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of On-site Sewerage Systems**

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SUMMARY:

This paper considers the adequacy of the maintenance given to on-site domestic wastewater treatment and disposal systems and concludes that the systems typically receive inadequate or no maintenance, and offers suggested methods to improve the regulation of these systems.



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REGULATORY METHODS TO ASSURE THE MAINTENANCE OF ON-SITE SEWERAGE SYSTEMS

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This paper begins with a consideration of the adequacy of the maintenance given to on-site domestic wastewater treatment and disposal systems and concludes that the systems typically receive inadequate or no maintenance. Since the present method of regulating the maintenance of on-site sewerage systems must also, therefore, be inadequate, needed improvements are assumed to be warranted. Detailed information about the location of the system and a method of requiring inspection and maintenance are identified as two components necessary for a successful maintenance program. This paper then assumes that from a legal viewpoint the administration and regulation of all types of on-site domestic wastewater treatment and disposal systems is similar and based on that assumption, the paper concludes with a suggested regulatory program.

I. Description of the Problem

As of 1971, there were an estimated 13 million private septic tank-soil absorption systems in use in the United States, serving approximately 50 million people (Patterson, et al., 1971). The use of these systems has been increasing at a rate of about 500,000 new systems per year, so that the number in use today is at least 16 million. And these figures do not include the newer methods and systems which are being developed and promoted for use in lieu of the conventional septic tank system.

Improper site selection, poor construction practices used when installing the system, incorrect design or sizing of the system as well as infrequent or non-existent maintenance have all been given as reasons for the failure of septic systems. Further, the increased degree of complexity associated with the mechanical components used in most of those systems being promoted as alternatives to the septic system has made their proper design, installation and maintenance even more critical.

Not only is there uncertainty about the failure rate of both the septic and the alternate systems, but even less is known about the precise number or percentage of system failures directly attributable to improper or non-existent maintenance. Probably no

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regulatory official today would dispute that some of his failing system problems were caused or exacerbated by incorrect maintenance. Unfortunately, though, a literature review revealed no research which could be used to document this intuitive belief or to give an estimate of the number of failures caused by lack of maintenance.

However, for septic systems, failure caused by poor maintenance often has been assumed to be as follows (anon., 1957):

"Septic tanks should be cleaned before too much sludge or scum is allowed to accumulate. If either the sludge or scum approaches too closely to the bottom of the outlet device, particles will be scoured into the disposal field and will clog the system."

Similarly, alternate systems, especially those mechanical systems such as aeration devices, are dependent on regular maintenance and those using soil absorption as the means of final disposal face the same danger of clogging if not properly maintained. Thus, the regulatory officials are certainly correct in assuming that the lack of maintenance has caused some system failures.

II. Need for a Regulatory Program

In summing up the problem, it must be assumed that proper maintenance of both septic tank and alternative systems could possibly limit the number of failing systems and would likely extend the longevity of most systems. So, the question then becomes one of how to establish a regulatory program to assure adequate maintenance.

The Manual of Septic-Tank Practice (anon., 1957) and most state codes simply recommend that septic tanks be inspected periodically (i.e., Manual suggests 1 year) and cleaned when necessary. This gratuitous recommendation generally is not followed since there is typically no regulatory enforcement of these provisions. For example, Wisconsin has requirements in the state code which require the pumping of septic tanks whenever the combined depth of sludge and scum equals one-third of the effective depth of the tank (anon., 1969). After surveying septic tank systems serving homes around 8 lakes in Wisconsin, the state Division of Health concluded there was "an almost complete lack of servicing of the septic tanks." This survey concluded that this lack of maintenance likely resulted because "Property owners for the most part have little knowledge of . . . even the location of their sewage disposal units (Wirth and Hill, 1967)."

From the homeowner's perspective, a regulatory program will likely be necessary because all too often the system is approached with an out-of-sight-out-of-mind attitude. One well respected expert in the field of on-site sewerage has isolated two reasons for

this neglect by the system owner (Winneberger, 1976):

1. The tolerance of many septic tank systems to function faithfully without any maintenance, and
2. The system resists maintenance in that it is buried somewhere underground.

From the typical results of the cited sanitary survey and knowing the system owner's perspective, it seems certain that a regulatory program involving more than a recommendation for cleaning in a local ordinance or state code will be needed to assure adequate maintenance.

III. Regulatory Program Components

There are two components necessary for a successful regulation of the maintenance of on-site sewerage systems. The first component must assure that the location of the system is known. This is usually accomplished by first requiring the actual location of the system be shown in adequate detail on a drawing of the lot (or portion of the lot) where the system is to be located. The location must be referenced to a benchmark or other permanent fixture or marker to allow ease of location after the system is underground. Also, a filing and retrieval system must be established to provide information about the system's location whenever future maintenance is to be performed.

The second component of a successful regulatory program should provide a method of assuring that each system will be inspected and maintenance performed when needed. This may be accomplished in one of several ways, and the most preferred method is the maintenance permit program.

Maintenance Permit

The regulatory authorities might institute a maintenance permit program whereby periodic inspection of each system would be required as a prerequisite before issuing (or renewing) the permit. It is anticipated that this permit program could be handled as a simple routine office matter with only clerical staff time involved. The clerk would issue a permit upon receipt of a completed application and fee. These permits would be valid for a given time period of 2 or 3 years and, as the permits expire, such system would have to be reinspected before the individual permit could be reissued. In states where wastewater pumpers or haulers are licensed, the inspection could be performed by them. Alternatively, inspection and necessary maintenance of systems involving mechanical components could be performed by plumbers or the system installers. Obviously, newly-installed systems would probably not need maintenance and could be issued the first permit simply upon payment of the fee. This program could most easily be applied prospectively

only to new systems installed since the date of the enabling ordinance or statute. Generally, lack of knowledge about the systems and the owner's address would usually make it difficult to impose the permit program upon existing systems. But, in either situation, the clerk would maintain a list of all permits.

Once instituted, the procedure would involve a tickler system which would mail a renewal permit form to each system owner reminding him that his present maintenance permit expires in 60 days and state that the system must be inspected by a licensed hauler (or plumber or installer) and that the hauler must certify (on the form) that the system was inspected (and necessary pumping or maintenance performed). The completed form plus a fee adequate to cover administration costs would be returned by mail to the clerk.

The enabling ordinance or statutory language which sets up this permit program must provide that it is unlawful to occupy a home served by an on-site system unless a current maintenance permit has been issued for that system. Thus, when the owner failed to renew an expired permit, he would be in violation of the ordinance or statute. From a legal viewpoint enforcement of this type of violation is straightforward since the only facts which have to be proven are the owner (or others) occupies a home served by an on-site system which does not have a valid maintenance permit. Note that it is not necessary to prove the negative facts that the system was not inspected, was not maintained or was not adequately functioning. The ease of the proof of facts should encourage enforcement and prosecution by governmental legal officials (district attorneys, etc.) and, depending upon the wording, the courts might give equitable relief by ordering inspection of the system at the owner's expense, as well as ordering the payment of a fine or forfeiture.

Conditional Sanitary Permits

Many local regulatory agencies, and in fact some state agencies as well, issue sanitary permits to homeowners who desire to install on-site sewerage systems (Stewart, 1974). By making the sanitary permit conditioned upon the performance of adequate inspection and maintenance, it can be used as an alternative to the maintenance permit program described above.

The enabling ordinance or statute which establishes this conditional permit program would have to provide that it would be unlawful to occupy a residence served by an on-site system which does not have a valid sanitary permit. The enabling legislation must also provide that a sanitary permit is void if adequate maintenance is not performed upon the system. This conditional aspect of the sanitary permit should be explained in detail to the homeowner in an attempt to emphasize the importance of maintenance. The performance of adequate maintenance could be administered by use of a certified statement and clerical procedures identical to the maintenance permit program.

The primary advantage of a conditional sanitary permit program lies in the fact that many regulatory agencies already administer a sanitary program. In these jurisdictions only a slight modification to the existing program would be required. It is anticipated that this might politically be more feasible than the enactment of a new regulatory permit program.

The proof of a violation of this program could be similar to the maintenance permit program, especially if the enabling legislation provided that failure to have the system inspected every 2 or 3 years constituted inadequate maintenance.

Governmental Ownership

Ownership of the on-site systems, especially the more innovative systems, by a governmental unit is an additional and very effective method of assuring proper maintenance of these systems. The governmental unit would, in effect, be providing services to the individual owners and would charge a user charge sufficient to cover the cost of maintenance as well as operation and debt service costs. The governmental units anticipated as potential system owners are both general purpose units of government, such as towns and counties, and special purpose units, such as sanitary districts, utility districts, sewerage districts, etc.

There are only a few instances to date where a governmental unit (special purpose districts) has undertaken the ownership of on-site systems (Stewart, 1975). One such approach is currently being considered for a small community in northcentral Wisconsin (Otis, et al., 1975).

IV. Model Legislation

The following model language is offered for consideration of any jurisdiction which desires to implement a septic tank maintenance permit program:

MODEL SECTION 1.0 SEPTIC TANK MAINTENANCE PERMIT
1.1 PERMIT REQUIRED. No owner may occupy, permit to be occupied, rent, lease, live in or reside in, either seasonally or permanently, any building, residence, or other structure serviced by an on-site domestic sewage treatment and disposal system; unless the owner has a valid septic tank maintenance permit for that system issued in his name by the _____ (sanitary inspector or zoning administrator). Owner is defined to mean a natural person, corporation, the state or any subdivision thereof.

1.2 FEE. A fee of \$ _____ shall accompany each application for the septic tank maintenance permit.

1.3 PERMIT APPLICATION. Application for a septic tank maintenance permit shall be made to the _____ (sanitary inspector or zoning administrator) on forms supplied by him. All applications shall state the owner's name and address, the address or location of the private sewage system and shall contain the following statement:

"I certify that on _____ day of _____, 19____, I inspected the septic tank located at the address _____ stated on this application, and I (check one):

_____ pumped all sludge and scum out of the septic tank, or

_____ found that the volume of sludge and scum was less than 1/3 of the tank volume, and I did not pump the septic tank.

Signature

Certification or license number _____"

1.4 ISSUANCE. The _____ (sanitary inspector or zoning administrator) shall issue a permit to the applicant upon receipt of the fee and a completed application, properly signed by a person licensed to service septic tanks and stating his sanitary license number. The permit shall include on its face all information contained in the application and shall contain the date of issuance.

1.5 VALIDITY. The permit issued under this section shall be valid for a period of two years from the date of issuance.

1.6 SALE OF PROPERTY. When property containing a private domestic sewage system is sold, the new property owner, prior to occupying, renting, leasing, or residing in the building, residence or structure served by the system, shall make application for and receive a septic tank maintenance permit; however, the system may be used for a period not to exceed 30 days after making application for the permit.

Additional model language is suggested to require that information about the location of all systems installed in the future. It is recognized that many jurisdictions already have this requirement and the following model language is suggested for those which lack such a requirement:

MODEL SECTION 2.0 PLAN VIEWS

2.1 Every application for a sanitary permit shall include a detailed plan view of the proposed system prepared or drawn

by a (state) Registered Surveyor or a (state) Professional Engineer. The plan view shall be signed by said surveyor or engineer and shall also contain the license number of said surveyor or engineer.

2.2 This detailed plan view shall be dimensioned and drawn to scale and shall show the location of the system and the dwelling served by such system. The recommended scale is _____ but in any case the scale used shall be sufficient to show clearly all the required dimensions and distances enumerated below.

2.3 The following dimensions and distances shall be shown on the plan view: the dimensions of the entire lot or a sufficient portion such that all other required dimensions and distances may be shown; the dimensions of the dwelling to be served by the system; the location of the dwellings and all other buildings on the lot with distances from lot lines to said dwellings and buildings; the location of all septic tank and other treatment tank manholes and the distance and direction of each manhole to the dwelling and to any other nearby reference points; the location and dimensions of all soil absorption fields and replacement areas; and the location and distances from all wells, reservoirs, swimming pools or high water marks of any lake, stream, pond or flowage located on the lot or on adjacent properties within 100 feet of the septic tanks, treatment tanks, sewage disposal systems or replacement disposal areas.

2.4 No on-site sewage treatment and disposal system shall be installed, modified, added to or replaced unless a plan view for that system drawn by a registered surveyor or professional engineer has been submitted.

To be useful, this information about location must be retrievable and the following model language is offered to establish a filing system:

MODEL ORDINANCE SECTION 3.0 PLAN VIEW FILING SYSTEM

3.1 A filing system for plan views of on-site sewage treatment and disposal systems is hereby established.

3.2 It shall be the duty of the _____ (county zoning administrator, sanitarian or other designated person) to accept all approved plan views and to file them by the address or the location of the system. He shall further establish a cross-index which shall list the original owner's name and shall cross list the address of the system. Further he may establish any additional files or other cross-indexes which he determines advisable. In furtherance of this filing system the _____ (county zoning administrator, sanitarian or other designated person) may require that additional information shall be included on the plan view to aid in filing, indexing or retrieving said plan view.

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