should also work to gauge the current status of conditions and capacities within your community. These include a community willingness to pursue solutions, individuals or organizations that will take responsibility for building a solution, and a basic set of assessment information that will provide some background for developing and implementing improvements. Do you have these factors covered? A few simple questions can provide you a basis for moving forward.

- Are there one or more regulatory agencies currently working to address our issues?
- How many people in my community recognize wastewater as an issue that needs to be addressed?
- Is there a clear problem resulting from poorly managed wastewater, today?

Your next steps depend upon the answers to these questions.

Are there government agencies currently working to address our issues?

Government agencies in your state or county play two roles. Some agencies are established to regulate the safety of wastewater management. Some agencies provide assistance to communities for the construction and maintenance of infrastructure. In some cases, it is the same agency wearing both hats. If there are one or more government agencies working on the issue, a call to those agencies can provide you an update and they will probably be appreciative of your interest. They can provide some suggestions on what you can do to help develop the solution more readily. State and County agencies may have some information related to the conditions of your water resources, as well. If your area is susceptible to ground water contamination or impaired lakes and rivers, the government agencies are likely to know.

To find your state regulatory agency, a good starting point is the National Small Flows Clearinghouse.¹ That organization has a database that includes contacts for information about regulations for each state: www.nesc.wvu.edu/nsfc/pdf/WWBLRG34-2003.doc%20.pdf.

¹ The National Small Flows Clearinghouse is the most comprehensive source of information on small community wastewater solutions in the United States. In addition to contact information for regulators, they have a menu of tools and reports gathered from years of experience.

In some cases, the regulatory agency can help guide you to technical and process assistance, but, in all cases, establishing a link to regulators will be necessary as your community moves towards a solution.

How many people in my community recognize wastewater as an issue that needs to be addressed?

There may already be individuals and organizations in your community that share your concerns about the status of wastewater management. Formal surveys can provide you a sense of local knowledge and interest. Less formally, questions to a dozen of your acquaintances may also give you an idea of how important the topic is to community members.

If there doesn't seem to be much interest among your community members, you will need to begin the slow process of building citizen awareness. The process for accomplishing greater awareness is related to the answer to the third question.

What are some of the basic hazards associated with wastewater problems?

The most obvious problem and of greatest interest to your neighbors is when poorly managed wastewater has an impact on human health. For thousands of years, communities have flourished or suffered based on the availability of clean drinking water. Water that is contaminated with human waste, resulting from poorly managed wastewater can be the source of illness and sometimes, death. Any evidence of contaminated drinking water is a strong starting point for community action to develop solutions. In addition to drinking water, wastewater pollution can contaminate local swimming areas. Some of these swimming areas are regulated and local public health agencies can close them when bacterial tests suggest high concentrations. In other cases, no one is testing, but local residents may be affected with "swimmer's itch" or stomach disorders.

Sometimes, drinking water contamination is not microbial, but nitrates. This often occurs in groundwater that receives minimally managed wastewater.

Excessive nitrate (often identified as concentrations greater than ten parts per million) can cause health problems, especially for infants. *The evidence of contaminated drinking water can be confirmed with tests for the presence of bacteria and/or nitrates.*

While health impacts are the most obvious problems associated with wastewater management needs, there are other issues important to homeowners and businesses. Practical problems with wastewater backing up inside the home or surfacing in the yard are the obvious symptoms of a failing system. Nutrient contamination of lakes and estuaries leads to algae blooms and the resulting degradation of aesthetics and aquatic habitat. In some communities, there is insufficient wastewater management capacity to accept further growth based on the lack of available land for soil treatment of septic tank effluent. Asking your neighbors about such occurrences will help you gather information, and at the same time begins to engage them in a better understanding of the wastewater situation. Helping other community members recognize their problems will start you on the path of finding a solution.

O.K., If I can get a lot of people in my community ready to act, what next?

There are a number of activities that need to be accomplished in order to move forward in solving your wastewater problems. This *Guide* includes several of the activities. Each activity is a step to accomplish one of the important milestones in a community project. These milestones include: assessing current conditions, understanding the law and regulatory environment, arriving at a decision making process, understanding different wastewater technologies arranging for financing and building an overall project strategy. The following page can serve as a checklist for activities to reach each milestone, and Section Two of the *Guide* provides some guidance to accomplish each one.

And, don't forget, you are not the first community to struggle through wastewater problems. Find someone who has been through this before and can help you with each of the steps.

A Checklist for Your Community Wastewater Project

Assess your current wastewater management (For help see *Guide* p.2-3)

- How many homes are on individual septic systems?
- Is there any evidence of failing systems?
- Is there capacity for future growth and expansion of existing systems?
- What are the primary factors that lead to differences in opinions about future wastewater solutions (cost, growth, loss of individual control)?

Understand the law and regulatory environment (For help see *Guide* p.2-5)

- Who oversees the effectiveness of your systems?
- Is your community under a regulatory order to act?
- With further investigation of local conditions, might some regulatory requirements arise?

Develop a decision making process that will lead to acceptable solutions (For help see *Guide* p.2-13)

- What is the current level of understanding of wastewater in your community?
- What is the current level of interest of municipal decision makers?
- Are some homeowners already active in addressing their own problems?
- How many homeowners are willing to participate in a decision process?

Build an understanding of technologies that are available (For help see *Guide* p.2-7)

- Is your community a likely candidate for a central collection system?
- Is the soil and depth to ground water generally acceptable for subsurface treatment?
- Is there interest in pursuing alternative solutions such as cluster systems or enhanced nitrogen reduction?

Understand potential funding sources for financing your solution (For help see *Guide* p.2-10)

- Is there sufficient financial capacity among existing businesses and homeowners to pay for replacement systems?
- Has your community identified sources of external funding to supplement your business and homeowner investments?
- Are there low interest loans available?

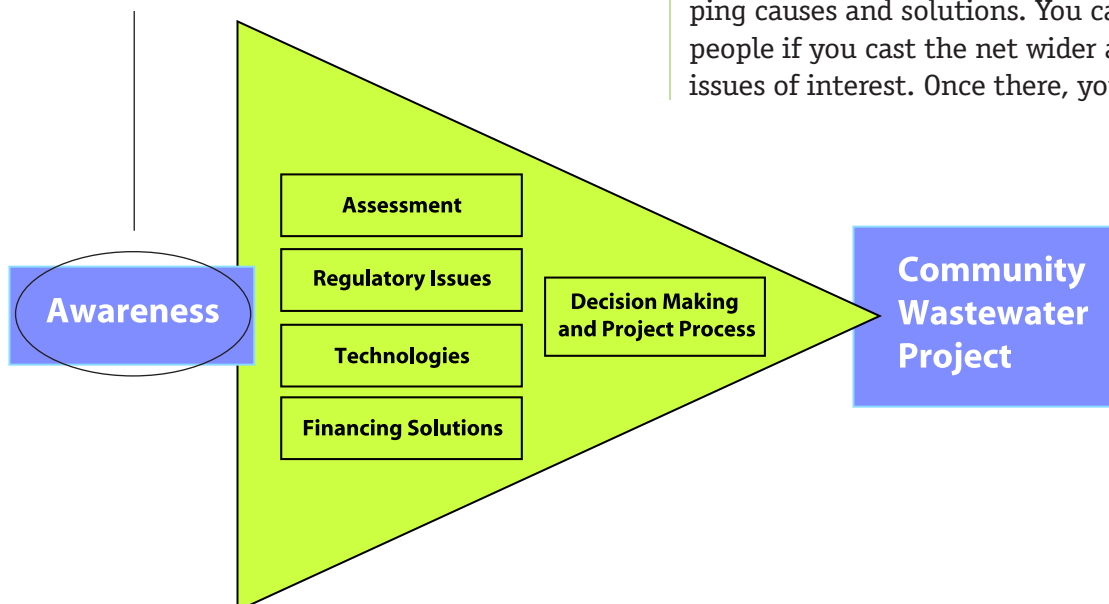
Develop a strategy to utilize information, stakeholder involvement and technical expertise in the design and implementation of your solution. (For help see *Guide* p.2-19)

- What group of individuals will design and finalize a decision?
- What is the goal of pursuing a community wastewater solution?
- Can you identify a series of steps that will move toward the goal?
- Is there a match between the resources necessary to carry out the steps and the available resources in the community?

Stage One: Building Awareness

The goal of Stage One activities is to build awareness regarding the status of wastewater management and the potential impacts from improperly managed wastes. For many communities, the issue of wastewater is one of a list that deserves the attention of local citizens. To move wastewater closer to the top of that list, the stage one activities are fairly simple and meant to be inclusive and non-threatening. The first hurdle for individuals interested in wastewater to engage their fellow citizens is to have an opportunity to introduce the issues. Information-rich exercises focusing on wastewater may be the most direct way to promote the discussion, but many community members simply won't show up or pay attention to large volumes of information. Therefore, this guide suggests some less comprehensive introductory forums to build initial interest.

Stage One



Forums to Discuss Wastewater

Use existing events

Because individuals may not be intrigued by wastewater and wastewater technologies, getting attendance at an event that is primarily focused on wastewater is hard. However, if individuals are already meeting, then some activities can begin to open the mental door to allow the introduction of issues about wastewater.

Celebrate (and keep wastewater issues on the side)

Food and music (or other entertainment) can be a lure to get local community members together. As with the idea of piggy backing on existing events—once you get them there, provide them some fun activities related to wastewater.

Consider the whole environment

A community may be facing many issues including growth management, new infrastructure needs, water quality problems or toxics issues. While wastewater may be one issue, it can have overlapping causes and solutions. You can attract more people if you cast the net wider and include other issues of interest. Once there, you've got 'em.

Public Activities

Quiz (with prizes)

Meeting attendees can fill out a questionnaire related to their knowledge and interest in wastewater issues. (Sample questions are on page 21.) The results will form a basis for meeting organizers to evaluate current knowledge. The prizes can vary but some possibilities that reinforce the wastewater theme include a free drinking water test from a local laboratory or a septic tank pumping (good for the next 3 years) by a local pumper.

Videos

Several videos exist from different government agencies and non profit organizations that describe septic tank operations, the possibilities for decentralized solutions and why people should care about wastewater management. Videos capture people's attention and if the meeting format accommodates such a display, folks will gravitate toward the screen. For a list of videos that are available, see page 61 in the National Small Flows Clearinghouse Catalog:

www.nesc.wvu.edu/nsfc/pdf/NSFC%20Products%20Catalog/NSFCProdCatlg-2003.pdf.

Fun with models

Physical septic tank (and leach field) models may not be the most informative description of their operation, but even more than videos, they capture people's attention. To carry out this activity, you will need to build a model. Directions for model creation are fairly straightforward, and with a little creativity, the models can serve to prompt questions about local conditions. Sample directions available: www.bae.ncsu.edu/bae/programs/extension/wgg/smp-18/septic/septic.html.

Pin the tank on the landscape

Provide a map of a local area (See "Making your local map") that is at a scale that allows individuals to mark where they know of valuable features such as their homes, schools, public wells, regularly visited fishing spots, etc. Such a map can be spiced

with knowledge about existing septic systems and private wells. A colored, transparent disk representing migration distances can show people the overlap between potential sources of contamination and the features of the community that are of value.

Create a slogan

Madison Avenue approaches do sometimes work, and, if you can capture the essence of your project in a single phrase, you may be successful in building awareness. Some possibilities include:

"Stopping the waste of wastewater."

"Today's wastewater is tomorrow's drinking water."

What's our future?

Using pictures (possibly drawn by school children) show some different future views of parts of your community. Considering the future, here are some categories that help describe a vision:

- Housing and commercial density
- Waterfronts with and without housing
- Vitality within the downtown districts

Different futures will result from choices among the following possibilities:

- Wastewater failures become more evident due to our lack of action and the general decay of existing systems that naturally occurs over time
- We upgrade our current systems and design them so that no future growth is possible
- We upgrade existing systems with the potential for growth in certain parts of town that make sense
- We upgrade existing systems and allow for extensive growth in home and business construction.

Letter-writing campaign

Stage Two of this guide presents some strategies for working with the media. But, even at the outset, letters to the editor are readily accepted and rela-

tively easy to draft. Here are some topics to elevate the discussion of wastewater in your media market:

- Other communities are addressing wastewater—we should, too.
- Let's join the 21st century and not be a backwater when it come to wastewater.
- New technologies open doors.
- New laws mean new responsibilities.
- The evidence for ground water and nearby surface water contamination is mounting. What do we know?

Contests

Contests are particularly good when working with school age children. Here are some contests that kids can participate in:

Science fair activity: build a leach field model—

The “best” model (or all participating kids) can get a prize (such as a rubber raft for floating, or a fishing pole, or some other appropriate item.)

*Find contaminated water—*Bacterial test kits are easy to use. Providing kids with some kits and letting them loose (but providing them guidelines on how to politely ask landowners for access) is a good way to gather some very preliminary information. Different classes in school can see how many stream segments they can test, the winner gets a prize, the class gets a lesson in watershed health and the community gets a map showing a snapshot of contamination.

*Build a local map—*See how many features you can include on a map of your watershed. Where are the houses, where are the storm drains, the parkland, the bridges and culverts?

*Art for your watershed—*Photographs and drawings of the waters of the area with an emphasis on some of the uses of the water

During a public event, you could introduce the contest or if it has already taken place, award the prizes.

Issues Complementary to Wastewater

As noted earlier, the urgency of wastewater as a motivation to engage local stakeholders is often missing. However, wastewater is an integral part of many aspects of communities and building the linkages not only improves motivation on wastewater, but can build a better understanding of potentially integrated solutions improving the effectiveness of a wide range of activities.

Economic development

Wastewater management represents an infrastructure investment; one of many investments that are important in the future vitality of a community's economy. Building contractors, business owners, and tourism officials are all interested in ensuring that a community maintains its infrastructure and attracts new investment. In some cases, water reuse can produce an available supply for enterprises such as agriculture and industry.

Sustainability

Water and wastewater services are an increasing portion of a community's budget and therefore represent a growing wedge of the pie of public investment. Sustainability is based on principles that ensure a continuing supply of necessary resources, like clean water. Embracing principles of sustainability in wastewater system design allows for attention to both the possibility for reuse and the need to keep future costs for water and wastewater service affordable.

Environmental quality

Water is the foundation for most ecosystems and also affects human health. Wastewater is a part of the human use cycle of water and can have significant impacts on a region's water budget and aquatic systems. Just as with economic development, some waste water and storm water solutions can provide a resource for restoring aquatic systems, maintain ground water tables and reduce fluctuation in local stream flows.

Land use changes and wastewater

For some communities, the issue of wastewater is tightly linked to the questions of future development. While restrictions on new growth may be an incentive to consider new wastewater solutions, wastewater management should not be used as a land use planning tool. It is inefficient and may only be a temporary fix to a long term problem related to growth. A presentation on wastewater options introduces the value for using wastewater decisions to support community goals for future growth.

In the past, communities constructed central sewers to address wastewater needs in densely settled communities. Onsite septic systems played the role of meeting wastewater needs in rural areas. Today, suburbs with intermediate density, new onsite technologies and the increasing costs for installing new central sewer infrastructure blur the distinction between the two types of wastewater solutions. In some cases, there may be real advantages to increasing the density of housing and commercial activity in an area that presently relies on onsite wastewater systems. Understanding the options for wastewater management allows for choices that meet the community's needs.



Some resources to help explore the overlap of wastewater and development

The University of Rhode Island Cooperative Extensions completed a guide titled “Creative Community Design and Wastewater Management.” It is available on the Internet at: www.ndwrcdp.org/userfiles/ACFuWe80H.pdf. The third chapter of the Rhode Island guide includes some pictures of real communities that made decisions on future growth and found wastewater solutions that would accommodate that growth and not facilitate additional growth beyond the community’s goals.

The State of Maine Office of State Planning has produced a series of Technical Assistance Bulletins that help communities and other guidance to help developers and planners consider the wastewater options for meeting particular land use goals. These documents are available from the Maine State Planning Office, or from Stone Environmental, a consulting firm that helped coordinate their production: www.stone-env.com/water/wwres.html (scroll to “Community Outreach Materials”).

The important factor in considering development as it relates to wastewater decisions is that every community will benefit from a clear vision of its future and then consider wastewater solutions to help meet that vision.

Using Surveys in a Community Project

There are two important purposes of a survey in a community project. The first is that survey results can provide information for better understanding local conditions. The second purpose is that a survey engages local citizens. A participant in a survey is more aware of the project and will pay greater attention to future communications. The information from and citizen engagement of a survey is increased when the personal interaction with the survey participant is increased. The most effective surveys are door-to-door carried out neighbor-to-neighbor. Phone surveys are less effective, and mail-in surveys have low response rates and may not provide a response from a representative cross section of your town.

In addition to reaching out to citizens who take the survey, keep in mind that local developers and contractors have an interest in the issue of wastewater and may want to be involved in the outreach process. Many of the wastewater solutions ultimately identified will require contractor implementation and engaging them early in a project improves the prospects of success.

Keeping information and engagement in mind, it is important to determine more specific objectives for a survey. While surveys can be useful, they can also alienate your neighbors and it is important to carry out surveys efficiently and use the results, keeping in mind the borrowed time that was required.

When designing a survey, it is also important to recognize that at the outset of a project, the overall knowledge held by local citizens may be fairly low and the responses may not be well informed. Early stage surveys can help your project understand the basic levels of awareness by considering the responses to fundamental questions:

- Is there a problem with your wastewater (or your neighbors')?
- Do you know what and where your system is?
- Are you willing to help with our project?

Survey questions follow the same general structure as do other aspects of assessment in a community wastewater project. There are three types of assessment and a survey can help with each of them.

Technical Assessment

The information necessary to choose among technical options includes the volume of wastewater generated, the status of existing infrastructure and the physical conditions including soil types and grade. It is difficult to use survey results to design detailed wastewater systems because the information from those surveys will suffer from inaccuracies and uncertainties. However, survey results can be used for better understanding the problem.

- Do you have a septic tank?
- Do you know where it is located?
- Is it a single chamber or multi-chamber tank?
- Does your tank have an effluent filter?
- Do you know where your leach field is, and its size?
- When did you last have your tank pumped?
- Have you had any recent problems with your septic system?

Political Assessment

The information to help make decisions regarding citizen willingness to pay or to be regulated can be informed through questions that ask for homeowner opinions. Unlike technical assessments, any responses from citizens are valuable, even from poorly informed citizens. A project may note that

the political assessment changes after a project has completed its communication and outreach strategies. In fact, a before and after survey can be an effective tool to gauge the success of communication and outreach.

- Is poor treatment of wastewater a problem in your community?
- Should homeowners be expected to pay to fix their failing systems?
- Should our town pursue public funds to fix wastewater problems?

Process Assessment

This information reports the skills and motivation of local citizens to carry out different parts of a community project.

- Are you willing to invest some time in solving our community wastewater problems?
- Are you or someone you know interested in developing communication materials?
- Can you help facilitate meetings?
- Do you know of any local engineers that can serve as a liaison between project leaders and wastewater consultants?
- Do you know any soil scientists or other technically trained individuals that can contribute to our understanding of local conditions?

(There is more on assessment in the second half of this guide on page 2-3.)

A Stage One survey

Purpose

To gauge the awareness and motivation of local citizens to act on issues of wastewater.

Delivery

This simple survey benefits from face-to-face interaction and is also practical via telephone, especially when the caller is a neighbor.

Prefacing the question

"I am working with (group name) to address our local wastewater issues. In order to move forward, we need to know more about what local citizens think, and their interest in tackling the problem. We are going to use these results for our internal meetings and we may develop a news release that newspapers will use to report the feelings of local citizens towards wastewater."

Starting question

Are you concerned about wastewater?

If the answer is yes: Explore the reasons by asking: Why? You can offer the following categories if appropriate:

- Human health
- Aesthetics
- Property values
- Cost
- Future development

If the answer is no: Offer the interviewee the following hypotheticals (or real stories if you have some).

- Folks are getting sick at the local swimming hole.
- No new housing is allowed in this neighborhood because of wastewater restrictions
- No new businesses are locating in our community and some existing businesses are considering leaving.
- Our community is perceived in lower regards because of poor wastewater management
- Our property values are lower than in adjacent communities.
- A state or county agency is considering sanctions against our community

And re-ask the question: *Are you concerned about wastewater now?*

More sample quiz or survey questions

Where does your wastewater go? (Check all of the appropriate boxes.)

- Septic tank
- Leach field or drain field
- To water and fertilize your lawn or garden
- To a local stream
- To the groundwater
- To a central treatment facility
- I don't know

Where does your wastewater go?

- To a site on our property:
 - and I know where the pipe, tank, and leach field are
 - and I don't know where the pipe, tank, and leach field are located.

Start by drawing a shape that represents your house. Then add the following:

Other structures

Septic tank and leach field

Road(s) near your house

Trees

Storm sewers

Driveway

Sewer pipe from house to tank

If you have a septic tank, when was the last time it was pumped out?

How much do you pay for maintaining your septic system?

How much do you think you would pay to replace your system if it failed?

Have you heard of any problems where nitrogen or phosphorus contaminate:

- groundwater?
- local ponds or lakes or estuaries?
- distant lakes or estuaries?
- None of the above.

Have you heard of any cases of microbial contamination in:

- local beaches or streams?
- drinking water?
- others, that you think may be related to wastewater?

If the answer is yes to any of these, describe where.

Using the Results

As you note in your preface, the results should help you and your fellow interested citizens move forward. Are you surprised by the response? Does the response suggest that you have the political fuel to seek government assistance? Do you need to develop an information campaign to improve citizen understanding?

Also consider, publicizing the results through a newspaper press release. Keeping the issue visible is a good way to maintain the energy in a project.

Sample Letters Introducing a Survey

For all of the considerations in designing a survey, it is important to prepare survey recipients with a description of the survey, its role and the value of the information in helping a community wastewater project progress. The following section includes three sample letters informing a community about a survey.

Dear Homeowner,

The Town of Make Believe is facing some problems in properly managing wastewater from homes and businesses. Poorly managed wastewater can result in human health risks as well as an erosion of our community vitality. Some recent studies show (that 15% of private drinking wells are at risk from faulty septic systems, or that new housing is being put on hold because of problems in siting leach fields, or that 25 homes have had recent events of failing systems.) We would like your help to better understand the current status of septic tanks and leach fields.

The Town Council has asked us to help deliver recommendations to solve our wastewater problems. In order to carry out this task, we need to better understand the local conditions. We would like you to complete this short survey (or answer some questions when one of your volunteer neighbors shows up) that will give us a starting point for considering some of our options. The more information that we have early in this process, the better able we will be in scoping out our options for effective and affordable solutions.

None of your answers are going to be passed on to regulators. We will compile the results from all of the neighbors to determine the magnitude of our needs, and the income data will help us apply for assistance funds.

If there is any aspect of this survey that concerns you, we ask that you give one of the individuals listed below a phone call and he/she will try to help you and relay to others any concerns that we will need to address.

Thanks.

Dear Homeowner,

The Town of Make Believe may be facing a problem in safely managing its wastewater. We don't know.

If we do have a problem, the repercussions could affect our property values and the potential for economic growth. Solving the problem may cost us money as well, and we don't want to plunge into an extensive project without learning more about what you and your neighbors know about the wastewater situation.

For that reason, we will be contacting you to complete a survey about your knowledge and concerns regarding the status of wastewater management in Make Believe. I hope that you will be able to answer the questions so that we can develop an accurate portrait of the opinions and knowledge of our townspeople. The results of our survey will be the subject of a town meeting in June. In addition, we will provide the Make Believe Journal a press release that describes our findings.

If you have any questions about our survey or the issue of wastewater management, please give me a call at 555-1357.

Thank you.

Dear Homeowner,

As you know, the Town of Make Believe is working to identify a cost-effective solution for managing wastewater. We have learned a lot about the number of failing systems and limits to improving systems based on the lack of available sites with appropriate soil conditions.

Today, we need more information to develop detailed engineering plans for a solution. In order to get that information, we need access to your property to inspect your wastewater system and soils. The results of this inspection will help us determine the overall demand for providing a community system in your neighborhood. If the frequency of failed systems is low, we may be able to avoid putting in a central collection system. This will end up saving you and your neighbors a significant amount of money.

In the next two weeks, you will be receiving a call from Sal Manusi who is a wastewater engineer that we have hired to complete this inspection process. I hope that you and Sal will be able to work out a schedule to accomplish this inspection process.

If you have any questions about this inspection process, or about our efforts to improve our wastewater management systems, please give me a call.

Thank you.

How Are We Going to Pay for This?

Money does the make the world go around, and the lack of money can stop a public process, cold. For many home and business owners, concerns about costs will distract their attention from any productive participation in wastewater management decisions.

Calculating the cost of a multi-user wastewater project is not practical without a significant base of information about local conditions. In addition to information, you will need the expertise of wastewater engineers to arrive at a ballpark figure for your range of costs. However, the mechanisms for financing a solution can (and should) be an early discussion in your community. For many places, the initial estimate of project costs suggest an impossible situation for affording the solution. It is not unusual for project costs to be several tens of thousands of dollars per household. Fortunately, state and federal government agencies have developed several responses to the impossible in order to make solutions affordable.

Low income communities have access to direct grant funding and higher income communities can develop bonding and low interest finance packages to spread the costs over many years. As with many issues for small communities considering their wastewater solutions, a key to moving forward is to tap the experience of Community Assistance Providers that have helped fund solutions for other communities in the past.

The bottom line for considering wastewater solutions at the outset is that even the impossible can be accomplished—and it has in communities across the country.

Stage One

Information Materials

The activities described in the first few pages of the Guide are intended for short term engagement that can lead to longer term awareness. The following offers three mechanisms to expand the availability of information.

Handouts

One- and two-page information sheets (“Fact Sheets”) can introduce many of the issues that provide a foundation to local wastewater needs. The following GMI fact sheets are included in this *Guide* and available for general distribution:

“The Language of Wastewater”
“What Is Wastewater?”
“The Septic System”
“Failing Septic Systems”
“Solutions for Failing Septic Systems”
“How Much Does It Cost?”
“Phosphorus in Wastewater”
“Nitrogen in Wastewater”
“Why is Safe Treatment of Wastewater Important?”
“E.coli and Other Microbial Contaminants”
“Wastewater Management in the United States”

The United States EPA also has a large list of fact sheets on individual wastewater technologies. You can find these on the Internet:
www.epa.gov/OW-OWM.html/mtb/mtbfact.htm.

Another site which includes fact sheets and other basic information is www.septic-info.com.

For more technical information, you can contact the National Small Flows Clearinghouse at the National Environmental Services Center:
www.nesc.wvu.edu/nsfc/nsfc_etifactsheets.htm.

Several states also have fact sheets that may be more relevant to your local conditions. For example, Purdue University has produced information for Indiana residents: www.ces.purdue.edu/HENV/SepticSystems.htm.

A basic Web site

GMI has designed some items that can be included in a basic Web site that will serve as a starting point for your project:

- Fact sheets listed above
- A glossary of terms for decentralized wastewater management
- A local map including houses, water supplies and streams
- An introduction to your local efforts for considering wastewater
- An opportunity for local citizens to provide their input
- Links to learn more

Introducing the project and information path

Sign up lists, and handouts that include the Web site or phone number (refrigerator magnets work well) can provide the public with ways that they can learn more.

It is important to use the contact information quickly and invite those who expressed interest into some of the Stage Two activities.

Stage Two: Starting towards a Solution

Stage Two Defined

In order to solve local wastewater problems, there are several activities that need to be accomplished. The decision leading to the most effective wastewater solutions requires a thorough assessment of local wastewater needs, physical characteristics of the soils and watershed, and an assessment of homeowner (and business) capacity and willingness for investment. All of these assessment results serve as the basis to consider the types of technical wastewater options that the community will decide upon. Stage Two includes the activities to complete assessments and initiate the process for reviewing technologies and structuring decision making.

This section of the *Guide* is divided into five parts.

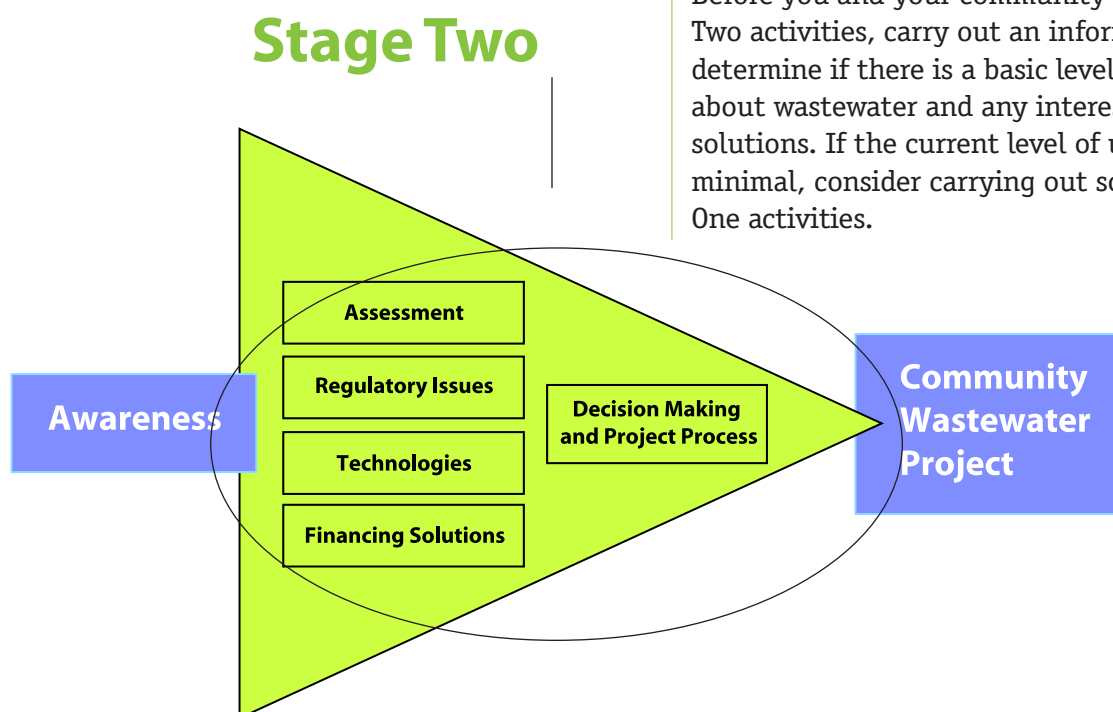
- Assessment
- Understanding the regulatory process
- Building technical capacity
- Communication
- Decision making and process activities

How Does Stage One Feed into Stage Two?

Most of the guidance for pursuing solutions to local wastewater presumes a level of participation within the community. Participants are necessary to do the work of planning a wastewater solution and for promoting the idea so that the local democratic processes can be used to implement the solution.

Unfortunately, the issue of wastewater management is not a high priority on most local citizens' list of concerns. The Stage One activities help introduce the issue of wastewater and water quality so that there is a greater level of general interest to consider some of the assessment activities and consideration of solutions.

Before you and your community take on these Stage Two activities, carry out an informal survey to determine if there is a basic level of understanding about wastewater and any interest to consider new solutions. If the current level of understanding is minimal, consider carrying out some of the Stage One activities.



Assessment

Assess what?

Your community will benefit from an assessment of conditions in three categories—physical, political, and process.

A physical assessment provides information on soils and housing unit density and the relationship between wastewater infrastructure and water resources such as wells or surface water at risk from contamination.

A political assessment gauges the interest of local citizens to consider wastewater and their willingness to make the necessary investments for the solution. Beyond the community itself, states and even federal politics well influence a wastewater outcome. Therefore, it is important to build a strong relationship with regulatory agencies and the political assessment can describe the roles and responsibility of federal, state and local government agencies.

A process assessment reviews the capacity of the community to develop a community project. This includes a determination of the technical skills that are available on the topic of wastewater and the group communication skills necessary to coordinate the activities of interested citizens.

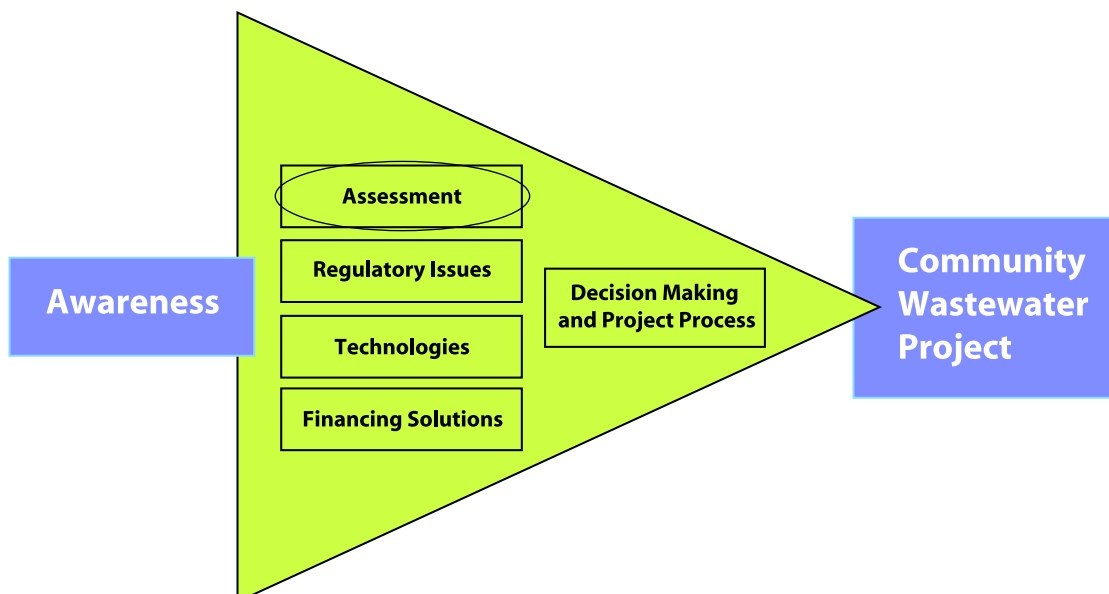
Why assessment?

The purpose of the *physical assessment* is to build an understanding of the potential for onsite development of wastewater management and the use of cluster systems to address problems in areas with limited land for subsurface soil treatment. In some cases, assessments show a constraint in land available for wastewater treatment and highlight the need for a community to consider alternative technologies

The *political assessment* helps identify the support for action and highlight particular obstacles that need to be overcome as well as opportunities for facilitating and financing the solution.

The *process assessment* begins to describe some of the skills that you will need to move the overall project forward.

All of the assessments combined help build a general understanding of local conditions and carrying out the assessment will form some communication links with local citizens. It is important to do a thorough and accurate assessment. Assessments are an important example where having support from a community assistance provider will ensure that your efforts are worthwhile.



How to carry out the assessment

Carrying out a physical assessment can be a technical challenge. Some of the first levels of assessment can be carried out by local citizens. Locating existing septic systems and wells provides a snapshot of the potential for existing contamination. More sophisticated assessments include a review of existing soil characteristics in order to investigate the prospects for cluster systems in areas adjacent to lots with marginal soils but identified for future growth. A detailed assessment can test individual septic systems for failures or test drinking water supplies for contaminants that may come from local systems.

A political assessment requires a strong network of connections between community members and different government agencies. A basic starting point to understand the political conditions is available through a review of recent newspaper articles and preliminary interviews with government officials. However, the details of wastewater policy are almost always heavy with nuance and available only through candid discussions after a personal link is made with the appropriate officials.

The National On Site Demonstration Program has a series of products which help communities complete a process assessment. A starting point is to consider the Community Self Assessment Workbook and a Community Readiness Indicator Instrument that reviews many process capacities for your community. (A sample of assessment questions are included in Appendix C. The full tool is available through the Small Flows Clearinghouse.) A good complement to these tools is the use of a community survey on both citizen awareness and interest.

For communities that may be eligible for financial assistance because of issues of low income, using census data or carrying out an income survey may be important for addressing the affordability of any solution. Ohio University has a document that describes the process for deciding to carry out and how to implement income surveys:
www.cpmra.muohio.edu/SCEIG/incsurv.pdf.

Assessment tools identify many questions that need answers, but perhaps more important will provide an outline of the overall information needs and highlight some technical and process issues that deserve your focus as you progress.

Using assessment

There are three applications for the information that you gather. First, the answers and the uncertainties provide a good discussion point for considering some of the specific steps that your community will need to move forward on a community project. Appendix D to this *Guide* includes strategies that will help your project move forward under different conditions.

The second application of assessment information is to open communication with community members regarding the status of wastewater. In several communities, the results of preliminary physical assessments show real and potential contamination of drinking water supplies which serves a strong motivation to get community members to participate in considering future solutions.

The third application of assessment information is to help technical experts better understand your local conditions and needs. There are typically several possible solutions that will effectively treat wastewater, but your community's conditions will be best addressed if the system designer knows as much as possible about what the community wants and needs.

Understanding the Regulatory Process

Each state, and in some cases, each county have unique regulatory strategies for ensuring that wastewater is treated in a responsible fashion. Understanding who makes the decisions and the criteria for those decisions is important for a community to understand the current status of its own wastewater management and the constraints on new solutions.

In general, there are six characteristics to consider for understanding the regulatory environment. We include the detailed answers for Vermont as an example in understanding the types of regulatory issues that need to be considered.

1. Design and installation of single-family onsite wastewater systems

In Vermont, the state provides towns the authority to permit the installation of septic systems for newly constructed housing. The towns have Septic Officers that typically review the plans from engineers. There are some standard site requirements that restrict the installation. This system of regulation is subject to change under a new law that allows for innovative systems but tightens the permitting process and requires new skills for local officials or the state will assume the permitting role.

2. The threshold for larger systems requiring a different permitting path

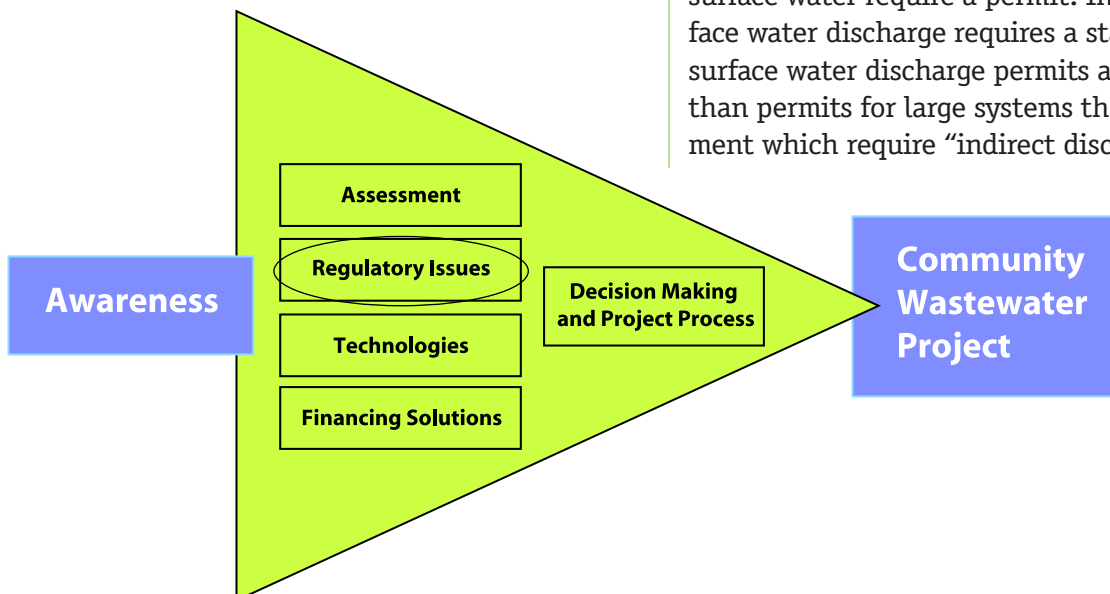
In most states, larger systems meeting the needs of commercial establishments or large residential facilities require a different regulatory process. Often, the regulations on larger systems are more complex and communities may design their own solutions to avoid crossing the size threshold. In Vermont, any system treating more than 6,500 gallons per day requires a state permit that is reviewed by a state wastewater engineer. Larger systems require greater oversight because of the impacts of wastewater treatment beyond the boundaries of any single parcel of property.

3. Changing your onsite system due to failure or the need to expand

Adding capacity to your system, or replacing failing components can require inspection and system design review. In Vermont, any system upgrade or replacement is regulated in the same way as new construction.

4. The threshold or possibility of surface water discharge from a wastewater system

Wastewater systems that release treated effluent to surface water require a permit. In Vermont, any surface water discharge requires a state permit. These surface water discharge permits are more complex than permits for large systems that rely on soil treatment which require "indirect discharge permits."



5. The mechanism for identifying failing systems that provide a risk to human health or water resources

In cases where septic systems cause the surfacing of poorly treated waste, or there is evidence of the contamination of water supply, the state, county or locality has the responsibility to work with landowners to address the failing system. In practice, the inspection and enforcement against failing systems is inconsistently applied. There tend to be very few inspection activities to identify failing systems unless a public complaint is filed. Vermont is similar to other states in having a state regulatory authority, but a cautious application of this authority. The preferred path is an informal notification to a homeowner.

6. The regular inspection and maintenance of onsite systems

In some states, counties, or municipalities, a government agency requires that homeowners or commercial property owners carry out regular inspection and maintenance of their wastewater treatment systems. While these requirements are not regularly applied, there are a growing number of locations using management tools to ensure the long term effectiveness of wastewater infrastructure. This issue is important, particularly for those who are designing innovative solutions or for those who live in areas where the potential for failing systems poses a risk to local health and resource quality.

In Vermont, there is currently no statewide mechanism for inspection and maintenance of individual onsite wastewater systems, although some communities are taking the first step to consider this option.

Finding answers to the regulatory questions in your community

For each state, there is an office in state government that has primary responsibility for wastewater management. The NSFC has a database for you to find that office and contact:

www.nesc.wvu.edu/nsfc/pdf/WWBLRG34-2003.doc%20.pdf.

You can call your state and ask if someone can help you with answers to the questions noted below:

- Who regulates the design and installation of wastewater systems for individual homes?
- Who is responsible for larger systems? What is the threshold for these larger systems?
- Who regulates the design and installation of a system upgrade or repair?
- What are the conditions when wastewater systems need surface or indirect discharge permits?
- Is there an inspection and maintenance program for onsite systems?
- What is the mechanism used to identify failing septic systems and what steps does the state or county take to enforce system repair and replacement?

Building Technical Capacity

The technical design of a community wastewater solution requires the expertise of wastewater engineers. However, it can be challenging to identify engineering experts that can design a solution that meets the needs of community members. The objective for the community is to provide the engineer with guidance reflecting the community's needs and identify a person or persons to stay involved with the engineer during his/her performance of the tasks for completion of a facility plan. This approach will keep the engineer on track and the products of their work consistent with the community's needs. In the stage of solution design, these products should be the basis for a community decision and the technical insights to further their goals.

There are two strategies that help communities gain the technical capacity to participate in the design and implementation of a solution that meets their needs.

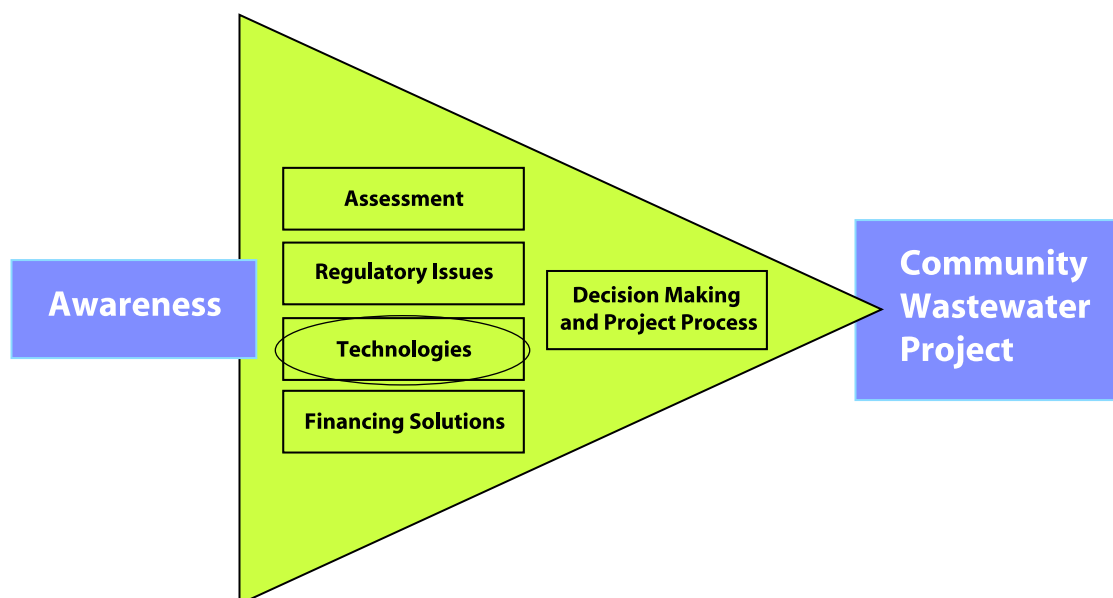
The first strategy is to identify engineering firms that have experience in using community input for structuring their solutions. Several organizations

have established guidelines for considering the appropriate engineering firm and building a relation with the firm to ensure that local input is incorporated. (The Winter 1997 issue of *Pipeline* focuses on this topic and is available at www.nesc.wvu.edu/nsfc/plarchiveframe.html.)

The American Consulting Engineers Council supports the use of "Qualifications based selection (QBS)" in addition to cost based selection. Different state chapters of the Council can help you apply the principals of QBS. (Nevada has a short description at www.acecnv.org/QBS.htm.)

In addition to that guidance, communities should be willing to question each prospective engineering consultant on their experience in working with community-generated input.

The second strategy is to build significant local capacity to understand the issues of wastewater system design and construction so that at least one local resident can participate in the decision making process related to the details of a wastewater system.



This latter option can be more difficult than simply hiring the right engineering firm and requires the commitment of one or more local citizens as well as skills in learning about technical issues. The following list highlights some of the topics for the local “expert” to absorb:

- Soil types
- Local hydrology-groundwater and surface water
- Climate impacts on construction and operating different technologies
- Construction practices including excavation and wastewater facility construction
- Water chemistry
- Maintenance requirements as related to the future capacity of communities to ensure long-term effective operations

In some cases, there are local community assistance providers that can serve as a liaison between the community and a wastewater engineer. In other cases, government agency representatives can serve the role, especially if they have worked with other communities in the development of their solutions. Regardless of the specific mechanism, communities will benefit from focusing some effort to ensure that the engineering process for their project is well integrated with the decision making and outreach strategy.

Regardless of the work group decision to pursue technical capacity from an outside source, or build it internally, there is value to consider finding a mentor that can oversee your progress and provide input from past experiences. The following section describes some of the factors to consider in identifying a mentor.

Finding a Mentor to Help You Progress

Your pursuit of a solution for local wastewater problems is noble. However, you are not alone and others have blazed this path before you. As with many things, it may be helpful to learn from those who have experience. One of the most important steps for moving forward is to find one or more individuals with experience in community wastewater solutions.

Why do I need a mentor?

There are several topics that your community will need to pursue that will benefit from some experience. These include:

- Technical issues with respect to wastewater technologies
- Process skills for managing a community project
- Financing the solution
- Coordinating the technical, financial, communication and management tasks

Who can provide me these experiences?

Many different types of individuals have been through this process before, you can pick among:

- Community assistance providers such as your local US Department of Agriculture Extension Service or the Rural Community Assistance Program
- Wastewater engineers
- Individuals from nearby communities that have done this before
- National clearinghouse representatives
- Government agency representatives
- Municipal officials

What about less-than-perfect mentors?

It can be difficult to find the right mentor for your community. Many individuals and organizations have experience in certain aspects of waste water, but their experience may be limited and they may attempt to direct a community toward a solution that is less effective or more expensive than a community desires. The best way to ensure a positive mentoring experience is to diversify the expertise. Regulators will provide a more comprehensive service when they are engaged together with engineers. Similarly, engineers will provide more substance when engaged with financial experts.

How do I find the right mentor?

You can start by developing a list of candidates by tapping the National Small Flows Clearinghouse (www.nesc.wvu.edu/nsfc/nsfc_manufacturers.htm) or develop your own list by performing a Web search for “wastewater management assistance.” Adding your state name provides a more locally relevant list of possibilities.

From that list, make a phone call to the most likely possibilities.

- Briefly describe your issue.
- Ask for some next steps.
- Ask for their experience on these kinds of projects.
- Ask for their advice. (“What would you do next?”)
- Ask if they or someone else from their organization would meet with your small group.

Hang up and consider “Could I call them next week or next month with additional questions?” If, after connecting with a few individuals, you can not find someone comfortable to work with, you may want to have another community member duplicate your phone calls. The first impressions that you had may not be the only impressions on which to base the decision. But, don’t give up, having someone with experience will help your project more than any other action that you can take.

Financing: How Will We Pay for the Solution?

Communities around the country are facing the realities of new wastewater infrastructure costs. The good news is that there are several mechanisms to pay for your solution. The bad news is that there is not enough public money available to pay for all of the systems that need to be built.

How do we learn about the full range of financing options?

There is no single source of information about different loans and grants. The National Onsite Demonstration Program has a CD that describes six federal programs available nationwide and some regional programs. In most parts of the country, Environmental Finance Centers provide communities information regarding the support of environmental infrastructure. (A list of EFC's is included on pages 62-63.)

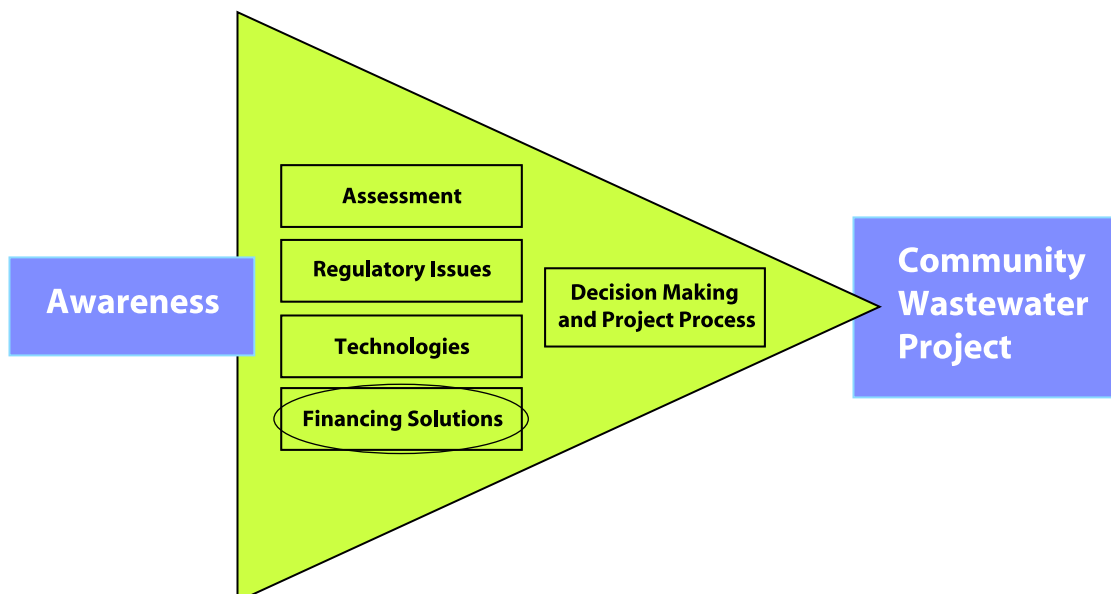
Each state has its own mechanisms for providing assistance, sometimes allocating federal funds. Private foundations can provide funds for unique situations and local private sector interests may be able to contribute.

How can we learn more about some of the specifics applicable in our community?

As with other aspects of developing solutions for wastewater problems, it is a good idea to make connections with one or more of your state government agency representatives and one of the support agencies such as Rural Development (a part of USDA) and the Rural Community Assistance Program (RCAP).

Are there standard criteria to qualify for public funds?

Most public money is based on need and there are two categories that help characterize the need. Poverty is one criterion that influences the amount of funds available. Areas with a significant proportion of households below the poverty line have more opportunities for gaining public funds. The other criteria are related to the environmental threat. In cases where there is direct and obvious harm to human health or ecological systems, there is a greater availability of funds. While these are general guidelines, each grant and loan program has their own specific application requirements.



Are grants and loans the full financing story?

Communities will probably need to use their own funds to complement the public grants and loans. In most cases, a municipality will seek bonding authority to pay for the capital costs of a large project. Establishing a financing strategy is going to be important for scheduling repayment of the bond and the strategy will help when applying to external sources of funds. The repayment may include user fees and taxes as on-going revenues.

What about operating costs?

In most cases, there is the expectation that operating costs will be covered by user fees. In cases of significant poverty, there are funds to defray operating costs.

This still looks like it is going to cost us more than we can afford. Any suggestions?

In addition to considering the availability of public funds, cost constraints should be important factors in the design and implementation of a solution. Certain technologies can help reduce costs and there are ways for local workers to contribute significant portions of labor and administrative support which minimizes the out-of-pocket costs for a project. The principles of “self help” are being applied to wastewater infrastructure extensively in the state of Texas. To learn more check out: www.twdb.state.tx.us/assistance/financial/fin_infrastructure/self-help.asp.

Self help sounds intriguing. Is there a catch?

Well designed self-help activities with appropriate guidance and oversight can save your community money. However, it is not always practical to have inexperienced citizens carry out tasks that are often accomplished by experts. Funders can be skeptical of the quality of work by local citizens and there are often restrictions on grants and loans provided to communities to ensure that only qualified experts undertake the project tasks.

Contact information

For a copy of the CD from the National Onsite Demonstration Program, check out the National Small Flows Catalogue at www.nesc.wvu.edu/nsfc/pdf/NSFC%20Products%20Catalog/NSFCProdCatlg-2003.pdf.

To find your state contact, use the National Small Flows Clearinghouse Regulatory Database at www.nesc.wvu.edu/nsfc/pdf/WWBLRG34-2003.doc%20.pdf.

Environmental Finance Centers

EFC at University of Southern Maine

Edmund S. Muskie School of Public Service
96 Falmouth Street
Portland, Maine 04104-9300
Dr. Richard Barringer, Director
barringr@usm.maine.edu
Telephone (207) 780-4418
Fax (207) 780-4317

EFC at Syracuse University

Maxwell School of Citizenship and Public Affairs
219 Maxwell Hall
Syracuse, New York 13244-1090
Catherine Gerard, Director
cmgerard@maxwell.syr.edu
Telephone (315) 443-3841
Fax (315) 443-5330

EFC at University of Maryland

Institute for Governmental Service
4511 Knox Road, #205
College Park, Maryland 20740
Dan Nees, Director
dannees@earthlink.net
Telephone (301) 403-4610
Fax (301) 403-4222

EFC at University of North Carolina

Institute of Government
CB# 3330 Knapp Building
Chapel Hill, NC 27599-3330
Jeff Hughes, Director
jhughes@unc.edu
Telephone (919) 843-4956
Fax (919) 962-2765

EFC at University of Louisville

University of Louisville
426 W. Bloom Street
Louisville, Kentucky 40208
Peter Meyer, Ph.D, Director
Pbmeyer@louisville.edu
Telephone (502) 852-8032
Fax (502) 852-4558

EFC at Cleveland State University

Maxine Goodman Levin College of Urban Affairs
1717 Euclid Avenue, Suite 120
Cleveland, OH 44115
Kevin O'Brien, Director
kobrien6@adelphia.net
Telephone (216) 687-2188
Fax (216) 687-9291

EFC at New Mexico Institute of Mining and Technology

Institute for Engineering Research and
Applications (IERA)
901 University Boulevard
Albuquerque, NM 87106-4339
Heather Himmelberger, Director
heatherh@efc.nmt.edu
Telephone (505) 272-7357
Fax (505) 272-7203

EFC at California State University, Hayward

Environmental Finance Center
Building 7, Alameda Point
851 West Midway Avenue
Alameda, CA 94501
Sarah Diefendorf, Director
sdief@aol.com
Telephone (510) 749-6867
Fax (510) 749-6862

EFC at Boise State University

1910 University Drive
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Decision-Making and Process Activities

The power of a community is the diverse skills that different individuals can bring to any project. The challenge for a community is to direct and coordinate those skills so that the end result is an effective solution.

One difficulty in carrying out a community project is tapping the community's strength to develop a commonly appreciated project goal and strategy. For wastewater, a community needs to at least recognize valuable endpoints towards which the wastewater solution can help attain. These end points include public health, future economic prosperity, limiting capital and operating costs, equity among users, and community responsibility. In the ideal, a community will have a consensus towards the goal. After considering one or more goals, different community members will need to agree on the strategy that directs the individual tasks towards the goal.

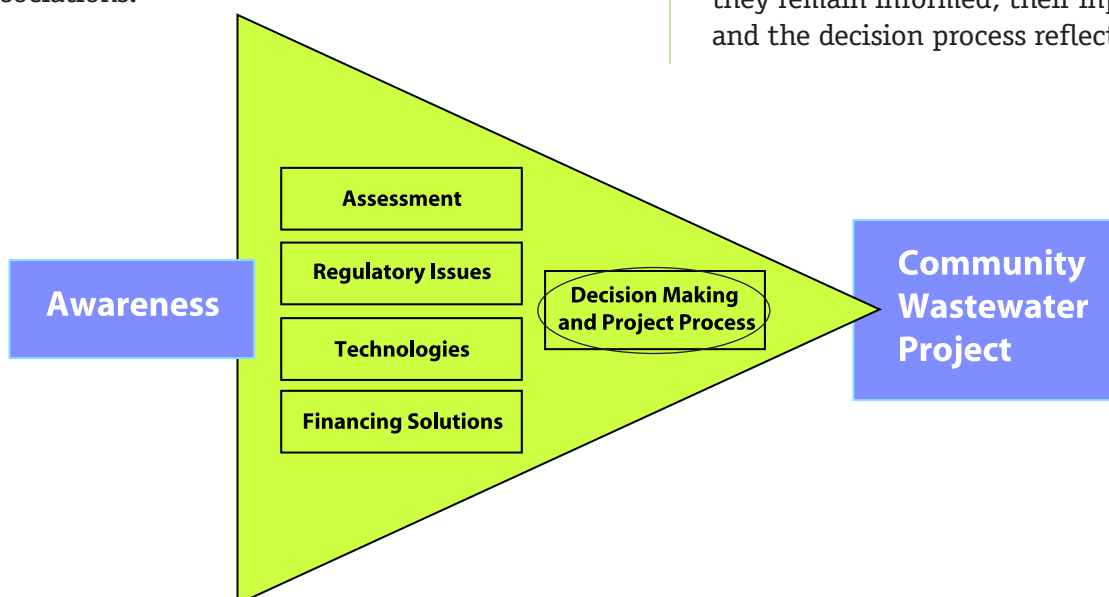
Both the goal and strategy will benefit from a decision making process that incorporates community members input and ensures consistency with other institutional structures such as municipal government and previously established community organizations such as neighborhood or business associations.

This *Guide* is structured upon a model that uses working groups to coordinate decision-making processes. In our research on successful community wastewater projects, we find that most of them use a working group model to promote project success. The working groups are a small group of individuals that serve as the focal point for information gathering, dissemination and decision making.

Basic tasks for a working group

Working groups are important for the completion of four activities:

- **Goal-setting**—Identifying the positive endpoints that define a successful project
- **Technology analysis**—Gathering the available information and structuring it to help identify which solutions will be most effective. While wastewater engineers will be necessary to complete a full facility plan, local citizens can build their capacity to provide significant direction to the overall solution.
- **Strategy design**—Identifying the steps necessary to move from the current condition to a solution
- **Process design**—Identifying the necessary stakeholders and decision makers and making sure that they remain informed, their input is considered and the decision process reflects their needs



Building a Work Group

Arriving at a wastewater solution is no different from any community project. An active group of volunteers willing to coordinate activities and work with the community can accomplish great things. How do we get a working group established and functional?

A website from the Vancouver Citizen's Committee provides some ideas developed for several kinds of civic projects: www.vcn.bc.ca/citizens-handbook/. While the handbook from British Columbia includes lots of examples, there are some basic considerations to keep in mind as you plot out your strategy for addressing community wastewater needs.

Emphasize a collaborative approach.

Most successes in community projects avoid potential conflicts. Many of the conflicts focus on money issues. ("I don't want to pay for that service.") A more positive problem solving effort often defuses a strong opposition. Improved wastewater can accomplish:

- Greater protection for public health.
- A well considered approach to tackling your community problems.
- The capacity to direct your community's future growth.
- A step towards overall community improvement.

A work group's initial activity can be the clear articulation of project goals developed through a collaborative approach. Carrying out this step will not only yield a goal for communication and future focus but the exercise for arriving at the goal sets a positive tone for future collaboration.

Balance action and meetings.

Many potential supporters for your effort will not be willing to attend meetings. Action such as door-to-door surveys, research on technologies and case studies, and creating public service communications can engage those who would rather not spend their evenings in meetings. Even more engaging is to design and carry out community activities such as fairs, dinners, and festivals. Each of these activities requires a range of skills that will tap the interests of many in your community.

While action is more fun for many, the direction of your project is going to require coordination and planning. Fortunately, all communities are blessed with a few individuals that are willing to take the responsibility of meeting and organizing the activities that will build the overall project identity. Providing opportunities for both acting and meeting expands the chance that people with both interests will participate.

Emphasizing process skills can sound trivial, but forgetting them is a sure path to conflict or inaction.

Respect for participants, providing continual communication to interested individuals, and sticking with project groundrules may sound like things we should have learned in kindergarten, but the fact remains that these fundamentals are important to keeping people engaged and keeping a project moving towards success. Ask others in your work group to gently remind you and others of the process needs for your project.

Goal-Setting

Not every individual will find this goal setting exercise worthwhile, but it can help some participants consider the overall direction for a project. In addition, a set of goals can serve as the foundation for a project communications strategy.

The following steps can take place during a single meeting of interested individuals or during a series of meetings.

Step 1: Covering all of the bases

- Introduce the value of goal-setting and this two-step process. The value of goal-setting is to strengthen communication and to coordinate the development of appropriate solutions.
- Introduce categories of goals (optional—can hasten the process, but may also lose some local creativity and engagement)
 - public health
 - future growth (related to land use)
 - equity among users
 - community vitality
 - community responsibility to legal requirements
- Pose the question: “What are your goals for our wastewater solution?”
- Review the audience-developed list, re-visit the preliminary list of goal categories (if used) and note those that seem to be most important to the group. If you did not use a starting list, group together some of the responses to develop some broad categories. If you used the preliminary list and some of the participants ideas are not included, add a new goal category
- Consider any possible quantification for each goal category. Quantified goals have pluses and minuses.

At the end of Step 1, consider how this group will decide among the possible goal categories during Step Two. Developing a decision-making process will be important, not only for this exercise, but for other topics as your project progresses.

Step 2: Setting priorities and recognizing limits

- Confirm how this group will make decisions
- Consider each goal category:
 - Do we have a legal/regulatory obligation to meet the goal?
 - Is there a community consensus to reach this goal?
 - Are we currently aware of any general strategies can help meet the goal?
 - Are any of goals in direct conflict?

With the answers to questions for each goal category, pose the question: “Do we want to focus on or exclude any of the goals?”

Step 3: Finishing the process

Consider how the goals can be communicated to those who did not participate in the process. For an issue that is potentially or already contentious, it is important to differentiate goals and strategies. For a community project such as the development of wastewater solutions, the goals should be fairly universal—such as those suggested as a starting point for the working group discussion.

The communication of select goals among the many possible goals for wastewater management will help provide others a sense of the direction of the project. For example, a focus on cost-reduction may help others who are interested in the development of innovative solutions. A focus on equity will entice those who like to work with low-income families.

Strategy Design

The term “strategy” can have many meanings, and for this Guide, we limit the meaning to include the list of general activities that will help meet a project goal. The focus on strategy use is to develop categories for considering activities rather than quickly jumping to specific activities themselves. A leap to activities may exclude more effective alternatives. You can get lost in the details of specific activities while strategies help construct a path to meet a community’s goals. It may be worthwhile for your project to develop a long list of potential strategies for rapid evaluation.

Brainstorming strategies

In order to develop this list of strategies, you may want to start with a single goal and pose the question: “What general group of activities will help accomplish this goal?”

Evaluating strategies

In a strategic planning process, the brainstormed strategies can be matched against some of the strengths, weaknesses, opportunities, and threats identified during an assessment process. This matching is one way to consider the relative strengths of any particular strategy.

Synthesizing strategies

Reviewing a list of strategies will help you consider where there may be overlap, synergy, or conflict between strategies addressing different goals.

Examples of strategies

Goal: Protect human health (drinking water)

Strategy 1: Monitor wells regularly. Act when there is evidence of contamination.

Strategy 2: Complete removal of all wastewater systems at risk of failure.

Strategy 3: Replace all systems within a distance of all drinking water supplies.

Goal: Minimize costs

Strategy 1: Seek external funding.

Strategy 2: Reduce capital costs by rightsizing the infrastructure.

Strategy 3: Reduce capital costs by actively seeking competitive bids of contractors.

Strategy 4: Reduce operating costs through initial project design.

Goal: Meet future growth needs

Strategy 1: Link wastewater decisions to planned growth.

Strategy 2: Require developers to design wastewater solution.

Strategy 3: Allocate future wastewater infrastructure costs to future development proposals.

Applying the strategies

Each strategy requires several steps in order to be successful. In several cases, the work group will need to contact individuals not currently associated with the project. In other cases, technical information will need to be gathered to test the prospects for success. In still other cases, the strategy will be the basis of public outreach. In this Guide, we suggest that each strategy be the basis of Work Plan development by posing the question:

What will be necessary to implement the strategy?
(See the Section on Building a Project Road Map)

Factors to consider in strategy development

Economics—The cost and allocation of costs for wastewater technologies is the most obvious characteristic of interest for local community members. Each solution requires a unique mix of capital and operating costs for individual community members and the overall community through tax increases. Developing the information and providing an opportunity to consider the implications of economic costs is important to the process.

Growth management—A second characteristic important to community members is the implication of a wastewater solution on the future growth of a community. As with economics, it is important to describe the growth scenarios that are possible with different wastewater solutions and use this information for community deliberation.

Other aspects of community importance—Environmental quality, aesthetics of infrastructure, the community role in managing a wastewater system and the perception of community quality are also important in considering a wastewater solution. By considering the goals of a community in designing a solution, the assessment and decision making process can ensure that important aspects of the decision are included.

Legal requirements—In addition to the interests of community members, different wastewater solutions may be constrained by regulatory requirements. Either by including regulators in the deliberative process or providing clear information regarding the potential for regulatory restrictions, the decision process should include this information.

Building a Project Road Map

There are dozens of activities that need to be accomplished for a community to successfully address its wastewater needs. The introduction to this section on decision making and process activities outlines the major categories and it is up to you and your organization to identify more of the specifics. A roadmap exercise can not only help you in the identification of necessary activities, but will also support team building for your work group. And having the group consider all the necessary activities to complete a project, the motivation for carrying out many of the project tasks will be made clear to the participants.

There are more comprehensive references to develop a project road map, (see one set of activities at <http://pace.naccho.org/Toolkit/Collaborative-roadmap.pdf>) and we can briefly outline some steps here to help you get started. This is a general approach that relies on a few core questions, each of them sparking additional consideration of tasks and suggesting the relative timing of those tasks.

For each of the overall project process requirements: assessment, technology, strategy and decision making, you can complete the sequence of steps:

- Identify objectives.
- Apply milestones.
- List tasks to meet the objectives.
- Consider resources to accomplish the tasks.
- Add new tasks.
- Identify the needs for implementing activities.
- Add new tasks.
- Sequence; prioritize; assign responsibilities.

Some examples

Assessment

- Survey community on current knowledge and their individual systems.
- Collect well-contamination test results.
- Complete a map.

Technology

- Identify technology options for addressing community conditions.
- Research and evaluate the technologies in general.
- Develop a facilities plan or the equivalent.
- Design a management system.

Strategy

- Establish some project goals.
- Describe a strategy for accomplishing each goal.
- List the activities for carrying out the strategy.

Decision-making

- Organize a community event with X% participation.
- Survey community about their perspectives on a wastewater solution.
- Develop a list of specific issues to be resolved.

Some More Sophisticated Decision-Making Tools

Using Scenarios

The use of scenarios is an intriguing exercise that can promote discussion in a community regarding the relationship of wastewater management decisions with the future of the community. Together with economic impacts, the implications of future growth are critical to the decision in different wastewater technologies.

What are scenarios?

Scenarios are “stories”—written narratives—about the future. They include real places and shared notions about a community and sometimes even fictional characters, all set in the future—usually 10 to 20 years out. Scenarios engage people and capture the richness of community life in ways that graphs and tables and the language of technical reports cannot. Scenarios are developed as a set of two to four stories about different ways the future might look and feel.

Why build scenarios?

Development of wastewater solutions is usually driven by present problems like failing septic systems or development pressure. Successful solutions also address the community’s future. Scenarios help decision-makers and citizens think about how future conditions will affect the success of a pending wastewater decision, or how the decision will affect the future of the community. There are two basic types of scenarios:

Exploratory scenarios describe how forces beyond a community’s control will shape the community. They are built around different plausible outcomes for one or more “critical uncertainties” about the future.

Normative scenarios present desirable and undesirable futures resulting from a community’s decisions.

What are some examples?

Community members in Aspen, Colorado built four exploratory scenarios around plausible outcomes for: a) future economic conditions, and b) court and higher government decisions about local government powers relating to property rights. They then used the four different futures to “test-drive” a number of proposed local affordable housing policies and programs. Some of the initiatives looked good in all four futures, and some looked good in few or none of the possible futures. This process helped the community decide which initiatives to pursue. Critical uncertainties for a community facing wastewater challenges might include county or state policies and regulations, wastewater technology changes, or the speed and nature of social changes brought on by growth. A community could use a set of exploratory scenarios to determine if a potential wastewater solution is “robust”: likely to turn out well whatever else happens to the community.

A Water and Wastewater Task Force in Waitsfield, Vermont reached consensus about a wastewater management plan. They then used two normative scenarios (see Appendix B) portraying the results of following the plan or not following it as the basis for a discussion with the Planning Commission and the Selectboard. The discussion verified that all three bodies were in agreement that the plan was necessary and appropriate. It also helped identify issues that would come up upon presentation of the plan to the general public, resulting in efforts to develop further information and “talking points.” The scenarios will also be used to help promote the plan prior to a bond vote.

How do we build scenarios?

Scenarios are best developed by a small group of people capable of thinking “outside the box.” Scenario builders first identify relevant social, technical, economic, environmental, and policy factors and forces in the local context and the broader soci-

ety. They then explore how those factors and forces will affect the community over time. Does “A” lead to “B”? Or does “A” lead to “C”? Once two to four plausible futures have been outlined, typically one creative person will write the scenario narratives. Then the group will review and revise the scenarios.

Where can we find out more about building and using scenarios?

The following books and Web sites provide more information:

The Art of the Long View, Peter Schwartz.

Scenarios: The Art of Strategic Conversation, [info]

www.gbn.org — the Web site of the Global Business Network, a consultancy specializing in scenarios.

Using Computer Models to Understand Wastewater Options

Some technical issues such as the alteration of stream hydrology through large volume withdrawals and wastewater recharge can be understood through the application of computer models.

What are models?

Models help describe very complex systems through the use of mathematical calculations providing quantifiable output that provides answers to questions regarding the response of the system to different assumptions.

Can models be understood by the public?

It is very difficult to build an understanding for how models work, but the output from a model should reflect the values and interests for the intended audience. A challenge in using the results from the model is building trust that the “black box” creating the output is not biased in generating information.

How do models help promote community wastewater discussions?

In many cases, the goals for a community can be quantified related to characteristics about water quality, dollar costs or future development. In these cases, a computer model can estimate changes in

the individual characteristics. For example, Calvert County, Maryland is very interested in reducing the nitrogen load to its local estuaries and the Chesapeake Bay. The fate of nitrogen is very complicated, affected by soil and climate and there are several sources that contribute to the overall nitrogen budget. The results of a sophisticated landscape based model developed at the Gund Institute for Ecological Economics helped local residents recognize the impacts from different alternatives to traditional septic tanks, as well as noting the impacts from air deposition to the local nitrogen story.

Besides nitrogen, what other topics might models help us understand?

Using similar landscape models, the impacts of wastewater decisions on surface water flows, and ground water recharge can help those communities looking at water scarcity issues and the damages from transferring large volumes of water between watersheds. And, for areas concerned about excessive nutrients in freshwater systems, phosphorus leads to significant impacts that models can help describe.

Other models describe the varying cost effectiveness of different wastewater treatment technologies taking into account the capital costs for construction and the operating costs of long term management and the relative efficiency of those technologies in reducing microbial contamination, biological oxygen demand or nutrients.

Where can I learn more?

The Gund Institute for Ecological Economics at the University of Vermont is a good starting point to learn more about the development and application of models for helping solve local watershed problems. Visit www.uvm.edu/qiee.

The Web site for the National Decentralized Water Resources Capacity Development Program features several modeling project reports that can be used to assist a community in understanding the potential impacts on local water resources from wastewater management choices. Visit www.ndwrcdp.org.

Communication Activities

A community wastewater project will need to dedicate some effort to building stronger citizen awareness of the issues and options for the wastewater decisions. A communication strategy should consider the mechanism to reach out to both those who have expressed interest in the issue and those who have not. The following includes a short description of some mechanisms to consider.

Information Meetings

The basic mechanism for engaging community members in discussions about wastewater solutions is to sponsor a community meeting. These meetings typically describe the status of wastewater management in the community, the impacts of current policies and the options to address future needs.

In general, there is the need to describe what is currently known about the wastewater situation and provide an opportunity to meeting attendees to express their interests in the issue and the information that they have regarding current conditions. There is always value to provide a mix of presentation and interactive exercises to maintain the interest of the audience and gain information from the meeting attendees regarding the critical elements for moving forward.

Information meeting sample agenda

Welcoming remarks—Why we are here, a brief update on current issues.

Introductions—Names and a brief statement about why the issue is important.

Presentation—More detail on one or more of the following topics.

Assessment of local conditions

Regulatory requirements for some action

Brief overview of some wastewater technologies

Structured dialogue—What are the primary issues that we need to address in moving forward and what are the factors that are going to be critical in making a wastewater decision.

Work group summary—Some details for moving the topic forward. (Provide an opportunity for participants to react to the summary.)

Invitation for additional community members to participate in future efforts—If there is time, break into small groups based on the specific tasks that need further effort such as outreach, assessment, gaining technical capacity, addressing regulatory requirements, identifying financial resources, or others identified during the meeting.

Identification of next steps

Web Sites for Communication

The Internet provides a mechanism to display information and offer individuals an opportunity to participate in community processes. For a wastewater project, the Internet can be used to:

- Provide project status.
- Produce assessment information through survey tools.
- Inform individuals regarding available technologies.

To fully utilize the capacity of the Internet, it is important to recognize that your site can be more than the display of written words.

- Pictures are easy to include from digital cameras or a scanner.
- Maps are engaging for some individuals and a map is a good tool to help people recognize some of the issues related to wastewater.
- Other graphics such as bar charts can help communicate the results of surveys.

- Animations can be an eye-catching mechanism to describe technologies.
- Advanced land use tools such as Community Viz provide simulated figures of changing community characteristics.
- Hyperlinks to other sites expand the range of your site and allow for more in-depth understanding of an issue. (GMI has developed a generic website www.gmied.org/ncdp.)

Using Your Local Newspaper

Both community meetings and the website are directed to individuals who may be seeking information about local wastewater solutions. However, a significant proportion of your public may not be looking for information. Just as with Stage One activities you will need to reach out. The newspaper is one option that is accessible to those who are not otherwise engaged. The long run objective for using the newspaper approach is to establish a continuing presence which builds credibility and a slow increase in the overall awareness of the issue.

Most local newspapers will gladly accept well-written pieces, and the following topics can provide you with opportunities to continually “beat the drum” on your local wastewater issue:

- Results of survey.
- Report of a site visit to similar community with operating system.
- Positive news regarding funds for planning or hopefully, construction.
- Report from state on water quality, particularly if there are regional concerns with issues of microbial contamination or nutrients.
- Future meetings and events, especially those that offer a real opportunity for citizens to participate.
- Milestones for project.
- Assessment results.
- Web site available.
- Facilities report results.

School-Based Wastewater Projects

Schools are a creative source of activities to engage community members in public policy issues. Students can carry out information gathering activities, can do simple research on the issue of wastewater and can initiate an information campaign through the use of art projects, service learning exercises and contributions to local newspapers. School based programs provide students a learning experience as well as strengthening the communication channels through their families.

Local monitoring—As a part of a biology or earth science curriculum, junior high school and high school students can assess the water quality of local streams. These activities can identify particular problem areas of contamination, but more often they serve as an introduction to the issue.

Art projects—Rivers, streams and lakes provide a rich source of creative content for young artists. Drawings or even multi-media creations can highlight attention on local water resources.

Map building—Where are the existing septic systems and water sources for a community? Students can carry out surveys and provide their own home information as a part of a map building exercise.

Develop information materials—As a part of a joint social studies-science curriculum, students can create materials that reflect their understanding of wastewater in the community. A written, oral or multi-media presentation of what happens to wastewater and its potential implications on community interests is a good exercise for high school students to build their communication skills while basing the project on what they have learned through their science curriculum. Local newspapers will regularly welcome the products from their schools and local civic organizations will provide a listening forum for their young citizens to make a presentation. One specific example of school based information materials is a description of the water cycle. Where does water come from used at the school or home and where does it go after you flush the toilet or empty the sink?

Making a Local Map

What is the simplest way to make a map for discussing community wastewater issues?

The simplest approach is to find a local government office that already has access to map making capabilities. Most local planning districts and public works or tax officials produce maps regularly.

And if I can't find someone to do it for me, can I make a map myself?

GIS technology and databases are much more accessible than even five years ago. "Making a map" is the presentation of existing geospatial data through your computer. You'll need:

- a computer;
- GIS software;
- access to GIS databases; and
- a large format printer (available at copying centers).

That sounds complicated.

Learning and applying GIS skills is not easy. An alternative approach is to use simpler maps that are readily available on the Internet. You can try:

www.mapquest.com

www.maps.yahoo.com

www.mapsonus.com

www.maps.com (for purchase)

These maps tend to emphasize the presence of roads, but also include other community features including rivers.

What should I include on a map for community wastewater discussion?

Parcel maps—Community maps that include property lines (parcel maps) are most interesting to local citizens. With a parcel map, one of the engaging activities is that homeowners can find their own home. Electronic versions of parcel maps may be available from county or municipal offices, or regional planning commissions.

Visible features—Roads and surface water features provide viewers reference points to help them get bearings. These are also important for considering the location of installing new infrastructure and protecting water quality. Electronic maps of your roads may be available from your state highway agency, or your local or regional planning commission.

Soil maps—The types of soils in your community are going to be important in considering the options for installing new systems or identifying candidates for failures that may affect local resources. Your local Natural Resource Conservation Service may be able to provide you access.

And more—Additional data layers that can be of interest are the current land use and zoning maps available from local planning agencies and the topography which highlights steep slopes and gives a general sense of ground water migration and surface water flows. Existing drinking water wells are a good find, but difficult to locate, except for public drinking water supplies.

What are ortho maps?

Ortho maps are images of a community produced by satellites that include physical features such as houses or other human structures, rivers, farms, roads and bridges. Ortho maps provide even more visual information to help individuals identify features of interest in their community.

More Information

Sources of information for considering different approaches to structure your wastewater project

At least two states (Minnesota and New Mexico) have produced guidance documents that describe the different steps in selecting wastewater solutions. Along with this *Starter's Guide*, these documents will help communities with process design elements that may be effective in their own locations:

Small Community Wastewater Solutions: A Guide to Making Treatment, Management and Financing Decisions, University of Minnesota, BU-07734-S, 2002.

Centralized Management of Decentralized Wastewater Systems: A Reality-Based Guide, New Mexico Environment Department, Construction Programs Bureau, April, 2002.

Sources of information on the different wastewater technologies

National Small Flows Clearinghouse. A part of the National Environmental Services Center, which also includes the National Onsite Development Project. This is probably the largest single source of information about small wastewater solutions in the world: www.nesc.wvu.edu/nsfc.

Another site that focuses on individual septic systems. This site is smaller and therefore easier to navigate: www.septic-info.com.

National Decentralized Water Resources Capacity Development Project (the sponsor for this project): www.ndwrcdp.org.

The United States Environmental Protection Agency has a website that directs viewers to many aspects of wastewater: www.epa.gov/owm.

And a website that focuses on decentralized systems: www.epa.gov/owm/mtb/decent/index.htm.

The National Onsite Wastewater Recycling Association (NOWRA): www.nowra.org.

The Rural Community Assistance Projects: www.rcap.org.



Appendix A

Sample Press Releases

Town Officials Consider Wastewater Solutions

The Our Town Selectboard met last night to hear presentations and community feedback on the need for addressing problems with locally failing septic systems. Selectboard chair, Angela Fromm noted that the meeting “raised several issues that we are going to have to address. Wastewater solutions may cost our residents some money, but it is equally clear that ignoring the problem will cost us more in the long run.”

The Selectboard heard a presentation from the “Wastewater Watchdogs,” an ad hoc committee that has been working for the past six months to better understand the wastewater situation and consider some direction for future solutions. A review of public records in addition to interviews with local citizens shows that about 10% of the private drinking wells in town have had evidence of contamination from improperly treated wastewater. In a few cases, the homeowners have given up on drinking tap water and purchase bottled water for drinking and cooking. The Watchdogs estimate that such costs are about \$300 per year.

The Committee reported that two other towns in the County are considering options for addressing their wastewater needs. In Murphy, the Selectboard has hired an engineering consultant to provide preliminary plans for a centrally located sewer. In Twiddle, another ad hoc group is looking into the possibility

of developing grant resources to do town wide inspections and soil suitability surveys for locating land for a community leach field.

The Wastewater Watchdogs have not developed specific recommendations for addressing the problem, but do suggest a more comprehensive set of testing to determine the number and location of water supplies that are at risk. The committee also recommended that the Selectboard seek funding to initiate investigation into possible solutions for the problem septic systems that appear to exist within the village.

For more information contact Ralph Newly at (555) 555-0000 or e-mail RNewly@localaccess.net.

New Plans Outlined for Addressing Local Wastewater Meeds

A site-by-site assessment of the residential lots in Our Town shows that as many as 20% of the existing homes are served by septic systems that are not adequately treating wastewater.

Walter Reeves, a member of the Selectboard that asked for the study stated that these results confirm the need for the Town to “put the pedal to the metal in figuring out a way to fix these septic problems.”

The comprehensive testing came about as the result of a preliminary study that was completed during the summer which showed that Our Town has some significant problems with wastewater. An ad hoc group of community members convinced 135 homeowners to carry out an anonymous test of their wastewater systems. The tests showed that several of the homes were using wastewater systems that were not adequately treating their wastes.

A “dye test” was used in the 135 homes that allows observers to note whether wastewater is undergoing sufficient treatment to eliminate microbial contamination. When the dye shows up in adjacent streams, that suggests that the septic tank and leach field are not allowing adequate treatment time to reduce dangerous microorganisms.

15 of the 135 tests resulted in the dye reaching two of the streams that feed into Our River. In an additional 13 homes, the owners noted that after periods of wet weather, there is some evidence of surfacing of wastewater noted by the odor of untreated sewage. Together, this information shows that the area is facing a potential threat of contamination that needs to be addressed.

According to Timothy Trackler, an organizer of the committee, these results represent a “smoking gun” that emphasizes the need to consider options for addressing the problem.

As the result of these tests, a work group convened by the City Council has outlined some specific “principles” that will be used to consider options for addressing the failing systems. The number one principle on the list and as a priority, according Trackler, is the protection of drinking water wells.

The second principle is for replacement systems or repairs to be monitored for long term effectiveness. The monitoring would ensure that the systems are providing safe treatment for human wastes reducing the associated diseases.

The third principle is the need to develop solutions that meet the mixed needs of local citizens. In addition

to housing, some of the commercial establishments need additional wastewater treatment in order to expand. Any system design should accommodate the desired growth in the village.

The final principle is that the construction of any wastewater solution be undertaken carefully so as not to disrupt the historical values of the village

For more information contact Ralph Newly at (555) 555-0000 or e-mail RNewly@localaccess.net.

Survey Results Show Community Members Ready to Address Wastewater

The Our Town Wastewater Committee has completed a survey to town members that shows that a majority agree that action must be taken to solve local wastewater problems.

More than 200 homeowners completed the survey which asked about their opinions regarding the need to consider some solution to the problem highlighted by a recent study which showed problem septic systems. Each survey was accompanied with a fact sheet that described the general problems when septic systems failed and what homeowners can do to prevent future failures.

Town Manager, Peter Burkett, feels that the survey results provide a significant message to move forward on finding solutions. “I know that this may end up costing us money, but the survey tells me we should at least be looking at options. Maybe we will be surprised and find some low-cost solutions.”

The reaction from wastewater committee members was more emphatic. “Our results from the summer showed that we have a problem with wastewater. Now our committee knows that we are not alone in wanting to see something done,” stated Tim Trackler.

For more information contact Tim Trackler at (555) 555-2000 or e-mail TTrackler@localaccess.net.

Wastewater Committee to Discuss Future Options

Our Town is facing a decision that can improve local water quality, but may cost homeowners money.

The Our Town Wastewater Committee is meeting on March 32, at 6pm to review a preliminary set of options that can address the community wastewater needs. These options range from a set of voluntary guidelines that homeowners can follow to reduce the frequency of failed systems, to a construction project that would link all of the Town homes to a new sewer. Between these two extremes are four options that vary tremendously in cost, but also may lead the town down different paths of future growth.

Burns Engineering from Big City, drafted the options after getting a \$20,000 contract to help the town describe some of the technical solutions.

According to Town Manager, Ezra Twitchell, "The decision on which path to take for managing our wastewater can effect future property values, and the appeal of the town to attract new businesses." Engineering consultant Frances Burns agreed. "Increasingly tight regulations on failing septic systems, coupled with the interest in some new growth make it necessary for Our Town to focus on some particular solutions. While I have some ideas that I think make sense, the town is going to have to consider how these different solutions can move their town to a successful future," she said.

Members of the Wastewater committee did not want to express their opinions about which option may make the most sense for the Town. "Some of the solutions cost more money, but those same solutions give us a greater range of options for future development. It is going to be a real tradeoff, and I am curious how my neighbors are going to react," said Don May, a local realtor who has been working on the wastewater issue for more than a year.

The meeting at the Our Town Town Hall is open to the public. Coffee and cookies will be available. Day care is also available to those who wish to bring their children.

To learn more about the options for addressing the wastewater solution, several copies of the report are available for review at the Town Library.

For more information contact Ralph Newly at (555) 555-0000 or e-mail RNewly@localaccess.net.



Appendix B

Sample Scenarios Used in Waitsfield, Vermont

March 10, 2004

“Wastewater investment” Scenario

The year is 2015.

John Doe is pleased. He just received approval from the town to connect his expanding business to the sewer system Waitsfield built in the mid '00s for Irasville and Waitsfield Village.

John wasn't too concerned about the wastewater plan when town voters approved the funding in 2004. His property in Irasville was on soils that were adequate for the septic tank and leachfield he had then, a system with enough capacity for his office and its ten employees and visitors. He did not need to connect to the sewer when it was built.

So back then, John was one of the many businesses and residents that remained on their existing onsite wastewater systems even though they were located within the sewer service area. This unique “partially decentralized” system used the new sewer to replace failing onsite systems, while leaving adequate systems as they were, in order to reduce costs and to reserve the limited capacity of the town's treatment plant and soil absorption field for future growth or onsite system failures.

Recently, John's business has been doing so well that it's clear an addition to his building is in order.

The expansion will accommodate another ten employees he expects to hire over the next few years if growth continues as expected. John's building expansion would have required increasing the size of his leachfield, which his property could not accommodate. So John applied to the town to connect his enlarged building to the sewer and decommission his septic tank and leachfield. This was one of the sorts of situations—allowing modest growth that would be impossible with onsite systems—that the town envisioned when it proposed the municipal wastewater system to voters in 2004.

Some property owners with failing or inadequate systems connected immediately. They paid a connection fee, and continue to pay a regular sewer bill to the town. Others, like John, pay a small annual fee to the town for regular inspections and other services to make sure their septic systems are functioning properly. This helps the town and septic system owners take early action—maintenance, repairs, or connection to the sewer—to avoid major failures that could pose a health or environmental threat. Gone are the days when residents worried about the “ticking time bomb” of old and inadequately maintained systems.

And gone are the days when businesses had to look outside the village centers to expand. The municipal wastewater system has allowed Waitsfield to stick to its town plan and direct commercial and light industrial growth to Irasville and Waitsfield Village. Some

residential growth in these centers has been possible as well, including second story apartments over commercial uses, condos, duplexes and single family residences on small lots—all serving households of diverse incomes, including working families with moderate incomes.

Up on North Road, Jane Deer looks out her window across fields and forests to Route 100 in the distance. The scene still looks much as it did in 2004. Open spaces still stretch along the highway north and south of the villages. The same is true for back roads in town. Most of Waitsfield still feels rural, while the village centers offer a modestly expanded array of services and job opportunities. It's this absence of strip development or "sprawl" that makes Waitsfield so different from other towns near ski areas, and so special.

Many voters in 2004, like Jane, were concerned about the impact of the project on their taxes and questioned whether the project would be of benefit to them or only to those property owners in the proposed service area. In the end, a majority of voters saw how the wastewater project would help the town as a whole to achieve its goals. Those goals included keeping areas outside the villages in a rural state while providing for a compact development pattern in the concentrated "growth centers" of Irasville and Waitsfield Village. Voters saw that modest development would provide jobs, housing, and services of broad benefit to Waitsfield. Waitsfield residents take pride in the cooperative solution they developed to wastewater problems. They know that other Vermont towns have experienced substantial discord when broad agreement on wastewater systems could not be reached.

Jane is especially happy today. She just got word that her son will be returning to Waitsfield when he graduates from college this spring. John Doe offered him a job. Jane is grateful that Waitsfield has the vitality that its young people need in order to find opportunities and see their way to making a life here.

It's a vitality based on a surprising degree of economic diversity for a small community. Of course tourism is still very important to the town. But the number and range of other small businesses, represented in 2004 by firms like Diffraction, Waitsfield Telecom, and the small outfits that occupied the "business incubator" space in the former Mad River Canoe facility, has grown since the town invested in water and wastewater infrastructure. The larger, diversified economic base has expanded the town's tax base, allowing Waitsfield to maintain and in some cases expand services, and to fund objectives identified in the 2004 town plan. The wages and purchases of these businesses also helped support the local economy when tourism dropped substantially during a recent very warm and dry winter, something that experts say will occur with increasing frequency due to global climate change.

The tax base has also increased because the value of properties within the wastewater service area has increased. The municipal sewer system enhanced values of properties that connected, and enhanced the value of other properties as well because a solution to future septic system failures was now available.

Big businesses and large residential developments still don't fit in Waitsfield, in part because of the limited capacity of the municipal wastewater system. The limited capacity of the Munn site soil absorption field serves as a kind of "governor" on the amount of growth the sewer system can accommodate. That suits most Waitsfield residents just fine. Going over that limit might be more growth than residents would like and would require very costly treatment facilities and politically unpalatable direct discharge to the Mad River. The main growth-related challenge the system brought to the town was a need to judiciously allocate remaining capacity between future onsite system failures and new growth, and to spread those allocations over time and between residential and commercial needs.

The chosen treatment technology for the municipal system has proven to be quiet and largely free of odors. Neighbors of the Munn treatment and sub-

surface discharge site were concerned about noise and odors when the system was proposed, but are now satisfied with its operation.

Sewer rates paid by connected users and the modest fees paid by wastewater service area property owners with onsite systems do more than pay for the sewer and septic system inspections. They've also supported development of wastewater expertise in the town. Running the sewer, treatment system, absorption field, and the onsite septic system program gives the town the experience and qualifications to keep most decisions about new or replacement septic systems, both in and outside of the sewer service area, at the local level. Waitsfield residents like it that way. They know that since 2007 the state has taken over permitting of onsite wastewater systems in a number of towns without the technical, managerial, and financial capacity to oversee proper siting, design, and construction of onsite systems.

March 10, 2004

"No wastewater investment" Scenario

The year is 2015.

John Doe is worried. He should be happy his business is doing so well, but its success means he may have to move the business and its jobs—ten now and ten more expected within the next few years—out of Waitsfield.

The problem is that his property in Irasville can't support a bigger septic system, which is required in order to expand his building. No other suitable spaces in Irasville or Waitsfield Village are available. All office spaces large enough for John's business are already leased. And like John, other property owners can't expand their septic systems because they are located on poor soils, shallow soils over bedrock, or have seasonally high ground water.

John could build a new office outside the villages, on better soils and away from site constrictions, but that's a difficult option. For one thing, land outside the villages has been getting a lot more expensive. Other businesses are in the same boat as John, as are some residential builders. With limited possibilities to build in the villages, development pressure has increased on land along Route 100 and a few other suitable locations in town.

For another thing, development outside the villages is very controversial. The Planning Commission and the Selectboard have been under a lot of pressure in recent years to deviate from the 2004 town plan and allow more development outside the village growth centers than the plan had targeted. A growing number of Waitsfield residents now say the town must do something to increase its tax base and diversify its economy, and therefore must allow commercial development outside the villages. Town leaders are sensitive to these arguments, and have rezoned a few properties along Route 100 outside the villages for commercial uses. Pressure is increasing to change the town plan and rezone more land or allow commercial uses in the Agricultural-Residential zone along Route 100.

Many town residents are adamantly opposed to such changes. They abhor the prospect of “sprawl” in Waitsfield, saying that would spoil the unique and valuable character of the town. Public hearings on development proposals are often very heated, and a number of proposals have been turned down.

Up on North Road, Jane Deer is fretting over her tax bill. Since there has been little new residential development in the villages, the market and assessed value of residential property outside the villages has gone up. That’s good for those who want to sell, but it also means that those who stay face higher property tax bills.

Jane is not really sure what she’s getting for her tax dollars. Sure, the town has been able to keep up with road maintenance. But it can’t afford “discretionary” expenditures on public amenities and services like library expansion, senior citizen programs, land conservation, public trails, and sidewalks. And Jane still doesn’t understand why voters didn’t approve the wastewater system in 2004 when town leaders explained that taxes were going to go up anyways to pay off loans the town had taken out for the system evaluation and purchase of the Munn site. She thinks the town should have followed-through on that investment.

Jane remembers that in 2004 some people supported building a public water system but not a sewer system. The argument was that by taking properties in the villages off of wells, the constraints on septic system expansion created by “isolation distances” around private water supply wells would be lifted, and this would allow for “enough” development in the villages.

For a while the “water yes, sewer no” decision seemed to work for Waitsfield. Some property owners were able to expand their septic systems, allowing for a few new buildings and some additions. In one case five property owners got together and installed a “cluster system”—a shared septic tank and leachfield on one property sized to meet the needs of all five owners. Residents and town officials welcomed these changes after the water system was

built. But in a few years the village development spurt stalled, once the limited potential for septic system expansions was exhausted.

Jane feels that the changes were minor, and Waitsfield just doesn’t have the vitality she once hoped for. Compared to 2004, the villages have only a few new shops and services. There aren’t a lot of good new jobs. Housing is becoming unaffordable for many workers, and it’s hard for local businesses to find good workers willing to drive in from cheaper housing in towns some distance from Waitsfield. For these and other reasons, many of the town’s young people aren’t drawn to or able to remain in Waitsfield. Jane’s son, for instance, has been talking with John Doe about a job after college, but John has said he may relocate his business.

And then there are the subtle and not-so-subtle reductions in quality of life. Jane is upset to look across at Route 100 and see a new building in a once-bucolic field the town rezoned for commercial use. She thinks about her neighbor’s daughter, who attends Waitsfield Elementary School. For years the school has not been able to serve hot lunches because the necessary kitchen service would generate more wastewater than the school’s septic system can handle. Recently, the leachfield failed altogether. The bathrooms then could not be used, and the school had to bring in Porta-potties.

Engineers are now looking at options for the school. It appears the leachfield can be replaced, but additional wastewater treatment between the septic tank and the new leachfield is required. The school board is grappling with the budgetary implications of this expense.

Some Waitsfield residents complain about the state’s substantial involvement in wastewater matters in town. This dates back to 2006, when a leachfield in Waitsfield Village failed, causing septic tank effluent to begin surfacing. A couple of children got sick from playing there before the smell got to the point that people noticed the problem. After that incident, the town had to adopt onerous requirements for frequent system inspections, costly retrofits or

replacements to bring all onsite systems in town up to current state standards, installation of monitoring ports and risers on all systems, and a mandatory septic tank pumping schedule.

In spite of these changes, the state in 2007 used its authority under a 2002 law to take over permitting of all new and replacement systems in the town. The state claimed that the town did not have the technical, managerial, or financial capability to properly oversee permitting of onsite systems. A number of residents and business owners have bemoaned the bureaucratic state approval process. A lengthy backlog exists since a small state staff must review onsite wastewater system applications from many towns.

Some people in Waitsfield claim the health incident might have been avoided if the town had voted for the municipal wastewater system proposed in 2004. And they say that supporting that system would have built the town's capability to oversee onsite wastewater systems, avoiding a state takeover of this function. Some argue the town now needs to invest in developing greater onsite wastewater management expertise, if not a sewer system, in order to win back local control.

More radical solutions have been proposed as well. Some people point out that the Munn site, proposed for the wastewater discharge field in 2004, is still available, so the town could build that system now. But preliminary study has shown that a village-wide system is much less cost-effective now than it was in 2004. This is because sewerage costs have escalated. Development since 2004, while less than would have occurred had the sewer been built, has created obstacles to installation of gravity sewers. Further, since the water system did away with well-to-septic separation issues, those property owners who improved or expanded their own wastewater systems are now against the idea of paying again for a municipal wastewater system.

Therefore, based on the success of the five-owner shared treatment system and leachfield, another group of business owners has floated the idea of developing a shared "package plant" treatment system to serve their 10 properties, with a direct discharge to the Mad River. They are lobbying the state for reclassification of the river to allow this. While the proposed system would treat wastewater to a "drinkable" level, the idea of any discharge to the river is vehemently resisted by many people in Waitsfield, especially those whose livelihoods depend on tourism based on the unspoiled image of the Mad River Valley. The businesses pushing the package plant take a different view. They say they must grow or leave, and since the town did not go forward with a wastewater plan based on soil discharge of wastewater, the town's choice is now to allow discharge to the river, or allow more development along Route 100.



Appendix C

Sample Assessment Questions

This checklist of information is extracted from the NODP Community Readiness Indicator Instrument.

Site characterization

Establish baseline data for physical characteristics and treatment activities of landscape:

- Groundwater hydrology, surface geomorphology, soil assessment, etc.
- Determine if the receiving environment can assimilate waste constituents.
- Demographics.
- Permitting systems.
- Description of wastewater treatment systems currently in use and their operating histories.

Through this assessment, we learned that the site characteristics are amenable for an alternative onsite wastewater system.

Yes No

Are site characteristics amenable to certain types of onsite systems but not others?

Yes No

List which systems will work:

Are there other viable options besides on-alternative on site treatment that you can consider (e.g., traditional septic, pipe systems)?

Yes No

Technical feasibility

Understand the onsite wastewater treatment options available and their viability for the particular site.

Have you examined a range of onsite treatment options and how they would work with the given site characteristics?

Yes No

Does the preferred system have an established track record in similar conditions?

Yes No

Is your preferred system capable of meeting the flow characteristics of the building and the site?

Yes No

Financial feasibility

Make sure you or the ultimate users have the financial capacity to install, operate and maintain the system for its life span.

Do the owners or prospective operators know the costs for installing and maintaining the proposed system?

Yes No

Have the owners or prospective operators demonstrated their ability to cover all present and future costs associated with the project?

Yes No

Are the installers or contractors properly bonded to ensure their financial integrity?

Yes No

If the system entails multiple participants, are all members of the system capable and ready to cover any present and future costs for installing and maintaining the system?

Yes No

Have you considered any potential financial constraints that would hinder full development of the system?

Yes No

Legal feasibility

Understand the local, state, federal and tribal laws and regulations governing wastewater discharge, drinking water protection, and natural habitat protection.

Have you familiarized yourself with current federal, state, local, and tribal laws and regulations governing wastewater management in the community/state?

Yes No

Does the community (state) have the enabling legislation/zoning that allows alternatives wastewater systems to be used?

Yes No

If yes, what does that enabling legislation allow and disallow?

Have you attained or at least identified all the necessary permits and zoning approvals to install the system?

Yes No

Have you identified any potential or known regulatory constraints that will affect implementation of the project?

Yes No

Does the community have the capacity/will to enforce agreements with those who violate permit requirements?

Yes No

Have you examined the liabilities to which installers, owners, regulators, and/or government officials are exposed by implementing an alternative wastewater management system?

Yes No

Have you explored any potential cross-boundary and water rights issues that might confront the community?

Yes No



Appendix D

Using Assessment Results to Move a Community Project Forward

The process for deciding upon solutions for wastewater management and implementing those solutions includes many steps, many of which are described in the Guide and can be time consuming. A challenge in working through each of the steps is that different communities have different starting points. In some cases, a community may have a small number of individuals with a great deal of background on wastewater issues and an interest in a particular solution. Another community may have no understanding of treatment options, but a regulatory body requiring action. A third community may have two conflicting proposals for managing their wastewater with equally influential advocates on either side.

A consideration of those starting points may help a community work through the necessary steps more effectively. This Appendix describes early steps that give a local project some of the background it needs to move through a wastewater management solution development process. This rapid assessment process is intended to identify some of the greatest needs in order to address the factors which will contribute towards long-term success.

The first three factors

In order to accomplish a successful project that addresses wastewater, there are several factors that need to be complete. Addressing the first three fac-

tors can avoid the need for several years of fruitless effort to implement a solution that does not have adequate public support. These include:

- A working group to coordinate the decision and implementation process.
- Basic understanding of wastewater issues within the community.
- A means for communication and decision-making within the community.

The status for each of these factors can be assessed by posing questions to community members.

Is there a working group?

A first-level need is the ability of a representative group to accurately reflect the community perspective in confronting the wastewater issue. In almost all communities that have effectively addressed their wastewater needs, a working group serves the role of representing the varied interests and perspectives of a community. Therefore, one of the first steps in rapid assessment is determining the strength of an existing group in participating in wastewater discussions. If the group does not exist, forming a group and taking some initial steps is described in the *Guide* pages 41-50.

The next pair of questions should be addressed by the work group. For each question, to the degree

to which the answer is “no,” some follow up activity will be appropriate to build a community capacity to move forward.

Does the public have a basic understanding of wastewater in the community?

For those aspects of wastewater to which the answer is no, the work group will want to consider steps that describe the impacts of wastewater management. These might include:

- Fact sheets communicated through the press or casual meetings (meetings where wastewater education is a secondary purpose)
- Physical assessment results presented in a public forum or through a comprehensive article in the press (Information in such an assessment can include the percentage of failing systems, the tons of nitrogen and phosphorus generated, the potential for drinking water contamination with bacteria or nitrate, available funding and the state or county regulatory actions that a community may face.)

Is the public or local government ready to participate in decision making?

The results of a political assessment should gauge the interest of local community members and officials to participate in a project focusing on wastewater decisions. If the political assessment suggests that most decisions can be made locally, the work group will want to consider steps that describe the impacts of wastewater management. These might include:

- Working sessions to outline solutions for accomplishing a community’s needs.
- Clear presentations of decision options with opportunities for feedback leading to the selection of more detailed solutions.
- Scenarios based on potential community solutions that describe the impacts from specific decisions.

The political assessment should also identify the role of state or county regulators. An important factor in initiating activity at a local level is the degree to which local or state regulators will be encouraging or in some cases forcing action to remedy an existing wastewater problem. The role of the local officials in any regulatory action will be important for moving forward.