Water Quality

FARM•A•SYST
Farmstead Assessment System

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An Action Program for Safe Drinking Water

WQ 660

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Are Your Farmstead Practices Affecting Your Drinking-Water Supplies?

Some agricultural practices can result in high risk to groundwater and your drinking-water supplies, while others present low risk or virtually no risk at all. With increased knowledge and careful management, the risk of groundwater contamination can be greatly reduced, often with little cost or trouble.

Farmstead activities and structures (Figure 1) are the most likely contamination sources for farm drinking-water wells. The design and construction of structures and their location relative to the drinking-water well, the condition of the well, along with the storage, handling, and disposal of potential contaminants at the farmstead, are important factors to consider in assessing risks. By identifying contamination risks around your farmstead and taking action to reduce them, you can better protect the health of your family and livestock, prevent potential liability from groundwater contamination, and avoid any difficulties in property transfer.

Your drinking water is least likely to be contaminated if you follow appropriate management practices, recycle whenever possible, and dispose of remaining wastes at least 300 feet downslope from your water source. Even with large separation distances, proper disposal practices are essential to avoid contamination that could affect the water supplies and health of others.

The Farmstead Assessment System provides accurate first-hand information about how your farmstead structures and activities, such as pesticide storage, fuel storage, or livestock facilities, might be affecting your drinking water. Some of the information will be reassuring, and some may encourage you to modify certain practices. Either way, you will have the information you need to do the best possible job of protecting the groundwater you depend on for your family's drinking-water supply.

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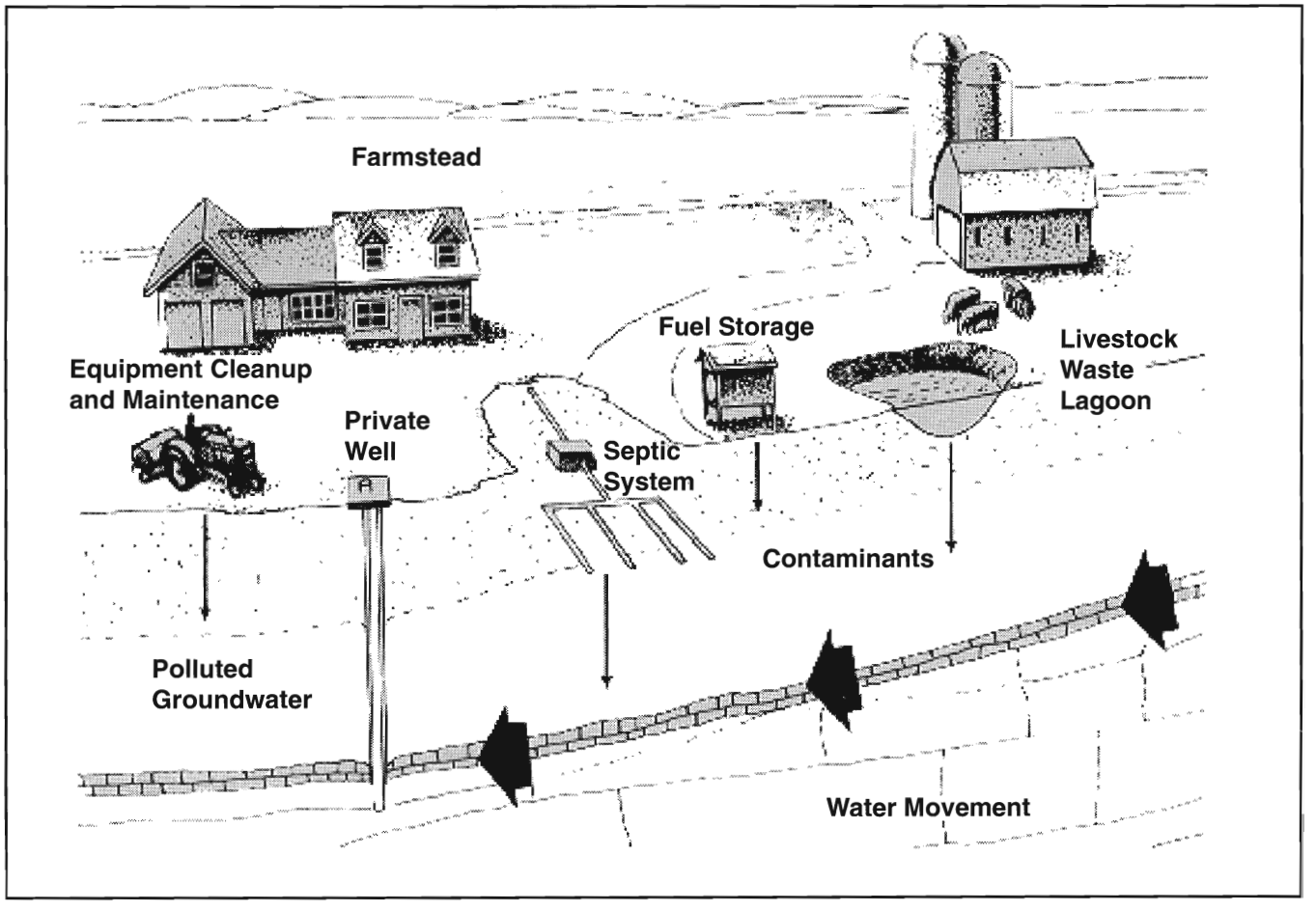

Figure 1. Many potential groundwater contaminants exist around the farmstead.

Rural Farmstead/Homesite Water Quality Risk

Well Characteristics

Well age (yrs)	Type well: Dug	Driven	Drilled
0-10	5	3	1
11-30	5	4	3
31 or more	5	5	5

Well Characteristics

Well age (yrs)	Total well depth (ft): 0-25	26-29	70+
0-10	5	3	1
11-30	5	4	3
31 or more	5	5	4

Landscape Features

Distance to well (ft)	Closest potential pollution source to well: Upslope	Level	Downslope
0-50	5	5	4
51-200	4	3	2
201 or more	3	2	1

Land Management (select as many as apply)

Land use w/in 300 ft	Position from well: Upslope	Level	Downslope
Livestock pen	5	4	3
Cropland	4	2	1
Fuel storage	5	3	2
Fertilizer or chemical storage	5	3	2
Septic system or lagoon	5	4	3

Seepage Potential Around Well Casing

Well casing height above ground (in)	Slope around well: Sloped	Flat, water pools	Flat, no pooling
12 or more	2	3	1
4-11	3	4	2
>2, or in pit	5	5	4

Soil Properties

Soil permeability	Potential pollution sources within 300 ft of well: 1	2	3 or more
Low (Clay)	1	3	4
Medium (Silt)	2	4	5
High (Sand)	3	5	5

Geologic Features

Depth to water (ft)	Type of soil: Clay	Silt	Sand
0-19	5	5	5
20-69	2	3	4
70 or greater	1	2	3

NOTES:

Risk Rating

The relative risk rating is determined by adding each of the assessment values. Compare your total to the ranges below and consider taking the suggested action based on the level of risk at your site.

Total for your site:_____

Risk Rating	Relative Risk	Suggested Action
0-14	Low	Test annually for bacteria and nitrate. Consider reviewing Farm•A•Syst for long-term protection plan development.
15-25	Caution	Have water tested. Conduct Farm•A•Syst assessment for a more specific evaluation.
26 and above	High	Test water immediately. Conduct Farm•A•Syst assessment and develop a water quality protection plan.

It is possible to have only a cautionary risk rating, but if three or more assessment areas rate as 5, the overall rating should be considered high risk.

Acknowledgement: *the original shorter version of the Rural Water Quality Risk Assessment was developed by Theresa Nelson at Kansas State University as part of a master's thesis based on farmstead assessment.*

What is the Farmstead Assessment System?

The Farmstead Assessment System (Farm•A•Syst) is a series of nine worksheets that helps you assess how effectively your farmstead practices protect your drinking water.

- The worksheets ask you about your farmstead structures and activities. Your answers will help you see how your farmstead practices might be affecting your well water.
- A series of fact sheets suggest things you can do to modify practices and direct you toward additional information and assistance if it is needed.

The Farm•A•Syst package is a voluntary and confidential service for concerned farmers and rural residents. As a user, you decide what to do with the results and keep them for your personal records. It's like hiring a private consultant to do a detailed assessment at little or no cost.

Farm•A•Syst specifically focuses on the effect of farmstead practices and structures on drinking-water supplies. While field practices also have the potential to contaminate groundwater, this package is not designed to address that concern.

Should you complete Farm•A•Syst?

As a private water user, you alone are responsible for your drinking-water quality. Farm•A•Syst will help you identify potential problems. Review of the fact sheets in the complete Farm•A•Syst packet will help you develop an appropriate response to potential problems. However, if you have not had any problems to date, and do not feel it is worth your time to do the full survey, at least complete the risk assessment in this guide to see how your farmstead or rural homesite fares.

The water-quality risk assessment enclosed in this guide does not replace the much more comprehensive Farm•A•Syst assessment. It does, however, highlight important factors associated with protecting groundwater.

Well characteristics

Several studies show older wells are more likely to be contaminated than newer wells. Deeper wells tend to have fewer problems than shallow wells. Construction methods influence ability of the well to protect groundwater from direct surface contamination. Hand-dug and driven wells do not meet current well construction standards.

Landscape features

Separation distances and drainage direction influence whether a potential pollution source will reach the well site. A large separation distance and an upslope position of a well site reduce the pollution hazard of a particular source.

Land management

There are many structures and activities around a rural well site that pose a risk to the water supply. These are depicted in Figure 1, and if they occur within 300 feet of the well, they should be assessed more completely with Farm•A•Syst. Do not ignore structures or activities that are not on your own property. Pollution does not recognize land boundaries.

Seepage potential

Drainage around the wellhead and well construction largely define seepage potential. Localized ponding and certain well construction shortfalls can be corrected to reduce movement of surface water into the groundwater around the well.

Soil properties

The soil's ability to protect the underlying water is dependent on a number of factors, including permeability. Sandy soils intake surface water rapidly and therefore offer less protection than silts or clays. Another factor is whether the soil is overwhelmed by the number of potential pollution sources in the vicinity of the well.

Geologic features

Deeper water tends to be better protected than shallow water. Different aquifer types are better protected than others, however, this mini-survey only looks at surface conditions as defined by the predominant soil texture.

How does Farm•A•Syst work?

Seven Farm•A•Syst worksheets help you assess the pollution potential of your farmstead structures and activities. Select the worksheets appropriate for your site:

1. Drinking Water Well Condition
2. Pesticide Storage and Handling
3. Fertilizer Storage and Handling
4. Petroleum Product Storage
5. Hazardous Waste Management
6. Household Wastewater Treatment
7. Animal Manure Management Facilities

An assessment of a site with Farm•A•Syst includes a site evaluation (8) which helps you assess how soil and geologic features affect groundwater pollution on your farmstead. An overall evaluation (9) combines the results of the individual worksheets with the site evaluation, allowing you to:

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Publications Order Form

Use this form to order copies of Farm•A•Syst: Farmstead Assessment System.

- ❑ Are your farmstead practices affecting your drinking-water supplies? .....WQ 660 .....Free
  (Farm•A•Syst Program Explanation Guide)

- ❑ Farm•A•Syst: Farmstead Assessment System .....WQ 650.....$7.50

  (This package consists of a series of seven fact sheets, nine worksheets and one program-explanation guide. The worksheets help you evaluate practices in and around the farmstead that can affect drinking-water well quality. The fact sheets provide suggestions about how to modify high-risk practices and where to go for more information and assistance.

- ❑ Drinking Water Well Condition worksheet .....WQ 651 and
  Improving Drinking-Water Well Condition fact sheet .....WQ 675.....$2.00

- ❑ Pesticide Storage and Handling worksheet .....WQ 652 and
  Improving Pesticide Storage and Handling fact sheet .....WQ 676.....$1.50

- ❑ Fertilizer Storage and Handling worksheet.....WQ 653 and
  Improving Fertilizer Storage and Handling fact sheet.....WQ 677.....$1.25

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- ❑ Hazardous-Waste Management worksheet .....WQ 655 and
  Improving Hazardous-Waste Management fact sheet .....WQ 679.....$1.75

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  Improving Household Waste-water Treatment fact sheet .....WQ 680.....$1.75

- ❑ Animal-Manure Management Facilities worksheet .....WQ 657 and
  Improving Animal-Manure Management fact sheet .....WQ 681.....$2.50

- ❑ Site Evaluation .....WQ 658.....$1.50
- ❑ Overall Farmstead Assessment .....WQ 659.....$.75

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- Look at each potential source of contamination in light of your particular site conditions.
- Compare potential contamination sources to see where improvements are needed most.
- Determine where to spend your time and money most effectively to protect the groundwater that supplies your drinking water.

Plan on spending 15 to 30 minutes to complete each worksheet you select. The site evaluation and overall assessment may take more time, as will reading the fact sheets.

As you work through the system, the fact sheets provide information on factors influencing pollution risks, health and legal concerns related to specific pollutants and resources to help you set priorities and take action to minimize groundwater pollution potential on your farmstead.

The goal of Farm•A•Syst is to help you protect the groundwater that supplies your drinking water.

Information derived from Farm•A•Syst worksheets is intended only to provide general information and recommendations to farmers regarding their own farmstead practices. It is not the intent of this educational program to keep records of individual

FARM•A•SYST
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The Missouri Farmstead Assessment System is a cooperative project of University Extension; College of Agriculture, Food and Natural Resources; and the Natural Resources Conservation Service.

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