

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Clean Water

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TITLE: Technical Decision Making (TDM) Guidance for On-lot Sewage System Repair Situations

EFFECTIVE DATE: 2022

AUTHORITY: Act 537 of 1966, the Pennsylvania Sewage Facilities Act (as amended), 25 Pa. Code Chapter 73

POLICY: It is the policy of the Department of Environmental Protection (DEP), under the Pennsylvania Sewage Facilities Act, to not preclude the appropriate use of alternate and experimental technologies when repairing malfunctioning on-lot sewage systems. It is also recognized that a common hierarchy of technical decision making is necessary to consistently produce successful results in repair situations.

PURPOSE: The purpose of this guidance is to establish a decision-making process to be followed by DEP staff, Municipal Officials, and Sewage Enforcement Officers (SEOs) when repairing malfunctioning individual and community on-lot sewage systems.

APPLICABILITY: This guidance document will assist DEP staff in the sewage facilities program, municipal officials responsible for implementing sewage programs within their municipalities and SEOs responsible for permitting decisions within their service areas in providing consistent resolutions to address malfunctioning on-lot sewage systems.

DISCLAIMER: The policies and procedures outlined in this guidance are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of DEP to give the rules in these policies that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement if circumstances warrant.

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LOCATION: Volume 33, Tab 1

DEFINITION: See Title 25 Pa. Code, Chapter 71, Chapter 72, and Chapter 73

I. DEFINITIONS AND ACRONYMS

Absorption Area—A component of an individual or community on-lot sewage system where partially treated effluent from a treatment tank seeps into the soil; it consists of soil or an aggregate-filled area containing subsurface piping or tubing for the distribution of the partially treated effluent. (25 Pa. Code § 73.1)

Alternate sewage system—A method of demonstrated on-lot sewage treatment and disposal not described in 25 Pa. Code Chapter 73 (relating to standards for onlot sewage treatment facilities). (25 Pa. Code § 73.1)

BAT—Best available technology—The combination of technologies and operational practices that achieves the most effective degree of pollution reduction.

BTG—Best technical guidance—a variance used when attempting to resolve existing pollution or environmental health problems from malfunctioning individual or community on-lot sewage systems where site limitations on existing properties prevent compliance with 25 Pa. Code Chapter 73 (relating to standards for onlot sewage treatment facilities) and classified alternate on-lot sewage system guidance. (25 Pa. Code § 73.3)

Conventional sewage system—A system employing the use of demonstrated on-lot sewage treatment and disposal technology in a manner specifically recognized by 25 Pa. Code Chapter 73 (relating to standards for onlot sewage treatment facilities). The term does not include alternate or experimental sewage systems. (25 Pa. Code § 73.1)

DEP—Pennsylvania Department of Environmental Protection.

Experimental sewage system—A method of on-lot sewage treatment and disposal not described in 25 Pa. Code Chapter 73 (relating to standards for onlot sewage treatment facilities) which is proposed for the purpose of testing and observation. (25 Pa. Code § 73.1)

Failure—A condition of an on-lot system or component that threatens the public health by inadequately treating sewage or by creating a potential for direct or indirect contact between sewage and the public.

Limiting zone—A soil horizon or condition in the soil profile or underlying strata that includes one of the following:

- (i) A seasonal high water table, whether perched or regional, determined by direct observation of the water table or as indicated by redoximorphic soil mottling.
- (ii) A rock formation with open joints, fractures, or solution channels.
- (iii) Masses of rock fragments, including gravel, with insufficient fine soil to fill the voids between the fragments.
- (iv) A rock formation, other stratum or soil condition which is so slowly permeable that it effectively limits the downward passage of effluent.

Local agency—A municipality, or any combination of municipalities acting cooperatively or jointly under the statutes of the Commonwealth, county, county department of health or joint county department of health— (25 Pa. Code § 73.1)

Malfunctioning on-lot sewage system—An on-lot sewage system that is failing as determined by the local agency sewage enforcement officer or DEP.

Minimal horizontal isolation distance—The minimum distance from an on-lot sewage system component(s) to another on or off-site feature as described in 25 Pa. Code Chapter 73.13.

OAT—On-lot alternate technology.

On-lot sewage system component—Any subsection or component of an on-lot sewage system such as building sewer (collection system), treatment tank(s), media filter(s), dosing tank, disinfection system, equalization tank(s), and absorption area(s) or any component necessary for an on-lot sewage system to function properly.

On-lot sewage system—An individual or community sewage system, whether public or privately owned, which uses a system of components for collecting, treating, and disposing of sewage into an absorption area or spray field or by retention in a retaining tank serving one or more lots.

O&M—Operation and maintenance.

On-lot Sewage Disposal System Permit—An authorization, license or equivalent control document issued by DEP or local agency to implement the requirements of the Sewage Facilities Act and regulations promulgated thereunder, relating to the installation, alteration, repair, or decommission of an individual or community on-lot sewage system. Types of permits are as follows:

- (i) *Alteration permit*—Any modification or structural change to an existing individual or community on-lot sewage system for any purpose other than to affect a repair.
- (ii) *Installation permit*—The construction of a new individual or community on-lot sewage system.
- (iii) *Repair permit*—Any action taken that is performed on an on-lot sewage system to restore the proper function of the system, including replacement of some or all of its components.

SFA—Sewage Facilities Act—Pennsylvania Sewage Facilities Act (35 P.S. §§ 750.1 750.20).

SFTF—Small flow treatment facility.

Sewage—A substance that contains the waste products or excrement or other discharge from the bodies of human beings or animals and 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. The term includes any substance which constitutes pollution under The Clean Streams Law— (25 Pa. Code § 73.1)

SEO—Sewage Enforcement Officer—An official of the local agency who reviews permit applications and sewage facilities planning modules, issues permits as authorized by the act and conducts investigations and inspections that are necessary to implement the act and the regulations thereunder. (25 Pa. Code § 73.1)

Site-specific experimental on-lot sewage system—A method of on-lot sewage treatment and disposal not described in 25 Pa. Code Chapter 73 (relating to standards for onlot treatment facilities) which is proposed for the purpose of addressing a malfunctioning on-lot sewage system when all other options for sewage treatment and disposal, excluding a holding tank, are unavailable.

TDM—*Technical decision making.*

TGD—*Technical guidance document.*

II. INTRODUCTION

This guidance document provides a process for making technical decisions in a consistent and concise manner to resolve malfunctioning on-lot sewage systems. The process uses a stepped approach to evaluate and repair of a malfunctioning system with a design that has the least potential to harm the health of the public or cause pollution to the waters of the Commonwealth. The SEO is to consider a classified conventional or alternate on-lot sewage system to affect a system repair in a manner that conforms to the regulations, and if none is physically possible, use a systematic TDM process, detailed in this guidance document, to resolve the issue. The TDM process uses an accepted hierarchy based on science and experience of DEP. Relevant sections of the SFA and the regulations promulgated thereunder are as follows:

Section 7 (a)(1) of the SFA requires, in part, that no person shall repair or alter an individual sewage system or community sewage system without first obtaining a permit indicating that the site and the plans and specifications of the system are in compliance with provisions of the SFA and the standards adopted pursuant to the SFA.

25 Pa. Code § 73.11(a) prohibits any person from installing and any SEO from issuing a permit for or approve a sewage system that violates 25 Pa. Code Chapter 73 (relating to standards for onlot treatment facilities).

25 Pa. Code § 72.22(b) requires a permit from the local agency for most repairs. Generally, any alteration, repair, replacement, or modification that will affect the permitted design of the system will need a permit. 25 Pa. Code § 73.3(b) provides relief to an SEO from the obligation to meet certain requirements of Chapter 73 when permitting the repair of a malfunctioning on-lot sewage system in situations where meeting all the technical requirements are not physically possible.

Malfunctioning on-lot sewage system terminology has been clarified to provide for additional flexibility in using BTG for the repair of malfunctioning on-lot sewage systems and their components that are failing, causing or at risk of causing a public health, safety, and/or environmental hazard. The focus on the term malfunctioning on-lot sewage system in the process is in reference to the requirement in 25 Pa. Code § 73.3(b) that allows BTG only when an on-lot sewage system is considered malfunctioning. We encourage SEOs, local agencies, and property owners to proactively inspect and receive a permit to alter, repair, modify or replace components before any on-lot sewage system malfunction occurs.

The DEP developed a step-by-step TDM process to assist the SEO in the repair and replacement of a malfunctioning on-lot sewage system. The TDM process will allow an SEO to consider all options before settling on a course of action, providing the SEO with the tools necessary to meet their obligations under the SFA and regulations promulgated thereunder.

III. SCOPE

The intended scope of this TGD is to:

- A. Provide consistent definitions for terms that are used in the TDM process.
- B. Explain guidelines for the TDM process to permit repairs for malfunctioning on-lot sewage systems and components.
- C. Provide guidance on the permitting of replacement on-lot systems and the use of BTG when siting those systems.
- D. Provide guidance on when a repair/replacement permit becomes an experimental permit and what that entails.
- E. Provide guidance on when SEOs can make independent decisions and clarify situations in which consultation with DEP is necessary.

IV. TECHNICAL DECISION MAKING GUIDELINES

The TDM process is illustrated in Figure 1. It describes the amount of flexibility that the SEO has while guiding the decision making process to the desired outcome of issuing a permit for an appropriate repair to the malfunctioning on-lot sewage system or component. Important concepts are as follows:

- **BTG does NOT excuse compliance with regulatory requirements that can be met.**
- The TDM guidelines were created as a multi-stepped process where each step indicates the general options that should be considered at that point in the process.
- If the options contained in a step are not feasible for the situation at hand, move to the next step and consider the options indicated therein. Continue this process until you arrive at one or more satisfactory resolution(s).
- These guidelines promote flexibility and creative problem solving while providing additional support for the SEOs and guidance from DEP to those making decisions in the field.
- The repair permit may be issued by the local agency SEO or by DEP, depending upon the situation or the type of technology selected.

STEP 1 – ON-LOT SEWAGE SYSTEM MALFUNCTION IDENTIFICATION

The TDM process begins when an on-lot sewage system malfunction is identified. Only the local agency SEO or DEP can verify that an on-lot sewage system is malfunctioning and issue a permit to repair or replace one or more components of the system. An on-lot system may be considered “malfunctioning” when it is either causing a nuisance, or it has the potential to cause a nuisance if one or more components of the system are not repaired or replaced. The following conditions are examples of on-lot system malfunctions:

- Partially treated or untreated sewage effluent on the ground surface.

- Backup of partially treated or untreated sewage effluent into a structure the on-lot sewage system is serving.
- Partially treated or untreated sewage effluent entering, either directly or indirectly, into a surface water of this Commonwealth.
- Partially treated or untreated sewage entering the ground water.
- Saturated conditions or ponding in the absorption area that are persistent over a period of 7 or more days not directly related to an identifiable excessive precipitation event.
- Cesspools or seepage pits in contact with the seasonal high water table, whether perched or regional.
- Cesspools that are structurally unsound.

The SEO or DEP has discretion to determine if an on-lot sewage system does not meet the current regulatory requirements, is malfunctioning.

STEP 2 – TROUBLESHOOTING AND TESTING

After a malfunction has been verified by the SEO or DEP, the system will need to be inspected and tested to troubleshoot the problem. To properly correct a malfunctioning on-lot system, it is critical to understand what is causing the malfunction. There may be one or more factors that are causing the system to malfunction, so care should be taken to ensure that the corrective actions selected will effectively resolve the malfunction. Here are a few guidelines to follow when troubleshooting a malfunctioning on-lot sewage system:

1. It is important to inspect every component of the malfunctioning system. Failure of one component may lead to failures of other components. If the SEO does not inspect the entire system, the SEO may miss other failing components, resulting in an unsuccessful repair. Pumping of the tanks are necessary to complete a thorough visual inspection of the interior of these components.
2. Verify during the inspection that servicing one or more components will correct the malfunction. Servicing may include pumping out of components, adjustments to component telemetry by a manufacturer representative or other maintenance activities.
3. Talk to the property owner and/or tenant to rule out inappropriate use of the on-lot sewage system as the cause of the malfunction. Exceeding the design flow rate and disposal of certain chemicals into the system are two common missuses.
4. If you can test it, test it. Test structural integrity of system components, test the pumps or siphons (if applicable), test the conveyance lines, etc. etc. Rule out the relatively simple fixes before proposing replacement of the whole system.
5. If deemed necessary, use dye testing when tank leaks or stream contamination is suspected. Use only industry specific dyes and follow the product directions for its use.

Once the cause of the malfunction has been identified from the inspections and testing, proceed to Step 3.

STEP 3 – MALFUNCTION REPAIR USING CONVENTIONAL OR ALTERNATE TECHNOLOGIES

Conventional on-lot sewage systems should first be considered before alternate or experimental on-lot sewage systems when correcting a malfunctioning on-lot sewage system. Considered does not mean that one must use a conventional on-lot sewage system to correct a malfunctioning system. It simply means that the site should be evaluated for the possibility of using a conventional system prior to selecting a technology.

- When using a conventional on-lot sewage system, follow all applicable sections of 25 Pa. Code Chapter 73 (relating to standards for onlot sewage treatment facilities) when designing and installing the system.
- When using an alternate on-lot sewage component and/or system, follow the appropriate alternate on-lot technology listing, OAT TGD and all applicable parts of 25 Pa. Code Chapter 73 (relating to standards for onlot sewage treatment facilities) when designing and installing the system. The alternate on-lot technology listing and OAT TGD documents provide additional information for consideration of alternate systems.
- A permit is required for repair or replacement of one or more components, and may only be issued by a local agency SEO or when necessary, DEP.

If the malfunction can be corrected in accordance with 25 Pa. Code Chapter 73 (relating to standards for onlot sewage treatment facilities) and the requirements set forth in the alternate on-lot technology listing or the OAT TGD, there is no need to proceed to the following step. If the correction cannot be made in accordance with those standards proceed to Step 4.

STEP 4 – USING BTG TO WAIVE HORIZONTAL ISOLATION DISTANCES OR SELECT DESIGN REQUIREMENTS

The first step in applying BTG is to consider selectively waiving specific horizontal isolation distance criteria under the provisions of BTG found in 25 Pa. Code § 73.3(b). The design and siting of the system must meet all the horizontal isolation distances in 25 Pa. Code § 73.13 whenever possible. SEOs using BTG should be able to defend their decision technically and scientifically, ruling out all options before proceeding. BTG is one tool in the toolbox and should be used following careful consideration. For example, carefully consider using BTG to waive a single horizontal isolation distance will have less impact than waiving multiple distances for the same absorption area. Additional review and consideration should be completed when proposing to waive multiple criteria.

Further, BTG does not allow a proposal to bypass the appropriate DEP technology review during the permitting process. It remains essential to interact with DEP when appropriate.

BTG should not be used for absorption areas in the following circumstances since there is a high probability of malfunctioning either immediately or very soon after installation:

- Placement on unsuitable sites as described per 25 Pa. Code § 73.12. Placing systems on unsuitable soils has a high probability of malfunctioning either immediately or very soon after installation.

- Placement on sites with a limiting zone to the mineral soil surface that is outside the design of the absorption area.

BTG is appropriate when:

- BTG is used to repair or replace a malfunctioning on-lot sewage system.
- The repair or replacement will not create a nuisance or direct/indirect public health hazard.
- The repaired system or replacement has a reasonable probability of functioning long term.

Limit the use of BTG to the waiving of the horizontal isolation distances in 25 Pa. Code §73.13 and the following:

- **Without reducing the minimum square footage of the absorption area** as designed using 25 Pa Code Chapter 73 (relating to standards for onlot sewage treatment facilities), the alternate on-lot technology listings, or OAT TGDs, the length and width may be adjusted by up to 5% to meet site constraints when no other options are available.
- Maintain the following horizontal isolation distance in 25 Pa. Code § 73.13: From the perimeter of the aggregate in the absorption area to an area identified as a floodway by a completed Federal Flood Insurance mapping~~-.~~ Where there is no flood mapping, a flood way extends 50 feet from the top of the stream bank as determined by the local agency~~-.~~ Locating an absorption area in a floodway will result in a malfunction when flooding occurs.
- To drinking water wells except as provided by Pa. Code § 72.33.

Under BTG, an on-lot system may encroach upon a water supply well when repairing a malfunctioning **individual** on-lot sewage system~~-.~~ There are several additional steps associated with choosing this route, and depending on the variables involved, not all scenarios will qualify for a well isolation exemption under Pa. Code § 72.33. Note, well isolation distance applies to all wells, even those that are inactive or have not been properly sealed when abandoned~~-.~~ These different situations and additional steps are as follows:

- 25 Pa. Code § 73.3(b) – “When application of BTG results in the absorption area or spray field encroaching on the regulated isolation distance to a well, the proper well abandonment procedure or the relocation of the well should be considered~~-.~~ The requirements of Section 72.33 (relating to well exemption) may be waived at the discretion of the local agency.”
- Additionally, 25 Pa. Code § 72.33(b) – “If a repair to a malfunctioning onlot system is being considered under § 73.3(b), the requirements of this section may be waived at the sole discretion of the local agency.” If during a repair of a malfunctioning individual on-lot sewage system, an absorption area must be placed within 100 feet of a well, regardless of well ownership, consideration should first be given to moving that well~~-.~~ If efforts to move the well are denied or are not feasible (no other suitable site, owner/neighbor will

not grant permission, etc.), then a well isolation distance exemption utilizing BTG may be considered.

- Pretreatment of the effluent to avoid fecal coliform and nitrogen contamination of the well will be based on the appropriate groundwater study, i.e., a hydrogeological report, submitted to the local agency, or if the local agency waives this requirement, best available technology should be used for the on-lot sewage system. Best available technology should include advanced secondary treatment, disinfection, and nitrogen reduction, to protect the well from contamination.
- Well isolation exemption is granted by the local agency and not the SEO. Such an exemption should be reflected in a signed written statement by the local agency on its letterhead.

When approving BTG, the SEO or local agency should provide the homeowner with a written notification that states the following:

- The site does not meet Chapter 73 standards. Itemized all deviation from the regulatory horizontal isolation distances in the permit.
- There is a possibility that the repair system may fail.
- Reducing water use and installing water-conservation devices may help prolong the life of the system.
- The repair permit does not relieve the applicant of the responsibility to correct any failures of on-lot sewage system components that may occur in the future.

If the on-lot sewage system cannot be installed using BTG and there is no viable sewerage connection proceed to Step 5.

Note: If there is a viable centralized sewerage option for the property, consider pursuing this option before proceeding to Step 5.

STEP 5 – INITIATE PLANNING FOR AN SFTF

Evaluate the site for placement of a Small Flow Treatment Facility (SFTF). See the DEP's *Small Flow Treatment Facilities Manual (362-0300-002)* available on DEP's eLibrary for information on SFTFs by following URL:

<https://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4660>

SFTFs require sewage facilities planning and a DEP permit. Please contact your region's DEP planning and permitting staff in the Bureau of Clean Water for the requirements to complete sewage facilities planning and to obtain a permit.

If the SFTF is technically infeasible or not permissible for placement on the property proceed to Step 6.

STEP 6 - PROPOSED USE OF SITE-SPECIFIC EXPERIMENTAL SEWAGE SYSTEM

All site-specific experimental sewage system proposals must include, as per 25 Pa. Code §73.71(g) complete preliminary design plans and specifications and must be sent, as per 25 Pa. Code § 72.25(d), to the SEO and DEP at least 60 days prior to applying for a permit. Central office DEP will review, determine if classification is appropriate and provide comments to the SEO within 60 days of receipt of a complete proposal. The following are examples of when a site-specific experimental classification of an on-lot sewage system may be justified:

- When violation of one or more vertical isolation distances to a limiting zone is necessary.
- When deviating from design specifications for a conventional or an OAT, outside of what is allowed for in BTG, are necessary to meet site constraints. Examples are as follows:
 - Adjusting the dimensions of the absorption area beyond the 5%.
 - Decreasing the infiltrative surface area of the absorption area, as required by 25 Pa. Code Chapter 73 (relating to standards for onlot sewage treatment facilities) or required by design in the OAT classification.
 - Adjusting lateral configurations.
 - When placing a conventional or alternate technology on slopes outside of design requirements. Note, slopes over 25%, as per 25 Pa. Code § 73.12(a), are unsuitable for on-lot sewage systems and a permit must be denied.

DEP has determined the only way to verify that an experimental design, including repairs, protects public health, safety, and the environment, is through monitoring, ~~observation~~observation, and testing. DEP has determined, that permitted experimental systems should receive periodic inspection and operation and maintenance to provide long-term proper operation, and therefore should be operated under an approved sewage management program (SMP) that specifies such monitoring, observation and testing of the experimental on-lot sewage system, and that an O&M agreement with a qualified service provider is maintained for the life of the system.

The following additional considerations should be addressed before the classification of a system as a site-specific experimental technology and the issuance of a site-specific experimental on-lot sewage system permit.

- A thorough site investigation using a qualified soil scientist under the direction of a DEP soil scientist. A soil morphological evaluation report should be completed following the site investigation and provided to DEP.
- A design completed, signed and, sealed by a professional engineer using BAT, including but not limited to, advanced secondary treatment of sewage, fecal coliform removal to less than 1 cfu/100 ml, and total nitrogen reduction of the sewage of at least 50%. Relaxation of these requirements may be acceptable if noted in a hydrogeologic report. Additional design requirements will be provided by DEP to the professional engineer based on the site conditions.

- A hydrogeologic report completed, signed and, sealed by a professional hydrogeologist stating the design will not adversely affect public health, safety, and waters of the Commonwealth. Relaxation of this requirement may be acceptable if determined unnecessary by a DEP professional hydrogeologist.
- An O&M manual developed, signed, and sealed by the professional engineer.
- A deed restriction requiring an O&M agreement be maintained with the property owner and a qualified service provider for the life of the experimental on-lot sewage system. The service provider may be the local agency or a third-party contractor.

When required by DEP the following additional conditions should be included in a site-specific experimental on-lot sewage system operational permit.

- A 5-year renewal cycle.
- Inspection of the system at a frequency detailed in the O&M manual by a local agency SEO or other SEO contracted with the local agency.
- Sampling of the effluent by a qualified service provider for CBOD₅, TSS, Fecal Coliform, and Total Nitrogen (if applicable) a minimum of once per quarter or until after review of the data by DEP allows for a reduction in frequency.
- Annual reporting of all inspection and sampling information should be provided to the DEP.

If the site will not support an experimental on-lot sewage system than proceed to Step 7

STEP 7 – HOLDING TANK

The use of a holding tank remains the “repair of last resort” because of the intense and expensive maintenance requirements that exist for this structure. Holding tanks should be used only when there are no other viable options available to repair a malfunctioning on-lot sewage system. Planning is often required for use of holding tanks; please contact your SEO and regional DEP planning specialist before proceeding.

Figure 1 - Technical Decision Making Flow Diagram

