



## Assessing Your Homesite

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The goal of *Home•A•Syst* is to protect your health and the environment from pollutants in and around your home.

Understanding the physical conditions of your house and property is an important step in safeguarding your health and the environment. The type of soil your home is built on, the depth to groundwater, the type of septic system you use, the condition of your heating and cooling system, and your drinking-water source, for example, are all important factors to consider when you're determining whether you have pollution problems in or around your home.

This factsheet has two parts that will help you understand how these factors affect you, your family, and the environment.

Section One is similar to the other *Home•A•Syst*

factsheets you've already completed. It consists of a checklist of questions concerning the property on which your home is located, followed by information relating to each question. Section Two asks you to draw a map of your property, which will help you understand how man-made and natural features interact. By completing these two sections, you can identify potential problems clearly and quickly.

### Section One

The following checklist is designed to help you pinpoint potential problem areas on your property that may affect the potential for pollution of the surrounding environment. If a statement reflects the current situation on your property, check "Agree." If the statement does not describe your property, check "Disagree." Some of the statements cover characteristics

Agree    Disagree

- |                       |                       |  |
|-----------------------|-----------------------|--|
| <input type="radio"/> | <input type="radio"/> | 1. The soil on my property is medium-textured— <i>not</i> predominantly clay, sand, or gravel. |
| <input type="radio"/> | <input type="radio"/> | 2. My soil is deeper than three feet to bedrock.   |
| <input type="radio"/> | <input type="radio"/> | 3. The water table on my property is more than 20 feet deep.                                   |
| <input type="radio"/> | <input type="radio"/> | 4. My soil is well-drained.  |
| <input type="radio"/> | <input type="radio"/> | 5. Any surface-water body (pond, stream, wetland, etc.) is over 100 feet from my property.     |

*Continued on p.2*

Agree Disagree

(Questions 6 and 7 apply only to homeowners with a private septic system.)

6. My septic system's drainfield is in an area that drains away from my home.
7. Nothing has been built on top of my drainfield (driveway, building, roadway, etc.).
8. Water drains away from my house.
9. My neighbors' property does not drain onto my property.
10. There are no activities occurring on property adjacent to mine that could cause pollution problems (landfills, storage areas, feedlots, etc.).

of your property with which you may not be familiar. You can contact your local county Extension office for basic geological information or other assistance.

If you disagree with any of the checklist statements, or if you are unsure, you may have a situation on your property that could affect the environment or your health. Refer to the fact section with the same number as that statement (under the heading, "What you should know about . . .") for more information.

Don't be alarmed if you disagreed with many or even all of these statements. That does not automatically mean you have a problem. It may, however, tell you that your attention is needed to avoid potential problems. In the same way, agreeing with every statement does not mean you are not at risk or should not consider your property's **topography** (the land's physical surface, including both natural and man-made features) when making decisions that could affect the environment.

## Why should you be concerned?

Simple, everyday activities in your home can affect water quality, air quality, and other elements of the environment. They can affect your health and well-being and may influence the value of your property or your financial liability for environmental damages.

The physical characteristics of your homesite include soil, geology, depth to groundwater, location of surface-water bodies, and topography. These characteristics help determine how activities in and around your home affect the environment.

The locations of buildings, roads, driveways, utility systems, bodies of water, and other features can help you determine risks to your health and the environment. Understanding the relationships between these features can also help you identify ways to protect the environment. Preventing pollution is much easier and often less expensive than trying to clean up pollution once it occurs.

*Home•A•Syst* is only for your own use and benefit. It is a voluntary program intended to provide general information about protecting your health and the environment. Information from a *Home•A•Syst* assessment will not be collected by Extension or any other outside agency and should remain in your private records.

## What you should know about...

### 1. Soil type

Soil type plays an important role in determining how water and contaminants move into the ground. Sandy or gravelly soils drain rapidly through large pores and have few clay particles to absorb contaminants. Large amounts of rainfall can pass quickly through these soils and cause dissolved contaminants to move rapidly into groundwater. Clay soils, on the other hand, are made up of extremely small particles that slow the movement of water and dissolved contaminants through the soil. In some cases, however, clay soils can impede water movement completely. The ideal soil is a mix of medium-sized particles, which allow infiltration, and tiny particles, like clay or **organic** matter (living matter, or matter that contains

carbon compounds), which slow water movement and filter pollutants.

Many contaminants stick tightly to organic matter or clay surfaces. While bound to soil particles, contaminants are broken down by bacteria, other organisms, and chemicals in the soil. Most chemical and biological breakdown takes place in the surface layers, where the soil tends to be warm, moist, well-aerated, and high in organic matter. Organic matter attracts and holds many contaminants. Soils high in organic matter provide an excellent environment for the chemical and biological breakdown of potential pollutants.

The soil can also influence surface-water contamination. Surface runoff is inevitable no matter what type of soil you have, but runoff is usually greatest from clay soils because they are the least permeable. Runoff from a rainstorm, or even from watering your lawn or garden, can wash contaminants from the land's surface into nearby surface-water bodies. Eroding soil is also a pollutant; bare soil, especially on sloping land, can run off into streams, lakes, or other water bodies.

## 2. Soil depth

The depth of your soil influences the potential for groundwater pollution. The deeper your soil, the further water must go before reaching groundwater. Deep soils offer a better chance than shallow soils of filtering or breaking down pollutants before they reach groundwater. Generally, soils that are less than three feet deep present the highest risk for groundwater contamination.

The depth of bedrock on your property is an important indicator of possible groundwater pollution. If bedrock can be seen at the surface, or if there is only a thin layer of soil above bedrock, the chances are greater that contamination will occur. Water will percolate down through the soil, reach the bedrock, and flow on top of it until it becomes surface water or until there is a crack where the water can move downward to groundwater. If the bedrock is limestone, however, water actually dissolves the limestone and then moves downward to groundwater. Sinkholes are formed when limestone bedrock dissolves so much that it cannot support the weight of the overlying soil and rock.

If you have shallow bedrock, it is especially important that you use the management practices outlined in other *Home•A•Syst* factsheets to reduce the risk of groundwater contamination.

## 3. The water table

If you dig a hole anywhere on your property, you will eventually reach soil saturated with water. This **water table** marks the boundary between the unsaturated soil (where pore spaces between soil or rock contain air, roots, organisms, and some water) and the saturated soil, or groundwater (where water fills all pore spaces). In a wetland, the water table is at or just below the surface.

Water tables fluctuate throughout the year, but are usually higher in the wet months of spring and late fall. In general, the closer the water table is to the land's surface, the more the groundwater is susceptible to contamination. Usually, a water table that is less than ten feet from the surface presents the highest risk for groundwater contamination, as well as contributing to moisture problems in basements and crawl spaces.

## 4. Soil drainage

Typically, about half the volume of a soil is filled with solids, and the other half is **pore space** (voids between soil particles). This pore space is filled with either water or air.

In a poorly drained soil, most of the pore space is filled with water much of the time. The pore space in a well-drained soil, on the other hand, is filled with water and air. Following a rainfall, the large pores of a well-drained soil drain quickly. As the water leaves the pores, air enters, creating an **aerobic**, or oxygen-containing, environment. In an aerobic environment, soil organisms break down contaminants quickly; without oxygen, the process is much slower or does not occur at all.

A homesite that is situated low in the landscape—at the bottom of hills or in a floodplain—usually has a higher risk of contaminating groundwater. Soils lower on the landscape are wetter than those higher up, and groundwater is closer to the surface. The closer groundwater is to the surface of the soil, the less chance there is for aerobic breakdown to occur before contaminants reach groundwater.

## 5. Surface-water bodies

Runoff from your property can carry contaminants to nearby surface water. The closer the water body, the greater the chances that contaminated runoff from your property will reach it.

You can't move your property or the water body, but you can prevent runoff from reaching surface water. Don't overwater your lawn or garden. Plant trees, shrubs, or grass strips on the side of your property nearest the surface-water body, since plant cover slows down runoff and increases the amount of water that soaks into the ground. Plants can also filter out some contaminants like silt and keep them from reaching surface water.

## **6. Drainfield location**

A septic system works like this: wastewater from the house flows into a septic tank, where heavy solids sink to the bottom and light solids and grease float to the top. The liquid portion flows out of the tank and into a drainfield, which is usually a series of parallel trenches containing perforated pipe in a gravel bed.

The liquid trickles out the holes, through the gravel, and into the soil. This process filters out solids. Dissolved materials are broken down by natural physical, chemical, and biological processes in the soil.

If your drainfield is in an area that drains toward your home, incompletely treated wastewater may surface near your home, create moisture or odor problems in your basement or crawl spaces, or cause other problems. Ideally, the drainfield should be located downslope from your home to avoid problems.

## **7. Building structures over drainfields**

Covering your soil's surface with cement, asphalt, or other building materials can hinder the natural processes that renovate wastewater. Drainfield pipes can be cut or crushed during construction. They can also collapse from the weight of buildings or vehicles on top of them.

Grass sod is the best soil cover for a drainfield area.

## **8. Drainage**

Water draining away from your house in all directions prevents problems with moisture and standing water in basements or crawl spaces.

Patios, walkways, driveways, and other impervious surfaces should slope away from your house. Gutters and downspouts with splash blocks or drainpipes can help direct water from roofs away from your house.

## **9. Drainage from adjoining property**

You may have problems caused by water from neighboring property. Planting grass or trees between your properties may solve the problem by slowing the flow of water and allowing it to soak into the ground. In other situations, redirecting the runoff by sloping, ditching, or terracing may be necessary.

## **10. Other problems from adjoining property**

Current or past activities on neighboring property can affect your own property. It may be direct and immediate, like surface runoff from an adjoining parking lot. However, the source may be hard to identify, like groundwater contamination from leaking underground fuel tanks at a long-abandoned service station far from your property.

Learning about current and past activities on surrounding properties may help identify the source of a problem, which is often a major step towards its solution.

# **Section Two**

Drawing a map of your homesite will help you more fully understand possible pollution risks. Although your property has physical features you cannot change, there are many things that you can do to minimize risks. Also, by involving other family members in making your map, they will learn about the importance of good environmental stewardship.

You will need a pencil, a red pen, and a ruler. Use the grid on page 7 and follow the steps listed. Your map will be an aerial view--the way your property would look if you took a photo of it from the air. A sample map is provided on page 5.

# Sample Homesite Assessment

## Homesite Assessment

Factsheet	Problems Found
C - HAZ. PROD.	STORED CHEMICALS
G - LAWN/GARDEN	STEEP SLOPES
H - HEATING/COOL	AGING HVAC EQUIPMENT
	LEAKY DUCTWORK
I - AIR QUALITY	ASBESTOS
	MOISTURE
J - STORMWATER	BARE SOIL
	BASEMENT LEAKS
	RUNOFF ACROSS DRIVEWAY
L - LEAD	LEAD SOLDER IN PLUMBING



### 1. Basic features to include on your map (draw these in pencil):

- Property boundaries
- House and garage
- Sheds and other buildings
- Septic system and drainfield
- Water wells, both in use and abandoned
- Lawns, trees, gardens, flower beds, and other cultivated areas
- Kennels, paddocks, and other pet/animal areas
- Roads and driveways
- Streams, ponds, wetlands, and other surface water bodies
- Drainage ditches and other waterways
- Patios, sidewalks, and other impervious surfaces

### 2. Problem areas (mark these in red pen):

The table on page 6 provides space for you to list all the problem areas you found while completing each *Home•A•Syst* factsheet.

After you have finished all the factsheets and are ready to draw your map, consult your list. Each problem you found should be noted on your map in red pen. It may be helpful for you to devise your own letter codes to designate certain types of problems. For example:

I=Assessing Your Indoor Air Quality

- dirty air filters
- asbestos
- moisture or standing water
- stored paint or varnish

In each place on your property where one of these problems occurs, you would place a red "I."

Use whatever designations best help you understand where problems occur on your property.



# Homesite Assessment

A large grid of graph paper, consisting of 20 columns and 30 rows of small squares, intended for taking notes or drawing during a homesite assessment.

This *Home•A•Syst* assessment does not cover all potential health or environmental risks related to your home and property. It is meant to be a starting point for identifying and addressing the most apparent risks.

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