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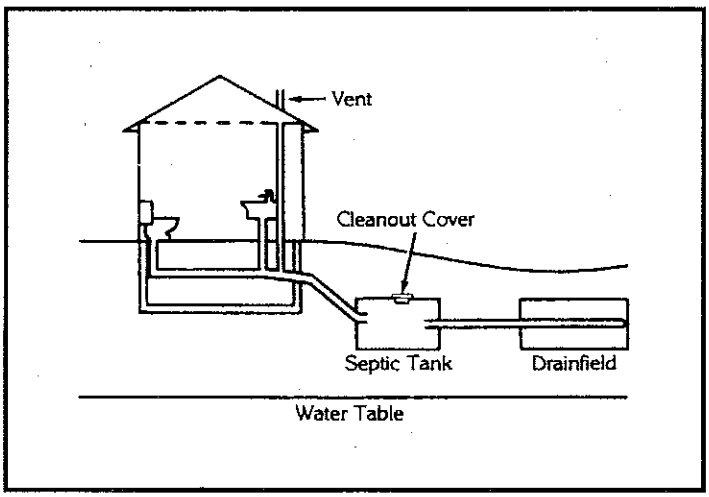
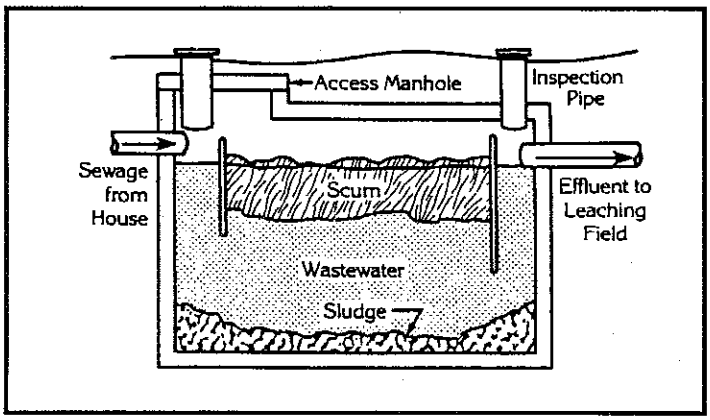
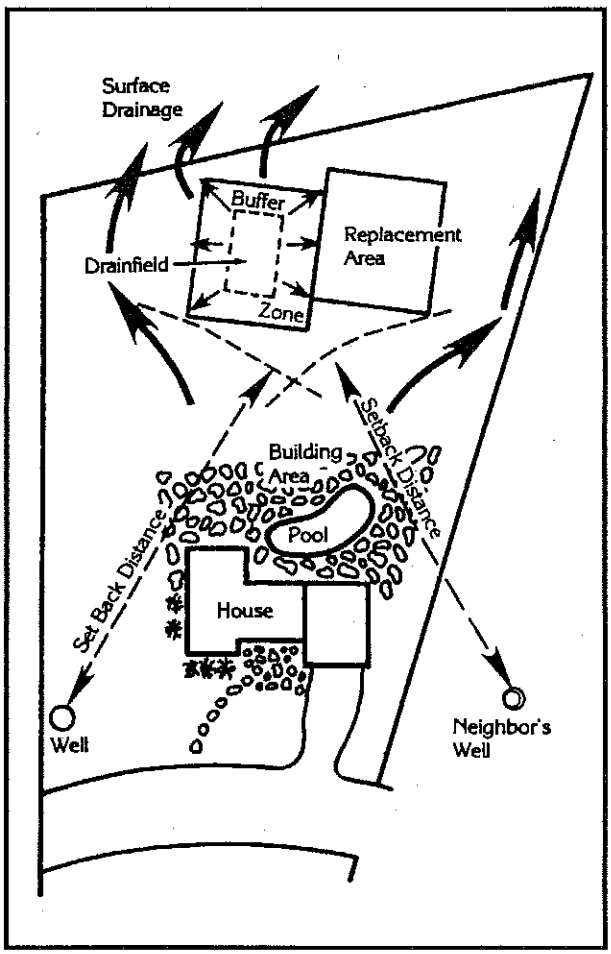
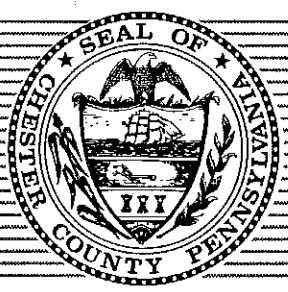






On-lot Sewage Management Programs



BOARD OF COUNTY COMMISSIONERS

Karen L. Martynick, Chairman
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Introduction

History of sewage disposal

Methods of waste disposal date from ancient times, with the earliest evidence dating back to 8000 BC in Scotland where evidence of indoor plumbing pipes or troughs that carried water and wastes out to a nearby creek has been found (Jungclaus, 1999). In 735 BC the Romans began the first major sewer project, the "Cloaca Maxima" which took 225 years to complete (Jungclaus, 1999). The primary function of these sewers was drainage, the Roman practice of dumping refuse in the streets caused significant quantities of organic matter to be carried along with the rainwater runoff. Following the Fall of Rome and the Middle Ages, infrastructure building came to a near halt and was not resurrected for hundreds of years. Wastes were thrown into the streets, out of doors, and from overhead windows. It was this practice that led to the "Dejecti Efflusive Act" in Rome, which allowed one to collect damages from being hit by wastes (Jungclaus, 1999). Up until the 1500s people tended to be careless about where they deposited their "wastes." At this time, solid and human wastes began to be a problem, and in some of the larger cities with large population densities, major health and aesthetic problems developed.

A few centuries later, there was renewed construction of sewage infrastructure, mostly in the form of open channels or street gutters. At first, disposing of any waste in these sewers was forbidden, but by the 19th century it was recognized that community health could be improved by discharging human waste into the storm sewers for rapid removal. Development in the early 1800s of municipal water-supply systems and household plumbing brought about flush toilets and the beginning of modern sewer systems (Rockefeller, undated). In spite of fears that sanitary sewer systems exhausted resources, posed health hazards, and were expensive, many cities built them; by 1910 there were about 25,000 miles of sewer lines in the United States (Microsoft Corporation, 2000). In rural areas having concentrations of houses on small lots, seepage pits or cesspools were utilized. These structures were typically pits in the earth that were lined with stone or brick on the sides and bare soil on the bottom. From the house, wastewater entered the pit via a pipe, thereby preventing the exposure of wastes to the surface and preventing the spread of disease. From the cesspool evolved the modern day septic tank and absorption field. Septic tanks allowed for the collection of solids and scum while permitting the liquid to pass to a soil seepage bed.

For many Pennsylvanians, centralized sewage disposal is not an option. In fact, 60% of Chester County residents currently rely on septic systems to take care of their sewage (CCHD, 1998). This is mainly due to the fact that rural areas have no central sewage facility, or in some cases, a central facility may have reached capacity due to development, requiring new homes to use septic systems on an interim basis. The on-site sewage disposal system is therefore designed to provide sewage treatment and disposal for homes not served by a community sewer system (National Association of Home Builders, 1978). To protect the ground water aquifer from sewage contamination and protect the health of the populace, on-lot sewage systems must be properly designed and installed to properly treat and dispose of human waste. Improper disposal of sewage wastes can cause many diseases in humans. In an effort to accommodate a wide range of conditions and to improve the quality of system functions, new technologies have been, and continue to be, developed. System design and placement has become very complex. In Pennsylvania, the design, siting, and installation of an on-lot sewage system is regulated by the state. The Chester County Health Department (CCHD), one of the few county health departments in the state, performs many of the regulatory functions for the state. Nevertheless, once the system is in place, operation and maintenance is most often left up to the homeowner. Many states and local governments are realizing that something more has to be done to control the operation and ensure the longevity of these systems.

What is an on-lot sewage system?

On-lot sewage systems are those that are located on the property of a homeowner to treat and dispose of domestic sewage through natural processes (U.S. EPA, 1980). Sewage Enforcement Officers (SEO), certified by the state and working for the CCHD, handle the septic system permitting process. The development of an on-site sewage disposal system begins by studying the lot to be developed. The SEO uses a series of analysis to determine site suitability. The first involves the analysis of soil profiles from which the soil layers can be observed. This is known as a soil probe, and determines the depth of acceptable soil above the groundwater or other possible limiting zone. If the soil probe shows the site suitable, a percolation test is performed. The percolation determines the absorption capacity of the soil when the soil is saturated. The percolation results are used in conjunction with the proposed daily sewage flow to calculate the size of the absorption area.

On-lot sewage systems are composed of two primary parts, the septic tanks or aerobic tank and an absorption field (Figure 1) (CCHD, 1998). Sewage, both human waste and water used for bathing and washing, flows to the septic tank. Here, primary treatment of the sewage takes place. Solids are removed from the wastewater by either the septic tank or the aerobic tank. By removing the solids, the septic tanks and the aerobic tank protect the absorption area from becoming clogged. The liquid, or effluent, then flows to a distribution box, a solid header in gravity flow systems, or to a pump tank in pressurized systems. The septic tank effluent is then directed to an absorption area constructed of pipe placed within a layer of gravel. The absorption area then utilizes the natural characteristics of the soil to filter and neutralize the remaining effluent that percolates through the soil, before coming in contact with the water table.

There are various types of on-lot systems found in Chester County. These include cesspool, septic tanks with seepage pit, septic tanks or aerobic tank with seepage bed, or standard and drip irrigation trenches, and septic tanks or an aerobic tank with elevated sand mound. Some of these systems, such as cesspools and septic tanks with seepage pits, are no longer permitted in the state of Pennsylvania due to newer technology that allows for better treatment of effluent. The CCHD provides more in-depth information about the various types of on-lot sewage systems in *On Lot Sewage Systems–An Owner's Manual* which can be obtained by contacting the CCHD or accessing their website (www.chesco.org/health/).

What is on-lot sewage management and why is it important?

On-lot sewage disposal systems were by no means intended for lifetime service without upkeep (Wooding, undated). With constantly changing environmental and usage factors, a correctly designed and installed system will still not operate properly if the system is not maintained. System neglect leads to failure of system components (PSATS, 1998). The most common failure of the on-lot sewage system occurs when scum or solids build up inside the septic tank to a level where they overflow the baffles in the absorption area (Robillard and Martin, 1991). Sometimes the baffles themselves break and cease to hold back the solids; thus allowing the solids to flow into the absorption area. Absorption areas are typically designed to have buried perforated pipes allowing liquid to seep into the surrounding soil. When these pipes become filled with solids or scum, the perforations clog and the liquid backs up into the home or breaks out onto the surface of the ground. To prevent this problem, the septic tanks need to be periodically pumped. Systems that are never pumped can fail after a short period of use; others may last for years before failing. Once they have failed, regardless of how old they are, they are costly and often difficult to replace. A community that has a number of failing on-lot sewage systems in an area will usually have to resort to constructing a costly sewage collection and treatment system (Wooding, undated).

On-lot sewage management involves monitoring and controlling operation and maintenance of on-lot sewage systems {Pennsylvania Department of Environmental Protection

(DEP, 1996)}. The goal of the on-lot sewage management program is to ensure that all on-lot sewage systems are pumped and inspected on a regular basis to prevent failures. Experts recommend that systems be pumped out every three- (3) years (DEP, 1997). Presumably, this would be the responsibility of the individual residence owner, however, in reality, system owners in many instances don't know, understand, or simply forget to meet their maintenance and operational responsibilities. The lack of individual responsibility will become, sooner or later, the community's problem, causing municipal officials to take notice (PSATS, 1998). It is therefore imperative that municipal officials take preventive measures and implement a sewage management program. A municipal management program will necessarily have some associated costs and commitments. However, the cost of an on-lot sewage management program may be minor in comparison to the costs, both monetary and environmental, of having to remediate failing on-lot sewage systems.

Regulations

Act 537 – Pennsylvania Sewage Facilities Act

On January 24, 1966, the Pennsylvania legislature enacted Act 537, the Sewage Facilities Act, to rectify existing sewage disposal problems and prevent future problems (DEP, 1996). To meet this objective, the Act requires proper planning in all types of sewage disposal situations. Under Section 5 of the Act, municipalities are required to develop and implement a comprehensive Official Sewage Facilities Plan that provides for the resolution of existing sewage disposal problems, provides for the future sewage disposal needs of new land development; and provides for future sewage disposal needs of the municipality (35 P. S. § 750.5). This official plan is sometimes called the "base" plan or the "Act 537 plan." That plan "shall", among other things, "provide for adequate sewage treatment facilities which will prevent the discharge of untreated or inadequately treated sewage or other waste into any waters or otherwise provide for the safe and sanitary treatment of sewage or other waste" (35 P. S. § 750.5(d)(3)). This clearly places the responsibility for the maintenance of all sewage management facilities including individual on-lot systems in the hands of the municipality. Act 537 was amended in Act 149 of 1994 to:

- Allow the use of newer types of on-lot systems,
- Provide a system whereby Act 537 plans need not be updated for minor subdivision development,
- Speed up the process of plan approval at the local and state levels,
- Encourage the establishment of multi-municipal local agencies, and
- Encourage the delegation of authority previously exercised exclusively by the DEP to local agencies that demonstrate the capacity to independently enforce additional sewage-related regulatory requirements.

The following information, taken from the DEP, concerns regulations related to the management and operation of on-lot sewage systems. These regulations will be vital in the preparation of an updated Sewage Facilities Plan that includes an on-lot sewage management program.

Chapter 71 – Administration of the Sewage Facilities Planning Program as amended November 7, 1997

The requirements of Act 537 for administering sewage facilities planning by the municipality and the DEP are clarified and implemented in 25 Pa. Code § 71. Chapter 71 is divided into six subchapters for the purpose of providing:

- General requirements
- Official plan requirements
- New land development plan revision requirements

- Official plan requirements for alternative evaluations
- Sewage management program requirements
- Fee requirements.

Subchapter E – Sewage management programs

Under Subchapter E, 25 Pa. Code § 71.71 states that "municipalities are required to assure the proper operation and maintenance of sewage facilities within their borders. Proper operation and maintenance of sewage facilities is essential to the provision of adequate sewage treatment and disposal over the functional life of a sewage treatment system. Municipalities shall, therefore, address long-term operation and maintenance in official plans and revisions to official plans." The section further indicates that the "establishment of a sewage management program as part of an official plan or revision to an official plan provides a method of assuring proper operation and maintenance of sewage facilities."

In 25 Pa. Code § 71.73.a it is stated that "when sewage facilities are permitted by local agencies, the municipality is responsible for taking actions necessary to assure continued compliance of these sewage facilities with the act, The Clean Streams Law and regulations promulgated thereunder." While not mandated by DEP that all municipalities develop a sewage management plan, this clause essentially places the responsibility of sewage facility maintenance on the municipality. Furthermore, 25 Pa. Code § 71.73.b states "when an official plan or official plan revision shows, or the Department determines, that existing sewage facilities permitted by the local agency need periodic inspection, operation or maintenance to provide long-term proper operation, or are not properly functioning because of inadequate operation and maintenance, the municipality shall revise its official plan to establish a sewage management program for these types of facilities." This clause in essence gives DEP the power to mandate institution of a sewage management program by a municipality if it is determined to be necessary. Present malfunctioning systems within a municipality may be all that is needed for DEP to invoke this clause.

According to 25 Pa. Code § 71.73.b, a DEP mandated sewage management program shall include the following at a minimum:

1. Identification of the specific legal authority to be used by municipal officials and their designated employees to enter lands and make inspections of onlot sewage facilities. The policy concerning a schedule of inspections and methods of notification of landowners of this policy shall be included.
2. Standards consistent with section 8(b)(9) of the act (35 P. S. § 750.8(b)(9)) for operation, maintenance, repair or replacement of sewage facilities which include:
   - Removal of septage or other solids from treatment tanks once every 3 years or whenever an inspection program reveals that the treatment tanks are filled with solids in excess of 1/3 of the liquid depth of the tank or with scum in excess of 1/3 of the liquid depth of the tank.
   - Maintenance of surface contouring and other measures, consistent with Chapter 73 (relating to standards for onlot sewage treatment facilities) to divert stormwater away from the treatment facilities and absorption areas and protection of the absorption areas from physical damage.

     Requirements for the use of water conservation devices to reduce hydraulic loading to the sewage system.
   - Requirements for the operation and maintenance of electrical, mechanical and chemical components of the sewage facilities; collection and conveyance piping, pressure lines and manholes; alarm and flow recorder devices; pumps; disinfecting equipment and related safety items.

- Requirements for septage pumpers/haulers which are consistent with the Solid Waste Management Act (35 P. S. § § 6018.101—6018.1003).
- Requirements for holding tank maintenance.

3. A discussion of the specific requirements of the sewage management program and administrative or legal functions needed to carry out the program.
4. Establishment of a fee schedule for the cost of municipal services related to implementing the provision of the sewage management program.
5. Identification of the authority to be used to enforce the requirements of the sewage management program or restrain violations of the program.
6. Identification of penalty provisions for violations of the program requirements.
7. Draft ordinances, regulations, or policies that relate to the sewage management program.
8. Other requirements consistent with the act and The Clean Streams Law.

Septage hauling

In the septic tank, solids and scum accumulate, and are the elements that will eventually build up and may cause problems if not removed. Excess solids and scum accumulation decreases the tanks available liquid volume, therefore reducing the retention time in the tank. Effective sewage treatment relies, impart, on biological processes, which are dependent on adequate retention time. Consequently, reduced retention time results in a reduced level of treatment. Therefore, pumping of septic tanks should occur on a regular basis to ensure continued effective treatment. Pumping of the tank removes the entire contents of the tank, including the liquid. The pumped contents are generally referred to as liquid waste, and are removed by a liquid waste hauler. Licensed by the CCHD, these haulers are knowledgeable of the proper pumping practices and have the appropriate facilities available to perform the final treatment and disposal of the wastes. Only CCHD licensed liquid waste haulers should be contracted to pump out the contents of the septic tank.

Whenever pumping a tank, a proficient hauler will perform a routine tank inspection. A tank inspection should address the condition of the baffles in the tank, the visible condition of the tank, any liquid flowing into the tank during pump out, and the general condition of the ground surface over the adsorption area. Problems found with any of these items should be reported to the homeowner immediately.

On-Lot Management Programs

With today's individual on-lot sewage systems continuing to evolve into increasingly complex systems, management programs are needed to provide for the maintenance and function of the specific components. An essential strategy for addressing non-point source pollution and for protecting sources of drinking water supplies is the improvement of on-lot sewage system management (U.S. EPA, 1986a &1986b). Malfunctioning sewage disposal systems pose a serious threat to public health and the environment. They can pollute public and private drinking water sources, often by discharging directly to the groundwater, and they can expose humans and animals to various pathogens (U.S. EPA, 1986a &1986b). Repairs to these systems often can lead to financial hardships for affected homeowners or municipalities.

The above list of requirements in the state's mandated sewage management program provides a guide of what should be included in an on-lot management program. In the section below, essential and additional features that comprise a successful management program are expanded upon. A solicitor should be contacted to address requirements related to matters of law such as entering properties for inspections, enforcement, penalties, fee schedules, and other legal or administrative functions since they are beyond the scope of this bulletin. Included in Appendix A of this document, as an example, is the on-lot sewage management ordinance for the Town-

ship of East Goshen, Chester County, PA. This ordinance is designed to apply to on-lot sewage management districts, and demonstrates the use of these legal and administrative functions.

Systems inventory

To gain an idea of existing system types, conditions, and locations, the municipality should perform an inventory of all systems. This inventory should include all on-lot systems (individual and community) for residences, as well as for commercial and industrial establishments. Establishing this inventory will help municipal officials determine the cycle for their selected management program. Since not all systems will be in the same condition, any management program that is chosen will be continuous, with every system requiring maintenance at different times.

To begin, the municipality may wish to mail a survey to all tax parcels (see Appendix B for example) and consult the CCHD record. This survey will be most helpful if questions are concise, allowing for the most accurate and thorough of answers. In addition to conducting the survey, follow-up visits to non-respondents may be required. In reaction to this survey, it should be anticipated that many questions will likely arise from concerned residents and commercial facilities, and should be handled by knowledgeable municipal staff. In anticipation of the construction of additional systems, a mechanism is needed for adding additional entries into the inventory. Once all systems have been inventoried, the municipality should then apply their chosen level of involvement in monitoring and maintaining the systems.

Program establishment

The establishment of a sewage management program is of critical importance. The types of programs and level of municipal involvement do vary, and should be based on the particular needs and resources of the municipality. What should be kept in mind is that sewage systems management programs are cost effective. Maintenance of correctly installed sewage systems can extend the life of the systems, saving the costs of repair and replacement of malfunctioning systems. In addition, Act 537 provides for 50% reimbursement to local agencies for the costs of implementing a on-lot sewage management plan into the official Act 537 plan, with certain municipalities being eligible for 85% reimbursement under the Act 149 amendments to Act 537. More information regarding municipal reimbursement can be obtained from contacting any DEP regional office or from the website (www.dep.state.pa.us).

Water conservation

Water conservation is an essential element in prolonging the life of an on-lot sewage system. The more water-using devices in a household, the greater the burden on the on-lot system. A common cause of failure of on-lot sewage systems results from hydraulic overloading or too much water flowing into the tank on a daily basis. On an average daily basis, peak water flows occur in the morning hours before work and school, and in the evening hours around and following dinner (National Association of Home Builders, 1978). On a weekly average, peak water flows are more likely to occur on the weekends. This is in direct relation to more homeowners not only being home for a greater part of the day, but also performing more household chores such as cleaning, laundry, and yard work on the weekends. On-lot management programs should indicate ways in which to limit these volumes. Conserving water and reducing the amount of wasteflow from household activities is an important step in ensuring long-term use, and is easily done through the installation of water conservation plumbing devices. The Delaware River Basin Commission's (DRBC) Water Conservation Performance Standards for Plumbing Fixtures and Fittings (Resolution No. 88-2 Revision No. 2) sets standards for plumbing fixtures and fittings. The regulation covers water closets, urinals, showerheads, and faucets. State and local compliance was required by July 1, 1991. It is appropriate that any sewage management program established by a municipality should include water conservation

ordinances to not only satisfy the DRBC requirements, but to help prolong the life of on-lot systems by reducing flows. An example water conservation ordinance is supplied in Appendix C. The DRBC provides more in depth information on the flow rates for various plumbing fixtures in accordance with American National Standards Institute, which can be obtained by contacting the DRBC or accessing their website (http://www.state.nj.us/drbc/).

Through education and involvement with homeowners, the management program could also encourage many existing homes to be retrofitted with these low-flow devices. In addition to water conservation plumbing, the CCHD has listed ten ways homeowners can limit the amount of water used on a daily basis in their publication entitled, *On-lot Sewage Systems: An Owner's Manual.* The following list should be included in the educational component of the management program:

- Install water saving plumbing fixtures in the home.
- Check your toilets periodically for leaks.
- Fix leaking faucets.
- Wash dishes once a day using a dishpan or plugging the sink. Do not let water run while washing.
- Operate the dishwasher only when full. Do not pre-wash dishes for the automatic dishwasher unless necessary.
- Refrigerate a bottle of water for drinking to avoid letting the water run to obtain a cold drink.
- Select the proper load size or water level on your washing machine. Do not wash multiple loads of laundry one right after the other.
- Take a shower instead of a tub bath. Also, try to limit the length of your showers.
- Do not allow the water to run while brushing teeth or shaving.
- Do not use garbage disposals.

Public education

Sewage management programs should have a continuing educational program for homeowners with on-lot sewage disposal systems. There are varying levels of involvement in an education program that are available to a municipality. The program can vary from short articles in the municipal newsletter to periodic flyers and reminders addressed to system owners to formal information sessions for system owners. The public education component is very important, and is often provided by municipalities. While public education is not the final answer to solving on-lot sewage problems, it is a beginning. However, the best education programs can go unheeded by residents, those having good intentions can misplace educational materials, and others may simply forget to follow through with their own maintenance and inspection. Another complication to consider is that during the life of the house and the on-lot system, there are likely to be several owners whose level of awareness, interest, and commitment may very greatly, if left unmonitored.

Some municipalities take a middle level of educational involvement by holding workshops where experts describe to the residents in attendance the maintenance needs of systems. Unfortunately, some residents do not attend these information sessions, and therefore do not receive the necessary information. In addition, those in attendance may not follow through with the necessary maintenance. Even door-to-door visits cannot ensure that system maintenance will take place. The only way to ensure system maintenance is to monitor systems, require maintenance, and verify that the necessary maintenance has been performed.

The CCHD can provide the public education needs of the municipality. The Health Department brochure, *On-lot Sewage Systems: An Owner's Manual* can be obtained for distribution (www.chesco.org/health). The manual provides to the homeowner excellent detail on system design, maintenance needs, water conservation practices, and a trouble-shooting guide.

Educational material and information sessions should emphasize the following:

- Effluent from settling tanks and from malfunctioning systems can cause human illnesses. Malfunctioning systems are health hazards to the individual family and to the neighborhood.
- Settling tanks do not provide complete treatment but rather, serve to settle solids and trap scum to prevent clogging the drain field. As such, these tanks need to be pumped out regularly. To demonstrate how systems are constructed and where problems can occur, local agencies should provide a pictorial representation of some of the more common disposal systems.
- If an owner's sewage system has electric and/or mechanical components, a knowledgeable individual should check it every year.
- The life cycle cost for an on-lot sewage disposal system is less expensive than a centralized community treatment system. Consider the example that if residents connected to a public treatment system, they could be paying $40 to $80 a month plus the initial tap-in fee. The cost to have their on-lot system pumped or inspected (about $135 to $150 every three years for most systems) is a small amount in comparison. It is only when systems malfunction and have to be periodically replaced that their costs begin to equal that of central systems. Proper maintenance and operation of on-lot systems, therefore, is "good insurance" in preventing large future costs.

Program Types

In this section, six types of programs for on-lot system management are discussed. The types vary concerning the level of municipal involvement as well as with levels of success in achieving the objectives of the program. The higher the level of municipal involvement in the operation and maintenance of on-lot sewage systems, the better the chance of assuring a prolonged life for the system.

A. Private ownership, operation, and management

This program type represents the most basic level of management, and is one that is not recommended due to a high degree of uncertainty that all systems will receive the necessary maintenance. In this program, the municipality merely provides education on system maintenance while the homeowner remains the system owner and is left to provide their own maintenance. As was discussed above, public education by itself will not ensure that all systems are maintained properly.

Note: The following program types, B – E, require the initial systems inventory step discussed earlier.

B. Required proof of pump-out

The homeowner owns and maintains the system and must provide proof that the system has been pumped out on a regular basis as defined by an adopted ordinance. As in program type A above, the municipality should continue to administer public education to all possible residents. With this program, residents should be required to pump out their system every 3-4 years as necessary and provide the municipality with a septage haulers receipt. The municipality should also have a notification system that sends notice to the homeowners when maintenance is due. A system for keeping track of records and enforcing the requirement should be developed as well.

C. Private ownership and operation with municipal inspection

Again, with this program, the homeowner retains ownership of the on-lot system and is responsible for its operation and maintenance. Here, the municipality monitors the systems operation by requiring an annual inspection and proof of pump out. The municipality can do this by hiring a public inspector or a private party/firm to visit every system on a schedule

designed by the municipality. The inspector measures the scum and solid levels to determine if pumping is needed and inspects the system for other signs of deterioration. The homeowner is issued a report of the inspector's findings and is required to comply with the necessary maintenance. Pump out should occur every 3-4 years upon recommendation of the inspector, and a septage hauler receipt should be sent to the municipality for recording. Again, the municipality should continue to administer public education to all possible residents as in program type A above. For this type of program to be successful, the municipality must have the administrative and enforcement functions as well as the necessary ordinances in place.

D. Municipal operation and maintenance

In this program, the municipality takes responsibility for system maintenance while the homeowner remains the owner and is responsible for system replacement if and when necessary. If chosen, the municipality could organize the program as above in C, with an inspector inspecting the system, determining the needed work, and the necessary maintenance being completed by the municipality. Since the homeowner still owns the system, they would be billed for the service, at a rate similar to the fees for public sewer service. The municipality could create on-lot sewage districts and incur all the maintenance and administrative responsibilities for those districts.

E. Municipal ownership

This program choice is similar to that of D above, the main difference here is that the municipality owns the system and is responsible for all system maintenance. Under this program, the municipality would be responsible to maintain and replace systems as needed. Again, on-lot sewage districts would be established and the homeowner would be billed for sewage services. To the benefit of the municipality and homeowner, the public education program described earlier in program type A should continue to be administered.

F. Municipal authority ownership

This program is identical to E above except that a municipal authority owns and operates the systems instead of the municipality itself. The program requires of the municipality the same legal and ordinance measures as in E, however, the authority handles much of the administrative responsibilities.

The preceding program types have only been briefly described. There are undoubtedly variations to the six types of programs that could be developed. Municipalities should select the program that provides the most comfortable level of flexibility, adaptability, and structure necessary to ensure proper operation and maintenance of all on-lot sewage disposal systems within their borders.

Creating a Sewage Management Program Plan

A sewage management program is an element of the municipal official sewage facilities plan. Thus, to create a sewage management program requires the previously discussed sewage facilities plan revision process regulated by the DEP. The municipality will need to select a consultant or ask the municipal planning commission to prepare the management plan. Once complete, the CCHD and Chester County Planning Commission (CCPC), in accordance with DEP regulations, should review the plan. The municipality then adopts the management plan and asks DEP to review and approve the Act 537 plan revision that will include the management plan into official sewage facilities plan of the municipality.

In order to establish a sewage management program plan, a municipality should prepare a policy statement on the proposed action, followed by inventory, analysis and the implementation

sections; in general, all the elements of a typical plan. The policy statement may simply be "The municipality wishes to prevent future malfunctions of on-lot sewage systems in their jurisdiction to protect the health, safety, and welfare of its resident by providing an on-lot sewage management program."

A system inventory, as previously described above, is necessary for smooth implementation of the program, but also to guide in the analysis of which management program to select. For the plan development, this survey can be limited to general observations of on-lot districts, ages, subdivisions, history of problems, types of soils, etc., realizing that a full survey of systems is needed later for the implementation of the program.

The analysis stage investigates the benefits and drawbacks to the different levels of the possible sewage management programs, and leads to the selection of the most appropriate program for the municipality. This analysis should include a section examining the costs of the various program types including all that is required to implement them. This analysis should also identify who shall administer the program, whether it is the municipality, an authority, or a private consultant. Identification of the legal functions and ordinances establishing rights to enter properties and inspect, enforcement provisions, sewage management districts, fee schedules as well as any other legal or administrative details needed to carry out the program should also be included in this analysis.

Finally, an implementation schedule should be shown for the chosen plan elements.

Final Tips for Homeowners and Municipalities

The CCPC strongly encourages municipalities to develop on-lot sewage management programs that include more than just public education. The CCPC believes that a management program which includes some level of required maintenance will go a long way toward preventing future pollution and public health threats as well as reduce costly repairs or new system construction. The CCPC also acknowledges that the first step to proper operation and maintenance of an on-lot disposal system begins with the homeowner. Being the primary user of the system, the homeowner is in the "driver's seat" when it comes to ensuring proper function of their system. Some steps that both municipalities and homeowners can take to ensure proper maintenance are:

- Removal of the kitchen garbage disposal system. While not only a source of wasted water, wastes that are put into a garbage disposal system don't settle out of the water, but are instead passed onto the absorption bed. Garbage disposals are detrimental to on-lot sewage systems in that they place additional hydraulic and nutrient loading burdens on the system (National Ocean Service, 1996). Instead, if space permits, wastes that would normally be placed in a garbage disposal system should be composted. Municipalities can address this issue by simply discouraging their use in public education sessions to restricting their use through the plumbing code.
- Plan for sewage pump-outs around vacation. The average household takes a vacation once a year. Homeowners should take the responsibility to schedule a pump-out right before leaving on vacation. This foresight in scheduling will allow for the 1-week recommended dry out period before the next use of the system.
- Suggest the use of a mixture of baking soda and water for kitchen and bathroom cleaning. Chlorinated products are not necessary to thoroughly clean the kitchen or bathroom and can shorten the life of an on-lot system. Remember, chlorine belongs in the pool not in your septic system.

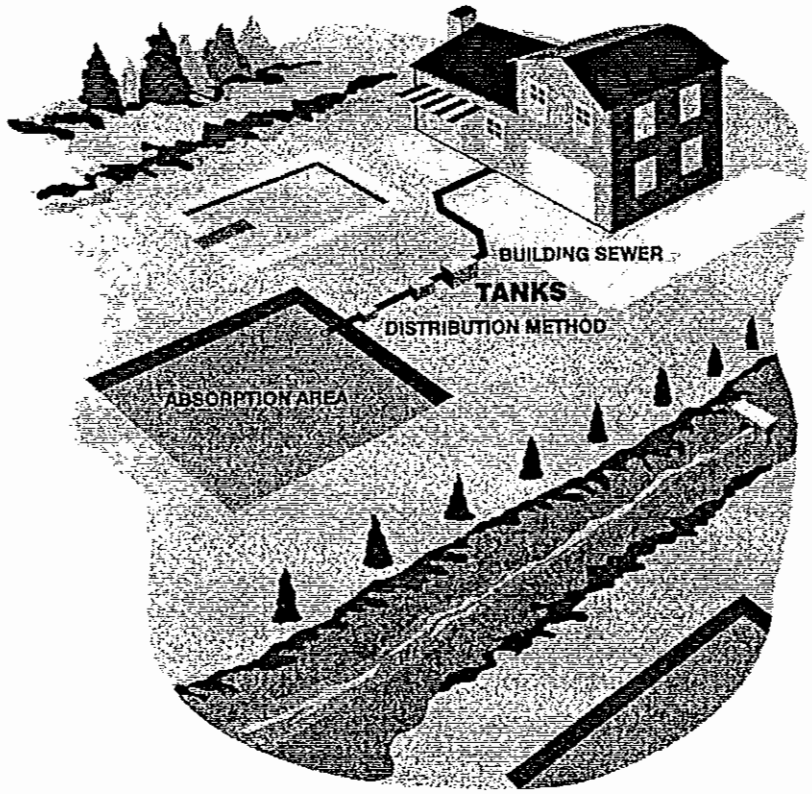
- Schedule to have the system pumped instead of using additives. At this time, the use of additives remains questionable, however, if additives are to be used, biological additives are the suggested choice since they not only break down but also help to treat the sewage.

Conclusion

On-lot sewage management is not just a homeowner or municipal responsibility, but a community effort. Homeowners should be aware of what they are putting in their system, how it functions, and how to properly maintain the system. Municipalities should also be at the forefront of not only providing educational programs, but also monitoring all homeowners to ensure that their on-lot sewage systems are functioning properly and, if not, to work with the homeowner and the CCHD SEO to repair or replace the malfunctioning system. Homeowners and municipalities alike need to remember that failing systems release harmful elements into the environment, contaminating the water supply, and affecting the health and well-being of ourselves and the surrounding environment.

Figure 1.

Example house with a typical on-lot sewage system. The wastes and wastewater flow for primary treatment into two septic tanks. The liquid, or effluent, then flows to the distribution box, and is directed to the absorption area where it percolates through the ground. The effluent is treated from the filtration with the soil, and eventually re-enters the water table.



Source: DEP. 1993. Technical Manual for Sewage Enforcement Officers. DEP #182. Bureau of Water Quality Management.

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Appendix A

On-Lot Management Ordinance Example

(Courtesy of East Goshen Township, Chester County, Pennsylvania)

PART II GENERAL LEGISLATION
Chapter 188, SEWERS
ARTICLE II, Sewage Management Program [Adopted 6-7-1994 by Ord. No. 105]

§ 188-18. Short title; introduction; purpose.

A. This article shall be known and may be cited as "an ordinance providing for a Sewage Management Program for East Goshen Township."

B. In accordance with municipal codes, the Clean Streams Law (Act of June 27, 1937, P.L. 1987, No. 394, as amended, 35 P.S. §§ 691.1 to 691.1001), and the Pennsylvania Sewage Facilities Act (Act of January 24, 1966, P.L. 1535, as amended, 35 P.S. § 750.1 et seq., known as "Act 537"), specifically Title 25, Chapter 71, Section 71.71, it is the power and the duty of East Goshen Township to provide for adequate sewage treatment facilities and for the protection of the public health by prohibiting the discharge of untreated or inadequately treated sewage. The official Sewage Facilities Plan for East Goshen Township states that it is necessary to formulate and implement a sewage management program to effectively prevent and abate water pollution and hazards to the public health caused by improper treatment and disposal of sewage.

C. The purpose of this article is to provide for the regulation, inspection, maintenance and rehabilitation of on-lot sewage disposal systems; to permit intervention in situations which may constitute a public nuisance or hazard to the public health; and to establish penalties and appeal procedures necessary for the proper administration of a sewage management program.

§ 188-19. Definitions.

As used in this article, the following terms shall have the meanings indicated:

AUTHORIZED AGENT — The Township Zoning Officer, a sewage enforcement officer, employee of the township, professional engineer, plumbing inspector or any other qualified or licensed person who is authorized to function within specified limits as an agent of East Goshen Township to administer or enforce the provisions of this article. [Amended 7-11-1995 by Ord. No. 105-A]

BOARD — The Board of Supervisors of East Goshen Township, Chester County, Pennsylvania.

COMMUNITY ON-LOT SEWAGE SYSTEM (COLDS) — Any system, whether publicly or privately owned, for the collection of sewage of a liquid nature from two or more lots, and the treatment and/or disposal of the sewage on one or more of the lots or at any other location for final disposal in whole or in part into the soil. This includes land application by spray irrigation.

LOT — A parcel of land, the land area of which is contiguous and undivided by a street and which conforms to the provisions of Chapter 205, Subdivision and Land Development, and Chapter 240, Zoning, and any other township ordinances, codes, regulations, plans and maps, or any other parcel or tract of land whether or not improved.

MALFUNCTION — A condition which occurs when an on-lot sewage disposal system dis-

charges sewage onto the surface of the ground, into groundwaters of this commonwealth and into surface waters of this commonwealth; backs up into a building connected to the system; in any manner causes a nuisance or hazard to the public health; causes pollution of groundwater or surface water; or causes contamination of public or private drinking water wells. Systems shall be considered to be malfunctioning if any condition noted above occurs for any length of time during any period of the year.

ON-LOT SEWAGE SYSTEM — A system of piping, treatment tanks or other facilities serving a single lot and collecting, treating and disposing of sewage into a subsurface absorption area or spray irrigation system.

PERSON — Any individual, partnership, corporation or other legal entity.

RETAINING TANK (also called a "holding tank") — A watertight receptacle which receives and retains sewage and is designed and constructed to hold sewage pending the ultimate disposal of the sewage at another site.

SEWAGE — Any substance that contains any of the waste products, excrement or other discharge from the bodies of human beings or animals and any noxious or deleterious substances being harmful or inimical to the public health or to animal or aquatic life or to the use of water for domestic water supply or for recreation or which constitutes pollution under the Act of June 22, 1937 (P.L. 1987, No. 394), known as the "Clean Streams Law," as amended.

SEWAGE ENFORCEMENT OFFICER — The Chester County Health Department.

TOWNSHIP — East Goshen Township, Chester County, Pennsylvania.

TREATMENT TANK — A watertight receptacle which receives the discharge of sewage from a house or building sewer line and is designed and constructed so as to permit settling of settleable solids from the liquid digestion of the organic matter by detention and discharge of the liquid portion into a distribution system or pit for underground dispersion or elevated sand mound, individual spray irrigation. Treatment tanks include septic tanks, cesspools, aerobic units and the like.

§ 188-20. Requirements.

A. The requirements of this article shall be effective throughout the municipal limits of East Goshen Township, Chester County, Pennsylvania.

B. Operation and maintenance.

(1) The operation, maintenance and repair of an individual on-lot sewage system shall be the responsibility of the lot owner; provided, however, that maintenance and repair shall be subject to the continuing surveillance and inspection by the township, its authorized agent and/or the Sewage Enforcement Officer.

(2) It shall be the responsibility of the owner of a lot which utilizes an on lot sewage disposal system to have it pumped in accordance with the schedule set forth in § 188-21 and to make such other repairs or replacements as are necessary to prevent the malfunctioning of the system.

(3) The construction, repair and/or replacement of individual on-lot disposal systems shall be subject to the issuance of appropriate permits by the Chester County Health Department.

§ 188-21. On-lot/COLDS system maintenance. [Amended 7-11-1995 by Ord. No. 105-A]

A. Treatment tank systems. The owner of a lot which uses a treatment tank system must have the tank(s) pumped and the contents disposed of at a licensed sewage disposal facility

at least once every three years by a Chester County Health Department licensed septic tank contractor. Every owner of a treatment tank system shall submit proof of the required pumping and disposal to the Township Zoning Officer in the form of a receipted bill issued by the contractor or such other proof as shall be acceptable to said officer. Such proof shall be submitted to the Township Zoning Officer demonstrating pumping and disposal of the system's contents within the preceding twelve-month period at least once every three years. The owner of a system installed after the effective date of this article shall henceforth pump his system in accordance with the schedule established by the township.

B. Retaining tanks. The owner of a lot utilizing a retaining tank(s) or a sewage treatment system designated or operated as a retaining tank on the effective date of this article shall enter into a written contract with a Chester County Health Department licensed septic tank contractor requiring periodic pumping and disposal of the tank's contents in accordance with the schedule required by the permit which authorized the installation and use of the retaining tank system. A copy of the contract shall be filed by the owner with the Township Zoning Officer annually and shall be in effect and valid for a period of at least one year. The owner of a system installed after the effective date of this article shall submit the required contract to the Township Zoning Officer within one year of the installation and annually thereafter.

C. Stream discharge systems. The owner of a lot on which a stream discharge sewage system approved and permitted by the Pennsylvania Department of Environmental Protection (DEP) has been installed shall register the system with the township within 90 days following the effective date of this article by filing a copy of the current DEP permit, together with any other information required by the Zoning Enforcement Officer to verify the current validity of the permit and copies of any tests verifying the system's operational integrity performed during the 12 months immediately preceding the registration. The owner of a system installed after the effective date of this article shall register the system with the township within 90 days of such installation. The Zoning Officer or other authorized agent shall arrange for periodic inspections by the Sewage Enforcement Officer as required.

D. Community on-lot disposal system (COLDS). The operator(s) of any COLDS system shall submit regular reports to the township. Reports shall be in the DEP format for waste management (Chapter 94) and discharge management report.

E. Compliance. Failure to comply with the provisions of Subsections A through D shall constitute a violation of this article, subjecting the owner of the property on which the system is installed to the enforcement and penalty provisions of §§ 188-23 and 188-24.

F. Change of ownership. Prior to the conveyance of any lot which is subject to the provisions of this article, the sewage system installed on such lot shall be pumped and its contents disposed of as required by this section unless the owner has filed with the township a receipt issued by a licensed septic tank contractor proving that the system was pumped out within the immediately preceding six-month period. Following any conveyance of the lot, the owner shall be subject to the provisions of this article.

G. Classification. If the type of on-lot sewage system is unknown, it shall be classified as a cesspool.

H. Promulgation of regulations and required proof. In addition to the requirements specified in this section, the Board may, by resolution, promulgate such forms and regulations for the administration and enforcement of this article as it shall determine necessary. Failure of a lot owner to receive or secure any required form shall not constitute a defense to the enforcement or penalty provisions of this article.

§ 188-22. System rehabilitation.

When the township becomes aware of a violations of this article or County Health

Department regulations, it shall be reported to the Chester County Health Department and become subject to their rules and regulations.

§ 188-23. Enforcement and appeals. [Amended 7-11-1995 by Ord. No. 105-A]

A. The Township Zoning Officer shall have the power and authority to determine all issues relating to compliance with the provisions of this article and to bring and prosecute in the name of the township enforcement and penalty proceedings for violations of its provisions.

B. Appeals from the Zoning Officer's determinations or interpretations of the provisions of this article shall be taken to the Board within 30 days from the date of such determination or interpretation. Appeals shall be heard and determined in accordance with the provisions of the Local Agency Law. The Board may request documentation and consult with the Township Engineer or other competent authorities as it determines necessary for a just resolution of the appeal, and may impose the reasonable costs thereof upon the appellant. Provided, however, that the Board shall have no jurisdiction to hear or determine any appeal from the action of the Zoning Officer in prosecuting a violation of this article in a summary proceeding before a District Justice.

§ 188-24. Violations and penalties. [Amended 7-11-1995 by Ord. No. 105-A; 5-7-1996 by Ord. No. 112]

Any person who violates or permits the violation of any provision of this article shall, upon conviction thereof in a summary proceeding brought before a District Justice under the Pennsylvania Rules of Criminal Procedure, be guilty of a summary offense and shall be subject to the payment of a fine of not less than $100 and not more than $1,000, plus the costs of prosecution. In default of payment thereof, the defendant may be sentenced to imprisonment in the county prison for a term of not more than 30 days. Each section of this article violated shall constitute a separate offense, and each day or portion thereof in which a violation of this article is found to exist shall constitute a separate offense, each of which violations shall be punishable by a separate fine imposed by the District Justice of not less than $100 and not more than $1,000, plus the costs of prosecution, or upon default of payment thereof, the defendant may be sentenced to imprisonment in the county prison for a term of not more than 30 days. All fines and penalties collected for the violation of this article shall be paid to the Township Treasurer.

§ 188-25. Fee schedule.

The Board of Supervisors shall, by resolution, adopt a fee schedule for the administration of this article. Said schedule shall be kept on file by the Township Secretary and shall be reviewed and revised as necessary

SEWAGE PUMPING CONFIRMATION
EAST GOSHEN TOWNSHIP
CHESTER COUNTY, PENNSYLVANIA

DATE OF ISSUE_____, 20____

PROPERTY INFORMATION

OWNER'S NAME: _____

MAILING ADDRESS: _____

_____

ADDRESS OF PROPERTY SERVICES: _____

_____

TYPE OF SYSTEM:_____SEPTIC_____CESSPOOL_____RETAINING TANK

LOCATION OF SYSTEM (provide sketch in space below):

TANK PUMPED BY: _____

CHESTER COUNTY HEALTH DEPT. HAULER LICENSE #: _____

COMMENTS: _____

I certify that on_____,_____ gallons of septage were pumped from the property described above. The contents were disposed at a D.E.P. approved facility/site.

_____

Pumper / Hauler Signature

Appendix B

Example of Inventory Survey

(Courtesy of Tatman & Lee Associates, Inc., Wilmington, Deleware)

Please Return Survey by_____

Questionaire (Circle your answers)

1. What kind of sewage disposal system do you have?

   a) Sewer
   b) Septic system
   c) Cesspool
   d) Holding tank
   e) Don't know

2. If you have a septic systems or cesspool, have you ever had problems with it?

   a) Yes b) No

3. Are these recurring problems?

   a) Yes b) No

4. When did these problems first occur? (Please write in year)

   _____

5. What is the frequency of these problems?

   a) Constantly
   b) Once a year
   c) Once every five years
   d) Other (explain):_____

   _____

6. What type of problems do you have?

   a) System back up into house
   b) Odors
   c) Wet or soggy spots in yard
   d) Sewage runoff on other parts of the lawn
   e) Other (explain):_____

   _____

7. **Is anyone in your neighborhood having difficulties with a septic system?**

   a) Yes b) No

8. **From where do you obtain your water supply?**

   a) Private company
   b) Well
   c) Bottled
   d) Other (explain):_____

   _____

9. **Have you ever had problems with the quality (taste, smell, color, etc.) of your drinking water supply?**

   a) Yes b) No

10. **Have you ever had other kinds of problems with your water supply?**

    a) Inadequate supply
    b) Inadequate pressure
    c) Other (explain):_____

    _____

Additional Comments:

Your Street Address_____

Tax Parcel No. (if known)_____

Name (optional): _____

Appendix C

Water Conservation Ordinance Example

(Courtesy of the Delaware River Basin Commission)

ORDINANCE #_____,
OF (MUNICIPALITY)
WATER CONSERVATION

WHEREAS, the Board of Supervisors of (municipality) hereby finds and determines that in order to conserve and protect its water supply for the greatest public benefit, it is necessary to reduce the demand for water in the manner hereinafter set forth, and

WHEREAS, the purpose of this ordinance is to insure continued availability and service of water to (municipality) residents, now therefore

BE IT ORDAINED BY THE BOARD OF SUPERVISORS OF (MUNICIPALITY) as follows:

Section One: General Policy

No water shall be provided for internal or external use to any residential, commercial, industrial, agricultural, recreational, governmental, or public building or structure of any kind which is constructed or remodeled and in which plumbing, water piping or water fixtures are to be installed, extended or altered in any way, and for which construction a permit is required to be obtained from (municipality) (or would be required but for an exemption from a permit requirement for public or governmental agencies) unless the new, extended or altered plumbing, water piping or other water using fixtures therein conform to the requirements and standards of Section Two of this Ordinance. The provisions of this Ordinance shall apply to any such building or structure for which such a building permit is issued, or would otherwise be required to be issued but for such an exemption, on or after (Date of Adoption).

Section Two: Water Conservation Performance Standards for Plumbing Fixtures and Fittings

Article 1 – Water Closets and Associated Flushing Mechanisms

The water consumption of water closets shall not exceed an average of 1.6 gallons per flush cycle over a range of test pressures from 20 to 8 psi. The fixture shall perform in accordance with the test requirements of the ANSI A112.19.2M and ANSI A112.19.6M.

Article 2 – Urinal and Associated Flushing Mechanisms

Urinal water consumption shall not exceed an average of 1.5 gallons per flush cycle over a range of test pressures from 20 to 80 psi. The fixtures shall perform in accordance with the test requirements of the ANSI A112.19.2M and ANSI A112.19.6M.

Article 3 – Showerheads

Showerhead discharge rates shall not exceed an average of 3.0 gallons of water per minute over a range of test pressures from 20 to 80 psi. The fixtures shall perform in accordance with the test requirements of the ANSI A112.18.1M.

Article 4 – Faucets

Sink and lavatory faucet discharge rates shall not exceed an average of 3.0 gallons of water per minute over a range of test pressures from 20 to 80 psi. The fixtures shall perform in accordance with the test requirements of the ANSI A112.18.1M.

Section Three: Special Provisions

Article 1 – Special Purpose Equipment

The performance standards of Section Two shall not apply to fixtures and fittings such as emergency showers, aspirator faucets, and blowout fixtures that, in order to perform a specialized function, cannot meet the specified standards.

Article 2 – Exemptions

Any person(s) may apply to the (municipality) for an exemption to the terms of this Ordinance, which may be granted by the Board of Supervisors, upon proof that some other device, system or procedure will save as much or more water as those set forth herein, or that those set forth herein cannot be complied with, without undue hardship.

Section Four: Official Review and Modification

The Board of Supervisors may, from time to time modify, add to, or remove from the standards and restrictions herein.

Section Five: Penalties

It shall be a summary offense for any person to use or apply water within (municipality) contrary to or in violation of the restrictions herein, and upon conviction thereof, such persons shall be punished by being imprisoned in the county jail for not more than_____days or by fine of not more than_____or by both such fine and imprisonment.

Adopted this_____day of_____, 19_____

May 24, 1991

Chester County Planning Commission Board Members

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George Asimos, Jr.

Nancy L. Cox

Robert S. Hankin

Patricia S. Imperato

Nancy Mohr

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March, 2002