



**Harford County Health Department
Resource Protection Division**
www.harfordcountyhealth.com

Building With Well and Septic System

Booklet # 01-08

Introduction

This booklet is intended for use by those planning to build a home on an existing lot to be served by private well water and an on-site sewage disposal system. It is not intended for those planning to subdivide property or to develop commercial property. (See additional information printed by the Health Department Booklet # 02-08 and # 03-08.)

For information regarding subdivision of property, contact the Subdivision, Perc Test Program, of the Resource Protection Division at 443-643-0317.

For information regarding development of commercial property, contact the Permits, Inspections, Complaints, Solid Waste and Air Program of the Resource Protection Division at 443-643-0330.



Process for Residential Development on Existing Lots

New homes constructed outside the service areas of public water and sewerage in Harford County requires considerable site evaluation before a building permit can be approved. Careful planning prior to construction is in the best interests of the potential homeowner and public at large. The proper placement and construction of your well and septic system is extremely important in protecting water quality and human health.

The eight steps outlined in this booklet will acquaint you with a general understanding of the procedures and information required during the building process.

Step 1 - Prepare a site plan

Step 2 - File for a percolation test

Step 3 - Perform the percolation test

Step 4 - Obtain a well permit and drill the well

Step 5 - File for construction permits

Step 6 - Build the house, install the septic system

Step 7 - Perform water quality testing for Certificate of Potability

Step 8 - Obtain the Use and Occupancy Permit

Step 1: Prepare a Site Plan

The first step in the building process is preparation of a scaled site plan. This may be done by the homeowner if accurate dimensions of the lot and proposed dwelling, well, septic system (septic reserve area- SRA) driveway and parking areas are shown. At the discretion of this office and/or the County Permits office, an engineered site plan may be required. The location of the dwelling and any outbuildings must follow the Harford County Department of Planning and Zoning (P&Z) building setback requirements. Contact that office at 410-638-3103 concerning setback requirements and any other necessary permit requirements, such as electrical, plumbing, sediment control, etc.

The site plan should be drawn to a scale of 1" = 100' or larger (1" = 50' or larger is recommended). The proposed house, well location, septic system/SRA, and driveway must be depicted on the plan using the siting restrictions. (See below) Features such as existing wells, septic systems, streams and structures, which are within 100 feet of the property lines must also be shown. Mapped soil types as designated by the Harford County Soil Survey Manual and topographic lines may be included, which will expedite review and approval. See Figure 1 for an example of an acceptable site plan.

The following siting restrictions are required by the state and local codes to protect the well and groundwater from contamination and to ensure a properly functioning septic system.

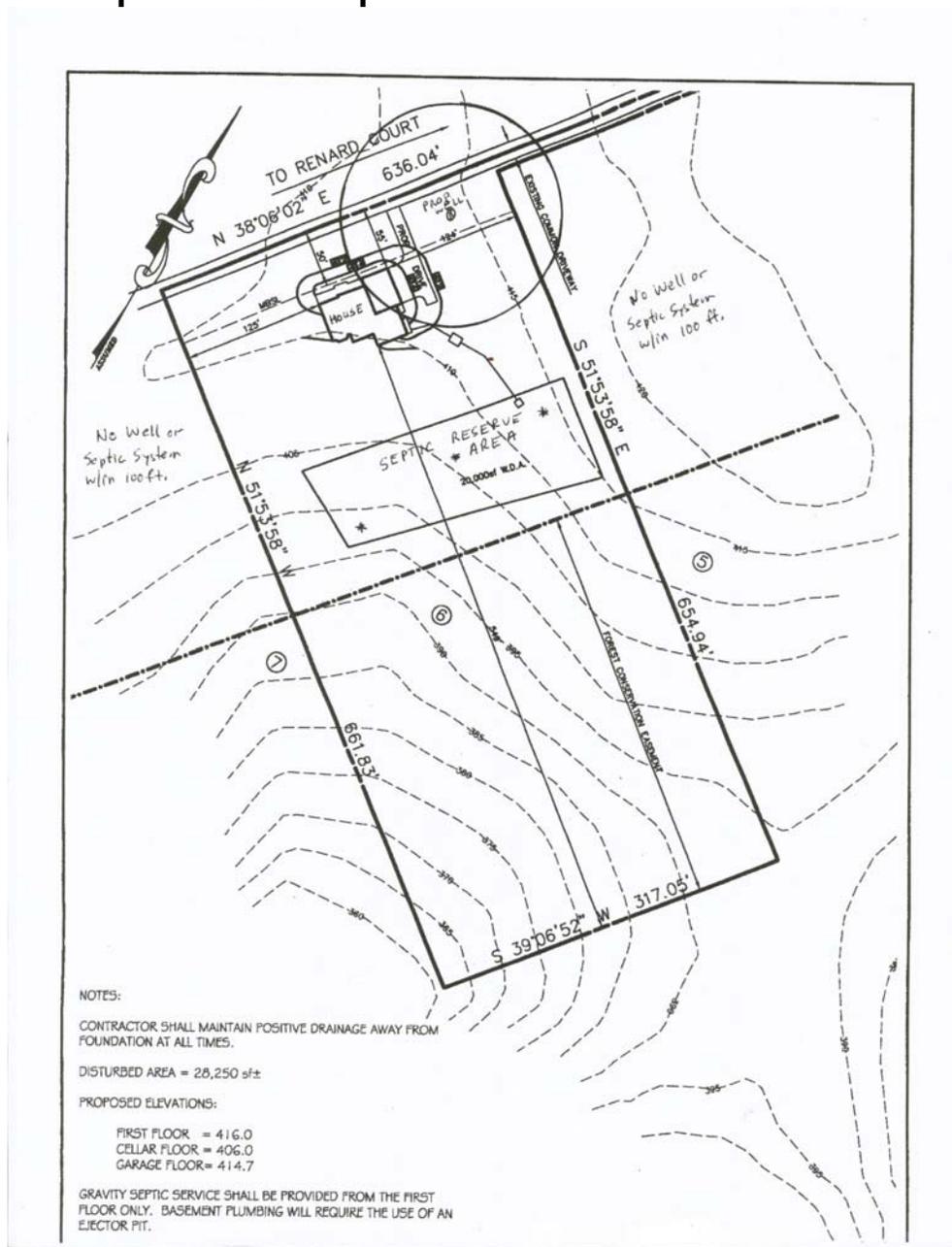
Well Locations Must Be:

- At least 10 feet from property lines
- At least 15 feet from road right-of-ways and dedicated easements
- At least 30 feet from a building foundation
- At least 100 feet from the septic system/SRA
- At least 100 feet from neighboring septic systems/SRAs
- The well should be at a higher elevation than the septic system/SRA. If not, additional separation is required and must be approved by the Health Department

Septic Systems/SRAs Must Be:

- At least 15 feet from property lines, road right-of-ways, and dedicated easements
- At least 100 feet from the well and any neighboring well
- At least 100 feet from any stream or body of water
- At least 25 feet from steep slopes (25% or greater)
- Outside of designated Forest Retention and Chesapeake Critical Bay Areas (See P&Z)
- The septic tank must be at least 20 feet from the house
- The drainfields/SRA must be at least 30 feet from the house
- The septic system should be at an elevation lower or equivalent to the well

Figure 1: Example of a site plan



Note: Existing properties may or may not have recorded septic reserve areas. If a property was created prior to March 1972 it probably does not have a recorded SRA, but must have sufficient area for an initial septic system and one complete repair system. The area required will be based on the results of the percolation test. Lots legally created (subdivided) after March 1972 will have a SRA from 10,000-40,000 sq. ft. size septic reserve area. The official legal description of the lot and/or the recorded plat of the property should be checked at the County Land Records office. The Health Department may have available the size of the septic reserve area on most lots.

Step 2: File for a Percolation Test

County certified soil percolation tests, or "perc" tests, are required to determine the size and suitability for a sewage disposal system on your property. To file for a perc test, an application with a site plan must be made to the Resource Protection Division at the Health Department. The application must include the appropriate fee (see website for Perc Application).

Most soils in the county may be tested during any time of the year. However, about 20% of properties are located in what are called "wet weather" soils. Typically, these may only be tested between February 1 through April 30. Each perc test application will be reviewed to determine if the property is in soils which require testing during the "wet season", or if it may be tested during any time of the year. If the property is in the wet weather soils category, and it outside the wet season, the percolation application will be returned to the applicant. The perc test should be re-applied for after January 1, prior to the wet season for that year. If a wet weather perc test is applied during the wet weather season, it may or may not be able to be tested depending on the schedule for the season. If submitted too late, you may have to wait until the next wet weather season. Usually, there is a four to five week backlog due to heavy scheduling during this time of year.

The percolation test application must be accompanied by an accurate, scaled site plan. This office will contact the applicant to schedule a mutually convenient date to perform the perc test. The house site, property corners, and SRA (if present) should be staked.

The owner must hire a backhoe operator to perform the digging of the holes, while a representative of this office will perform the actual test and record the soil description on each hole dug. Typically, three holes, up to 14 feet deep, will be dug during the percolation testing of the property.

Upon completion of the percolation test, this office will send the applicant a copy of the results.

If satisfactory, this report will provide information necessary to size a septic system for the property according to the house size (based on the number of bedrooms) and list any restrictions, if necessary.

If the percolation test is unsatisfactory, the property may not be suitable for an on-site waste disposal system. However, if the initial evaluation demonstrates some limited potential, there may be additional type tests that could be attempted, such as for a sand mound type system. (See HCHD website-I&A testing). Although, there is no guarantee that every existing vacant property will be able to be built on utilizing any type of septic system.

Step 3: Perform the Percolation Test

An excavation contractor is hired by the applicant or property owner to dig the soil excavation pits. The backhoe should be able to dig to a depth of at least 12-14 feet. Enough water, approximately 5 gallons /pit, must be available on site to use for the timed test in each hole.

The County Sanitarian must be on site to determine exactly where the test pits should be dug. Also, they will record the soil characteristics, ground water level (if encountered), and depth to bedrock (if encountered). A water test to assess the soil permeability will be performed in each test pit, if deemed necessary.

Both the soil characteristics and percolation test must meet the state and local criteria in order to be approved for building on the lot.

Note: A passing perc test should not be construed to mean that the lot is acceptable for any size home. There may be restrictions due to the perc test results or other constraints that are found to be existing (e.g. neighboring wells and/or septic systems may encroach the lot or restrict the area for satisfactory location of the proposed private utilities). Again, the size of the septic system is dependent on the results of the percolation tests. Area needed for the system can vary widely, due to the permeability of the soil on the property.

Figure 2- Picture of Soil Percolation Test



Step 4: Obtain a Well Permit and Drill the Well

Upon completion and approval of the lot based on satisfactory percolation testing, arrangements must be made to drill a well for the domestic water supply. Only a well driller licensed in the State of Maryland can make application to the Health Department for a well. The well driller should visit the property and provide the owner with a contract to perform the work.

Most wells drilled in the county are "rock" wells, obtaining water from fractures in the bedrock. Air-percussion well drilling rigs are used for these wells. Each year, a few wells are drilled in the coastal plain area, east of Interstate 95, which are considered "sand" wells. These require "Mud" rotary drilling equipment.

The well permit application must include a site plan acceptable to the department. A Sanitarian will review all appropriate documents, including the Health Department's Environmental Concerns GIS Maps for the immediate area. If approved, the permit to drill will be issued to the well driller.

The well driller must drill the well in the approved location on the site plan. At times, an unsuccessful well ("dry hole") is drilled. Prior to moving to another site, the driller must first obtain approval from the Health Department.

After drilling the well, the driller is required to perform a yield test to determine that the quantity of water is adequate in the well. Depending on the yield, the procedure takes from three to six hours. The well driller must record the water level and pumping rate every 15 minutes until the test is completed.

As stated in the MD State Well Construction Regulations, C.O.M.A.R. 26.04.04, a well must be able to produce at least 1 gallon/minute and provide 500 gallons within a two hour period. The well must be able to sustain the yield for at least six hours at 4 gal/minute or less and for at least three hours if it is able to pump over 4 gal/minute.

Upon verifying adequate yield, the well driller completes the well by sealing the casing into the bedrock (for rock wells) with a procedure known as grouting. Sand wells are also grouted down into the impervious clay layer above the aquifer. The grout is typically a mixture of cement and bentonite clay which prevents surface water from contaminating the well and ground water.

A cap is placed on the well and the well tag containing the State identification number is attached to the casing. It is recommended that the well cap be securely fastened to the casing to prevent any contamination of the well prior to connecting it to the house.

Once the well is completed, a well completion report and yield test report is submitted to the Health Department for review for approval. This information is required prior to approval of a building permit.

Figure 3-Picture of a well rig

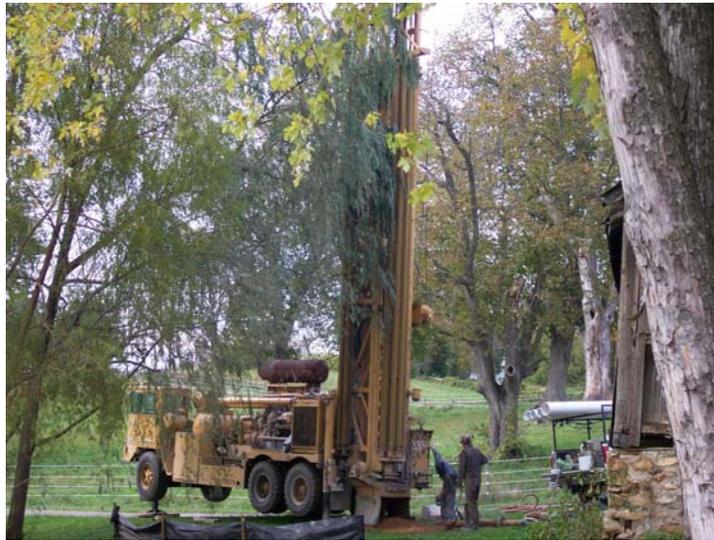


Figure 4- Picture of a completed well with tag, cap, conduit



Step 5: File for Construction Permits

These may include: (Also see P & Z link)

- Building Permit (Includes Water Sample Certification and Use and Occupancy Permit)
- Engineering/Sediment Control
- Electrical Permit
- Plumbing Permit
- Septic System Permit

Once the septic system/SRA has been established by percolation tests* and a satisfactory well* has been drilled, it is time to apply for a **building permit**. (See note below) An application must be filed at the County Planning and Zoning office with the site plan that will be reviewed for compliance for all setback requirements. At least six copies of the site plan and two copies of the construction plans are required with the application. The building permit fee is dependent on the square footage of the proposed house. A copy of the application will be distributed to all pertinent offices (Health Department, Building Plans Review, **Engineering/ Sediment Control**, etc.) The application is reviewed concurrently by all appropriate agencies so that it is processed as expeditiously as possible.

At the time of building permit application, a **Water Sample Certification** fee and **Use and Occupancy Permit** fee is assessed to ensure that the water will be tested and that all inspections will be performed and approved by the departments involved with construction of the home.

An **electrical** and **plumbing permit** will not be issued unless a building permit has also been applied for and approved.

To obtain a **septic system permit**, a licensed septic system installer or licensed plumber must submit an On-Site Sewage Disposal Permit application at the Health Department. In limited situations, a homeowner may apply for the permit if he will be performing the work, residing at the property and can demonstrate the ability to install the system. An inspection of the septic system is required by the Health Department at the time of installation, prior to backfilling and covering the system.

***Note:** Soil percolation standards have changed over the years; therefore, if it has been in excess of five years since the soil percolation tests have been performed on the property, additional perc tests may be required, unless a percolation test update is obtained in writing from the Health Department. If the water yield test on the well is over ten years old, it is recommended that a new yield test be performed to ensure the adequacy of the well.

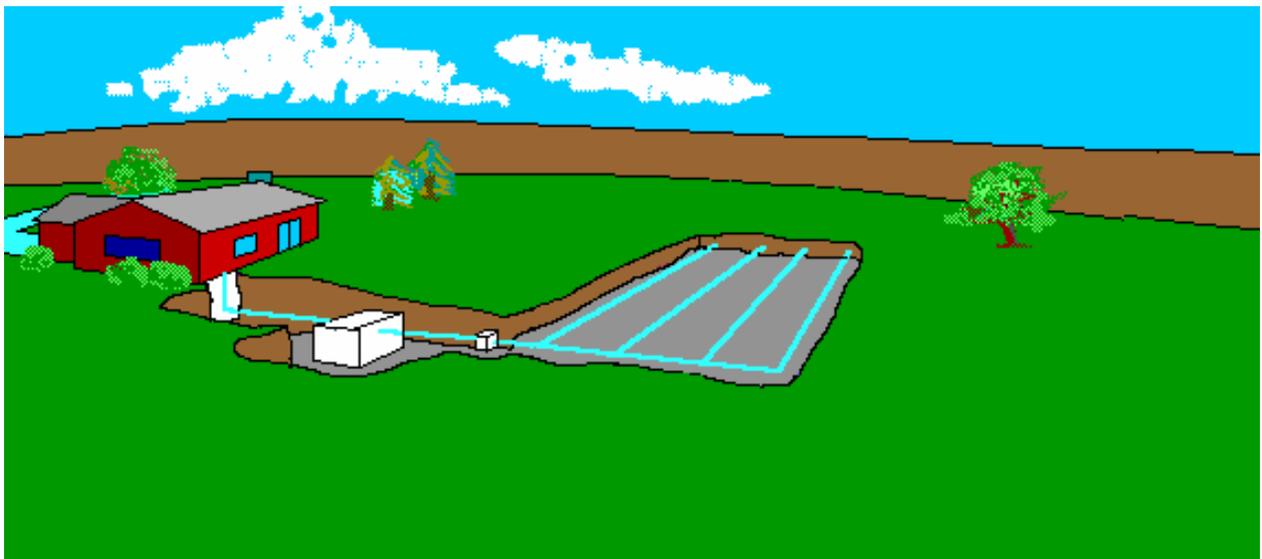
Step 6: Build the Home and Install the Septic System

During construction of the home, care needs to be taken to ensure that the approved plans are adhered to and that the well and septic reserve area are protected from damage. Vehicular traffic or heavy equipment should not be allowed in the SRA. In addition, no trenching, cutting or filling of soils is to be performed within the SRA without prior approval in writing from the Health Department. Compaction, addition, or removal of soils in the SRA may severely impact the proper functioning of the septic system.

Once the house is well under way, the septic system should be installed. The system must be placed in the septic reserve area or the area designated by the satisfactory percolation tests. The Health Department must be contacted for an inspection of the system to ensure proper installation of the system.

In fact, all steps of the construction process must be inspected by the appropriate agencies to ensure that all building codes are in conformance. This is also necessary to obtain a final Use and Occupancy Permit at the end of the building process.

Picture of a house and Septic System



Step 7: Perform Water Quality Sampling for Certificate of Potability

After the well service line and all of the plumbing distribution system has been installed in the house, the system and well must be disinfected by chlorination (see website for instructions) and then sampled for water quality. The samples may only be obtained when all of the chlorine has been flushed from the system. Water samples are tested to ensure that the bacteriological and chemical quality of the water is safe for drinking purposes (see website for a list of drinking water laboratories).

The indicator bacteria organisms are total coliforms and E. coli. If these are present, the disinfection and chlorination procedure must be repeated. The standard chemical tests performed are for nitrates, turbidity and sand. These are the minimum tests required by State C.O.M.A.R. 26.04.04 Well Construction Regulations. Additional water quality tests, e.g. volatile organic compounds (VOCs), may be required by the Health Department. This is determined by the initial review of the well permit application and dependant on potential contamination sources noted on the Environmental Concerns Maps in the area of your property.

Two consecutive satisfactory tests for bacteria at least seven days apart are required to meet the standard. Only one nitrate, turbidity and sand test are required, if they meet the drinking water standard for these parameters. If these are not met, water treatment may be required.

The Health Department may be contacted to arrange for collection of water samples which are then submitted to the Central Laboratory in Baltimore for testing. Otherwise, a State Certified Private Laboratory may collect and analyze the water and submit a report to the Health Department for review and approval. (Note: Use of a private lab will typically expedite the sampling process).

Once satisfactory water sample results are obtained, the Health Department will issue a Certificate of Potability so that the well may be put into use.

Step 8: Obtain the Use and Occupancy Permit

The Use and Occupancy Permit is issued by the Harford County Department of Inspections, Licenses and Permits. Approval from all departments involved in home construction is required prior to the issuance of the U & O. Including most or all of the following:

- Water and Sewer (occasionally houses are constructed using a well and public sewer or public water and a private septic system)
- Health Department
- Engineering/Sediment Control
- Planning and Zoning
- Electrical
- Building
- Plumbing
- U & O

It may be possible to obtain a Temporary Use and Occupancy Permit if an agency determines that only minor, non-life-threatening, issues remain for completion of the construction of the home. The temporary U & O is usually only good for 30 days, after which a final U & O may be obtained when all work has been completed.

The Health Department will issue their part of a Temporary U & O if the chemical tests and one good bacteria test are satisfactory. After the second good bacteria test is performed, the Health Department will inform the U & O office that a final may be released.

For question regarding the status of departmental approvals, the U & O office should be contacted at 410-638-3305.

For question regarding water sampling certification and inspection of the septic system, you should contact the Health Department at 443-643-0300.

Now it's time to move in! We hope building your home will be an experience to remember!