Kansas Environmental Farm Program

River-Friendly Farm Plan

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Acknowledgments and Definitions

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Center for Rural Affairs, P.O. Box 406, Walthill, NE 68067. *Integrated Farm and Resource Management*.

Confidentiality Statement: This assessment tool is designed to be filled out by a farm operator and his or her family members or other farm partners. It is most useful to your farm if the answers are honest and thoughtful. Anyone who is consulted for technical advise as part of this planning process and/or anyone who reviews this document as part of an application for the River Friendly Farm Award program

is asked not to share any part of this document with another individual or with an agency. Sensitive information may be contained, and it is our intent that farmers be able to develop remediation plans without endangering their livelihood or current farming operation.

Anonymity Policy and Applications for Funding: If you wish to receive the Clean Water Farms Project (CWFP) incentive payment ($250) from the Kansas Rural Center, or apply for additional cost share funds, the CWFP staff or members of the CWFP advisory board will review the assessment. For the incentive payment, reviewers will simply determine whether the assessment has been completed satisfactorily. With regard to applications for additional cost share, the review process will examine the assessment to determine how the action plan is addressed by the cost share proposal.

Information from the assessment will not be shared with other individuals or agencies in ways that identify the individual farm or farm family. Some statistical information from the assessments may be used for research or reporting purposes. In these cases, statistics representing groups of farms will be used in such a way that individual farms are not identified.

Definitions

Some of these definitions may be helpful to you as you answer questions in this assessment tool.

Aquifer - a water bearing rock, rock formation, or group of formations. Generally thought of as underground supply of water, may or may not have annual re-charge, and may be subject to contamination from above ground sources.

Buffer Strip - a vegetated strip (perennial grasses or woody plants) between cultivated land and a watercourse, pond, wetland, or other environmentally sensitive area.

Cropland - Those fields where primarily annual crops are grown. The cropland inventory also may include fields where perennials (such as alfalfa or grass) are grown in rotation with annual crops.

Environmental Quality - the condition of natural resources such as water, soil, and air. Water quality and air quality often are defined by the absence of pollutants such as dust or sediment, pathogens, excess nutrients, and pesticides. Soil quality is defined by factors related to tilth and the ability of life to thrive in the soil, including plants, microorganisms, and invertebrates such as earthworms. Soil quality is characterized by adequate but not excessive levels of nutrients, the ability of soil to take in and hold water, and medium to high organic matter levels and is context and use dependent.

Erosion types - *Sheet* is uniform erosion or removal of soil. *Rill* is a small channel created by water, which would be called a *gully* if larger.

Farm - A physical, financial, or social entity that produces livestock, crops, vegetables, flowers, herbs, or other products based on the capture of sunlight to produce plants or plant-derived products.

Farmstead - The house, barns, sheds, and other storage buildings as well as the driveways, windbreaks, and other human-made structures on a farm.

Grassland - Fields of either native grass or seeded perennial grasses, including brome, CRP fields, and waterways that are seeded to grass. Riparian buffer strips also may be included in the grassland inventory if they are grass and managed in some way, for example, for hay production or grazing. Riparian buffers that are not seeded to grass should be included either in the woodland inventory (if trees or other woody plants are present) or as part of the watercourse inventory.

Rotational grazing - Also called management intensive grazing (MIG). The principle involves creating several paddocks or grazing area, stocking animals at a high density, and moving them frequently.

Watercourses - A natural drainage area where water flows seasonally or year-round. These include creeks, streams, rivers, and constructed ditches for the purpose of carrying water away from a field or water to a field for irrigation purposes. Waterways constructed to carry water from a field during periods of heavy rain, if seeded to grass, should be included in the grassland inventory.

Watershed - the region draining into a river, river system, or body of water. A ridge of high land dividing two area that are drained by different river systems.

Wetland - Areas with general characteristics that include the presence of standing water for all or part of the year; generally saturated or wet soils; and the presence of water loving plants such as cattails, reeds, etc. Wetlands are important biological buffers or filters. Constructed wetlands are areas where small catchments are created with an impenetrable layer covered by gravel, sand, or soil and often include wetland plants. These areas are constructed to filter waste water from septic systems and lagoons.

Whole-Farm Planning - A process by which all of the members involved in a farm or ranch can engage in systematic goal setting, resource assessment, environmental assessment, financial planning, and monitoring progress towards goals.

Woodland - Areas of the farm in trees or other woody vegetation. These can include plantations, woodlots, or Christmas tree farms, and either managed or unmanaged native stands. Size may vary from a fraction of an acre to several acres or hundreds of acres.

ENVIRONMENTAL FARM PLANNING

Overview

Environmental farm planning is a relatively new concept. The idea for environmental planning builds on previous programs for risk assessment, such as the Farm-A-Syst Program, originally created in Wisconsin and subsequently implemented in several states including Kansas. The Farm-A-Syst program in Kansas allows rural residents to complete checklists to determine risk factors related to well- water safety, fuel storage, and other farmstead structures and practices. Written information and programs are available from K-State Research and Extension to help rural residents remediate or correct high priority items.

In the mid-1980s, farmers in Ontario were encouraged by the government to take steps to reduce nonpoint source pollution from agriculture. More than two dozen agricultural organizations formed a coalition to discuss how to respond to pressure from the government and nonfarm citizens to improve environmental quality. A voluntary program was developed, modeled initially after Farm-A-Syst. The worksheets were expanded to include field crops, wildlife areas, milking parlors, and livestock waste management. The program is controlled by the farm organization coalition, implemented by a non-governmental organization called the Ontario Crop and Soil Improvement Association, with technical support and assistance from the agricultural university in Guelph. This program has experienced considerable success, and more than 5,000 farmers have completed farm plans in Ontario within the first 5 years of the program.

A committee was formed in Kansas to review the work in Ontario, as well as other programs, and determine the feasibility of creating a similar voluntary program here. Several speakers from Ontario have visited Kansas and shared the trials and tribulations of their program, the implementation process, and the workbook that farmers complete to develop an action plan. A subgroup of the committee secured funding to modify the workbook for Kansas soils, crops, and climate and to pilot test the workbook in the Kansas River Valley. When it was pilot tested in the spring of 1999, the notebook drew positive comments, along with some suggestions for streamlining the notebook, and some minor wording changes on a few questions. Most felt the notebook is complete, and none suggested new questions, or felt that the original questions were irrelevant and should be left off. A revised notebook (fall 1999) has been used in additional pilot testing, and also was put on the K-State web site for others to down load and print as needed. A few minor revisions have been made, and two new sections added to this current version (July 2002).

The Kansas environmental plan is a five-step process. First, farm goals are determined. Family goals and quality of life values are integral to developing farm goals, in addition to economic and other farm goals. The second step is to complete a field and natural resource inventory of the entire farm that includes aerial photos, soils

maps, and wildlife inventories. The third step is to complete a series of questionnaires that assign a ranking of 1 to 4 to various practices and conditions that exist on the farm. A ranking of 1 or 2 indicates an item in need of attention or where improvement could be made. A ranking of 3 is considered good, and means that the farm meets generally accepted guidelines for best management practices, has low risk of off-site environmental impact, and meets safety guidelines for the farm operator and his or her family. A ranking of 4 indicates exceptional stewardship and conscientious management.

The fourth step of the process is the section of the workbook that summarizes the scores for all of the questions, or scorecard. Average scores can be calculated for each section: soil conservation, nutrient management, pest management, and livestock waste management. Also on the scorecard, the farm operator can assign priority ratings for items that score a 1 or 2. In most cases, these items will rank as high priority for future action, but in some cases, action may not be possible, for example, if responsibility for remediation needs to be borne by a landlord, who may be holding the land for future nonagricultural use.

The final, and most important section, is the action plan. Here all items that have a low score but are high priorities are listed. Possible steps for remediation are listed, with their possible cost and a projected time frame for action. Completion of the questionnaire takes time and commitment. A minimum amount of time is about 6 to 8 hours for a small- to medium-sized operation. A complex operation with several farm units and numerous fields will require more time. However, planning committee members who completed the questionnaire for their farms remarked that the time spent was worthwhile. Having a complete set of maps and field inventory helps one organize other parts of the farm operation. The action plan, which initially may seem like a depressingly long list, actually gives one a sense of satisfaction and control. The educational value of the questionnaire also should not be underestimated. Best management practices and trade-offs between practices become immediately apparent.

This entire process is designed to be farmer-driven, and will be kept completely confidential. But, solutions to problems or situations are rarely found without assistance from subject- matter specialists. Resource staff from Kansas State University are available to provide assistance, in partnership with the Natural Resource Conservation Service and state agencies involved in helping solve technical problems, and provide information on best management practices. A list of organizations and agencies can be found on pages 13-14.

Introduction

The River-Friendly Farm Program is a tool for self-assessment of your overall farming operation. Protecting and improving water quality in Kansas is the overall goal of this program.

This tool uses a workbook format that lets you assess how you are doing in various areas and an action plan for you to fill out to help you plan for corrections in areas that need attention. You may find that only a few areas on your farm require attention at this time or conclude that it would take a lifetime to address all of the issues. Either way, cost share may be available to help you in some areas. The questionnaire has several sections. The rationale for each is provided in this introduction.

The objectives of this assessment tool are to:

Help to define farm goals and strengthen progress towards goals.
Reduce costs in the long term, if not in the short term.
Lead to improved quality of natural resources (soil, water, air) and be part of a good neighbor policy.
Improve quality of life for farmers and families.
Maintain confidentiality and farmer control over the process.

I. Quality of Life

Does your farm plan meet your farm goals?
Does it help you to obtain your economic goals?

Does it distribute labor in an acceptable way for you and your family?
Can you farm in a way that is consistent with your personal value system?
Do your farming practices make positive contributions to your community?
Are you a good neighbor?

This section is designed to help you identify goals, both personal and farm, and to assess whether those goals are consistent with your value system. Several exercises are included for you to do by yourself or with your family; including a time-management assessment, a time line to look for “crunch periods,” and a diagramming process for exploring the things that you value in your life. Profitability is a part of quality of life. Economic assessment tools are not included in this packet, because a wide variety of such tools are available to you and probably being used already. If you would like to find out more about other tools, including K-State Farm Management services, computer software, or other financial services, your local extension agent, state specialist, or private consultant can provide help and direction.

Soil and Natural Resource Conservation

Goals:
Create an inventory of fields and natural resource areas on the farm.
Reduce soil erosion on each field and area of the farm to tolerable levels.
Improve soil quality on all fields (e.g., organic matter, water-holding capacity)
Maintain and/or improve yields and yield stability on all fields.

Every farm needs a soil conservation plan. Such a plan lays out a strategy to limit soil loss on the farm to less than what the land can regenerate. To be sustainable, the farm must produce as much new soil as it depletes. This plan also should address biological resources such as wildlife and plant diversity. Resource conservation plans may include designs for any or all of the following features:

Soil conservation structures (terraces, waterways etc.)
Soil conservation practices (strip cropping, crop rotation, cover crops, reduced tillage)
Windbreaks, shelterbelts and farmstead protection
Establishment of permanent vegetative cover areas (where needed)
Buffer strips, riparian protection and improvement
Wildlife habitat and corridors

Many farms already have a soil conservation plan, because participation in federal farm programs required farmers to have a plan in place by 1990 and to implement that plan by 1995. If your farm doesn't have a plan now, you may develop one by contacting your local Natural Resources Conservation Service (NRCS) office. The NRCS provides technical assistance, maps, a field-by-field plan, and additional assistance in resource assessment at no cost. It also will assist in obtaining available cost share for the items listed in the plan. Check with the local office to determine current availability and eligibility requirements for cost-share programs.

III. Nutrient Management

Goals:
Develop a nutrient management plan for the farm.
Use all nutrient sources effectively, e.g., manure, legumes, rotations.
Provide adequate nutrients for good yields of all crops.
Avoid excess nutrient application and expense.
Minimize potential run-off and leaching of nutrients (keep them on the farm and available for production).

Every farm needs a nutrient management plan. Nutrient losses from the farm pose a nonpoint source pollution threat to surface and groundwater and also can mean unnecessary expense to the farmer. A nutrient management plan addresses problems by keeping nutrients where they do the most good and by targeting applications for maximum efficiency. Some important features of a nutrient management plan include the following actions:

Test the soil regularly to determine the current levels of nutrients in your field. You need to know what's already there to avoid wasteful over-application of any nutrient and to avoid nutrient deficiencies.

Match crop needs to nutrient application using yield goals determined by historical yield averages. Use the appropriate amounts of fertilizers, including manures and composts, and factor in the credits for nitrogen fixed by legumes in the crop rotation.

Use nutrient application methods that minimize runoff or leaching of nutrients. Proper timing and method of application are as important as the overall amount of nutrients applied.

Examine the whole-farm nutrient balance, as well as on a field-by-field basis. Balance the nutrients brought onto the farm in the form of fertilizers, manures, and feeds with the amount of nutrients that leave the farm in the forms of crop and livestock products.

Build up soil tilth and organic matter because good structure holds nutrients for plants.

In addition to the local NRCS office, the K-State Research and Extension office can offer assistance with a nutrient management plan.

K-State Research and Extension ag agents have access to specialists on any topic related to nutrient management through the area and state offices affiliated with Kansas State University. Private consultants in your area also may offer some or all of the services you need to develop a nutrient management plan.

Pest Management

Goals:

Manage pests to below damage thresholds (economic yield or quality loss).

Use preventative measures whenever possible (e.g., rotation, diversity).

Use biological controls when possible and economically feasible.

Manage pesticide application amount and frequency to save money and reduce risk.

Minimize the potential for pesticide drift, run-off, leaching, and contamination of food, feed, and fiber.

When pesticides are used, choose the most environmentally benign product.

Reduce human and livestock health risks from pests or pest control measures.

Every farm needs to follow preventative practices for pest management and to minimize pesticide use. An effective pest management plan should minimize the use of pesticides whenever possible, thus minimizing their release into the environment and cutting costs for farmers. Cultural controls and nonpesticide alternatives (e.g., crop rotation, cultivation, diversification) can reduce the need for pesticides. Integrated pest management (IPM) techniques (which include monitoring to anticipate pest problems) enable the farmer to target pesticide application at the point of maximum effectiveness and avoid unnecessary or redundant applications. Once a pest is identified and pesticide application becomes necessary, choose the most effective and environmentally friendly product available.

VV.**V. Livestock Waste Management**

Goals:
Assure adequate land-to-animal ratio for spreading of livestock waste.
Distribute animal wastes on farm as widely as possible; avoid creating hot spots.
Monitor nutrient levels on all fields to avoid excess application.
Use a storage system that minimizes or eliminates risk of runoff, leaching, odor, fly, and other problems.
Preserve human and animal health and comfort.
Prevent unintended nutrient loss from the farm.

Every farm with livestock needs careful management of livestock waste and manure. Manure and bedding from barns and lots, as well as areas where animals are grazed, fed, or over-wintered, need to be managed properly to reduce the chance of migration of nutrients and fecal bacteria into nearby surface or groundwater. Your NRCS or K-State Research and Extension office can introduce you to an array of innovative alternatives for watering animals other than free access to open bodies of water. An animal waste management plan should include the following measures:

An appropriate cropland-to-livestock ratio.
Good storage facilities for the manure, whether liquid or dry.
Testing or estimation of nutrient quantities in manure sources.
Application procedures for manure to eliminate runoff and incorporate the manure into the soil as soon as possible.
Proper composting methods.
Feeding and overwintering in areas where waste will not run directly into streams, ponds, or other water sources.
Development and maintenance of buffer areas with established vegetation between animal lots and drainage routes.
Controlled access of animals to streams, ponds, or drainage areas.

VV.**VI. Irrigation Management**

Goals:
Conserve both water quantity and quality whenever possible.
Highlight permit and record keeping requirements for irrigators.
Prevent unintended water or nutrient loss from the farm.

Irrigation of cropland in Kansas requires a different set of management skills and awareness of environmental guidelines. This section highlights those issues that specifically apply to irrigation systems.

VV.**VII Farmstead Assessment**

Goals:
Assure the environmental safety of both active and abandoned wells.
Evaluate wastewater systems, solid waste disposal, and fuel storage risk.

Farmsteads are an important part of the farm. This section allows one to include family and farmstead activities in the overall farm risk assessment.

Resources

These resources are available to you if you have questions while completing the assessment, and especially once you are into the implementation phase, and are looking at your options. Many of these will already be familiar to you. As you work through your plans, you may find you need to coordinate your projects with the assistance of more than one office or agency.

Farm Service Agency (FSA), USDA: The local office will be in your county seat. State office 3600 Anderson Ave., Manhattan, KS 66503. Ph. 785-539-3531.

Kansas Center for Agricultural Resources and the Environment: William Hargrove, Director. 44 Waters Hall, Kansas State University, Manhattan, KS 66506-4002. Ph. 785-532-7103. Fax 785-532-6563. bhargrov@oznet.ksu.edu. http://www.oznet.ksu.edu/kcare.

Kansas Center for Sustainable Agriculture and Alternative Crops: Jana Beckman, Coordinator. 3602 Throckmorton Hall, Kansas State University, Manhattan, KS 66506-5506. Ph. 785-532-1440. Fax 785-532-5780. E-mail kscaac@oznet.ksu.edu. http://www.oznet.ksu.edu/kcsaac.

Kansas Department of Agriculture, 109 SW 9th Street, 4th Floor, Topeka, KS 66612-1280. Ph. 785-296-3556. www.kda.state.ks.us.

Kansas Department of Health and Environment: KDHE Non-Point Source Section,1000 SW Jackson, 4th Floor, Suite 420, Topeka, KS 66612-1367, Ph. 785-296-4195, Internet: http://www.kdhe.state.ks.us/nps

Kansas Department of Wildlife and Parks: Office of the Secretary, 900 SW Jackson Street, Suite 502, Topeka, KS 66612-1233. Ph. 785-296-2281. http://www.kswp.state.ks.us

Kansas Forest Service, 2601 Claflin Road, Manhattan, KS 66502-2798. Ph. 785-532-3300, Fax 785-532-3305. http://www.kansasforests.org/.

K-State Research and Extension: College of Agriculture, 115 Waters Hall, KSU, Manhattan, KS 66506. Ph. 785-532-7137. K-State University directory assistance Ph. 785-532-6011. http://www.oznet.ksu.edu. County Agents are located in every county in Kansas, usually in the same town as the county government. Area watershed specialists have been assigned to high priority watersheds in Kansas, and may be contacted through your county agent, K-State College of Agriculture, or the KCARE office.

Kansas Rural Center: 304 Pratt, P.O. Box 133, Whiting, KS 66552, Ph. 785-873-3431, Fax: 785-873-3432, e-mail: ksrc@rainbowtel.net, website: www.kansasruralcenter.org

Kansas State Conservation Commission:
109 SW 9th Street , Suite 500, Mills Bldg. Topeka, KS 66612, Ph. 785-296-3600, Fax: 785-296-6172, Internet: http://www.ink.org/public /kscc/programs.html

Kansas Wetlands and Riparian Areas Alliance: Tim Christian, Coordinator, P.O. Box 236, McPherson, KS 67460-0236, Ph. 620-241-6921, Fax: 620-245-9618, E-mail: tchristian@kscable.com, Internet: http://www.kwraa.org

Local Conservation District. These are often located with the district NRCS office (see below). For more information contact the District Manager.

Natural Resource Conservation Service (NRCS): Contact your local or district conservation office, usually located in the same town as your county seat. State office: 760 Broadway, Salina, KS 67401. Ph. 785-823-4565. http://www.ks.nrcs.usda.gov.

Section I. Quality of Life

The most important factor affecting the sustainability of any given farm is the farm family's desire to keep working at making the farm successful. Farm profitability and ecosystem health are important, and much of this whole-farm planning exercise reflects that. But equally important is the quality of life for the people who live and work on the farm.

Often farmers don't take the time to talk with their families about the values and goals they share, and how these can be incorporated into the farm as they build it and their lives. A comment often heard is that farmers don't want their kids to farm, primarily because of the lack of opportunities. But if the further question is asked: Would you like your kids to be able to farm?, the answer often is positive. These exercises are meant to help you get at this shared vision in order to build a solid base for the farm to continue, for kids to have the opportunity to come into the operation, and for all family members to be involved.

Who should be involved in the Quality of Life assessment?

To answer a question with a question, who depends on , lives on, or uses the farm? The entire family, including children and active grandparents, should be involved. You also might consider getting input from others who work on the farm.

What is it?

Quality of life considerations often mean asking questions about the most important things in life to each family member. What are the core beliefs and value held by each member? How are these values reflected in short- and long-term goals, interactions within the family, and in the neighborhood or community? Do trust and a good climate for communication exist within the family?

We are offering several tools to help you assess quality of life. The first, a family goal-setting exercise, will help you and your family create a vision for your desired quality of life. The second tool, a family activities calendar, will help you to monitor how well your desired quality of life matches your actual quality of life on a day-to-day basis. We ask you to complete these two tools early on in the assessment. The third tool, a farm goal-setting exercise, will help you determine the direction you wish your farm to go. This section will feed directly into the action plan, and may be completed after the farm inventory section if desired. A warm up exercise is also included along with the farm goal setting sheets, to help you get started.

When done honestly, these tools can help you to answer some pretty basic questions about your farm and to help to:

determine the best profit-producing enterprises and systems for the farm given the people involved and the resources available;
create a base of support for non-profit-generating activities like flower gardens or wildlife reserves; and
begin to change how the farm is managed to reflect the skills and talents that each member wants to contribute.

So, take a look at the enclosed exercises, get your family together, and start thinking about what you want to do, what you do now, and why you do it.

Family Goal-Setting Exercise

Professed values, values in action, and beliefs or assumptions are all different things. Professed values are what you say is important to you. Sometimes, these professed values do not match your values in action. Using the example of passing the farm on to your children, possibly you profess that this is what you would like to have happen, but you do not adequately plan for this as you structure your farm or do estate planning. One reason for this discontinuity between professed values and values in action may be that you just don't see how it is possible to pass on the farm successfully to your children. Possibly your core belief and assumption is that there is just not a future in farming, and your actions reflect that belief, not what you say your values are.

When we find contradictions like this, we need to ask ourselves, does this belief or assumption support my values? Really examining beliefs and assumptions often reveals they are flawed or not fully thought out. Don't be afraid to reconsider them.

Begin by taking a blank sheet of paper and listing your Family Quality of Life Goals. Goals should be clear, positive, and specific. You should be able to measure your compliance with them, and thus monitor them to see how you are doing. Here are some example goals; some are applicable to the whole family, and others are applicable to an individual within the family:

spend our Sundays together as a family
encourage our children by attending as many school activities as possible.
talk to our parents at least once a week
take my spouse out on a date at least twice a month
take a family vacation every year
work together with my spouse doing chores at least once a week
spend time with my younger sister twice a week

Some of these goals will require commitments from the whole family, like spending Sundays together. But it is important that the whole family support individual member's goals, by not judging, dismissing, laughing at, or putting them down. Regularly, sit down with your family and these goals and assess how you are doing. See the next two pages for an example worksheet, and a blank worksheet to help you with the family goal-setting exercise.

Family Goal-Setting Example

Person	Role	Goal
	Nurse	Work no more than 40 hours per week, no night shifts.
Joan	School Board	Attend all meetings. Head up wage task force for new contract negotiations.
	Mother	Attend daughter's home games and band concerts. Be home for dinner each evening. Teach daughter how to cook. Volunteer as chaperone for two school events this year.
	Wife	Help husband care for parents.
	Farmer	Help in field during planting and harvest. Help work cattle at weaning.
	Dad	Take daughter to weekend basketball practice, games, and band practices.
Bob	Husband	Cook dinner at least twice a week.
	Farmer	Maintain steady cash flow and reduce debt on farm this year. Take accounting class, learn how to use accounting software on home computer.
	Son	Check in on parents each evening. Bring groceries or take shopping at least once a

		week.
	Carpenter	Work at least 20 hours per week during winter months. Make $ xxx from non-farm income this year.
	Student	Get at least a “B” average. Apply to at least two colleges, think about a major.
Jane	Daughter	Help with planting. Drive truck during harvest. Learn to cook.
	Band member	Play in fall orchestra and winter pep band.
	Basketball player	Practice at least once a week year-round and play varsity ball this winter.

Family Goal-Setting Worksheet
(make additional copies of this page if needed)

Person	Role	Goal

Family Activities Calendar

A way for families to determine how they actually spend their time is to create an activities calendar that notes all the major activities of each family member throughout the year. The calendar can:

give everyone a sometimes eye-opening picture of what each family member does;
point out differences in workloads and serve as a starting point for renegotiating;
help you pinpoint times when you will be overloaded and let you develop strategies to deal with them in advance;
let you see if you are allocating time to those things you say are most important to you;
help you to adjust when the unexpected happens.

Simply list all the activities your family members undertake that you wish to incorporate into the calendar. Then begin graphing them by calendar period, noting when the activity is sporadic, or more intense by leaving gaps or making the line wider.

Activities you might include could be 4-H, planting, harvesting, sports, housework, machine repair, teaching, cooking, fence repair, milking, or off-farm work. Note the relationships at the busy and slack times of the year. When can you make time for family activities? Are you using your time wisely?

Family Activity Calendar - Example

Activity	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
Planting												
Livestock												
Bedding Plant Production												
Market Gardening												
School Volunteer												
Bookkeeping												
Cooking												
Community Volunteer												

Family Activity Calendar - Worksheet

(make additional copies of this page if needed)

Activity	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC

Farm Goal-Setting Exercise

Sometimes, the people on the farm are surprised to see what other family members' goals are for the farm. It can cut both ways: either a lot of agreement or total disagreement about the direction the farm should take. Each family member interested should complete this exercise in private and then share the results with others in a family meeting.

Think of one or two top goals for each of the time periods (short, medium, and long) in all of the following categories:

Infrastructure Goals (Land, Buildings, Equipment, Other)
Ecological/Landscape Goals (Cropland, Grassland, Woodland, Wetlands & Ponds, Watercourses)
People Goals (Skills, Labor, Communication, Family and Quality of Life)
Financial Goals (Production/Enterprise, Cash Flow, Debt/Asset, Marketing)

You will be asked to share this farm goal page with the field assistant, and with an advisory committee if you are submitting your River Friendly Farm Plan for cost share or funding. These people will not be critiquing your farm goals, since they should be specific to your farm, your family, and to you. The purpose of the review is simply to look at the farm goals at the same time as the action plan. These two parts of your farm plan should fit together.
For example, if your action plan calls for more fencing to protect waterways and create a rotational grazing system, but your farm goals state that you will be decreasing the herd size, or eliminating cattle to invest more time in an alternative enterprise, the review committee would come back to you and ask for clarification.

As a warm-up for writing down your farm goals, you may wish to think about the following questions, and jot down a few notes next to each item.

1. What is working on your farm?

2. What is not working on your farm?

3. What do you enjoy from your farm life?

4. What frustrates you about your farm life?

5. What do you value about farm life?

6. What do you hope to have accomplished when you retire from farming?**Farm Goals Worksheet Example**

	Short Term (1-3 Years)	**Medium Term (3-10 Years)**	**Long Term (10+ Years)**
Infrastructure			
Land	maintain all leased land		transfer land to daughter
Buildings	repair barn roof	new hay shed	
Equipment	replace tractor	purchase ridge-till equipment	upgrade, replace as needed
Other	concrete compost pad		
Ecological/Landscape			
Croplands	develop rotations	retire erodible	

	for all land	land to grass	
Grasslands	re-seed back pasture		
Woodlands	increase wildlife diversity	control deer, hunting $?	
Wetland/Ponds etc.	fence ponds		
Watercourses	add buffer strips to stream		
People			
Skills	attend borrower's training	begin using accounting/ budgeting software at home	
Labor	hire one person during summer	begin retirement, cut back on hours	retire
Communication	have monthly meetings w/ family		
Family/Quality of Life	see family goals sheet		
Financial			
Production/Enterprise	diversify crops		
Cash Flow	monthly cash flow of $ xx		
Debt/Asset	reduce debt by x % per year		
Marketing	direct market beef locally		

Farm Goals Worksheet

(This worksheet is 2 pages. Use separate paper if needed.)

	Short Term (1-3 Years)	**Medium Term (3-10 Years)**	**Long Term (10+ Years)**
Infrastructure			
Land			
Buildings			
Equipment			
Other			
Ecological/Landscape			
Croplands			
Grasslands			
Woodlands			
Wetland/Ponds etc.			
Watercourses			
People			
Skills			
Labor			

Communication			
Family/Quality of Life			
Financial			
Production/Enterprise			
Cash Flow			
Debt/Asset			
Marketing			

Section II. Soil And Natural Resource Conservation

Preliminary: Farm Site Description

You have now completed the Quality of Life section of the River Friendly Farm plan. Later on, you will be asked to complete an action plan (blue pages in the notebook), and there are two sheets in the action plan saved for you to write action steps related to your family goal-setting and your farm goal-setting exercise. However, you may wait until you complete the rest of the notebook to do this step. Proceed now to the inventory sheets on page 40 of the notebook. Take out the packet of green sheets, set them next to the notebook, and use them to record information as you answer the questions in this section of this notebook; Soil and Natural Resource Conservation.

Locate your current farm maps. These may be Farm Service Agency aerial photographs or your Natural Resource Conservation Service maps. Also obtain a current county soil survey for your area, locate your farm, soil types, and characteristics. Include land that you farm that is rented from others. The next four questions are general questions about your whole farm, designed as a transition into the more specific questionnaires that follow.

1: What are the general soil series names and soil characteristics on your farm? How would you describe the surface and subsurface drainage (Adequate? Poor? Good?). What do you consider to be the limitations of the soils on your farm?

2: Describe the topography of your farm. If interested, topographic maps are available from the U.S. Geological Survey or other sources. What are the strengths and limitations of this topography for farming?

3: Does your farm's physical layout (e.g., field boundaries, location of farmstead) help you meet your farm goals and does it fit the enterprise mix on your farm? What do you consider the strengths and limitations of your current farm layout?

4: What do you consider the strengths and limitations of your current enterprise mix?

Now take out the green pages (page numbers 40-46). There you will find instructions for how to begin your inventory. You will use these to record a complete inventory of your croplands, grasslands, woodlands, ponds/wetlands, and watercourses. You may do this for the whole farm, or start with just a part of the farm. Make more copies of the inventory pages if needed.

Once the inventory pages have been assembled, assign numbers to fields, and write them on the inventory sheets. When this is done, turn to the next page and begin answering the following six questions about your croplands. These scores will all be recorded on the cropland sheet (page 42). Then turn to the five questions on grassland management (pages 31-32), and record those scores on the green inventory sheet labeled "grassland." (page 43) Proceed to the remaining three parts of this section - woodlands, springs/ponds/wetlands, and watercourses, and complete in a similar manner. Once all the scores are recorded on the green inventory sheets, an average score may be calculated for each section, and recorded on the yellow score-card sheets.

Soil and Natural Resource Conservation - Cropland

Instructions: Please answer the next six questions for each crop field on your green cropland inventory sheet (see page 42). There are columns numbered 1-6 that correspond to these questions. After you have scored all fields, calculate your average cropland scores. Then continue on to the next sections

(grasslands, woodlands, ponds/wetlands, and water courses), and answer those questions on the designated columns on the inventory sheets.

1. Soil Structure.

4	3	2	1
Open. The soil is very crumbly with lots of pore space.	Mostly open. Soil is crumbly with good pore space.	Slightly dense. The soil breaks into clods. Pores are less visible.	Dense. The soil breaks into large clods. Very little pore space.
No sign of crusting or soil compaction	No sign of crusting or soil compaction.	Soil sometimes crusts. Some compaction.	Crusting and compaction evident.
Roots grow freely in the soil.	Good root growth.	Fair root growth.	Poor root growth and poor crop stands.

Surface Water and Soil Drainage.

4	3	2	1
Minimum amount of water remains on the surface of the field right after a storm.	Some water remains on the surface of the field right after a storm.	Some small ponds remain on surface of the field 24 hours after a storm. May be caused by soil compaction.	Large ponds of water remain on surface of the field 24 hrs after a storm. May be caused by soil compaction.
Water table low. Does not affect crop growth.	Water table near the surface for short periods of time in the spring.	Water table near the surface for a month or more during rainy periods.	High water table, near the surface for extended periods.
All crop growth is the same. No drainage problem effects.	Crop growth is uneven in some sections of the field.	Crop growth is uneven across most of the field due to poor drainage.	Crop growth and yield often below the county average.

Amount of Organic Matter in the Soil (as measured by soil test for your soil texture class).

Instructions: If you farm east of Highway 81 which goes through Salina and Wichita, use the two rows of this table for eastern Kansas. If you farm west of this point, use the rows for western Kansas. Then look at your soil type designation in your county's soil survey book. For each field, decide if you soil is primarily sandy, or whether it is a loam, clay, or clay loam. The finer textured soils (clays and loams) have the capacity to retain higher organic matter contents. Then, for each field, based on soil tests for organic matter, record the designated rating on the green sheet. If you haven't tested a field for organic matter content within the past 5 years, put "NA" (not available) on the sheet, but consider having it tested, especially if you are concerned about organic matter loss, or if you are in a soil-building program, and would like to document progress.

Soil Location/Type		4	3	2	1
Eastern Kansas	**Sandy**	3-4%	2-3%	1-2%	<1%
	Loams & Clays	4-6%	2.5-4%	1.5-2.5%	<1.5%
Western Kansas	**Sandy**	2-3%	1-2%	0.5-1%	<0.5%
	Loams & Clays	3-4%	2-3%	1-2%	<1%

4. Tillage Intensity/Possible Soil Movement from Tillage.

4	3	2	1
No-till system (can include no-till with fertilizer "knifed in").	Normally one or two tillage passes.	Normally 4 or fewer tillage passes.	More than 4 tillage passes.
All or most residue left on surface.	50% or more of residue left on surface.	Less than 50% of residue left on surface.	Zero to 30% residue on field, may be bare ground much of the time when not cropped.
If tillage is performed, is on average less than one time per year, and at different depths each time (tillage type rotation).	Generally rotate tillage implements (alternate deep and shallow tillage).	Only one or two tillage implements used, no rotation of tillage depth.	No rotation of implements. Tilled at same depth year after year.
Shallow tillage only - less than 4 inches.	Tillage depth between 4 and 6 inches.	Tillage deeper than 6 inches, some subsoil mixing with topsoil.	Deep tillage that mixes subsoil with topsoil.

5. Potential for Erosion. (This question assesses the risk of wind or water erosion.)

4	3	2	1
1) Field is nearly level (0-2% slope). 2) Land is in perennial crops (alfalfa or other sod crop) or in rotation with perennial crops, 3)Cover crops and/or residue covers the field most of the year when not crops, 4)Hedgerows or mature trees every ½ mile or less. 5) Soil conservation practices and/or structures in place (e.g., terraces or waterways).	Three of the five "best" conditions (to the left) are present.	Three of the five "worst" conditions (to the right) are present.	1) Rolling topography with several knolls with steep slopes. 2) Land in annual crops every year. 3) Soil is not covered during the winter and/or fall tillage often used. 4) More than ½ mile between hedgerows, mature trees, or other windbreak. 5) No soil conservation practices used and no structures in place.

6. Evidence of Erosion. (This question rates erosion that has already occurred.)

4	3	2	1
Subsoil is not exposed on hilltops or slopes - similar in color to rest of field. No evidence of wind erosion on or off farm. No rill/gully erosion evident.	Occasional blowing of soil, but no permanent evidence of wind erosion. Rill erosion beginning to be evident.	Seasonal evidence of damage by wind erosion on and off farm. Rill and gully erosion evident.	Subsoil has been recently exposed on hilltops; soil is often lighter in color and stonier, and crop growth is stunted. Frequent evidence of dust, drifting soil, dark brown snowdrifts, and crop damage. Gully erosion a problem.

Soil and Natural Resource Conservation – Grasslands

Please rate all of the **grassland** fields in your inventory using the following scales (see green sheet on page 43).

1. Management of Grassland.

4	3	2	1
Actively managed. Prescribed burns, hand-applied pesticides or goats for brush control. Controlled grazing through planned grazing systems. Appropriate stocking rates. Vegetation is good or improving.	Some management. Burn and/or ground apply pesticides when brush gets out of hand. Livestock numbers are reduced when signs of overgrazing appear. Some larger paddock field divisions used.	Livestock graze on land inconsistently. Little cross-fencing. No active management other than spraying for occasional weed control. Stocking rates not calculated based on amount of available forage.	No burning or brush control. Forage is dying or trampled. No cross-fencing. Pastures may be over-stocked. Lots of weeds and/or aerial spraying of pesticides.

2. Plant Diversity. This question applies primarily to native grass pasture, meadow, and CRP plantings. Using the accompanying plant species list (see appendix A), identify as many plants on your land as you can. The following ratings are broad guidelines or ratings for abundance. Individual pieces of land may have the potential for more or fewer species. These ratings are a starting place and a way to track progress over time for your farm and to compare similar pieces of land to one another;. They may give you an indication of grassland quality. For brome hay fields and waterways, answer “NA” on the green inventory sheets.

4	3	2	1
More than 15 species. Most species are perennial grasses or forbs.	Between 10-15 species.	Between 5-10 species.	Fewer than 5 species and/or most species are weedy annuals.

3. Water Sources. Are there several sources of water for grazing livestock on your grasslands? Are these water sources protected from trampling, erosion, and contamination (e.g., tanks, protected limited access, gravel or concrete pads.)?

4	3	2	1
Several alternative sources of water on grasslands. Fenced to prevent trampling or erosion; cattle cannot loaf in water. Constructed cattle crossings through streams. Water access points protected by gravel or concrete pads. Water is tested for pathogens. Water is clear.	Single source of water. Livestock have access but are discouraged from loafing in or near water. Some concrete or gravel protection around well heads or water areas, but animals are not fenced out. Water is occasionally muddy but then clears up.	Single source of water. Some concrete or gravel protection around watering areas, but areas generally muddy. Water is muddy.	Animals have full access to watering areas and loaf in stream beds or ponds and/or water is very muddy.

4. Potential for Erosion.

4	3	2	1
Less than 5% bare soil in the grassland, including hilltops. Few steep slopes or stream beds. Streambeds and watercourse areas well vegetated. No rills forming	A few patches on hillsides where cover is gone. Places with lots of annual weeds, rather than perennials. Some rill erosion beginning on steep paths.	Larger areas without soil cover. Animals are wearing away stream banks. Few trees or other foliage along stream banks. Steep slopes with deep cattle paths.	Large areas with little grass on hilltops. Forage is consistently grazed way down. Permanent livestock paths. Only water source is streambed, and animals are allowed unlimited access. No foliage along streambeds.

5. Observed Erosion.

4	3	2	1
Subsoil is not exposed on hilltops or slopes - similar in color to rest of field. No evidence of wind erosion on or off farm. No rill/gully erosion evident.	Occasional blowing of soil, but no permanent evidence of wind erosion. Rill erosion beginning to be evident.	Seasonal evidence of damage by wind erosion on and off farm. Rill and gully erosion evident.	Subsoil is exposed on hilltops, soil is often lighter in color and stonier, and crop growth is stunted. Frequent evidence of dust, drifting soil, dark brown snowdrifts, and crop damage. Gully erosion a problem.

Soil and Natural Resource Conservation – Woodlands, Including Hedgerows And Windbreaks.

Please rate the **Woodland** areas on your farm inventory using the following five questions. (See green sheet on page 44.)

1. Management of Woodlands.

4	3	2	1
Forest managed by a set plan for environmental and commercial benefits. A variety of trees and other woodland species present. Forest operations cause no damage to soil and water quality.	Forest is managed by proper harvesting - no long-term plan. Undergrowth is moderate - commercial species only. Forest operations cause minimal damage to soil and water quality.	Forest is neglected, too heavily cut or all best trees have been harvested. Few young trees (saplings or seedlings). Some field weed species present. Forest operations cause significant damage to soil and water quality.	Forests have been removed or clear-cut recently. No young trees (saplings or seedlings). Field weed species only. Forest operations cause severe and long-term damage to soil and water quality.

2. Plant Diversity. Using the accompanying plant species list (appendix A), identify as many plants in your woodlands as you can. The following ratings are general guidelines or ratings for abundance. If your woodland area is a plantation, e.g., for Christmas trees or walnuts, rate this question "NA" on the green inventory sheets.

4	3	2	1
More than 15 species. Long-lived perennial woody plants dominate.	Between 10-15 species.	Between 5-10 species.	Fewer than 5 species. Many annual weedy species present.

3. Water Quality in Woodlands.

4	3	2	1
No access to woodlot by livestock. No direct effluent from confinement areas passed through woodlots.	Livestock restricted to less than 10% of woodlot or access is less than 6 weeks out of the year.	Livestock have access on seasonal basis. Shrubs and soil surface disturbed. Muddy areas in woodlot. Effluent from confinement areas passes through.	Livestock have free access to woodlot all year long. Only water source is streambed, and animals are allowed unlimited access.

4. Potential for Erosion.

4	3	2	1
100% plant coverage. Few steep slopes. Stream bed areas well vegetated. No rills forming. Good mix of trees, shrubs, and grasses.	A few patches where cover is gone. Shrubby understory maintained under trees.	Larger areas without soil cover. Animals are wearing away stream banks. Few trees or other foliage along stream banks. Steep slopes with deep cattle paths.	Trees girdled; shrubs gone. Large areas of bare ground.

5. Observed Erosion.

4	3	2	1
Subsoil is not exposed on hilltops or slopes - similar in color to rest of field. No rill/gully erosion evident.	Occasional erosion in woodland due to “100-year” (large or extreme) storms. events. Some soil movement, but no rill or gully formation.	Seasonal evidence of damage by erosion. Rill and gully erosion evident.	Subsoil is exposed on hilltops; soil is often lighter in color and stonier. Gully erosion a problem. Water coming off woodland often loaded with silt.

Soil and Natural Resource Conservation – Springs, Ponds and Wetlands

Please rate each wetland, spring or pond area on your farm inventory sheet using the five questions below. (See inventory sheet on page 45).

1. Management.

4	3	2	1
Wide perennial buffer strips (> 66 ft.) on upland side of pond/wetland. Wetland permanently retired from agriculture at natural limits. Permanent vegetative cover on nearby fields. Wetland has untapped supply of water.	Narrow upland buffer (16-66 ft.) in natural or dryland perennial vegetation. Pond/Wetland permanently retired. Conservation tillage on nearby fields. Water is taken only when it does not disrupt wildlife in critical nesting periods. No artificial drainage.	Narrower buffer (8-15 ft.) in vegetation that is grazed or cut annually. Minimum tillage used in adjacent fields. Water is taken for irrigation each year. Some artificial drainage of a wetland.	Minimal buffer strip width, planted to annual plants, conventional tillage and planting system adjacent to pond/wetland. Area may be farmed during dry years or artificially drained to allow for cultivation. Unrestricted water use.

2. Plant Diversity (for wetlands only). Using the accompanying plant species list (see Appendix A, pg. 101-108), identify as many plants as possible.

4	3	2	1
More than 15 species. Threatened or endangered species present and protected.	Between 10 and 15 species.	Between 5 and 10 species.	Fewer than 5 species. Invasive species present.

3. Water Quality.

4	3	2	1
Sources of water are under control of the farmer. Livestock do not have access to the spring, pond or wetland. Confinement effluent does not pass directly into the wetland. Water is tested. Area never served as a trash dump.	Some sources of water not under farmer's control. Livestock are permitted to flash graze only. Confinement facility is at some distance from the water. Trash has been removed.	All sources of water come from neighboring farms, but neighbors are conservation minded. Livestock have seasonal access, or confinement facilities are close by. Nonpolluting trash may be found in water.	Visible sediment or other pollutants coming into water from farmed, neighbor's land. Livestock have year-round access to water. Area used as dump for chemical containers or manure.

4. Potential for Erosion.

4	3	2	1
Pond dams are well	Cattle have some	Denuded sections of	Actual damage to

maintained. Overflows are free of obstruction and in good condition. Cattle are fenced out of springs, ponds, and wetlands. Watering points are at a distance. Good vegetative cover on dam (except for trees), vegetation surrounds wetlands and springs.	access to spring, pond or wetland but have not disrupted vegetation.	pond dam, and areas near springs and wetlands. Overflow is in poor condition. Large trees on dam.	dam and overflow. Cattle have free access and have overgrazed. Dam beginning to erode. Area around spring or wetland lacks vegetation.

5. Observed Erosion. Are ponds, wetlands, or springs in need of remediation at this time?

4	3	2	1
No structures in need of remediation or repair at this time	Some repair needed to maintain integrity of structure of pond, spring or wetland.	Significant repair required in the next 2 years to maintain structure.	Immediate repair required, and/or pond, spring or wetland non-functional at this time.

Soil and Natural Resource Conservation - Watercourses (Stream, Rivers and Ditches)

Please score the following six questions on the inventory sheet on page 46.

1. Are You and Your Family Familiar with Watercourses on Your Farm?

What is the name of your watershed?

Name the tributary (or tributaries) that your farm drainage flows towards.

Name the connecting rivers from your tributary to one of the major waterways in Kansas (Kansas River, Arkansas River,
Neosho River, etc.).

Have you ever used one or more of these rivers for recreation such as fishing, swimming, hunting, or boating?

4	3	2	1
Could answer all of the first three questions above correctly and answered “yes” to fourth question.	Could only answer 3 of the 4 questions above correctly or positively.	Could only answer 2 questions correctly or positively	Only one correct answer to above questions, and/or answered “no” to the fourth question.

2. Vegetative Cover.

4	3	2	1
Riparian zones are completely covered in perennial grasses, shrubs and trees. Flash grazing or carefully monitored rotational grazing only.	Riparian zones are completely covered, but livestock are allowed to graze periodically.	Riparian zones are not in perennial covers. Animals have access to waterways.	Riparian zones are cultivated or animals have free access.

3. Pollutants in the Watercourse.

4	3	2	1
Waterway has never served as a dump. No effluent runs directly into watercourse.	Watercourse has been cleaned of trash. No direct effluent.	Watercourse contains nonbiodegradable items: e.g., plastics, rolls of wire, cans, appliances, automobiles.	Watercourse contains trash, and effluents run directly into stream. Toxic waste a probable contaminant.

4. Observed Erosion.

4	3	2	1
No visible erosion of banks or channel. Vegetation and structures appear to be satisfactory at this time.	Occasional cuts into or caving in of banks, but not a significant problem. No waterway migration.	Waterway beginning to migrate only under circumstances of very high water. Generally seems to be "natural" movement of banks. Roots and other structures generally control erosion.	Waterway cuts into fields more than 5 ft. per year. Erosion is severe.

5. Does the Water Leaving Your Farm have Higher or Lower Quality than That Entering Your Farm? You may want to look at your maps again at this point. Determine where water comes from that enters your farm. It is possible that there is no noticeable difference as it crosses your land, and/or that it is in poor condition when it enters your land. Working closely with upstream neighbors will be necessary to accomplish water quality goals in this case. Also, problems with excess flow, and flooding due to channel straightening may also require upstream-downstream neighbor cooperation. Water quality at these points can be measured directly using test kits or labs, if you want to know more.

4	3	2	1
Water is noticeably cleaner where leaving the farm than where entering, or is clean both where it enters and where it leaves the farm. Water appears clean at all outlets.	Water quality slightly diminished, but main problem is silt load.	Water quality is worse when leaving farm than when entering. One or two known pollutants possible.	Water quality is noticeably worse when leaving farm than when entering. Variety of pollutants possible (animal waste, pesticides, excess nutrients).

You have now completed the Soil and Natural Resource Conservation evaluations and inventory sheets. The next step is to calculate your total and average scores on the green inventory sheets, and transfer those numbers to the yellow scorecard sheets. Also, answer the wildlife habitat question on the following page. Then proceed to the Nutrient Management section on page 47. These questions will be answered for your whole farm.

Wildlife Habitat. Give yourself a +1 point for each item that applies to your farm from the "beneficial" column and a –1 point for each item in the "detrimental" column. Add each column to determine your final score. Record this number on the yellow scorecard sheet on page 98. For this question you may have a number higher than 4, or less than 1.

Land Use Type	Beneficial to Wildlife	Detrimental to Wildlife
Croplands	No fall tillage. Strips of unharvested crops left for wildlife.	Fall plowing or other clean tillage. No borders on fields with cover for wildlife. Granular insecticides used that may be toxic to birds. Crop residue burned.
Grasslands	Grasslands burned or managed through grazing to leave some areas of undisturbed grass reserve. Not overgrazed, so that some tall grass remains as cover.	Grasslands completely mown or burned in April or May at the peak nesting season. No reserve or "islands" for wildlife.
Woodlands	Woodlands connected to one another with woody species "corridors" for wildlife. Dead trees left standing for nesting sites. Brush piles provided as cover.	Bait used for predator control that may be consumed by other wildlife species.
Springs, Ponds, and Wetlands	Ponds maintained in good condition. Fish populations kept in balance through management. Wetlands restored.	Ponds shallow or degraded in water quality.
Watercourses	Undisturbed woody or tall grass buffer strips along all watercourses (at least 66 ft. wide).	No vegetative buffer strips on watercourses.
Whole Farm	Water provided in areas if it doesn't exist naturally. Abandoned farmsteads remain undisturbed (except for plugging and filling wells). Hedgerows remain intact and are pruned and/or root pruned occasionally. Wildlife feeders provided.	Hedgerows have been removed. Abandoned farmsteads are converted to annual cropping.
TOTAL SCORE		

Farm Site Description Inventory

Instructions:

Farm Walk - if possible first schedule a farm walk of your place with the field assistant. This person will be available to answer any questions you have about this assessment tool, the overall program, technical assistance, grants and awards that may be available as a result of your participation.

To complete the farm site description inventory, begin by gathering or knowing where to find the following materials.

Aerial photo maps of all the farm lands for which you are responsible. Make several copies of each map. Be sure the maps are up-to-date by drawing in your present fields.

Cropping information on all your farm land, including inputs used, yields, and crops grown for the last several years, if available.

Figures on livestock owned for the last several years.

Several fine-point highlighting pens or magic markers of various colors.

Farm Inventory and Soil and Natural Resource Conservation Assessment - to complete this section, use your maps, the green inventory pages in this notebook, and the Soil and Natural Resource Conservation Assessment questionnaires found on pages 26 - 39.

Using the aerial maps, assign field numbers to all your crop fields, if you have not already done so. Also assign numbers to your grasslands, wetlands, and woodlands. Designate each field, for example: C1, C2, and C3 for cropping fields; G1, G2, and G3 for grasslands. You also may want to name ditches, floodplains, and ponds. Waterways and riparian areas can be listed on both the “woodlands” sheet and the “streams” worksheets.

If you are farming several farms, precede each location code with a farm name. Label all these on your maps. It is OK to start the assessment with one part of your farm, rather than working with numerous tracts of land, and dozens of fields. You might choose to start with a part of your farm that you’ve owned or farmed the longest. Another approach is to select a portion of the farm that you know you want to improve, or for which you want to obtain cost-share. The main idea of this assessment tool is to help you organize and prioritize plans for the future, not to try to get the best score, so feel free to choose problem fields, rather than pick areas where you know you’ll score

well.

Possible scores range from 1 (poor) to 4 (very good) for each field, grassland, etc. characteristic that is being rated. If the question is not applicable to your farming operation, write NA (not applicable) on the score sheet. Scores of 1 or 2 indicate items that probably should be on your action plan for further attention. A score of 3 means that you are meeting basic requirements for water quality, and a score of 4 indicates that you are doing everything possible in this particular area to meet water quality standards.

Remember, this information is being held confidential, is useful only to you, and is most useful if you are completely honest. When finished, add the total for each column and divide by the number of fields to get an average number for your farm in terms of cropland structure, drainage, etc., and do the same for grasslands, woodlands, etc. If the score is NA, do not include it in the total number of fields when calculating the average.

Transfer these scores to the appropriate place on your scorecard (yellow pages 81-82). Later you will be asked to go back through the scores on your yellow sheets, determine your desired rating for each item, and then rank each as no action needed, low, medium, or high priority. A check mark in the last column on the score sheet will help you track which items will be written up on your action plan.

The final question in this section is on wildlife habitat. Wildlife on a farm can either be seen as a pest, a resource, or both. This question allows one to simply add up the practices and structures on the farm that may be beneficial to wildlife, the ones that may be detrimental, and see where the farm is overall on balance. Record the score from this question on page 98 of the yellow score sheets. A second wildlife question is located in Appendix A. This is a question about wildlife diversity on the farm, and may be of particular interest to farms developing agri-tourism, hunting lease programs, or simply for farms with children that may want to inventory species of birds, mammals, plants etc. on the farm as part of a school or 4-H project. A scorecard is provided in Appendix A. along with a list of species that one is likely to find in Kansas, provided by the Kansas Biological Survey.

Cropland Inventory Sheet (see questions on pages 28-30)
(make additional copies of sheet as needed)

Farm	Field	Acres	Cultivated since?	Owned?	Rented or leased?	RATINGS

	1. Structure	2. Drainage	3. Organic	4. Tillage	5. Potential	6 Observed

			matter	intensity	erosion	erosion

Example	*C-1*	*35*	*~ 1920*		*X*	*3*	*3*	*1*	*2*	*3*	*3*

Grassland Inventory Sheet (see questions on pages 31-32)

(make additional copies of sheet as needed)

Farm	Field	Acres	Grass since?	Owned?	Rented or leased?	Ratings

	1. Management	2. Plant diversity	3. Water sources	4. Potential erosion	5. Observed erosion

Woodland Inventory Sheet (see questions on pages 33-34)

(make additional copies of sheet as needed)

Farm	Lot I.D.	Acres	Used for?	Owned?	Rented or leased?	Ratings

	1. Management	2. Plant diversity	3. Water quality	4. Potential erosion	5. Observed erosion

Springs, Ponds and Wetlands Inventory Sheet (see questions on pages 35-36)
(make additional copies of sheet as needed)

Farm	Area I.D.	Size of Water Area	Acres Drained	Owned?	Rented or leased?	Ratings

	1. Management	2. Plant diversity	3. Water quality	4. Potential erosion	5. Observed erosion

Watercourses Inventory Sheet (Rivers, Streams, Ditches) (see questions on pages 37-38)
(make additional copies of sheet as needed)

Farm	Field	Stream Name	Linear Feet (estimate)	Owned?	Rented or leased?	Ratings

	1. Familiarity	2. Vegetative cover	3. Pollutants	4. Observed erosion	5. Water quality

III. Nutrient Management

As you work through the next three sections, keep the yellow scorecard handy and record your scores as you answer each question. Each of the three remaining assessment tools (all on pink pages) consist of questions that apply to your whole farm. Transfer your scores directly to the scorecard (yellow sheet) on page 99. After you have filled in the rating column, fill in the "desired rating" column. Note that the desired (or possible) rating may not always be a "4."

1. Crop Rotations for Soil Organic Matter Building and Nutrient Buffering.

4	3	2	1
Perennial forages or overwintering cover crops grown at least 1/3 of the time in the rotation. (Wheat is considered a crop, not a cover crop in most situations).	Perennial forages or overwintering cover crops included in the rotation at least once every 10 years. Diverse crop rotation of at least 3 to 5 different types of crops, alternating summer (corn, milo, soybean) and winter (wheat) crops.	No perennial forages or cover crops, but diverse crop rotation includes at least 3 to 5 different types of crops.	Continuous cropping of same crop several years in a row.
Nutrient applications are low to moderate for all crops in the rotation. Fertility is adequate to maintain root and top growth.	Crops that receive high rates of fertilizer are alternated with crops that use residual fertility.	More than half the rotation is occupied by crops that receive high levels of nutrients.	The farm is in continuous row crops that receive high levels of nutrients.

2. Legume and Manure Credits.

4	3	2	1
Amount of nitrogen is reduced by the estimated amount of available nutrient added by legumes or cover crops.	Amount of nitrogen is reduced after perennial forages, but not after cover crops or grain legumes.	Amount of nitrogen is reduced only slightly after legumes in the rotation.	Amount of nitrogen is not reduced by the amount of available nutrient added by legumes or cover crops.
Amount of nitrogen is reduced by the estimated amount of available nutrient added by manure or sludge. Manure is applied to crops that need the nutrients.	Some credits taken for manure or sludge application, but amounts applied are not measured.	Fertilizer rates reduced only slightly following application of manure or sludge. Manure applied to crops based on need for disposal, not crop uptake needs.	Fertilizer rates not reduced after application of manure or sludge.

3. Potential for Nutrient Loss from Fields.

4	3	2	1
Growing crops such as perennials and cover crops cover the ground	Cover crops and/or perennial crops are used in the crop	Annual crops dominate the crop rotation, and cover	Fields are left bare for large parts of the growing season. No

for all or most of the growing season. There is little or no bare ground in this rotation.	rotation with annuals to keep the ground covered most of the time. If the annual crop is grazed, another crop is quickly planted, or some stand is left to cover the soil.	crops and/or perennial crops are used infrequently. If the annual crop is grazed, ground is then left bare.	cover crops or perennial crops are used.
Grass buffer strips between all fields and surface water to slow water and absorb nutrients. All waterways have good thick stands of grass.	Grass buffer strips between some fields and surface water to slow water and absorb nutrients. All waterways have adequate stands of grass.	Buffer strips between some fields and waterways, but sod is not established. Some waterways in need of renovation.	No buffer strips. Waterways in serious need of renovation.

4. Amount of Nutrient Used.

4	3	2	1
Amount of nutrient applied is determined from last soil test of each field and estimated crop demand.	Last soil test for each field is used as a guide for the amount of nutrient needed, but crop demand is not factored in.	Soil tests are not used to determine the amount of nutrient needed.	No soil tests performed. High rates of fertilizer used every year.

5. Fertilizer Application System.

4	3	2	1
All nutrients are incorporated by banding or tillage within 24 hours or broadcast over solid-seeded crops (such as alfalfa or brome). Split application of high levels of nutrients.	*Most* nutrients are incorporated within 24 hours. Surface application of fertilizer only on level fields away from surface water sources. Split application of high levels of nutrients.	Less than half of the fertilizer applied to tilled crops is incorporated. Surface-applied fertilizer used on sloping land.	All fertilizer is surface applied and not incorporated.

6. Timing of Nitrogen Application.

4	3	2	1
Nitrogen is applied just before the time that the crop can absorb it best. Crops that need a large amount of nutrient get more than one application.	All nitrogen is applied at one time, less than 2 weeks before planting or as a sidedress or topdress application.	Nitrogen is applied more than 2 weeks before planting or after the time when the crop can absorb it. A nitrification inhibitor is used when	Nitrogen is applied in the fall or winter without a nitrification inhibitor.

Sidedress rates are adjusted for crop conditions and/or soil tests.		anhydrous ammonia is applied in the fall.	

7. Lime Needs for Your Crops.

4	3	2	1
Soil tests show that pH on all fields is 6.0 or above, or soils are alkaline.	Some fields test lower than 6.0 pH, but crops appear healthy.	Several fields are in need of lime (have pH lower than 6.0), and some crops show nutrient deficiencies.	Majority of fields have a pH lower than 6.0, and crops show nutrient deficiencies related to pH and/or are difficult to establish.

8. Micronutrient Needs.

4	3	2	1
Soil tests show that micronutrient levels are adequate on all fields	Soil tests may not have been performed, but no micronutrient deficiency symptoms have been observed on crops.	Some crops show micronutrient deficiencies.	Majority of crops show micronutrient deficiencies and/or are difficult to establish because of these deficiencies.

9. What are Your Chief Sources of Macro (N, P, K) and Micronutrients? Are They Being Met Primarily with On-Farm Sources or 0ff-Farm Sources? Are These Sources Renewable? Are You Treating Your On-Farm Sources of Manure as a Waste or a Resource?

4	3	2	1
All available on-farm sources of N are used in the form of legume cover crops and/or animal manures. As much as possible, P, K, and micronutrients are supplied with manures.	All available on-farm sources of animal manure are used, but legume cover crops are used rarely if ever for N.	Purchased fertilizers are the main sources for crop nutrients. Cover crops are not used. Animal manures used occasionally if ever.	If on-farm sources of manure exist, and cover crops are possible, none of these are used to supply nutrients to crops. All crop nutrient needs are met with purchased, off-farm fertilizers.

10. Storage of Fertilizer - Amount.:

	4	3	2	1
Dry Formulation	None stored at any time.	Less than 1 ton stored for longer than immediate use period.	1-20 tons stored for longer than immediate use period.	More than 20 tons stored for longer than immediate use period.
Liquid Formulation	None stored at any time.	Less than 50 gallons stored for longer than immediate use period.	50-1000 gallons stored for longer than immediate use period.	More than 1,000 gallons stored for longer than immediate use period.

11. Storage of Fertilizer - Distance from Water Sources. Note: if your farm is located near a public (municipal or rural water district) well or intake, please see Appendix B for special considerations and requirements.

	4	3	2	1
Surface Water	Greater than 500 ft.	250-500 ft.	100-250 ft.	Less than 100 ft.
Well Water	Greater than 400 ft.	250-400 ft.	100-250 ft.	Less than 100 ft.

12. Storage of Fertilizer - Facility.

	4	3	2	1
Dry	Stored in building on an impermeable surface (e.g., sealed concrete).	Stored in building on soil.	Stored on soil with temporary cover.	Stored on soil with no cover.
Liquid	Impermeable secondary containment does not allow spill to contaminate soil, well, or surface water.	Clay-lined secondary containment.	No secondary containment. Permeable soil (loam).	No secondary containment. Highly permeable soil (sand).
Security	Original container clearly labeled. Sight gages and lock on valves for liquid storage. Locked fenced area or locked building separate from all other activities.	Label on original container partly missing or hard to read. Sight gages. Fenced area or building separate from activities that could damage containers or spill fertilizer.	No labels. Containers patched. Area open to activities that could damage containers or spill fertilizer.	No labels. Leaks from containers. Area open to theft, vandalism, and children.

13. Mixing, Loading, or Transfer of Fertilizer - Safety and Containment. Note: many of these situations are applicable only to liquid handling systems, but some apply to both liquid or dry fertilizer products.

4	3	2	1
Emergency cleanup plan. Safety training provided. Equipment in top working order.	No emergency plan. Safety training provided. Equipment well maintained.	No emergency plan. No safety training provided. Equipment in satisfactory condition.	No emergency plan. No safety training. Equipment not well maintained. Spills not cleaned up.
Has permanent roof and impermeable floor with curb. Area kept neat and tidy.	Temporary mixing/loading area with plastic-lined berms.	Mixing done at site of spray application - site changed frequently.	Regular mixing/loading area has no containment to prevent soil contamination.
Leftover dry fertilizer or liquid rinsate applied to cropped area more than 50 ft . from surface water source and more than 200 ft. from well.	Leftover dry fertilizer or liquid rinsate applied to noncropped area more than 50 ft . from surface water source and more than 100 ft. from well.	Leftover dry fertilizer of liquid rinsate applied to area less than 50 ft. from surface water source and less than 100 ft. from well.	Leftover dry fertilizer or liquid rinsate dumped at farmstead or in field, but not spread or diluted.
Backflow prevented by use of separate water tank. Closed system for transfer of all liquid products. Constant supervision.	Backflow prevented by permanent antibackflow device. Closed system for transfer of most liquid products.	No permanent antibackflow device and/or liquids hand poured. Sprayer opening easy to reach.	No antibackflow device and/or liquids hand poured. Sprayer opening hard to reach.

14. Mixing, Loading, or Transfer of Fertilizer - Distance from Water Sources. If your farm is located near a public (municipal or rural water district) well or intake, please visit with the field coordinator or agency specialist for special considerations and requirements.

	4	3	2	1
Surface Water	Greater than 500 ft.	250-500 ft.	100-250 ft.	Less than 100 ft.
Well Water	Greater than 400 ft.	250-400 ft.	100-250 ft.	Less than 100 ft.

15. Soil Testing (include testing done by self or consultant).

4	3	2	1
Fields are tested every 2-3 years for pH, P, and K. Deep profile (0-24") tests are taken to determine N carryover every year prior to a high N demanding crop. Careful records of phosphorus levels are kept for each field, and nutrient applications are adjusted to prevent long-term excessive levels or over-application.	Fields are tested every 4-5 years for pH, P, and K. Occasional deep profile N tests are taken. Careful records of phosphorus levels are kept for each field for monitoring purposes, with the goal of preventing over-application.	Fields are tested less than once every 5 years. No testing for deep profile N. No long-term phosphorus soil test records. Don't know if have excessive levels on any fields or not.	Soil is not tested.
Complete records of soil tests. Samples taken at same time of year and at same point in rotation cycle for comparison.	Records kept, but soil samples not taken at the same time of year or at the same point in the crop rotation cycle.	Records of soil tests incomplete.	No records kept of soil tests.

You have now completed the Nutrient Management Section of the notebook. If you would like assistance with nutrient management planning, see the list of resources on pages 13 and 14. The answers to these questions should be recorded on the yellow scorecard sheet, page 99. You may now average your scores to come up with your section average.

Proceed now to the next section, Pest Management. Similar sets of questions will be answered on page 100 on your yellow scorecard sheets. These questions will apply to your whole farm.

IV. Pest Management

Please record scores from this section on the scorecard provided in the yellow section, page 100.

1. Crop Rotations for Weed, Insect, and Disease Management.

4	3	2	1
Different crop species used for every new planting on the same field.	Different crop species used 3 out of 4 times that same field is replanted.	Different crop species used 2 out of 4 times that same field is replanted.	Same crop grown for several years in a row.
Pesticide applications minimized for all crops in the rotation.	Crops that receive higher rates of pesticide are alternated with crops that use little or none.	More than half the rotation is occupied by crops that require high levels of pesticides.	The farm is in continuous row crops that require high levels of pesticides on an annual basis.

2. Seed Source.

4	3	2	1
Certified seed (weed free) used for all planting.	Some seed from own farm is used; seed is cleaned and tested for weeds (weed free).	Seed from own farm is used - not cleaned or tested for weeds.	Seed source and quality unknown.

3. Management Skills.

4	3	2	1
Operator attends workshops at least twice a year or reads material to learn about new methods of crop or animal protection (e.g., nonchemical alternatives, new types of pesticides, better application methods). Knowledge is applied on farm. **OR** professional consulting services utilized regularly to assist with pest management/pesticide decisions.	Operator attends workshops once a year or reads material to learn about new methods of crop or animal protection. Methods of pest control are reviewed annually and updated as needed. Professional consulting services used as needed to assist with pest management/pesticide decisions.	Operator attends workshops less than once a year. Limited effort to learn about new methods of crop or animal protection. Chemical pesticides selected *only* because of low price and satisfactory level of control.	Operator does not attend workshops - makes no effort to learn about new methods of crop or animal protection.

4. Pest Monitoring (including weeds).

4	3	2	1

Crops are inspected for pests each year during critical periods of crop development (e.g., fruit set, flowering, early development). Inspections performed by farm owner/operator (if qualified) or professional crop consultant.	Crops are inspected for pests on an "as needed" basis by owner/operator (if qualified) or professional crop consultant.	Crops are inspected for pests. Crop consultant performs all inspections.	Crops are not inspected for pests.
Pest control is used only when pest population is large enough to do economic damage. Owner/operator is familiar with pest life cycles and threshold levels.	Controls and treatment are adjusted based on pest levels.	Spraying done at first sign of pests.	Pests are controlled at certain stages of crop development or by calendar date.

5. Methods of Control.

4	3	2	1
Selection of pest-resistant crops, cropping system design, and other cultural practices result in a cropping system where no chemical (synthetic or botanical) methods are required for pest management. If biogenetically engineered varieties are used (e.g., Bt corn), large pest refuge areas are established, and crop is not grown every year.	All options for pest control are assessed. Where possible, nonchemical methods are used to reduce insect pests, weeds, and disease (e.g., crop rotation, resistant varieties, sanitation, biological control).	Chemical control methods are minimized through the use of standard scouting and monitoring techniques and knowledge of the life-cycle of the insect or other pest. No use of non-chemical methods.	Chemical pesticide is the only method used for pest control.
Environmental impact is considered as a very high priority when designing the cropping system.	Impact on environment is considered in selecting chemicals (e.g., toxicity, residue, effects on nontarget crops and animals).	Environmental impact is reduced only because the frequency of pesticide use is reduced.	Chemicals selected *only* on the basis of price, effectiveness, and convenience. (Biological and cultural controls not considered or used.)

6. Record-Keeping.:

4	3	2	1
Records kept on farm for all pesticides used including date, type of chemical, rates applied, target pest, stage of crop and pest development, weather conditions.	Detailed records kept for all pesticides used, but some are kept on farm, and some by custom applicator or consultant. Records are not all in one place or easily accessible.	Records are kept of what chemical was applied and where.	No records are kept. Chemicals used are known by memory or invoices only.

7. Sprayer Calibration and Maintenance (self or custom applicator).

4	3	2	1
All spray and granular equipment is serviced and calibrated before the start of each crop season. Sprayers are rinsed thoroughly and calibration checked and adjusted at each use.	All spray and granular equipment is serviced and calibrated before the start of each crop season. Sprayers are rinsed thoroughly and recalibrated at least once a year in addition to initial calibration.	All spray and granular equipment is serviced and calibrated before the start of each crop season.	Equipment is serviced only after it breaks.

8. Application Safety.

4	3	2	1
The pesticide label is always checked for safety precautions and for use instructions. Protective clothing and personal safety equipment are worn for mixing, loading, spraying, and cleanup. All personal safety equipment is cleaned and properly maintained (e.g., cartridge of respirator).	The pesticide label is always checked for safety precautions. Protective clothing and personal safety equipment are worn for mixing, loading, spraying, and cleanup.	The pesticide label is not checked for safety precautions. Only some protective clothing (gloves, goggles) are worn for mixing, loading, and cleanup.	The pesticide label is not checked for safety precautions. No protective clothing or personal safety equipment is worn.

9. Application - Potential for Movement.

4	3	2	1
Grass buffer strips between all fields and	Grass buffer strips between some fields	Buffer strips between some fields and	No buffer strips.

surface water (and tile inlets) to slow water and absorb pesticides.	and surface water (including tile inlets) to slow water and absorb pesticides.	waterways, but sod is not established.	
No spraying if winds are greater than 10 mph (small branches are moving in wind). Spraying is postponed when heavy rain is forecast within the next 24 hrs. Herbicides are incorporated if necessary. Correct nozzles and other equipment are used and calibrated frequently.	Weather forecast (rain and wind) is considered when planning spraying within the next 24 hours. If rain or high winds begin during spraying or tillage, then operation is stopped. Correct nozzles and other equipment are used and occasionally calibrated.	Spraying done on windy days (more than 10 mph). Correct nozzles used, but equipment not calibrated.	Spraying operations done in any kind of weather. Weather forecasts are not considered when planning spraying and tillage. Incorrect, old, or worn nozzles used for application.

10. Separation Distance of Pesticide Application from Water Sources. If your farm is located near a public (municipal or rural water district) well or intake, please visit with the field coordinator or agency specialist for special considerations and requirements.

	4	**3**	**2**	**1**
Open Water or Tile Inlet (terrace or field):	Greater than 50 ft.	Greater than 30 ft.	Less than 30 ft.	Spray applied adjacent to or over top of a water source, tile drain inlet, or well.
Well Water	Greater than 200 ft.	100-200 ft.	50-100 ft.	Less than 50 ft.

11. Good Neighbor Policy.

4	3	2	1
No pesticides used, or only spot spraying, and not near roads or residences.	No aerial spraying or ground spraying under windy or other adverse conditions. Spraying avoided near residences and gardens.	Awareness of location of neighbor's homes and gardens. Volatile pesticides (e.g., 2,4-D ester) not sprayed near gardens.	No consideration given to residences or gardens.
Signs posted on all fields sprayed as required by label or law, with name of pesticide and safe re-entry period. Neighbors in nearby residences notified. Family is notified, and pets are not exposed.	Signs posted as required by label or law on sprayed fields with "danger" or "do not enter-pesticides."	No signs posted, but neighbors notified.	No signs posted. Neighbors not notified.

12. Storage of Pesticide - Amount, Duration, and Toxicity Level

	4	3	2	1
Amount	None stored at any time.	Less than 10 lb. (dry) or 5 gallons (liquid) stored for longer than immediate use period.	10-100 lb. (dry) or 5-50 gallons (liquid) stored for longer than immediate use period.	More than 100 lb. (dry) or 50 gallons (liquid) stored for longer than immediate use period.
Length of Time in Storage	None stored at any time.	Stored only for length of time between purchase and use, generally 3 months or less.	Stored for less than one year.	Carryover accumulated and stored more than one year.
Toxicity Level	Product is basically non-toxic to mammals; for example, biological control (bacteria, protozoa), physical barriers (clay, oil), and pheromone traps, etc.	Least toxic category of pesticide, LD 50 higher than 500 (500 mb/kg body weight lethal to half of subjects). Label reads "caution."	Moderately toxic, LD 50 of between 50 and 500. Label reads "warning."	Most toxic category of pesticide, LD 50 below 50, label reads "danger, poison." Storage of "restricted use" pesticides.

13. Storage of Pesticide - Distance from Water Sources. If your farm is located near a public (municipal or rural water district) well or intake, please visit with the field coordinator or agency specialist for special considerations and requirements.

	4	3	2	1
Surface Water	Greater than 500 ft.	250-500 ft.	100-250 ft.	Less than 100 ft.
Well Water	Greater than 400 ft.	150-400 ft.	100-250 ft.	Less than 100 ft.

14. Family Safety. (Please ask your children or other family members to answer this question.)

4	3	2	1
All family members, including children, are aware of basic rules of safety for pesticides and know where to find the emergency phone numbers for the local hospital and poison control center. These phone numbers and safety rules are discussed with family members and updated regularly. Clothes used for pesticide application are washed in a separate area from household laundry, using different equipment.	Family members are aware of safety precautions. Phone numbers are available and/or 911 service is available. Clothes worn for pesticide application are washed separately from other clothes.	Family members may or may not be aware of safety precautions. Emergency phone numbers are not posted.	Family members are not familiar with safety precautions. Emergency phone numbers are not easy to find. Clothes worn for pesticide application mixed with family laundry when washed.

15. Storage of Pesticide - Facility.

	4	3	2	1
Containment of Spills or Leaks	Stored in building on an impermeable surface (e.g., sealed concrete) without cracks, does not allow spills to soak into soil. Curb installed in floor to contain leaks and spills. No floor drain, or floor drain to acceptable holding tank.	Impermeable surface (e.g., sealed concrete) without cracks, does not allow spills to soak into soil. No curb installed. No floor drain, or floor drain to acceptable holding tank.	Permeable surface (e.g. wooden floor) has cracks. Spills could contaminate wood or soil. No curb installed. No floor drain, or floor drain to acceptable holding tank.	Permeable surface (e.g. gravel or dirt floor). Spills would contaminate soil. No curb installed. Has floor drain that leads to tile drain, surface water source, etc.
Storage Area	Stored in separate free-standing building or cabinet used only for pesticides and protected from freezing.	Stored in a designated storage area, with separation walls, within a storage building. Storage area may be adjacent to nonfood items such as seed or farm equipment.	Stored in several designated areas, each with separation walls, within storage buildings. Storage area may be adjacent to nonfood items such as seed or farm equipment.	Stored with human or animal food or stored in residence.
Human Safety	Meets all of the following requirements for pesticide storage: 1) locked door - enter only from outdoors, 2) warning sign at entrance, 3) ventilated to outside, 4) respiratory equipment and protective clothing, 5) emergency telephone numbers posted, and 6) only labeled containers (with original labels).	Meets four of the six requirements on the best pesticide storage practices list (to the left).	Meets only two of the six requirements on the best pesticide storage practices list, more of the negatives (see list on the right) apply.	Any of the following: 1) no locked door, 2) no warning sign at entrance, 3) not ventilated to outside, 4) no respiratory equipment or protective clothing, 5) no emergency telephone numbers posted, 6) containers not labeled.

16. Pesticide Mixing, Loading, or Transfer Area - Safety and Containment.

4	3	2	1
Written emergency cleanup plan. Safety training provided. Equipment in top working order and spill cleanup equipment available. Constant supervision of filling.	Emergency plan, but cleanup equipment may not be available. Safety training provided. Equipment well maintained. Frequent supervision.	No emergency plan. No safety training provided. Equipment in satisfactory condition. Some supervision. No cleanup equipment available.	No emergency plan. No safety training. Equipment not well maintained. Little or no supervision of sprayer filling/mixing.
Has permanent roof and impermeable floor with curb. No floor drain or floor drain to acceptable holding tank.	Mixing done at site of spray application - site changed frequently or temporary mixing/ loading area with plastic-lined berms.	Regular mixing/loading area has no containment to prevent soil contamination.	Regular mixing/loading area has no containment to prevent soil contamination. Containers left at well-head site.
Sprayer rinsate applied to crops listed on label more than 30 ft. from surface water source and more than 200 ft. from well.	Rinsate applied to crops listed on label more than 30 ft. from surface water source and 150- 200 ft. from well.	Rinsate applied to crops listed on label less than 30 ft. from surface water source and less than 150 ft. from well.	Rinsate applied to crops not listed on label or dumped at farmstead.
Backflow prevented by use of separate water tank. Closed system for transfer of all liquid products.	Backflow prevented by permanent antibackflow device or permanently fixed 6-inch air gap above sprayer tank (if filling from a clean water source).	No permanent antibackflow device or air gap of at least six inches maintained above sprayer tank. Use water source connected to clean water supply.	No antibackflow device or no air gap maintained above sprayer tank.

17. Pesticide Mixing, Loading, or Transfer Area- Distance from Water Sources. If your farm is located near a public (municipal or rural water district) well or intake, please visit with the field coordinator or agency specialist for special considerations and requirements.

	4	3	2	1
Surface Water	Greater than 500 ft.	250-500 ft.	100-250 ft.	Less than 100 ft.
Well	Greater than 200 ft.	100-200 ft.	50-100 ft.	Less than 50 ft.

18. Disposal of Pesticide Containers.

4	3	2	1
Use of returnable or refillable containers, custom application, or containers triple-rinsed or pressure-rinsed and taken to recycling depot. Paper or cardboard taken to licensed solid waste facility.	Triple or pressure-rinsed containers and empty bags taken to licensed solid waste facility.	Triple/pressure-rinsed containers buried on own property. Paper or cardboard containers burned on farm.	Improper disposal of unrinsed containers on farm.

19. Mulches and Plastic Used for Weed Control (if used).

4	3	2	1
Mulches of degradable, natural materials such as straw, hay, wood chips) used.	*Some* use of degradable materials used, e.g., plastic mulches, landscape fabric, but mulch is re-used, recycled, or disposed of in an approved facility.	Nondegradable materials used *extensively*, some re-use or re-cycling, proper disposal. Some use of photo-degradable plastics.	Nondegradable materials that cannot be reused or recycled, e.g., plastic mulches for row crops. Disposed of on-farm in an unlicensed facility (burned or burried) or allowed to accumulate on farm.

20. Greenhouse Containment (complete this question only if you operate a greenhouse).

4	3	2	1
Closed system. Fertilizer solution and leachate collected and reused. Closed system recycles all water. Pesticides collected and handled in a way consistent with KDHE requirements.	Fertilizer solutions and leachate collected and reused for alternative purpose (e.g., water lawn or orchard. Pesticides collected and handled in a way consistent with KDHE requirements.	Fertilizer and pesticide leachates allowed to drain to ground.	Spray or leachate contaminates locations off-site (e.g., spray drift or leaching). Fertilizer solution and leachate allowed to drain to a tile drain system.

V. Livestock Waste Management

Calculate the number of livestock units on your farm. (Include animals on grassland as well as in confinement). If animals are on the farm for less than one year, take the livestock units multiplied by the % of the year they are on the farm.

Type of Livestock	Number on Farm	Multiplication Factor	Livestock Units (animal units/year)
Milking Dairy Cows		1.40	
Nonmilking Cows		1.00	
Replacement Heifers		0.50	
Calves		0.25	
Beef Cows (with young calves), Bulls and Feeder Calves > 700 lb.		1.00	
Feeder Calves (< 700 lb)		0.50	
Veal Calves		0.30	
Sows and Boars (> 55 lb)		0.40	
Feeder Pigs		0.25	
Young Weaned Pigs		0.05	
Adult Sheep and Goats		0.25	
Feeder Lambs		0.10	
Horses		2.00	
Laying Hens		0.008	
Broilers/Roasters		0.005	
Meat Turkey (> 20 lb)		0.02	
Meat Turkey (< 20 lb)		0.013	
Turkey Pullets/Chicks		0.002	
Adult Rabbits		0.025	
Dogs		0.10	
Other (estimate based on body weight: 1000 lb over 1 year = 1 unit)			
Totals			

2. Add up the Acres of Land Available to Spread Manure (cropland and grassland including grazed land). _____

Calculate the Number of Livestock Units per Acre of Land (total units divided by total acres, or question #1 divided by question #2) = _____

Suggestion: After you calculate the ratio for your whole farm, you also may want to calculate ratios for

individual pieces of land or livestock enterprises, For example, one part of a farm could have a high rate, whereas another part could have a low rate. If you practice rotational grazing, some of these rules of thumb may not be applicable, but go ahead and do the calculations anyway. Please record these scores on page 101.

4. **Ratio of Livestock Units to Farm Acreage.**

4	3	2	1
Less than 0.5 livestock units per acre of land available for manure applications and/or grazing.	0.5 to 1 livestock units per acre.	1 -2 livestock units per acre.	More than 2 livestock units per acre of land available for manure application and/or grazing.

5. Livestock Concentration.

4	3	2	1
Animals dispersed throughout the farm throughout the year and integrated into the production system.	Animals dispersed throughout the farm at certain times of the year. Areas for confinement vary from year to year.	Seasonal concentration, always in the same location.	Livestock are concentrated year-round in one place.

6. Manure Application.

4	3	2	1
Manure application is part of a crop rotation system, nutrient credits are given for manure applied, which is based on soil tests and crop needs.	Manure is applied to fields where there appear to be nutrient deficiencies or crop demand.	Manure applied to the nearest dry field.	Manure is left to stockpile in or near feedlots.

7. Manure Application Conditions.

4	3	2	1
All of the following conditions apply: (BEST)	Any four of the items in the BEST column are usually present when manure is applied.	Two or three items in the POOR column may be present when manure is applied.	Most of the following conditions apply: (POOR)
1) soil is dry enough to cultivate; 2) no surface cracks; 3) risk of compaction is low; 4) fields are nearly level; 5) fields are tilled after application of manure or liquid is injected; 6) heavy rain is not expected for at least 24 hours.			1) soils are often wet or frozen; 2) dry soils have deep cracks; 3) high risk of compaction; 4) field slopes toward a well, tile drain inlet or surface water source; 5) no tillage after manure is applied or liquid is not injected; 6) heavy rain is expected within 24 hours.

8. Manure Spreading - Distance to Surface Water Source, Well, or Tile Drainage. If your farm is located near a public (municipal or rural water district) well or intake, please visit with the field coordinator or an agency specialist for special considerations and requirements.

4	3	2	1
Manure is spread more than 30 ft. from a surface water source or tile drain inlet and more than 150 ft. from a well. Grass buffer strips in place between field and water source.	Manure is spread more than 30 ft. from a surface water source or tile drain inlet and 100-150 ft. from a well. No grass buffer strips in place between field and water source.	Manure is spread less than 30 ft. from a surface water source or tile drain inlet or 50-100 ft. from a well. No grass buffer strips in place between field and water source	Liquid or solid manure is spread or dumped close to a surface water source or tile drain inlet, less than 50 ft. from a well.
No tile drains.	Tile drains are monitored and appropriate action taken if necessary (stop application, block outlets, and remove contaminated water).		Tile drains are not monitored.

9. Manure Safety and Handling Procedures.

4	3	2	1
Operator (including custom applicator) has attended education courses to improve management skills and reduce risk.	Operator has gained knowledge of safe application methods through written material or learned from other skilled operators.	Operator has some knowledge of safe application methods.	Operator has no knowledge of safe methods for manure application.
Equipment in excellent working condition. Operator on hand with phone or radio contact in case of emergency.	Equipment in good working condition.	Equipment in frequent need of repairs. Operator on hand (slurry system).	Equipment in poor or inoperable condition. System sometimes operates unattended (slurry).
All safety precautions are taken to minimize the risk of leaks or spills. Emergency plan prepared and spill cleanup equipment available. Spills are reported to the proper authorities and cleaned up promptly.	Occasional minor leaks have been repaired and cleaned up quickly with no harm to the environment.	Frequent minor leaks and spills. Some attempt at cleanup.	No specific plan for cleanup of spills. Spills are not reported. Potential for major leak or spill in the future.

10. Potential Nuisance to Neighbors.

4	3	2	1
Manure injected or promptly incorporated or applied through a subsurface drip irrigation system.	Manure spread on cool breezy weekdays and incorporated as soon as possible.	Manure spread on hot humid weekdays. Not incorporated for a week or more. Dust occasionally a problem.	Manure spread on hot humid weekends or holidays or used in surface sprinkler or spray type irrigation system.
No open storage of manure.	Well-managed composting or other aerobic digestion or closed system anaerobic manure storage system.	Well-managed anaerobic system with occasional odor. Improper composting results in some odors or flies.	Poorly managed anaerobic storage results in frequent, noticeable odors and flies.
Hauling system prevents spills and leakage on highway.	Manure spills largely prevented. Cleaned off of roadway as soon as possible.	Occasional spills or leakage on roadway. No attempt at cleanup.	Leakage and spills common on highways during transport.
No other residences near farm boundary.	Three or fewer residences at or near farm boundary.	More than three residences and/or commercial or industrial uses at or near farm boundary.	Schools, sub-divisions or recreation areas at or near farm boundaries.

11. Off-Farm Sources of Nutrients (e.g., sewage or septic tank sludge, food processing wastes, municipal or industrial compost).

4	3	2	1
Meets all government standards and regulations. Have all required permits and follow reporting procedures. Material from a known source, and testing shows that no hazardous compounds are present.	Meets all government standards and regulations. Detailed records of application amounts and sources.	Have some tests of nutrient content and potential contaminants. Incomplete records of application amounts and sources.	Untested nutrient sources applied to fields. Required permits not obtained. No records kept.

12. Manure Credits for Nutrient Content.

4	3	2	1
Amount of fertilizer is reduced by the nutrient value of manure added. Nutrient management plan in used.	Amount of fertilizer is reduced by the nutrient value of manure added.	Amount of fertilizer is reduced *slightly* by the nutrient value of manure added.	Nutrient value of manure is *not considered* when determining amount of fertilizer to use.
Phosphorus levels in soil used to determine if manure spreading rates should be reduced, especially if soil P levels are in the high to very high range. If soils are low in P, manure may be applied based on N needs of the crop.	P and N levels in soil monitored carefully. Manure application limited on high P fields.	P and N levels in soil monitored, but manure or fertilization rates not adjusted accordingly.	P and N levels in soil not measured or known.
Manure applications are weighed or measured. Detailed records kept.	Manure application rates are estimated, not weighed or measured. Amounts are recorded.	Incomplete records.	No records are kept.

13. Storage of Agricultural Wastes – Location. On a clear acetate overlay, on your farm maps, note the location of all noncapped wells, surface water (ponds, streams, ditches), and tile drainage inlets in blue pen. With a brown pen, note location of waste storage areas (feedlots will be drawn in later). Also note on the map if berms, grass buffers, or other structures are in place to prevent nutrients and bacteria from manure storage areas from reaching water sources. Measure the distance between the manure storage areas and all water sources. Note any that do not meet or exceed state and federal guidelines. If your farm is located near a public (municipal or rural water district) well or intake, please visit with the field coordinator or agency specialist for special considerations and requirements.

KDHE Set-Back Requirements for Manure Storage Areas **

Type or Structure	Distance Requirement	Areas in Compliance:	Areas not in Compliance:
Well	**100 ft.**		
Height above Aquifer or Seasonal Water Table	**10 ft.**		
River, Stream, or Ditch	**100 ft.**		
Water Line (Rural Water District of private system)	**50 ft.**		
Pond	**100 ft.**		
Property Line	**100 ft.**		

****[KDHE Draft Guidelines]**

Rate Yourself Based on the Numbers of Areas in Compliance as Compared to the Total Number of Areas.

4	3	2	1
All distances are in compliance.	More than 50% of distances are in compliance.	Less than 50 % of the distance requirements are met.	None of the distance requirements are met.

Storage of Agricultural Wastes – Facilities. Answer this question for any of the following that apply to your operation.

System:	4	3	2	1
Concrete or Steel Tanks (Liquid)	Designed and installed according to engineering standards and specifications including leak detector. Plans on file. No sign of leaks, cracks, or other structural problems.	Designed and installed according to engineering standards and specifications. No sign of leaks, cracks, or other structural problems.	Design method not known. No sign of leaks, cracks, or other structural problems.	Design method not known. Evidence of leaks, cracks, or other structural problems in tank.
Earthen Storage (Liquid)	Designed and installed according to engineering and hydrogeological standards. Plans and soil tests on file. No sign of leaks, cracks, or other structural problems. Regular monitoring of seal.	Designed and installed according to standards in use at the time. No sign of leaks, cracks or other structural problems.	Not designed according to standards. Installed on soils with less than 15% clay. Water table more than four ft. below bottom of storage.	Not designed according to standards. Installed on soils with less than 15% clay. Water table less than four ft. below bottom of storage. Evidence of leaks, cracks, or other structural problems.
Stacked on Concrete (Solid)	Storage has roof. No liquid runoff.	No roof, but liquid runoff contained and up-slope surface water diverted.	No roof, but some liquid runoff contained. Up-slope surface water diverted.	No roof. Liquid runoff not contained. Up-slope surface water not diverted.
Stacked in the Field on Soil Base (Solid)	Never stacked in field or on bare soil.	Stacked for a period of 30 days or less on nonsandy soils. Up-slope surface water diverted. New location for pile each time.	Stacked for more than 30 days. New location for each new pile. Up-slope water diverted.	Stacked for more than 30 days. Location of pile never changed. Up-slope surface water not diverted.
Composting Facility (Solid)	Concrete yard with roof. Runoff contained and recycled as moisture source for composting.	Concrete yard, no roof. Use windrow covers and/or frequent turning to control moisture content. Runoff contained and	Concrete yard, no roof. No runoff control. Up-slope water diverted. Process takes no longer than 90 days.	Soil base, no roof. Up-slope water not diverted. Process takes longer than 90 days.

		recycled.		

15 Manure Storage Capacity.

4	3	2	1
More than 250 days of storage capacity.	180 to 250 days.	Less than 180 days.	Less than 90 days.
Application at appropriate times.	Application at appropriate times.	Some applications during wet or frozen periods	Application during wet or frozen periods can't be avoided.

16. Risk of Overflow and Leakage (liquid systems).

4	3	2	1
Transfer system from barn to storage uses an air gap to prevent backflow, or transfer point is higher than storage.	Two check valves used in transfer line. Overflow alarm used.	Two check valves used. No overflow alarm.	Single check valve used, or no check valve. No overflow alarm.
All solid waste storages have a roof. Berms and eave troughs used to prevent water from entering storage. Wash water controlled or recycled, and livestock drinking water leaks not a problem.	Storage surface area as small as possible. Berms and eaves troughs used to prevent water from entering storage. Wash water controlled or recycled, and livestock drinking water leaking not a problem.	Some control over amount of surface, roof, and other water entering storage.	No control over amount of surface and roof water entering storage. No control over amount of washwater used, drinking area frequently overflows, drainage water enters from barn gutters.

17. Livestock Yard Distance from Water Source. On the clear acetate overlay with your water sources and manure storage areas noted, now add livestock yards in brown dotted lines. Note on the map if burms, grass buffers, or other structures are in place to prevent nutrients and bacteria from reaching water sources. Measure the distance between the manure storage areas and all water sources. Note any that do not meet or exceed state and federal guidelines. If your farm is located near a public (municipal or rural water district) well or intake, please visit with the field coordinator or agency specialist for special considerations and requirements.

KDHE Set-Back Requirements for Feedlots or Holding Pens:

Type or Structure	Distance Requirement	Areas in Compliance:	Areas not in Compliance:
Well	**100 ft.**		
Height above Aquifer or Seasonal Water Table	**10 ft.**		
River, Stream, or Ditch	**100 ft.**		
Rural Water Line	**50 ft.**		
Pond	**100 ft.**		
Property Line	**100 ft.**		

Rate Yourself Based on the Numbers of Areas in Compliance as Compared to the Total Number of Areas.

4	3	2	1
All distances are in compliance.	More than 50% of distances are in compliance.	Less than 50 % of the distance requirements are met.	None of the distance requirements are met.

18. Yard Design and Management.

	4	3	2	1
Surface Water	All up-slope surface and roof water diverted away from yard.	Most up-slope surface and roof water diverted away from yard.	Some up-slope surface water diverted away from yard, collected, or redirected.	All up-slope water from surface and roof runs through the yard.
Paved Yards	Yard has roof.	All yard runoff properly handled as liquid manure.	Runoff from heavily used portion of yard properly handled as liquid manure. Manure from total yard area scraped and collected regularly and stored.	Yard runoff not collected or controlled. Yard rarely scraped.
Earthen Yards	Yard has roof.	Vegetative cover. Maintained by restricting the number of animals, removing them in wet weather, and rotating use of yard. Feeding area rotated regularly, or area round feeders paved and runoff collected and stored.	Vegetative cover exists for part of the year. Number of animals is restricted. Feeding area not moved regularly.	Gravel yard or no vegetative cover. No control over number of animals. Feeding area never moved.

19. Manure Management in Grazing Areas.

	4	3	2	1
Permanent Grassland	Stocking density low and/or controlled grazing results in even distribution of manure. No livestock access to ponds, streams, or ditches.	Stocking density low and/or controlled grazing results in even distribution of manure. Limited livestock access to ponds, streams, or ditches with no damage apparent.	Moderate stocking density and no overgrazing. Limited livestock access to ponds, streams, or ditches.	Moderate to high stocking density, with no control over manure distribution. Full access of livestock to surface water sources. Erosion and contamination evident.
In Annual Crops (e.g., milo stubble, or wheat)	Controlled (MIG) grazing results in even distribution of manure. No livestock access to ponds, streams, or ditches, and buffer strip left between grazed area and surface water sources. Feeding area moved frequently.	Some control over grazing results in even distribution of manure. Limited livestock access to ponds, streams, or ditches, and buffer strip left between grazed area and surface water sources. Feeding area moved occasionally.	Moderate stocking density. Limited livestock access to ponds, streams, or ditches. No buffer strips. Feed hay in same area for several weeks in a row.	Moderate to high stocking density, with no control over manure distribution. No control of livestock to surface water sources. Feed in same place in field all winter.

20. Disposal of Dead Animals.

	4	3	2	1
Farms in Non-Remote Areas	Prompt pickup by local rendering plant.	Compost on-farm using wood-chips, straw, etc. in appropriate structure.	Bury on farm away from watercourses under 2 ft of earth within 48 hours.	Leave carcasses outside on ground for scavengers, in manure storage, or burn in unapproved incinerator.
Farms in Remote Areas	Prompt pickup by local rendering plant or compost on-farm using wood-chips, straw, etc. in appropriate structure	Bury on farm away from watercourses under 2 ft of earth within 48 hours.	Leave carcasses outside on ground for scavengers in remote area of farm where predator control is not a problem.	Leave carcasses outside on ground near other livestock, buildings, or work areas; in manure storage; or burn in un-approved incinerator.

21. Silage Facilities.

4	3	2	1
Designed leachate-collection system in place and seepage is land applied. No ponded infiltration or run-off to surface water.	Leachate is collected in a designed system and distributed over grassed filter area.	No leachate collection system. Leachate moves to crop land or pasture area without ponding in single location.	No leachate collection system. Leachate collects in low area or moves to ditch, surface water, or wetlands.

VI. Irrigation Management

Note: Complete this section only if you use irrigation for crop (field crop, fruit, or vegetable) production purposes. You might skim this section to see if any concerns apply to homestead use of water for lawns and gardens. Complete this section only after you have already completed the section on general well safety. Because of the activities near an irrigation well or pump site there often are additional considerations not addressed in the section on wells. The proximity of the irrigation well or pump to various farming practices will be assessed here.

Introduction: In Kansas, about three million acres of cropland are irrigated. Several factors make irrigation wells vulnerable to contamination. Wells are located adjacent to or in cropland areas, meaning that there is a high probability that agricultural chemicals, pesticides, and fertilizes will be applied near the well. Many irrigation wells are pumped using an internal combustion engine, which means fuel and oil products are used at the well site. A spill of petroleum products at the well site could result in groundwater contamination. Application of chemicals (chemigation), fertilizers (fertigation), and/or lagoon waste through the irrigation water has become a common practice. Backflow or back-siphonage during chemigation or fertigation without the proper safety equipment can allow chemicals to flow down the well directly into the groundwater. Once groundwater is contaminated, it is very difficult, expensive, and sometimes impossible to clean up. It is important that the well construction be such that agricultural chemicals cannot reach the aquifer directly down the well or around the well casing. Past irrigation well construction methods have not been as protective of water quality as those provided by current well construction standards.

Note: Items in bold do not comply with Kansas laws and regulations.

(Credits: Developed by Morgan Powell and Danny Rogers, Kansas State University. The University of Nebraska Cooperative Extension Worksheet EC 98-791-S, "Farm-A-Syst: Nebraska's Farm Assessment System for Assessing the Risk of Water Contamination," provided valuable ideas and concepts included here.)

VI. Irrigation System Management

Please record these scores on page 102.

Are you using the most efficient and cost effective irrigation system (flood, sprinkler, drip, etc.) ?

4	3	2	1
I have recently evaluated or re-evaluated my site, and have determined that the most efficient and cost effective system is the one I presently have.	I have not recently reevaluated my irrigation system options, but at the time of installation, the system that I have was the most water, energy, and cost efficient.	I think that my present irrigation system is the most efficient and cost effective system available, but it has not been evaluated so I'm not sure.	I believe that another system would be, or might be more water efficient and cost effective than the one I presently have.

2. Is there any field runoff (evaluate each field separately) from irrigation?

4	3	2	1
Through irrigation timing, water management, and use of structures, etc. there is no surface water runoff from the field due to irrigation.	Through irrigation timing, water management, and use of structures, there is little surface water runoff due to irrigation. All irrigation runoff is contained on-site using tailwater-pit or other containment and is reused.	High irrigation runoff, but all is contained on-site by tailwater pit or other containment.	***Irrigation water sometimes runs off the field.****

****Items in bold italics do not comply with Kansas laws and regulations.***

3. Do you schedule your irrigation to optimize water use?

4	3	2	1
All irrigation water is applied based on crop water use and forecast need. An irrigation scheduling method based on climatic data and crop growth information or other soil water balance scheduling is used.	Irrigation scheduling is done but application does not always follow the irrigation scheduling result.	Irrigation is based on visual crop indicators and stopped following heavy rainfall. Little or no monitoring of soil water or estimation of water consumption by the crop.	There is no irrigation schedule. Under or over application of water may frequently occur. No monitoring of water use or soil water.

4. Do you have the appropriate water-use permit?

4	3	2	1
The appropriate water-use permits are on file at the Division of Water Resources. I have a good water measuring method and report water use as accurately as possible.	The appropriate water-use permits are on file at the Division of Water Resources. ***I report water use as accurately as possible but do not have a water measuring method.***	I have water-use permits for all fields but ***water-use reports may not be up-to-date*** or ***I don't have a very good idea of the water volume applied.***	***I commercially irrigate more than 2 acres, but I do not have a water-use permit for my water source for all acres that I water.***

****Items in bold italics do not comply with Kansas laws and regulations.***

5. Monitor water usage and record keeping.

4	3	2	1
I have a water meter on my well or pump, and have a record-keeping system to keep track of water use by date and by field. I periodically have my water meter tested for accuracy.	***I have a water meter, and generally record water use, but don't have an overall record- keeping system and have not verified the meter accuracy.***	***I do not have a water meter, but keep records of pump operation or I have a meter but keep no water-use records.***	***I don't have a meter or keep water-use records.***

****Items in bold italics do not comply with Kansas laws and regulations.***

6. Do you test your irrigation water?

4	3	2	1
Water is tested regularly (every one to three years) for quality factors related to irrigation suitability (alkalinity, electrical conductivity, total dissolved solids, sodium, nitrate, pesticides, etc.). All test records are kept for review and trends are observed.	Water is tested at least every five years for factors related to irrigation suitability (alkalinity, electrical conductivity, total dissolved solids, sodium, etc). Test records are available to review.	Water may have been tested at one time, but don't have current tests or records on file.	Water never tested.

7. Do you use chemigation?

4	3	2	1
I don't use chemigation.	I chemigate and have all appropriate permits, protective equipment in place, follow label directions, and calibrate my equipment.	I chemigate and originally met all requirements. I do not regularly recalibrate equipment, inspect equipment, or review label requirements before applications.	***I chemigate but am not aware of risks, permits, or equipment requirements.***

NOTE: Any storage of fertilizer, pesticides or other chemicals requires the completion of worksheets (see sections III and IV in this notebook) which addresses storage of those materials.

8. Well location in relationship to cropland.

4	3	2	1
Well is located outside cropped area and no chemicals are used in the vicinity of the well.	Well is within or adjacent to field but a chemical-free exclusion zone of at least 50 ft. radius is maintained around well site.	(blank)	Well located within cropland where agricultural chemicals are applied within 50 ft. of well.

NOTE: Well construction and location guidelines with respect to other pollution sources can be found in the Farmstead Assessment section of this notebook, and should be completed for each irrigation well.

9. Type of lubrication for pump.

4	3	2	1
Water lubrication.	Soy-based oil lubrication.	Petroleum-based oil lubrication with dripper turned off when pump is not in use. Dripper feed is consistent with manufacturers recommendations.	Petroleum-based oil lubrication with known leakage of oil into water or dripper left on during nonuse. Recommended drip rate is unknown.

10. Completion of worksheets for energy source.

When the energy source is electric and no potential water contaminating sources are involved the only risk is from the well and pump. When the energy source is LP (propane) or natural gas the farm waste worksheet should be completed for each power unit location. When the energy source is diesel or gasoline both the farm waste and fuel storage worksheets should be completed for each power unit location.

VII. Farmstead Assessment

This section contains four parts: 1) well water, 2) household wastewater treatment, 3) farm and home waste disposal, and 4) on-farm fuel storage. All four sections were adapted from previously published "Farm-A-Syst" materials, and "Kansas Food-A-Syst:

A Food Safety Risk-Management Guide for the Producer" (March 2001). Edited and revised by Morgan Powell and Dan Rogers, Kansas State University.

1. Farmstead Well Water Contamination Risk

Assessing Well Water Contamination Risk (Skip this section if you have no wells on your property.)

Contamination that reaches groundwater will move with the groundwater and can eventually reach your or a neighbor's private water well, or a public water supply well. Contaminated water can pose a serious health threat for people or animals that use it. Rate each well on the farm separately, regardless of the water use, whether for house, livestock, irrigation or other purpose. If unused or abandoned wells still exist that have not been properly plugged, answer question 14 in this section to evaluate the risk of those wells.

Start by making an inventory of all wells and springs used as water supplies on your farm. Use this list when completing the scorecard on page 103. Make extra copies of this scorecard; one for each well or spring.

Well location (T,R, Sec ¼):	**Water use:**	**Well drilled or constructed (year?)**	**Other notes:**

1. What is the position of the well in relation to any pollution source?

4	3	2	1
Upslope from all pollution sources. Surface water runoff from sources could not reach well. Surface slopes from well in all directions. ***	Upslope or at grade with pollution sources. Surface water runoff from sources does not reach well.	Down slope from some pollution sources. Surface water runoff from sources may reach well.	Located in low area, depression or drainage way. Surface water runoff from one or more pollution sources reaches well.

*See K-State Research and Extension publication MF 970, *Private Wells - Safe Location and Construction*.

What is the separation distance between the well and any bacteria contamination source?
(animals, animal waste, wastewater system)

4	3	2	1
More than 200 ft. separation from source of bacteria contamination.	100 to 200 ft. separation from source of bacteria contamination.	Less than 100 ft. from potential bacteria source but exceeds minimum 50ft. separation distance.	***Less than 50 ft. to a bacteria contamination source.****

* ***Note: Responses in bold italic type are not only high risk, but also violate Kansas regulations for new well location.***
State well drilling regulations require more than 50 ft. separation, and some counties require 100 ft.

3. What is the separation distance between the well and any potential contamination source other than bacteria?

4	3	2	1
More than 400 ft. separation from a potential contamination source of nutrient, fuel, pesticide, or hazardous material.	150 to 400 ft. separation distance from potential contamination source.	Less than 150 ft. from potential pollution source but exceeds minimum 50 ft. separation distance.	***Less than 50 ft. to a potential contamination source other than bacteria.****

* ***Note: Responses in bold italic type are not only high risk, but also violate Kansas regulations for new well location.***
State well-drilling regulations require more than 50 feet separation, and some counties require100 ft.

4. Do soils and geologic material at the well site put this well at risk?

4	3	2	1
More than 50 ft. of medium or fine-textured soils (clay loams, silty clay, silt loam, loam, etc) above water table or fractured rock.	More than 50 ft. of coarse-textured (sandy) or 20-50 ft. of medium or fine texture soil above water table or fractured rock.	20-50 ft. of coarse or more than 10-20 ft. of medium or fine-textured soils above water table or fractured rock.	Less than 20 ft of coarse-textured or less than 10 ft. of medium or fine textured soil above water table or fractured rock.

5. Does depth to groundwater put this well at risk?

4	3	2	1
Water table deeper than 150 ft.	Water table 70 to 150 ft. deep.	Water table 20 to 70 ft. deep.	Water table shallower than 20 ft.

6. What is the condition of well casing for this well?

4	3	2	1
Approved well casing meeting ASTM specifications* is known water tight with no holes or cracks from at least 12 inches above the land surface to the water table. No possible flooding.	Well casing of at least schedule 40 PVC or ¼ inch thick steel has no visible defects from at least 12 inches above the surface to the water table. Possibility of flood water reaching the well.	Casing extends from ***less than 12 inches above grade*** to water table with no visible holes, cracks or joints. Possibility of flood water reaching the well.	***Top of casing is below grade in pit or basement and is likely to flood. Casing is loose material such as brick or rock or it has unsealed joints, has visible holes or cracks, or condition of the casing can not be determined.***

Note: Responses in bold italic type are not only high risk, but also violate Kansas regulations for new well location.

Approved casing will be marked on the casing that it meets ASTM (American Standards for Testing and Materials) specifications.

(See K-State Research and Extension publication MF 970, *Private Wells - Safe Location and Construction.*)

7. What is the condition of the sanitary well seal?

4	3	2	1
A KDHE-approved sanitary well seal with screened vent is tight and secure. *	Approved sanitary seal tightly secured. Well vented but not screened.	Sanitary seal loose, not approved type or is defective.	**Sanitary seal missing, loose, or very inadequate.**

*(See K-State Research and Extension publication MF 970, *Private Wells - Safe Location and Construction*.)

8. What is the grout seal between drill hole and casing?

4	3	2	1
Well drilled since 1987 and well log shows	Well drilled since 1975 and well log	Well drilled since 1975 but **no well log**	Well predates 1975 and no well log can

grout the greater of 5 feet into the first confining clay or shale layer or at least 20 feet whichever is more.** Confining layers between formations are also grouted.	verifies at least 10 feet prior to 1987 or 20 feet of approved grout during or after 1987. No grout at confining layers in formation.	**can be located** to verify what grout seal was placed. OR well log shows grout was not placed or is not of approved type.	be located to verify grout seal. **Assume that no grout was installed.*** Space between casing and the drill hole contains porous material which will allow pollutants from surface to enter.

* A minimum 20 foot grout seal is required for all new well installations. Placement of a grout seal in all wells is a key element of a safe well and highly recommended. Existing wells must meet requirements in effect at time of well construction and must be brought up to current standards if well is reconstructed or upgraded. (See K-State Research and Extension publication MF 970, *Private Wells - Safe Location and Construction.*)

9. Does a well protection plan help assure the well and groundwater will not be contaminated?

4	3	2	1
Protection plan with exclusion and management zones is written, revised as needed, reviewed annually, communicated with employees, household members, and others and is followed. *	Plan is written but may not be complete and may not be reviewed or updated. Others have been informed of contents. Plan may not be followed.	Plan is not complete or is not written and no one else is familiar with well protection plan. Plan is not followed.	Not aware of the need for a well protection plan to protect the well and groundwater and no plan exists.

*(See K-State Research and Extension publication MF 2396, *Private Well Maintenance and Protection.*)

10. Is annual well inspection done as part of a well maintenance program?

4	3	2	1
Wellhead and surrounding area is inspected at least annually for needed maintenance or repairs.	Wellhead checked every 2or 3 years following guidelines in bulletin MF2396.	Wellhead checked more than 3 years ago; no guidelines followed.	More than 5 years or do not know the last time wellhead and surrounding area was inspected.

*(See K-State Research and Extension publication MF 2396, *Private Well Maintenance and Protection.*)

11. Is shock chlorination of well and water system done annually?

Shock chlorinated annually following recommended guidelines.*	Shocked annually but not following the recommended guidelines.*	Well shocked only after service work is done to well or pump or when water quality becomes a problem.	More than 5 years or do not recall the last time that well was shocked or well not shocked after service to well or pump.
4	3	2	1

*(See K-State Research and Extension publication MF 911, *Shock Chlorination for Private Water Systems.*)

12. Are backflow prevention measures in place for drinking water system?

4	3	2	1
No hose ever connected to any water outlet and no pipe connection with another water system. No aspirator feed chemical applicator is ever attached to hose end.	Hoses are used but an air gap with distance at least twice the diameter of the hose end is always maintained by using a hose support.	Spring loaded anti-backflow device installed on all faucets with hose connections. Hose may be placed in tank during filling.	No anti-backflow devices and air gap not maintained for hose use or pipe connection with another water system. Aspirator feed chemical applicator is sometimes attached to hose end.

13. Do you test your household drinking, livestock and irrigation water supplies as part of annual maintenance?

4	3	2	1
Well water used for drinking, livestock, or irrigation, especially for garden, is tested regularly (at least annualy). Water for all uses other than irrigation is free of bacteria. Nitrate and other tests meet appropriate standards. Long- term records indicate consistent, satisfactory water quality.	Regular testing of drinking water and occasional tests for other uses. Bacteria, nitrate, and other tests generally meet standards. Records indicate occasional bacteria problems or increasing levels of nitrate or other contaminants. Still meets drinking water standards.	Irregular testing. Bacteria, nitrate and other tests do not meet standards some of the time. No action taken to correct source of cause. Records incomplete. No testing of water for uses other than drkinking water.	No water tests done or tests indicate bacteria, nitrate or other contaminant levels frequently above standards. Noticeable changes in color, clarity, odor or taste after rainstorms or snow melt.

14. Are there unused or abandoned wells on your property?

4	3	2	1
No unused or abandoned well on property you own. Previously closed wells were plugged following KDHE standards.	**Unused (abandoned) well***, less than 1,320 feet (1/4 mile) from any drinking, livestock, or irrigation water well. Abandoned wells properly plugged according to Kansas laws and regulations.	**Unplugged abandoned well*** more than 400 feet from any drinking, livestock, or irrigation water well. Previously closed wells not plugged following standards.	**Unplugged abandoned well*** less than 400 feet from drinking, livestock, or irrigation water well.

* Kansas law requires that all abandoned wells (unused for 2 years or more) be plugged following KDHE standards or be upgraded to current standards and placed on inactive status.

2. Farmstead Household Wastewater (Septic System) Risk

Household Wastewater Treatment. Serious health risks result from contact with untreated or inadequately treated household wastewater. Systems must be designed for treatment and not just disposal of wastewater. Minimum standards for wastewater treatment system are found in your County Sanitary Code or the KDHE bulletin 4-2 (K-State Research and Extension publication MF-2214, *Minimum Standards for Design and Construction of Onsite Wastewater Systems*). ***Note: Items in bold italics violate state standards and/or sanitary codes.*** Record results on the scorecard on page 104.

1. Are water saving fixtures used in the household?

4	3	2	1
Have water-saving fixtures, good maintenance of fixture leaks, and follow most water conservation recommendations. No other non-plumbing (sump pump, AC condensation etc.) water goes into septic tank.	Have some water-saving fixtures, fair maintenance of fixture leaks, and follow some water conservation recommendations. No other non-plumbing (sump pump, AC condensation etc.) water goes into septic tank.	No water-saving fixtures, poor maintenance of fixture leaks, but follow some water conservation recommendations.	No water-saving fixtures, poor maintenance of fixture leaks, and don't follow any water conservation recommendations.

2. Is the wastewater collection system intact, with no leakage?

4	3	2	1
Watertight collection system for all wastewater needing treatment. No evidence of wastewater coming to the surface, no green strips on lawn over pipes, tank, or soil absorption field.	Watertight collection system for all wastewater needing treatment. No evidence of wastewater coming to the surface, though some evidence of sub-surface leaks, such as occasional green strips on lawn over pipes, tank, or soil absorption field.	***Some wastewater is not collected*** or some leakage of water that should be treated. ***Intermittent evidence of wastewater coming to the surface.***	***Some wastewater is not collected*** or leakage loss of water that should be treated. ***Wastewater on the surface nearly year-round.***

3. Are settleable solids kept to a minimum?

4	3	2	1
No use of garbage disposal unit in kitchen sink. No disposal of bulky items (disposable diapers, sanitary napkins) in toilet.	Minimal use of garbage disposal unit (less than 3 times per week) and no disposal of bulky items in the system.	Moderate use of garbage disposal unit (3-7 times per week) or some disposal of bulky items in system.	Frequent use of garbage disposal unit (more than once per day) or frequent disposal of bulky items in system.

4. Are household chemicals (such as detergents, salt, cleaning supplies, bleaches, ammonia) put into the wastewater treatment system?

4	3	2	1
Minimal disposal of diluted household chemicals (few cups per week). No water softener, or not recharged into system.	Careful disposal of diluted household chemicals (few pints per week). Water softener is recharged into system based on water use or a demand schedule.	Moderate disposal of diluted household chemicals (few quarts per week). Water softener is recharged into system based on timer schedule.	Extensive disposal of diluted household chemicals (gallons per week). Water softener is often excessively recharged. Some disposal of concentrated or undiluted household chemicals.

5. Are floatable materials (fats, oils) put into the wastewater treatment system?

4	3	2	1
No disposal of grease or oils into sanitary system. Oil and grease wiped from cooking utensils before washing.	Occasional disposal of grease or oils. Some attempt made to reduce disposal of grease and oil from household with little generated.	Routine disposal of grease or oils. No attempt to reduce disposal of grease and oil from household, but moderate amount generated.	Extensive disposal of grease or oils in household wastewater system.

6. What is the separation distance between the wastewater system (treatment or absorption) and water?

4	3	2	1
Wastewater goes to municipal treatment facility or on-farm treatment system more than 400 feet from well or surface water.	Treatment or absorption system 150-400 feet from well or surface water.	Treatment or absorption system 50-150 feet from well or surface water.	***Treatment or absorption system less than 50 feet from the well or surface water.***

The remaining questions in this section are for specific wastewater treatment components. Answer

ONLY those questions that apply to your system. Mark NA (not applicable) for those that do not apply to your farm or system.

Septic Tank only. Later questions will address other components of your system such as soil absorption field or lagoon.

7. What is the condition, inspection schedule, and maintenance of your septic tank?

4	3	2	1
Structurally sound and water tight tank with no leakage. Baffles or tees in place. Good maintenance with inspection every 1-2 years and pumped as needed. Size of tank appropriate for size of house (300 gallons per bedroom, plus 50% more for garbage disposal).	Structurally sound tank with no leakage. Baffles or tees in place. Good maintenance and checked at least every 3-5 years and pumped as needed. Size of tank adequate for the number of people currently in the house, but not scaled to the number of bedrooms in the house.	Condition of tank not known and may be leaking. Delayed maintenance schedule and tank rarely pumped. ***Tank size is less than 1,000 gal.***	Tank in poor repair and likely leaking. Tank maintenance not performed until a problem develops or tank not pumped. ***Tank size is less than 500 gallons*** and/or nonstandard tank construction or material.

8. Is your septage (septic tank, aerated tank, or lagoon sludge) pumped or removed and disposed of properly?

4	3	2	1
County approved or licensed septage hauler. Disposal at municipal treatment facility.	Approved septage hauler. Land application at approved site with pumping planned for best application time. Incorporated within 24 hours. Application to site at least 400 feet from well or surface water**. Soil is medium or fine-textured (silt loam, loam, clay loam, clays) with more than 6 feet to restrictive condition, water table or limiting layer.	Approved septage hauler. ***Land-applied at approved site with no incorporation.**** Application to site 200-400 feet** from well or surface water. Coarse-textured soils (sandy loam, sands). More than 4 feet to water table or limiting layer.	Non-approved septage hauler. Disposal at non-approved site or through outlet pipe to surface drainage system. Application to site less than 200 feet from well or surface water. Less than 4 feet to saturated soil or limiting layer.* Or soil on site is frozen or snow-covered.

* Local ordinances may require incorporation of wastes into the land surface.
** Check local ordinances for required separation distance.

Lagoon Treatment System only

9. Does your wastewater lagoon meet requirements and is it well maintained?

4	3	2	1
Lagoon securely fenced and embankments well maintained. Water level typically between 3 to 5 ft. Lagoon loaded at less than design capacity.*	Fenced and well maintained lagoon loaded at or near design capacity. Water level sometimes below 3 ft. or above 5 ft.	Fenced and maintained lagoon. Load may exceed design capacity. Partial cover of lagoon with cattails or duckweed, water level often too high or too low.	Unfenced or poorly maintained lagoon. Excessive leakage or ***occasional overflows.*** Load exceeds design capacity.

* (For more information on lagoon design and maintenance, see K-State Research and Extension publication MF-1044, *Wastewater Pond Design and Construction*.)

Holding tank only

10. Is your holding tank maintained and pumped regularly.

4	3	2	1
Excess capacity for usual pumping interval. Tank checked regularly. No leakage or overflowing. Has a water meter (of flow going into tank) or a gage of the level in the tank, and a high water alarm system.	Sufficient storage to accommodate usual pumping schedule. No water meter or gage, but tank checked regularly. High water alarm system. No leakage.	Tank may overflow at times or has minimal leakage losses. Frequent pumping needed. Tank not checked regularly.	Leakage losses. Tank in need of repair or replacement. **Surface discharge of wastewater is observed.**

The following two components and some others provide enhanced wastewater treatment and are used to increase the treatment of wastewater before absorption. They are well suited to sites with absorption field soil limitations.

Constructed Wetland Treatment only

11. Is your constructed wetland treatment system maintained and functioning?

4	3	2	1
Constructed wetland treatment cell has living plants and plant debris is removed seasonally. Secondary or absorption cell also has living plants, and is not saturated.*	Constructed wetland treatment cell has some plants, but not complete cover. Plant debris is sometimes removed. Secondary cell is not saturated.	Constructed wetland cell does not have significant cover of plant material. Secondary cell is sometimes saturated at the surface and odor may be present.	Constructed wetland cell has noticeable odor or sometimes water is seen above the surface of the gravel. Secondary cell is saturated during the wet season, or effluent runs to surface water.

*(For more information, see K-State Research and Extension Publication MF-2340, *Rock-Plant Filter Design and Construction for Home Wastewater Systems.***)**

Aerobic Treatment System only

12. Is your package aerobic system (mounds, sandfilters, textile filters, etc.) maintained and functioning (if applicable).

4	**3**	**2**	**1**
Maintenance program followed and/or maintenance contract with reliable service provider. Solids removed as needed. Backup power supply available. System loaded at less than design capacity.*	Maintenance program followed with solids removed as needed. Reliable but no backup power supply. Loading does not exceed design capacity.*	Poor maintenance. Aeration failures or power outages reoccur. Load may exceed design capacity.	Maintenance lacking or non-existent. System failure or power outages at least quarterly. Load exceeds design capacity.

* (For more information on aerobic systems, see K-State Research and Extension publication MF-2542 *Selecting an Onsite Wastewater or Septic System.)*

Soil Absorption Field only All wastewater systems that do not rely on evaporation or collection must have some type of soil absorption. **Units intended for effluent disposal rather than treatment (cesspools, dry wells, rat holes, etc.) violate Kansas laws and regulations.**

13. Is your soil absorption system well maintained and functioning properly?

4	3	2	1
Well maintained lateral or mound system loaded below absorption capacity. Medium- to fine-textured soils (silt loam, loam, clay loam) with more than 4 feet to saturated soil, bedrock or other limitation.*	Well maintained lateral or mound system on coarse-textured soils (sandy loam, sand) with more than 4 feet to saturated soil or limiting layer. Loaded below absorption capacity.	Lateral or mound system with less than 4 feet to saturated soil or limiting layer. Loaded near absorption capacity. Seasonal wet spots in absorption area.	**Pipe to surface, field drain or tile drainage system. Cesspool, dry well or rat hole.** Poorly maintained or failed lateral or mound system. System loaded above absorption capacity.

* For more information on lateral and mound absorption systems, see KDHE bulletin 4-2 (K-State Research and Extension publication MF-2214, *Minimum Standards for Design and Construction of Onsite Wastewater Systems).*

3. Farmstead Solid and Hazardous Waste Risk

This section addresses the solid waste, waste oil, antifreeze, and other hazardous materials from your farm and home. Questions 3-8 must be addressed for each irrigation power source powered by an internal combustion engine. The scorecard is found on page 105.

1. Is your farm and home waste or trash disposed of properly?

4	3	2	1
Waste minimized through careful purchase, recycling, reusing, and sharing with others whenever possible. Disposal of non-recyclables via waste hauling service or taken to local licensed solid waste facility. Only paper, cardboard, or untreated wood products burned on site.	Some products recycled or reused, but not a strong commitment to reduce amount of waste. Most waste is taken to licensed solid waste facility. Primarily burn only paper, cardboard or wood products on site.	Little or no recycling or reusing of products. Disposal or burning of several types of items on-farm, including plastics.	No recycling. Disposal or burning of many types of trash on-farm, or dumped on-farm in dump-site, abandoned well, or ditch.

2. How are hazardous materials (flammable, explosive, reactive, poisonous, etc) from your farm and home handled?

4	3	2	1
All hazardous products separated from trash and disposed of through appropriate means.**	Most hazardous products separated out from trash and disposed of appropriately.**	Few hazardous products separated from regular trash.	Seldom if ever separate hazardous materials from other farm or home waste.

** Appropriate disposal of hazardous waste includes local hazardous waste pick-up days, sites, or collection service for hazardous materials.

3. Are vehicle and equipment area drips and spills contained?

4	3	2	1
Drips and spills contained on impermeable surface with absor-bent material such as sawdust. Spill soaked material disposed at licensed solid waste facility.	Drips and spills contained on paved area with sawdust or other absorbent material and disposed on farm at least 400 feet from well or surface water.	Drips and spills uncontained less than 400 but more than 200 feet from well or surface water.	Drips and spills uncontained less than 200 feet from well or surface water.

4. Are used oil and lubricants disposed of properly?

4	3	2	1

Used oil and lubricants collected and recycled. Any storage is in leak proof container more than 400 feet from well or surface water. Oil is fully drained from filters.	Used oil stored in leak proof container 200 to 400 feet from well or surface water. Oil burned in an approved space heater or reused for lubrication. Oil drained from filters.	Storage of used oil on farm 100 to 200 feet from well or surface water. Some disposal of petroleum products on farm more than 400 feet from well or surface water.	Storage of used oil on farm less than 100 feet from well or surface water. Disposal of petroleum products on farm less than 400 feet from well or surface water.

5. Are used oil and lubricant containers and filters disposed of properly?

4	3	2	1
Empty and thoroughly drained containers and filters are recycled, reused, or taken to licensed solid- waste facility.	Empty containers and drained filters taken to licensed solid-waste facility.	Some empty containers and used filters disposed on farm more than 400 feet from well or surface water.	Empty containers and used filters disposed on farm less than 400 feet from well or surface water.

6. Are used automotive and equipment batteries disposed of properly?

4	3	2	1
Used batteries taken to battery recycler or traded-in at time of purchase.	Used batteries temporarily stored (up to 3 months) in protected area more than 200 feet from well or surface water.	Used batteries recycled annually, storage on farm is more than 100 feet away from well or surface water.	Batteries accumulated and stored less than 100 feet from well or surface water or disposed on farm.

7. Is used antifreeze disposed of properly?

4	3	2	1
Collected and disposed of at municipal sewage treatment drain with permission of utility, or taken to licensed solid waste facility after placing in absorbent material.	(blank)	Disposal on farm more than 400 feet from well after placing in absorbent material.	Disposal on farm less than 400 feet of well or in on-farm wastewater system.

8. Are solvents, fuels, and other petrochemicals disposed of properly?

4	3	2	1
Leftover cleaning solvents, fuels and other products used up, or taken to service station, recycler, or hazardous waste collection. No disposal on farm.	Leftover cleaning solvents, fuels and other products stored on farm in leak proof container more than 200 feet from well or surface water. No disposal on farm.	Leftover cleaning solvents, fuels and other products stored on farm in leak proof container 100 to 200 feet from well or surface water.	Leftover cleaning solvents or fuels stored less than 100 feet from well or spilled, dumped or poured on ground within 400 feet of well or surface water.

9. Are paints, stains, and solvents disposed of properly?

4	3	2	1
Leftover paint, stain, and solvents are used up, shared with someone else, or taken to hazardous-waste collection facility.	Liquid evaporated in open air or well ventilated area. Sludge (residue) taken to a licensed solid waste facility.	Disposal of paints, stains, and solvent sludge on farm, more than 400 feet from the well or surface water.	Disposal of paints, stains, and solvents on farm less than 400 feet from well or surface water.

10. Are household cleaners, hazardous products, and their containers disposed of properly?

4	3	2	1
Materials are used up, shared with others, or taken to a hazardous-waste collection facility. Empty containers are reused for like products or taken to a licensed solid-waste facility.	Liquid cleaners evaporated in open air. Cleaners, sludge and containers taken to licensed solid- waste facility.	Disposal of sludge and empty containers on farm more than 400 feet from well or surface water.	Disposal of sludge, cleaners, empty containers, and partially filled containers less than 400 feet from well or surface water.

11. How are household, lawn, and garden pesticides, rinsate, and their containers disposed of?

4	3	2	1
All pesticides used up following label, returned to place of purchase or taken to hazardous- waste collection. Empty liquid containers are triple-rinsed and containers or bags taken to licensed solid-waste facility.	(blank)	**Disposal of unused pesticides or rinsate on farm** more than 400 feet from well or surface water. Disposal of rinsed containers or empty bags on the farm.	**Disposal of rinsate and unused pesticides on farm less than 400 feet from well or surface water. Disposal of unrinsed containers or partially filled containers or bags on farm.**

4. Farmstead Fuel and Petrochemical Storage Risk

Assessing the Risk of Surface Water and Groundwater Contamination from Fuel and Petrochemical Storage

When liquids are spilled on the soil, some will mix with water and eventually be carried to groundwater. Contamination that reaches groundwater will move with the groundwater and can eventually reach your or a neighbor's private water well, or a public water supply well. These contaminants can pose a serious health threat to people or animals that consume the water. The scorecard for this section is found on page 106.

1. What is the position of all fuel tanks in relation to water wells and surface water bodies? (Assess each well separately)

4	3	2	1
Fuel storage tank more than 660 feet from the well and surface water.	Storage tank 400 to 660 feet from the well or surface water body.	Storage tank 200 to 400 feet from the well or surface water body.	Storage tank less than 200 feet from well or surface water body.

The next three questions apply to aboveground tanks only.

2. Is there spill and overfill protection by secondary containment?

4	3	2	1
Tank placed within concrete, steel, or synthetic lining containment basin with capacity to hold 125% of tank contents. Automatic shutoff on fuel nozzle and not left unattended.	Tank placed within clay lined dike with low permeability with capacity to hold 125% of tank contents. Overfill alarm or constant supervision assures no overfill.	Tank placed on low permeability pad without dike. No overfill protection and constant supervision not provided during fuel transfers.	No secondary containment protection. No protection of overfill during transfers.

3. Is the tank securely enclosed and protected from damage?

4	3	2	1
Tank protected by fence with lock and located in low-activity area.	Tank protected by fence with lock but located in high activity area.	Tank in low-activity area but not surrounded by fence. Fuel storage subject to theft or vandalism.	Tank in high activity area and no fence enclosure. Fuel storage subject to theft or vandalism.

4. Can leaks be detected?

4	3	2	1
Visual inspection is easy with no items stored under the tank. No leaks occurring and no cracks in hoses. Fuel inventory records kept.	Some items stored under and around the tank interferes with visual inspection. No leaks occurring and no cracks in hoses. No inventory records kept.	Visual inspection very difficult. No leaks occurring, but hoses cracked or tank rusted. No inventory records kept.	Visual inspections not performed, or fuel is leaking from the tank, piping or hoses.

The following two questions apply to underground fuel storage tanks only.

5. Are there underground fuel storage tanks still in active use at this time?

4	3	2	1
There are no underground fuel storage tanks in use at this time.			Underground storage tanks are in use.*

* If you are using underground storage, it is a risk factor for your farm. It is doubtful that underground

tanks comply with current regulations. Consult with KDHE for the proper measures to be taken.

6. Are there unused underground tanks that are not correctly abandoned or removed?

4	3	2	1
All tanks have been removed according to regulations and by a licensed individual. Excavation checked for contamination and any contaminated material has been removed.	Tank contents completely removed and tank filled with inert material. Any contaminated material around site removed.	Tank removed or filled with inert material. Excavation and site not checked for contamination.	Tank has not been removed or properly abandoned (using approved methods) in place.

Scorecard Worksheets

The Scorecard

The scorecard is designed as a place to record your scores from all sections of the notebook, allow you to look at areas of concern, and then designate them as high, medium, low, or no priority. These numbers can also be used to mark your progress over time should you repeat the assessment again in the future. If you are applying for cost share or awards associated with the River Friendly Farms program, your scores may be reviewed along with your action plan, not to see if your scores are low or high, but to see that high priority items based on your scores were in fact addressed in your action plan. In some programs, scores may be summarized in an aggregate (combined) data base, so that statewide, or program-wide averages can be published. Then individuals can see how their farms compare to these averages.

It is probably easiest to fill out the scorecard as you go through the questionnaire, by writing your scores in the first column, current rating. Ignore the rest for now. Then, once all questions are answered, go through and fill in the rest of the columns, desired rating, and check or mark the priority level for your farm in each area.
See the first line on the scorecard on page 76 for an example of how to complete each line.

Your aggregate, or average scores may not be interesting to you now, but might be useful later in comparing areas of your farm to state averages, or in five years, comparing your scores then, to now. You can calculate your average scores now or later.

Scorecard Worksheets

Section/Question	Ratings (Average)	Priority Areas and Need for Action

	Current Rating	Desired Rating	No Action Needed	Low Priority	Medium Priority	High Priority	List on Action Plan
II. SOIL AND NATURAL RESOURCE CONSERVATION							
Example	*2*	*3*			*X*		*X*
CROPLAND							
1. Soil structure							
2. Surface water and soil drainage							
3. Organic matter							
4. Tillage intensity							
5. Potential for erosion							
6. Evidence of erosion							
Cropland Average							
GRASSLAND							
1. Management							
2. Plant diversity							
3. Water sources							
4. Potential for erosion							
5.							

Observed erosion							
Grassland Average							
WOODLANDS							
1. Management							
2. Plant diversity							
3. Water quality							
4 . Potential for erosion							
5. Observed erosion							
Woodlands Average							

Section/Question	**Rating**	**Priority Area and Need for Action**

	Current Rating	**Desired Rating**	**No Action Needed**	**Low Priority**	**Medium Priority**	**High Priority**	**List on Action Plan**
II. SOIL AND NATURAL RESOURCE CONSERVATION (CONTINUED).							
WETLANDS, SPRINGS, AND PONDS							
1. Management							
2. Plant diversity							
3. Water							

quality							
4. Potential for erosion							
5. Observed erosion							
Wetlands, Spring, and Ponds Average							
WATERCOURSES							
1. Familiarity							
2. Vegetative cover							
3. Pollutants							
4. Observed erosion							
5. Water quality leaving farm							
Watercourses Average							
Wildlife Habitat Question - Score							
Wildlife Diversity Score (optional -- see Appendix A.)							
OVERALL AVERAGE FOR SOIL AND NATURAL RESOURCE							

CONSER VATION SECTION							

Section/Question	Ratings	Priority Areas and Need for Action

	Current Rating	Desired Rating	No Action Needed	Low Priority	Medium Priority	High Priority	List on Action Plan
III. NUTRIENT MANAGMENT							
1. Crop rotations							
2. Legume and manure credits							
3. Potential for nutrient loss from fields							
4. Amount of nutrient used							
5. Application system							
6. Timing of nitrogen application							
7. Lime needs							
8. Micro-nutrient needs							
9. Renewable sources of N, P, and K							
10. Fertilizer storage - amount							
11. Fertilizer							

storage - distance from water							
12. Fertilizer storage - facility							
13. Mixing fertilizer - safety and containment							
14. Mixing fertilizer - distance from water							
15. Soil testing							
AVERAGE SCORE FOR THIS SECTION:							

Section/Question	Ratings	Priority Areas and Need for Action

	Current Rating	Desired Rating	No Action Needed	Low Priority	Medium Priority	High Priority	List on Action Plan
IV. PEST MANAGEMENT							
1. Crop rotations							
2. Seed source							
3. Management skills							
4. Pest monitoring							
5. Methods of control							
6. Record keeping							
7. Sprayer calibration and maintenance							
8. Application safety							
9. Application potential for movement							
10. Separation of application from water							
11. Good neighbor policy							
12. Storage of pesticide -							

amount							
13. Storage of pesticide - distance from water							
14. Family safety							
15. Storage of pesticide - facility							
16. Pesticide mixing - safety and containment							
17. Pesticide mixing - distance from water							
18. Disposal of pesticide containers							
19. Mulches and plastic used for weed control							
20. Greenhouse containment							
AVERAGE SCORE FOR THIS SECTION							

Section/Question	Ratings	Priority Areas and Need for Action

	Current Rating	Desired Rating	No Action Needed	Low Priority	Medium Priority	High Priority	List on Action Plan
V. LIVESTOCK WASTE MANAGEMENT							
1. Number of livestock units (no rating)							
2. Number of acres available (no rating)							
3. Livestock units/land ratio (no rating)							
4. Livestock units /land ratio							
5. Livestock concentration							
6. Manure application plan							
7. Manure application conditions							
8. Manure spreading distance to water							
9. Manure safety and handling							
10. Potential							

nuisance to neighbors							
11. Off-farm nutrient sources							
12. Manure credits							
13. Storage of agricultural wastes - location							
14. Storage of agricultural wastes - facilities							
15. Manure storage capacity							
16. Risk of overflow and leakage							
17. Livestock yard distance from water							
18. Yard design and management							
19. Manure management in grazing areas							
20. Disposal of dead animals							
21. Silage facilities							
AVERAGE							

SCORE FOR THIS SECTION							

Section/Question	**Ratings**	**Priority Areas and Need for Action**					
	Current Rating	**Desired Rating**	**No Action Needed**	**Low Priority**	**Medium Priority**	**High Priority**	**List on Action Plan**
VI. IRRIGATION MANAGEMENT							
1. Efficient and cost effective irrigation system							
2. Field runoff							
3. Irrigation schedule and water management							
4. Water permits							
5. Water usage and record keeping							
6. Irrigation water							

testing							
7. Do you chemigate							
8. Well location from cropland							
9. Type of lubrication for pump							
AVERAGE SCORE FOR THIS SECTION							

Section/Question	Ratings	Priority Areas and Need for Action					
(Make extra copies of this sheet for each well)	**Current Rating**	**Desired Rating**	**No Action Needed**	**Low Priority**	**Medium Priority**	**High Priority**	**List on Action Plan**
VII. (1) FARMSTEAD DRINKING WATER WELL CONDITION AND CONTAMINATION RISK							
1. Position of well relative to pollution sources							
2. Separation distance to a bacteria source							
3. Separation distance to source other than bacteria							

4. Soils and geologic material							
5. Depth to groundwater puts well at risk							
6. Type, height, and condition of well casing							
7. Condition of sanitary well seaL							
8. Grout seal between drill hole and casing							
9. Well protection plan is written and up to date							
10. Annual well inspection is done as part of well maintenance							
11. Annual							

shock chlorination of well and water system							
12. Backflow prevention measures are in place							
13. Water tested for all wells as part of maintenance program							
14. All unused and abandoned wells are properly plugged							
AVERAGE SCORE FOR THIS SECTION							

Section/Question	**Ratings**	**Priority Areas and Need for Action**					
	Current Rating	**Desired Rating**	**No Action Needed**	**Low Priority**	**Medium Priority**	**High Priority**	**List on Action Plan**
(2)							

HOUSEHOLD WASTEWATER TREATMENT							
1. Water saving fixtures and conservation							
2. Wastewater collection system water tight							
Settleable solids minimized							
4. Dissolved solids minimized							
Floatable solids minimized							
Separation distance from water supply							
Septic tank condition and inspection							
8. Septage removal and disposal							
9. Wastew							

ater lagoon maintenance							
10. Holding tank pumped regularly							
11. Constructed wetland							
12. Packaged aerobic treatment							
13. Soil absorption system							
AVERAGE SCORE FOR THIS SECTION							

Section/Question	Ratings	Priority Areas and Need for Action					
	Current Rating	Desired Rating	No Action Needed	Low Priority	Medium Priority	High Priority	List on Action Plan
VII. (3) FARMSTEAD FARM AND HOME WASTE DISPOSAL							
Farm and home waste and trash (general disposal)							
Hazardous materials properly disposed							
Vehicle and Equipment drips and spills							
Used oil and lubricant disposed of properly							
Empty oil, and lubrica							

nt containers and filters							
Automotive and equipment batteries							
Antifreeze disposal							
Solvents, fuels, and other petrochemicals							
Paints, stains and solvents							
Household cleaners, hazardous products, and containers							
Household, lawn, and garden pesticides and rinsate							
AVERAGE SCORE FOR THIS SECTION							

Section/Question	Ratings	Priority Areas and Need for Action					
	Current Rating	Desired Rating	No Action Needed	Low Priority	Medium Priority	High Priority	List on Action Plan
VII. (4) FUEL STORAGE							
Position of tanks relative to wells and surface water							
Spill and overfill protection by secondary containment							
Tank securely enclosed and protected from damage							
Leak detection							
Active underground fuel storage							
Underground abandoned fuel							

tanks							
AVERAGE SCORE FOR THIS SECTION							

Action plan

The Action Plan

The Action Plan (blue pages) are to be used to prioritize and plan how you will make changes on your farm. It may also be reviewed by advisory committees if you are seeking cost-share or funding through this program.
From the scorecard worksheets, review the questions that you scored 1 or 2. Proceed to the action plan form (blue pages) and post those problem areas to the sheet provided. There are sheets for your family and farm goals action plans, as well as individual sheets for each section of the questionnaire. Begin constructing a plan that details the timing of your efforts, as well as knowledge and resources you need to acquire. See page 88 for examples from real farms.

The Dream Farm -- It may be helpful to draw any changes you would like to see on your aerial photo maps. How would you like your farm to appear? What would it look like if all water quality issues were addressed? A good idea may be to assemble the maps into an overall view of your farm. Place it near your desk or somewhere where you will see it often.

Cost-Share and Awards

Several cost-share programs may be available to participants in the River Friendly Farms Program. The field assistant can help you identify cost share-possibilities and sources for technical assistance. Several organizations and agencies that may offer these programs are listed on pages 13-14.

For a cost-share program, first choose a priority area for your water quality project. Discuss the project with the field assistant and prepare a plan to the funding entity. Technical assistance from subject matter specialists may be helpful in preparing the plan and/or application. Some sources of this assistance are listed on page 13-14. Remember that this exercise is for your benefit. It is our intent that all questionnaire responses and action plans will be held in strictest confidence by the technical resource staff and program-review committees. We
hope that this exercise benefits you and your family and
helps keep you farming.

Family Goals
ACTION PLAN

(This page does not need to be shared with reviewers)

Priority area or item of concern	Underlying source of problem or barriers identified	Action to be taken and why	Timetable for action and estimated cost

Farm Goals
ACTION PLAN

Priority area or item of concern	Underlying source of problem or barriers identified	Action to be taken and why	Timetable for action and estimated cost

Soil and Natural Resource Conservation
ACTION PLAN -

Priority area or item of concern	Underlying source of problem or barriers identified	Action to be taken and why	Timetable for action and estimated cost

Nutrient Management
ACTION PLAN

Priority area or item of concern	Underlying source of problem or barriers identified	Action to be taken and why	Timetable for action and estimated cost

Pest Management
ACTION PLAN

Priority area or item of concern	Underlying source of problem or barriers identified	Action to be taken and why	Timetable for action and estimated cost

Livestock Waste Management
ACTION PLAN

Priority area or item of concern	Underlying source of problem or barriers identified	Action to be taken and why	Timetable for action and estimated cost

Irrigation Management
ACTION PLAN

Priority area or item of concern	Underlying source of problem or barriers identified	Action to be taken and why	Timetable for action and estimated cost

Farmstead Assessment
ACTION PLAN

Priority area or item of concern	Underlying source of problem or barriers identified	Action to be taken and why	Timetable for action and estimated cost

-- Example --
ACTION PLAN

Priority area or item of concern	Underlying source of problem or barriers identified	Action to be taken and why	Timetable for action and estimated cost
Example: Farm Goals ***Diversify Crops***	*Not sure which ones to try, or which ones are profitable.*	*Talk to Extension about new crops that are recommended for Kansas. Start test plots in field C-3. Talk to NRCS about growing grass seed for CRP plantings.*	*Pick up some information and fact sheets next week. Start test plots next summer. Spend no more than $300 on test plot seed.*
Example: Soil and Natural Resource Conservation ***Streambank Erosion along Timber Creek Area T-1.***	*Large fluctuation in creek flow. Past removal of trees in riparian area.*	*Revetment in creek bend and/or willow pole planting. Establish riparian forest buffer planting.*	*5 years? 2001-2005 Labor - $1500 Materials $ 500? (rough calculation)*
Example: Nutrient Management ***Nutrient Loss***	*No buffer strips*	*Establish grass buffer strip.*	*2000-2002 explore CRP as an option*
Example: Pest Management ***Record-Keeping***	*Pesticide records are here and there, but not organized or combined.*	*Develop complete combined pesticide record keeping system by field.*	*No cost. Do by 2001.*
Example: Livestock Waste Management ***Concentration of animals in corrals during winter months.***	*Need alternative spaces during the winter.*	*Extend grazing season by planting fescue, brome, also utilize crop residues as available.*	*Plant brome spring 99 ($2380). Plant fesuce fall 99 ($2900) "Stalks" as available ($300 - $400)*
Example: ***Abandoned Well***	*Old well needs plugged.*	*Windmill needs to be removed and well plugged.*	*This year. Cost of $500 (est.)*

Appendix A.

Wildlife Diversity. Using the accompanying species list, identify as many wildlife species on your land as you can including birds, mammals, amphibians, reptiles, fish, insects and other species that may be present such as earthworms or crawdads. Be aware that different species will be present in your croplands, grasslands, and woodlands. This may be a fun project for the whole family. The following ratings are broad general guidelines or ratings for abundance. Individual pieces of land may have the potential for more or fewer species. These ratings are simply a starting place and ways to track progress over time for your farm and to compare similar pieces of land to one another. Count the number of species you observe on different types of land and record them in the appropriate columns.

Land Resource:	Amphibians	Reptiles	Mammals	Birds	Fish	Other
Cropland						
Grassland						
Woodland						
Wetlands Springs and Ponds						

Watercourses						
Total						

Wildlife Scores.

4	3	2	1
More than 100 species.	Between 50-100 species.	Between 25-50 species.	Fewer than 25 species.

Plants and Animals in the Kansas River Valley

Common Amphibians in the Kansas River Valley

Common Name	Latin Name
American toad	Bufo americanus
bullfrog	Rana catesbeiana
Cope's gray treefrog	Hhyla chrysoscelis
crawfish frog	Rrana areolata
gray treefrog	Hhyla versicolor
great plains narrowmouth toad	Gastrophryne olivacea
great plains toad	Bufo cognatus
mudpuppy	Nturus maculosus
northern cricket frog	Acris crepitans
plains leopard frog	Rana blairi
smallmouth salamander	Ambystoma texanum
southern leopard frog	Rana sphenocephala
tiger salamander	Ambystoma tigrinum
western chorus frog	Pseudacris triseriata
Woodhouse's toad	Bufo woodhousii

Common Breeding Birds in the Kansas River Valley

Common Name	Latin Name
American coot	Fulica americana
American crow	Corvus brachyrhynchos
American goldfinch	Carduelis tristis
American kestrel	Falco sparverius
American robin	Turdus migratorius
Baltimore oriole	Icterus galbula
barn owl	Tyto alba
barn swallow	Hirundo rustica
barred owl	Strix varia
bell's vireo	Vireo bellii
belted kingfisher	Ceryle alcyon
black- capped chickadee	Poecile atricapillus
blue grosbeak	Guiraca caerulea
blue jay	Cyanocitta cristata
blue- gray gnatcatcher	Polioptila caerulea
brown thrasher	Toxostoma rufum
brown- headed cowbird	Molothrus ater
Canada goose	Branta canadensis
Carolina wren	Thryothorus ludovicianus
cattle egret	Bubulcus ibis
cedar waxwing	Bombycilla cedrorum
chimney swift	Chaetura pelagica
chipping sparrow	Spizella passerina
chuck-will's-widow	Caprimulgus carolinensis
cliff swallow	Petrochelidon pyrrhonota
common grackle	Quiscalus quiscula
common nighthawk	Chordeiles minor
common yellowthroat	Geothlypis trichas
Cooper's hawk	Accipiter cooperii
dickcissel	Spiza americana
downy woodpecker	Picoides pubescens
eastern bluebird	Sialia sialis
eastern kingbird	Tyrannus tyrannus
eastern meadowlark	Sturnella magna
eastern phoebe	Sayornis phoebe
eastern screech- owl	Otus asio
eastern towhee	Pipilo erythrophthalmus
eastern wood- pewee	Contopus virens
European starling	Sturnus vulgaris
field sparrow	Spizella pusilla
grasshopper sparrow	Ammodramus savannarum
gray catbird	Dumetella carolinensis
great crested flycatcher	Myiarchus crinitus

great horned owl	Bubo virginianus
greater prairie- chicken	Tympanuchus cupido
great- tailed grackle	Quiscalus mexicanus
green heron	Butorides virescens
hairy woodpecker	Picoides villosus
horned lark	Eremophila alpestris
house finch	Carpodacus mexicanus
house sparrow	Passer domesticus
house wren	Troglodytes aedon
indigo bunting	Passerina cyanea
killdeer	Charadrius vociferus
loggerhead shrike	Lanius ludovicianus
Louisiana waterthrush	Seiurus motacilla
mallard	Anas platyrhynchos
mourning dove	Zenaida macroura
northern bobwhite	Colinus virginianus
northern cardinal	Cardinalis cardinalis
northern flicker	Colaptes auratus
northern harrier	Circus cyaneus
northern mockingbird	Mimus polyglottos
northern rough- winged swallow	Stelgidopteryx serripennis
orchard oriole	Icterus spurius
purple martin	Progne subis
red- bellied woodpecker	Melanerpes carolinus
red- eyed vireo	Vireo olivaceus
red- headed woodpecker	Melanerpes erythrocephalus
red- tailed hawk	Buteo jamaicensis
red- winged blackbird	Agelaius phoeniceus
ring- necked pheasant	Phasianus colchicus
rock dove	Columba livia
rose- breasted grosbeak	Pheucticus ludovicianus
ruby- throated hummingbird	Archilochus colubris
scissor- tailed flycatcher	Tyrannus forficatus
tufted titmouse	Baeolophus bicolor
turkey vulture	Cathartes aura
upland sandpiper	Bartramia longicauda
western kingbird	Tyrannus verticalis
whip-poor-will	Caprimulgus vociferus
white- breasted nuthatch	Sitta carolinensis
wild turkey	Meleagris gallopavo
wood duck	Aix sponsa
yellow warbler	Dendroica petechia
yellow- billed cuckoo	Coccyzus americanus

Common Mammals in the Kansas River Valley

Common Name	Latin Name
American badger	Taxidea taxus
American beaver	Castor canadensis
big brown bat	Eptesicus fuscus
black-tailed jack rabbit	Lepus californicus
common gray fox	Urocyon cinereoargenteus
common porcupine	Erethizon dorsatum
common raccoon	Procyon lotor
coyote	Canis latrans
deer mouse	Peromyscus maniculatus
eastern cottontail	Sylvilagus floridanus
eastern fox squirrel	Sciurus niger
eastern gray squirrel	Sciurus carolinensis
eastern mole	Scalopus aquaticus
eastern red bat	Lasiurus borealis
eastern spotted skunk	Spilogale putorius
eastern woodrat	Neotoma floridana
evening bat	Nycticeius humeralis
Franklin's ground squirrel	Spermophilus franklinii
Hayden's shrew	Sorex haydeni
hispid cotton rat	Sigmodon hispidus
hispid pocket mouse	Chaetodipus hispidus
hoary bat	Lasiurus cinereus
least shrew	Cryptotis parva
least weasel	Mustela nivalis
little brown myotis	Myotis lucifugus
long-tailed weasel	Mustela frenata
meadow jumping mouse	Zapus hudsonius
mink	Mustela vison
mountain lion	Felis concolor
nine-banded armadillo	Dasypus novemcinctus
northern grasshopper mouse	Onychomys leucogaster
northern myotis	Myotis septentrionalis
plains harvest mouse	Reithrodontomys montanus
plains pocket gopher	Geomys bursarius
prairie vole	Microtus ochrogaster
red fox	Vulpes vulpes
southern bog lemming	Synaptomys cooperi
southern flying squirrel	Glaucomys volans
striped skunk	Mephitis mephitis
thirteen-lined ground squirrel	Spermophilus tridecemlineatus

Virginia opossum	Didelphis virginiana
western harvest mouse	Reithrodontomys megalotis
white-footed mouse	Peromyscus leucopus
white-tailed deer	Odocoileus virginianus
woodchuck	Marmota monax
woodland vole	Microtus pinetorum

Common Fish in the Kansas River Valley

Common Name	Latin Name
bigmouth buffalo	Ictiobus cyprinellus
black bullhead	Ameiurus melas
black crappie	Pomoxis nigromaculatus
blue catfish	Ictalurus furcatus
blue sucker	Cycleptus elongatus
bluegill	Lepomis macrochirus
bluntnose minnow	Pimephales notatus
central stoneroller	Campostoma anomalum
channel catfish	Ictalurus punctatus
common carp	Cyprinus carpio
creek chub	Semotilus atromaculatus
fathead minnow	Pimephales promelas
flathead catfish	Pylodictis olivaris
freshwater drum	Aplodinotus grunniens
gizzard shad	Dorosoma cepedianum
golden shiner	Notemigonus crysoleucas
grass carp	Ctenopharyngodon idella
green sunfish	Lepomis cyanellus
highfin carpsucker	Carpiodes velifer
johnny darter	Etheostoma nigrum
largemouth bass	Micropterus salmoides
logperch	Percina caprodes
longnose gar	Lepisosteus osseus
orangespotted sunfish	Lepomis humilis
orangethroat darter	Etheostoma spectabile
quillback	Carpiodes cyprinus
red shiner	Cyprinella lutrensis
redfin shiner	Lythrurus umbratilis
river carpsucker	Carpiodes carpio
sand shiner	Notropis stramineus
shorthead redhorse	Moxostoma macrolepidotum
shortnose gar	Lepisosteus platostomus
shovelnose sturgeon	Scaphirhynchus platorynchus
slender madtom	Noturus exilis
smallmouth bass	Micropterus dolomieu
smallmouth buffalo	Ictiobus bubalus
stonecat	Noturus flavus
suckermouth minnow	Phenacobius mirabilis
western mosquitofish	Gambusia affinis
white bass	Morone chrysops
white crappie	Pomoxis annularis
white sucker	Catostomus commersoni

yellow bullhead	Ameiurus natalis

Common Reptiles in the Kansas River Valley

Common Name	Latin Name
brown snake	Storeria dekayi
collared lizard	Crotaphytus collaris
common garter snake	Thamnophis sirtalis
common kingsnake	Lampropeltis getula
common map turtle	Graptemys geographica
copperhead	Agkistrodon contortrix
corn snake	Elaphe guttata
five- lined skink	Eumeces fasciatus
flathead snake	Tantilla gracilis
graham's crayfish snake	Regina grahamii
great plains skink	Eumeces obsoletus
ground skink	Scincella lateralis
lined snake	Tropidoclonion lineatum
massasauga	Sistrurus catenatus
milk snake	Lampropeltis triangulum
northern water snake	Nerodia sipedon
ouachita map turtle	Graptemys ouachitensis
painted turtle	Chrysemys picta
pine snake	Pituophis catenifer
plains garter snake	Thamnophis radix
prairie kingsnake	Lampropeltis calligaster
prairie skink	Eumeces septentrionalis
racer	Coluber constrictor
rat snake	Elaphe obsoleta
ringneck snake	Diadophis punctatus
river cooter	Pseudemys concinna
rough green snake	Opheodrys aestivus
six- lined racerunner	Cnemidophorus sexlineatus
slender glass lizard	Ophisaurus attenuatus
slider	Trachemys scripta
smooth earth snake	Virginia valeriae
smooth softshell	Apalone mutica
snapping turtle	Chelydra serpentina
spiny softshell	Apalone spinifera
texas horned lizard	Phrynosoma cornutum
timber rattlesnake	Crotalus horridus
western box turtle	Terrapene ornata

western ribbon snake	Thamnophis proximus
worm snake	Carphophis amoenus

Common Prairie Plants of the Kansas River Valley

Common Name	Latin Name
Trees	
red-cedar, eastern	Juniperus virginiana
Shrubs and Vines	
dogwood, rough-leaf	Cornus drummondii
plum, wild	Prunus americana
New Jersey tea	Ceanothus spp.
rose, wild	Rosa arkansana
sumac	Rhus spp.
Grasses and Forbs	
aster	Aster spp.
black-eyed-Susan	Rudbeckia hirta
bluestem, big	Andropogon gerardii
bluestem, little	Schizachyrium scoparium
compass-plant	Silphium laciniatum
coneflower, prairie	Ratibida columnifera
coneflower, purple	Echinacea spp.
dogbane	Apocynum cannabinum
dropseed	Sporobolus spp.
fleabane	Erigeron spp.
gayfeather	Liatris spp.
goldenrod	Solidago spp.
grama, side-oats	Bouteloua curtipendula
grass, eastern gamma	Tripsacum dactyloides
grass, June	Koeleria macrantha
grass, love	Eragrostis spp.
grass, Indian	Sorghastrum nutans
grass priarie cord	Spartina pectinata
ground-cherry	Physalis spp.
indigo	Baptisia spp.
ironweed	Vernonia spp.
leadplant	Amorpha canescens
petunia, wild	Ruellia humilis

prairie-clover	Dalea spp.
puccoon	Lithospermum spp.
milk-vetch	Astragalus spp.
milkweed	Asclepias spp.
ragweed	Ambrosia spp.
sagewort	Artemisia ludoviciana
scurfpea	Psoralea spp.
snow-on-the-mountain	Euphorbia marginata
spiderwort	Tradescantia spp.
spurge, flowering	Euphorbia corollata
strawberry	Fragaria virginiana
sunflower	Helianthus spp.
switchgrass	Panicum virgatum
tickclover	Desmodium spp.
vervain, Canadian	Verbena canadensis
wild-rye	Elymus spp.
yarrow	Achillea millefolium

Common Forest and Woodland Plants of the Kansas River Valley

Common Name	**Latin Name**
Trees	
ash	Fraxinus spp.
boxelder	Acer negundo
buckeye, western	Aesculus glabra
coffee-tree, Kentucky	Gymnocladus dioicus
cottonwood	Populus deltoides
elm	Ulmus spp.
hackberry	Celtis spp.
hickory	Carya spp.
locust, black	Robinia pseudoacacia
locust, honey	Gleditsia triacanthos
maple, silver	Acer saccharinum
mulberry, red	Morus rubra
oak	Quercus spp.
pawpaw	Asimina triloba
red-cedar, eastern	Juniperus virginiana
redbud	Cercis canadensis
walnut, black	Juglans nigra
Shrubs and Vines	

ash, prickly	Zanthoxylum americanum
bittersweet	Celastrus scandens
buckbrush	Symphoricarpos orbiculatus
cherry	Prunus spp.
dogwood, rough-leaf	Cornus drummondii
gooseberrry, Missouri	Ribes missouriense
grape	Vitis spp.
greenbriar	Smilax spp.
hop-hornbearm	Ostrya virginiana
poison ivy	Toxicodendron radicans
moonseed	Menispermum canadense
Virginia creeper	Parthenocissus spp.

Grasses and Forbs

Alexanders, golden	Zizia aurea
anemone	Anemone spp.
bedstraw	Galium spp.
buttercup	Ranunculus spp.
Dutchman's-breeches	Dicentra cucullaria
fawn-lily	Erythronium albidum
goldenrod, elm-leaf	Solidago ulmifolia
May-apple	Podophyllum peltatum
phlox	Phlox spp.
nettle, stinging	Urtica dioica
sanicle	Sanicula spp.
smartweed	Polygonum spp.
Solomon's seal	Polygonatum biflorum
tick-clover	Desmodium spp.
violet	Viola spp.

Common Wetland Plants of the Kansas River Valley

Common Name	Latin Name
Trees	
boxelder	Acer negundo
cottonwood	Populus deltoides
sycamore	Platanus occidentalis
willow, black	Salix nigra
willow, peach-leaf	Salix amygdaloides
willow, sandbar	Salix exigua
Shrubs and Vines	
buttonbush	Cephalanthus occidentalis
Grasses and Forbs	
arrowhead	Sagittaria spp.
beggartick	Bidens spp.
bugleweed	Lycopus spp.
bulrush	Scirpus spp.
burhead	Echinodorus spp.
buttercup	Ranunculus spp.
cardinal-flower	Lobelia cardinalis
cat-tail	Typha spp.
cup-plant	Silphium perfoliatum
dock, pale	Rumex altissimum
false-indigo	Amorpha fruticosa
flatsedge	Cyperus spp.
Jerusalem-artichoke	Helianthus tuberosus
lobelia, blue	Lobelia siphilitica
loosestrife	Lythrum spp.
ragweed, giant	Ambrosia trifida
rush	Juncus spp.
sedge	Carex spp.
smartweed	Polygonum spp.
sneezeweed	Helenium autumnale
spike-sedge	Eleocharis spp.
sprangletop	Leptochloa spp.
touch-me-not, spotted	Impatiens capensis
vervain, blue	Verbena hastata

water willow	Justicia americana
watercress	Nasturtium officinale

Common Non-Native Plants of the Kansas River Valley

Common Name	Latin Name
Trees	
elm, Siberian	Ulmus pumila
mulberry, white	Morus alba
Osage orange	Maclura pomifera
Shrubs and Vines	
honeysuckle	Lonicera spp.
Grasses and Forbs	
alfalfa	Medicago sativa
bindweed, field	Convolvulus arvensis
brome	Bromus spp.
clover, hop	Trifolium campestre
clover, Korean	Kummerowia stipulacea
clover, red	Trifolium pratense
clover, white	Trifolium repens
crown-vetch	Coronilla varia
dandelion	Taraxacum officinale
dock, curlty	Rumex crispus
fescue	Festuca spp.
flower-of-an-hour	Hibiscus trionum
foxtail	Setaria spp.
grass, barnyard	Echinochloa spp.
grass, blue	Poa spp.
grass, Johnson	Sorghum halepense
grass, orchard	Dactylis glomerata
hemp	Cannabis sativa
henbit	Lamium amplexicaule
lespedeza, sericea	Lespedeza cuneata
medick, black	Medicago lupulina
mullein	Verbascum spp.
mustard, blue	Chorispora tenella
mustard, garlic	Alliaria petiolata

pennycress	Thlaspi arvense
salsify, western	Tragopogon dubius
shepherd’s-purse	Capsella bursa‑pastoris
speedwell	Veronica spp.
sweet-clover, white	Melilotus albus
sweet-clover, yellow	Melilotus officinalis
thistle, bull	Cirsium vulgare
thistle, musk	Carduus nutans
timothy	Phleum pratense
velvet-leaf	Abutilon theophrasti
wallflower, bushy	Erysimum repandum