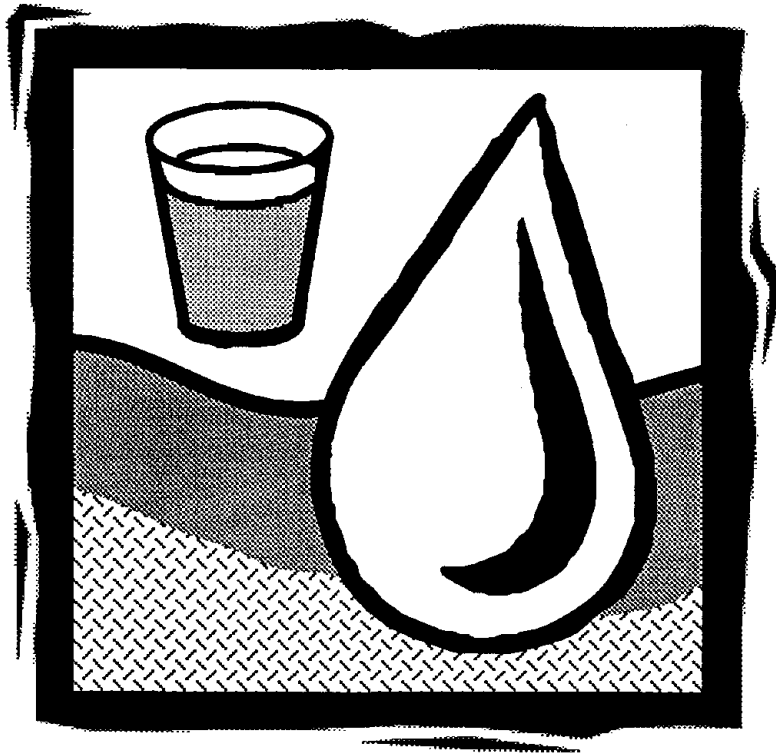


How to Conduct an Inventory in Your Wellhead Protection Area



**A Training Manual
for Use With Volunteers**

This manual is intended to help you take an active and positive role in protecting your community's ground water that is used for your drinking water supply. It will introduce you to the natural cycle that supplies the earth with ground water, briefly explain how ground water can become contaminated, and most importantly, describe how you and your community can protect valuable drinking water supplies by using volunteers to conduct an inventory of potential sources of contamination within wellhead protection areas.

This manual is divided into two guides. The Preliminary Guide is intended for the person(s) in a community that are initiating wellhead protection. It helps lay the foundation that the volunteer coordinator will need to conduct the wellhead protection area inventory with volunteers. The Volunteer Coordinator's Guide provides the detailed steps needed to recruit and train the volunteers so the inventory can be conducted.

Acknowledgments

There are many organizations and individuals who contributed to the success of the training manual development process, as well as the pilot test of the manual in Moscow, Idaho. Thanks to all who took the time to attend planning meetings, edit drafts, collect data and create and critique new ideas. We also extend thanks to the Moscow public entities who took the time to share and explain public records. Major funding for this project was provided by a 1993 EPA Region 10 Environmental Education Grant.

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Idaho Water Resources Research Institute, University of Idaho
Idaho Department of Health and Welfare, Division of Environmental Quality
Palouse-Clearwater Environmental Institute
Pullman-Moscow Water Resources Committee
Latah Soil and Water Conservation District
Idaho Rural Water Association

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Foreword

The primary purpose of the project was to develop and disseminate a training manual that would actively involve community members in conducting wellhead protection area inventories. The project involved the development and pilot test of the training manual. The intent of this manual is to assist communities in training volunteers to collect useful and valid data to incorporate into a local wellhead protection plan.

The pilot test of the training manual took place in the Moscow, Idaho area where the wellhead protection area was defined as the entire aquifer. Many of the examples in the training manual were designed to meet this need. The hydrogeology in other areas may dictate the designation of a very different type of wellhead protection area(s). However, the process of recruiting and training volunteers to conduct the inventory will be similar.

This training manual will help communities begin wellhead protection plans and at the same time increase the awareness of the volunteers and their families involved in the inventory program. Due to increased awareness the potential protection of our drinking water supplies will be improved. Although this manual has been developed primarily for use in Idaho, other states should be able to easily adapt it for their needs.

Additional copies of this training manual are available for a nominal cost. Please contact:

Idaho Water Resources Research Institute
106 Morrill Hall
University of Idaho
Moscow, ID 83844-3011

Telephone (208) 885-6429
Fax (208) 885-6431

How to Conduct an Inventory in Your Wellhead Protection Area

A Training Manual for Use With Volunteers

This project was developed through a cooperative effort of the:

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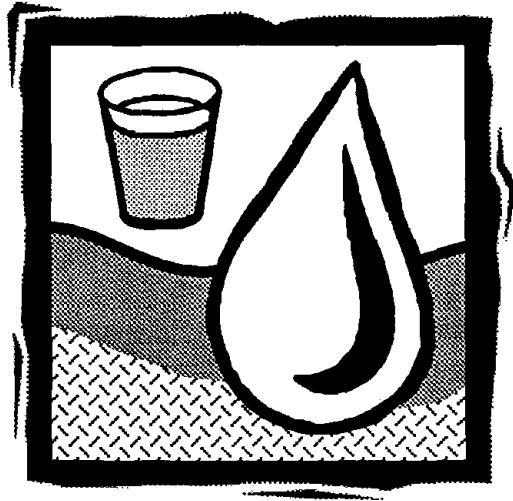
**This project was supported by a
1993 EPA Region 10 Environmental Education Grant.**

Contents of this publication do not necessarily reflect the view and policies of any of the cooperative members listed above nor the policies of the EPA. The mention of trade names or commercial products does not constitute endorsement or recommendation of their use.

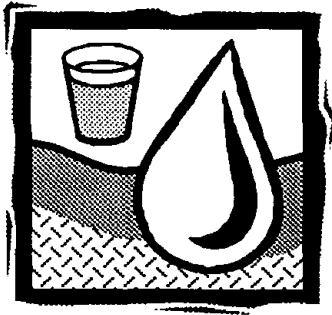
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Preliminary Guide



This section of the manual is written for the person or persons that are initiating wellhead protection in your community.



Preliminary Guide

Laying the Foundation

▲ Introduction

So, you are interested in helping your community protect its drinking water. This manual will help your community preserve and protect the quality of its drinking water by beginning a local wellhead protection planning process.

Clean drinking water is one of the essential elements for quality of life in your community. In Idaho, approximately 95 percent of the state's population uses ground water for their drinking water supply and everyone uses ground water indirectly through the crops that are grown and consumed in the state.

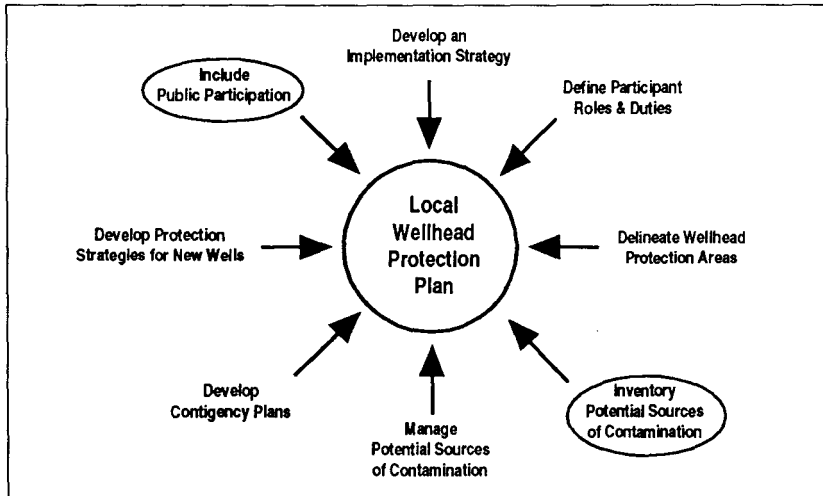
Ground water was once thought to be protected from contamination by layers of rock and soil that acted as filters. Today, we know that ground water is vulnerable to many types of potential contamination, such as landfills, chemical spills, leaking underground storage tanks and improperly managed hazardous waste sites. Other common practices, such as the use of septic tanks, salt for de-icing, fertilizer and pesticide application are also potential contaminants. If a ground water source becomes contaminated, the costs of cleaning up or replacing wells could become very expensive. It is, therefore, sensible to prevent the contamination of wells and the underlying aquifer by implementing the concepts of wellhead protection.

Your community may have already begun the process of developing a wellhead protection plan or may be thinking about developing a plan to protect your ground water resources. This process can help your community plan growth and development so that drinking water supplies are protected. Completing a wellhead protection plan for your community includes a variety of specific actions. The specific components recommended by the Idaho Wellhead Protection Plan are diagrammed in Figure 1. The components most pertinent to this manual have been highlighted.

A wellhead protection area is defined as the surface and subsurface area surrounding a drinking water well or well field through which contaminants can flow and reach the well or well field.

A local wellhead protection plan is a plan developed by a community to protect a wellhead protection area(s) so that ground water contamination can be prevented.

Figure 1. Components of a Recognized Local Wellhead Protection Plan
(From Idaho Wellhead Protection Plan - Draft)



Preliminary Steps

- 1 Understand**
your state's wellhead protection guidelines.
- 2 Organize**
a wellhead protection advisory team.
- 3 Define**
clear goals and objectives for the inventory program.
- 4 Delineate**
the wellhead protection area(s).
- 5 Select**
the data collection procedure.
- 6 Develop**
a publicity strategy.
- 7 Recruit**
and train the volunteer coordinator.

This manual provides specific guidelines that will help you organize community volunteers to conduct the wellhead protection area inventory. One of the actions in this process is to inventory potential sources of contamination by identifying, locating and ranking potential sources in wellhead protection areas. However, before you are ready to recruit and train volunteers to conduct the inventory (using the guidelines in the Volunteer Coordinator's Guide) your community should have a commitment to ground water protection. The steps described in detail on the following pages will help your community be prepared for the inventory.

1 Understand your state's wellhead protection guidelines.

A copy of the Idaho Wellhead Protection Plan can be acquired from:

Idaho Department of Health and Welfare
Division of Environmental Quality
1410 North Hilton
Boise, Idaho 83706-1290
(208) 334-5860
ATT: Elizabeth Cody
Senior Ground Water Quality Analyst

The Idaho Wellhead Protection Program is voluntary for local governments to develop and implement.

The program has been developed to:

- be flexible and simple so that implementation can be attainable,
- be able to be administered with limited resources, and
- emphasize public education.

The Idaho Wellhead Protection Program provides the guidelines that a community can follow and offers flexibility in developing local wellhead protection plans that meet the needs of any community.

2 Organize a wellhead protection advisory team.

Identify others in your community who are concerned about the protection of drinking water. We suggest that you gather as diverse a group as possible. The more perspectives present on the Advisory Team the more comprehensive and supported your plan will be. Suggested team members may include a representative of the:

- Business community
- City public works department
- County planner's office
- State water quality agency
- City council, and/or county commissioner's office
- Agricultural community
- Local conservation or environmental organization
- Water purveyors
- Irrigation users

- Health district
- Technical or scientific community including, a resident or state level expert in hydrology, geology or hydrogeology
- Local tribal council in your area

The Advisory Team will provide guidance and support for this program and will eventually develop the final wellhead protection plan based on data collected during the inventory for your community.

3

Define clear goals and objectives for the inventory program.

Community goals for this program may be mostly educational, mostly technical or both educational and technical. Some communities may see the need to educate their citizens about ground water issues as the most important goal of the inventory program while other communities may only be concerned with completing the data collection process. Whatever the goal, communities will ultimately be interested in the accumulation of information and public support that will lead towards the development of a wellhead protection plan. The Advisory Team must clearly define the goals of the project, since these goals will direct the methods used in the inventory. For instance, if your goal is to heighten the awareness of community members about ground water and how to protect it, you will spend far more energy promoting and publicizing your program than if your only

goal is the collection of data. Below are some questions that can guide your goal development process:

Why is wellhead protection important for this community?

- What is the #1 goal of the inventory?
- How does public education fit in the inventory?

What final product does the community hope to get from the inventory?

- What data are necessary to help formulate a wellhead protection plan?
- How should the data be formatted, in a data base or simply plotted on a map?

Your Advisory Team should be able to answer all of these questions and have clearly written goals established before completing the remaining steps.

4

Delineate the wellhead protection area(s).

Wellhead protection areas are defined based on available hydrogeologic information, on ground water flow, recharge, discharge, and other information. Your community may choose to establish wellhead protection areas around each public well or well field, or also around non-public wells. Another possibility is that your community may choose to establish a wellhead protection plan for your entire aquifer. The Idaho Wellhead Protection Plan (Chapter 4) provides guidance in delineating wellhead protection areas in your community. Below are some delineation questions that need to be answered to determine the specifics of the inventory.

What and Where are the wellhead protection areas you plan to protect?

Will you protect:

- the zone of contribution for each individual well?
- the entire aquifer?
- the recharge areas to the aquifer?
- some other designated area?

What wells are you interested in protecting?

- public wells?
- non-public wells?
- both public and non-public wells?

The wellhead protection area or areas should be well defined and recorded on a map before proceeding to the next step.

5 Select the data collection procedure.

Now that the Advisory Team has delineated the wellhead protection area(s), the next step must focus on the specific data needed and the method(s) that will be used to collect the information. Two factors that will strongly influence the type and level of data needed are understanding your community's aquifer type and knowing the proposed use of the data. Below are some questions that can help your team define the data collection procedure:

What potential sources of contamination will be inventoried?

- Which contaminants are a priority?
- What kind of information is needed about each potential source of contamination?
- Is historical data of interest?

The Idaho Wellhead Protection Plan provides a list of potential sources of contamination. This list, categorized by the nature of their release of substances to ground water, can be found in Appendix A.

What methods will be used to collect the potential sources of contamination data?

- Use of existing records?
- Use of personal interviews with community members?
- Use of mail surveys?
- Use of on-site visits?

More detail on data collection methods can be found in Chapter 4 of the Volunteer Coordinator's Guide.

How should the data be organized?

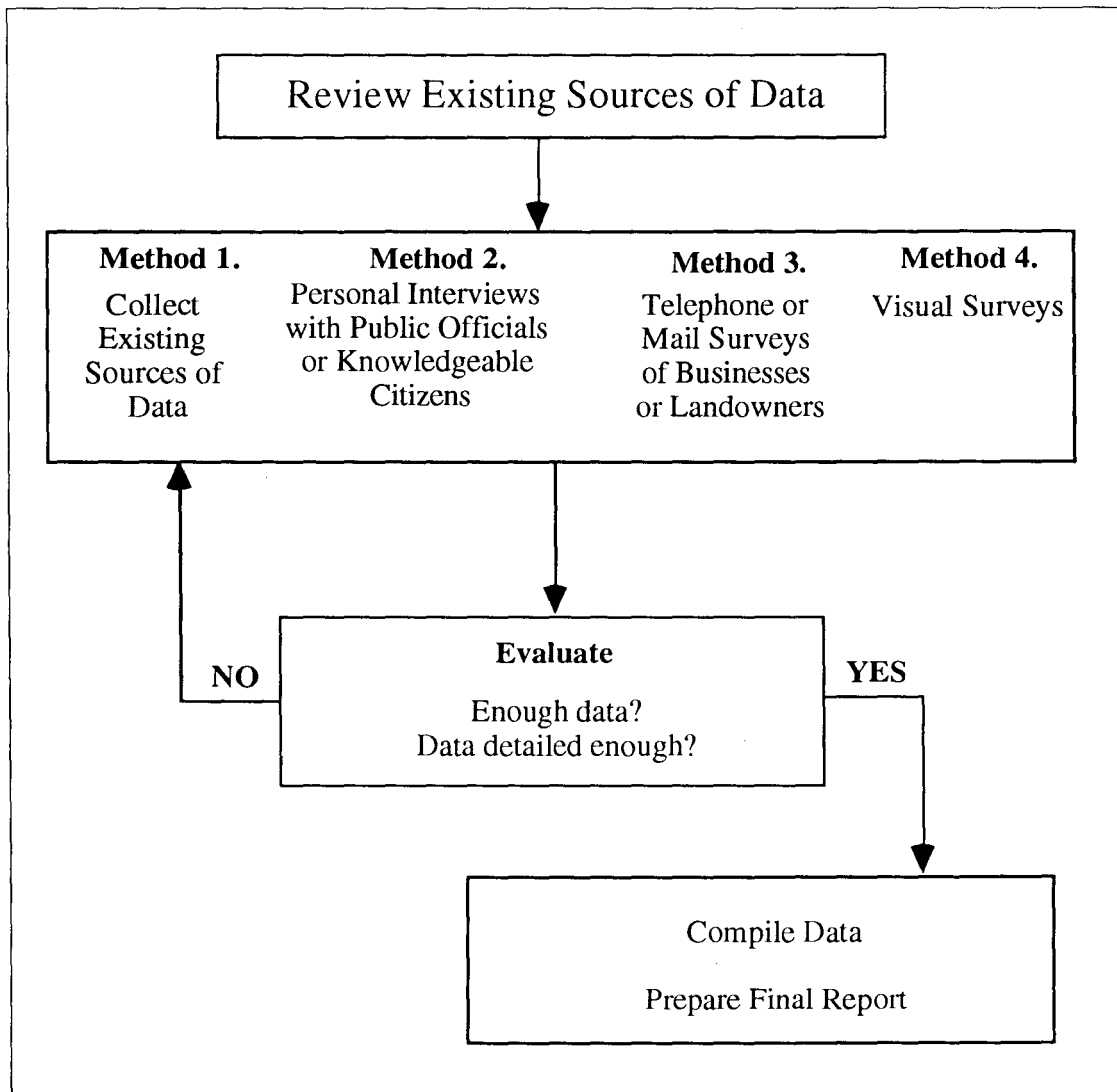
- Data base?
- Data collection forms?
- Maps with plottings?

Example data forms are in Appendix E.

The flow chart in Figure 2. may make it easier to guide the above decisions. You may need to take time to review the existing sources of data before you choose the specific data collection methods. This review of data could be done by the advisory team, but you may want to have a person, such as the volunteer coordinator, collect this information. There is more detail on conducting a review of existing data in the Volunteer Coordinator's Guide, Chapter 2. After the existing sources of data are reviewed, you will be able to make further decisions on the data collection method. How your data will be used should influence the data collection method(s).

Be aware that some methods are more complex than others. As the complexity increases, so will the number of volunteers and the amount of time needed to complete the wellhead protection area inventory. Do not move on to Step 6 until the Advisory Team can come to agreement on the data collection method(s) needed for the inventory in your community. It is possible that in the beginning one method will be decided upon but later in the process, more information will still be needed and an additional method will be added.

Figure 2. Choosing Data Collection Methods



6

Develop a publicity strategy.

Now that you have a clear vision of what your inventory program will entail, it is important to inform your community about the program. This section will provide you with some guidelines for developing a publicity strategy for your community.

Getting the word out effectively can be critical to the success of your program. It is possible that you may encounter some resistance from certain members of your community. This resistance may be due to a lack of understanding of the program and/or a perceived threat to their activities or livelihood. Early development and implementation of a publicity strategy will clear up any misconceptions and resistance in a non-confrontational manner. As the vision setters, the Advisory Team members are the most effective spokespeople for the program's efforts.

You will need to build a cooperative relationship with the media (newspaper, radio, television, etc.) and other groups such as chambers of commerce, water departments, and city offices by informing them exactly what is being done and why.

It will be important to maintain open lines of communication throughout the entire program. The wide distribution of accurate information and the endorsement by the local government and media will attract volunteers for the program and ensure cooperation from the entire community. An information packet will be a useful item for sharing information with the press and recruiting potential volunteers. This information packet will also be extremely useful to your Volunteer Coordinator for recruitment and publicity purposes, if you choose to use volunteers to complete the inventory.

The packet may include:

- Basic ground water information
- Local ground water conditions
- Explanation of the wellhead protection area inventory program (brochure or a question and answer sheet)

Media releases, public service announcements, notices in monthly water bills, press conferences and civic group presentations are all methods of publicizing and promoting the inventory program. Details and examples of these methods are described in the Publicity Packet in Appendix B.

Once a clearly stated direction is determined by the Wellhead Protection Advisory Team, two options are available for completing the inventory.

(1) You can hire a consultant to conduct the inventory.

OR

(2) You can use volunteers in your community to conduct the inventory and meet public education needs.

NOTE: This manual will assist you in the process of promoting and coordinating the inventory program, and recruiting and training volunteers. If you will be using volunteers, continue with Step 7.

If you choose to hire a consultant to conduct the inventory, the workshop activities can be used to raise public awareness through education.

7

Recruit and train a volunteer coordinator.

If you opt to use volunteers you will need a person responsible for the recruitment, training and supervision of the volunteer inventory team. The Volunteer Coordinator for your inventory will need to be a person who is comfortable talking and working with a wide range of people. Figure 3 is a suggested job description that you can use in your search for a qualified Volunteer Coordinator.

Once the Volunteer Coordinator has been recruited, this person should set up a meeting with each member of the Advisory Team. These meetings are an opportunity for the Volunteer Coordinator to become familiar with the perspective and expertise of each Advisory Team member.

Provide the Volunteer Coordinator with:

- 1) a copy of your state's wellhead protection plan,
- 2) the suggested educational resources (see Appendix G),
- 3) this manual,
- 4) a map of the wellhead protection area(s) as defined by your Advisory Team, and
- 5) a list of the Advisory Team members, including address, phone and area of expertise.
- 6) written goals for the inventory program.

Schedule regular Advisory Team meetings to provide updates on the progress of the inventory. With the help of the Advisory Team, the Wellhead Inventory Volunteer Coordinator should be able to take charge of the inventory program. You may want to welcome your Volunteer Coordinator with a formal letter. An example letter is provided (see Figure 4).

Figure 3. Sample Job Description for the Volunteer Coordinator
(Adjust this announcement to the needs of your community.)

Volunteer Coordinator

(Include a brief paragraph defining the inventory as determined by the Wellhead Protection Advisory Team.)

The Volunteer Coordinator will work cooperatively with _____. *(Explain who the Wellhead Protection Advisory Team is and who will act as the Volunteer Coordinator's immediate supervisor.)*

Responsibilities: The Volunteer Coordinator will heighten public interest and participation in the inventory program, recruit volunteers for the program, conduct volunteer training session(s), organize the data collection process, coordinate volunteers in the collection of data, and compile and submit the data to the Wellhead Protection Advisory Team.

Minimum Qualifications:

1. Must be able to:
 - Write and speak effectively;
 - Work independently and keep Advisory Team informed of program status;
 - Maintain accurate records;
 - Operate a personal computer; and
 - Work in an organized manner.
2. Must possess a valid driver's license.

Desirable Qualifications:

1. Experience:
 - Recruiting and training volunteers;
 - Facilitating workshops; and
 - Writing articles for publication.
2. Ability to:
 - Interact effectively with diverse groups;
 - Present non-biased information on environmental issues;
 - Coordinate, write, and edit reports; and
 - Facilitate and conduct workshops.
3. Good knowledge of local community.
4. Some knowledge of local hydrology and hydrogeology.

Please submit your resume and a writing sample to:

Application due:

Figure 3. Sample Job Description for the Volunteer Coordinator
(Adjust this announcement to the needs of your community.)

Volunteer Coordinator

(Include a brief paragraph defining the inventory as determined by the Wellhead Protection Advisory Team.)

The Volunteer Coordinator will work cooperatively with _____. *(Explain who the Wellhead Protection Advisory Team is and who will act as the Volunteer Coordinator's immediate supervisor.)*

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 - Work in an organized manner.
2. Must possess a valid driver's license.

Desirable Qualifications:

1. Experience:
 - Recruiting and training volunteers;
 - Facilitating workshops; and
 - Writing articles for publication.
2. Ability to:
 - Interact effectively with diverse groups;
 - Present non-biased information on environmental issues;
 - Coordinate, write, and edit reports; and
 - Facilitate and conduct workshops.
3. Good knowledge of local community.
4. Some knowledge of local hydrology and hydrogeology.

Please submit your resume and a writing sample to:

Application due:

Figure 4. Sample Letter to the Volunteer Coordinator
(Adjust this letter to the needs of your community.)

From: Wellhead Protection Advisory Team
To: Volunteer Coordinator

Congratulations! You have been chosen to provide overall leadership to the Wellhead Protection Area Inventory Program. You have a very exciting project ahead of you.

In Idaho, 95% of our drinking water comes from ground water. In the past, we believed that ground water was protected from contamination by virtue of its underground location and the ability of soil to filter and chemically alter some contaminants. Only in the last couple of decades have we learned that ground water is vulnerable to contamination. Dwindling supplies are also a problem in some areas.

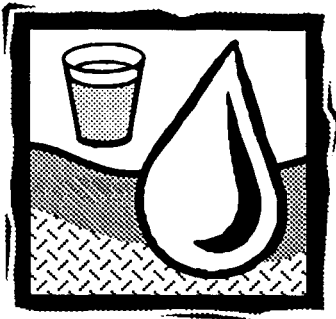
To prepare for the future, our community has decided to embark on developing a wellhead protection plan. One step in the development of this plan is to inventory potential sources of contamination in wellhead protection area(s). Your role as the Volunteer Coordinator will be to educate and organize community members to conduct the inventory.

In this process you will have five main responsibilities:

- **Publicize** the inventory (for both educational and recruitment purposes).
- **Recruit** a broad base of people to volunteer to conduct the inventory.
- **Train** the volunteers in both basic ground water information and inventory procedures.
- **Insure** the data is collected and presented to the Wellhead Protection Advisory Team.
- **Communicate** progress with the Advisory Team, while seeking their guidance.

The Volunteer Coordinator's Guide will provide you with the details needed to complete the above steps. The Wellhead Protection Advisory Team is here to help you answer any technical or local questions that you may have. We suggest that you read through this manual and other readings to familiarize yourself with the program and basic ground water information.

We look forward to working with you to protect our community's drinking water source. Welcome aboard the team!



Volunteer Coordinator's Guide

1 Getting Prepared

▲ Introduction

Congratulations, you are now in a position to provide leadership for a very important program: conducting a volunteer-based wellhead protection area inventory. This guide will provide the direction needed to accomplish this goal.

Completing a wellhead protection area inventory of potential sources of contamination is one of the steps involved in designing a wellhead protection plan. By now, your community's Advisory Team has probably completed some of the preliminary steps towards developing a community-wide wellhead protection plan. You have been brought on board to work with the Advisory Team and to follow through on the tasks needed to train and supervise volunteers to inventory potential sources of contamination. Using volunteers to conduct the inventory will also play an important role in increasing the public's awareness about ground water protection. The two steps in the local wellhead protection plan development process that you will focus on are highlighted in Figure 5.

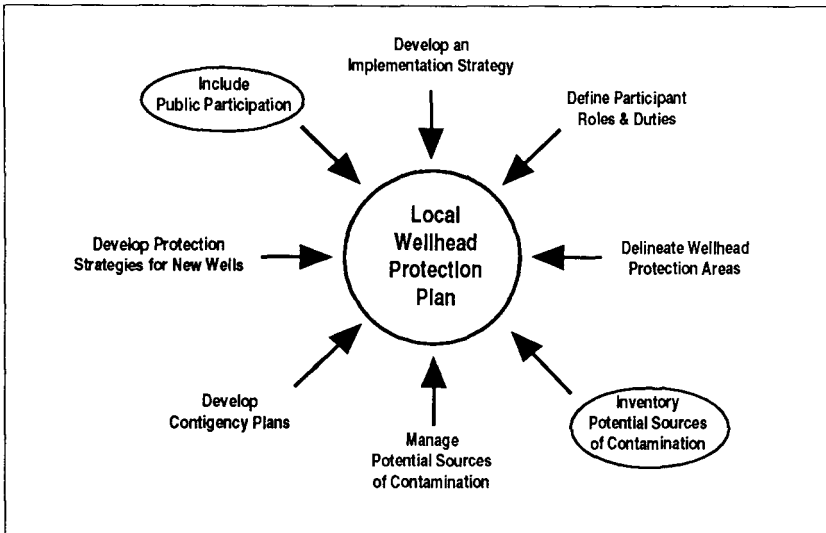
Although most of the information within these chapters is arranged in chronological order, you will find that working with the Advisory Team and updating them on the progress of the data collection will occur simultaneously with many of the other steps.

What's in this guide?

This guide is designed to help you work with your Advisory Team and volunteers to complete a wellhead protection area inventory. It consists of the following chapters:

- 1 Getting Prepared
- 2 Data Collection Preparation
- 3 Recruiting Volunteers
- 4 Data Collection Details
- 5 Training & Recognition of the Volunteers
- 6 Ground Water Education Workshop
- 7 Final Steps

Figure 5. Elements of a Wellhead Protection Plan
(From Idaho Wellhead Protection Plan - Draft)



▲ **Get the Big Picture: What is Wellhead Protection?**

The Wellhead Protection Program in Idaho is a voluntary program designed to reduce the threat to the quality of ground water used for drinking water. This is accomplished by identifying and protecting the vulnerable areas surrounding a well.

A wellhead protection area is defined as the surface and subsurface area surrounding a drinking water well or well field through which contaminants can flow and reach the well or well field.

A local wellhead protection plan is a plan developed by a community to protect a wellhead protection area(s) so that ground water contamination can be prevented.

▲ **Preparing Yourself to be the Volunteer Coordinator**

The way in which each community uses this guide will be different. **Therefore, it is imperative that you read through the entire guide so that you are familiar with the information provided in each step.** Only after reading the guide will you be ready to provide the leadership and begin planning the wellhead protection area inventory. You may need to become more familiar with ground water information too. A list of educational resources related to ground water is provided in Appendix G.

▲ **Working with the Advisory Team**

As the Volunteer Coordinator, you will work directly with the Advisory Team, since they have set the vision for the inventory process in your community. You will need to update the team on the types of volunteers that you recruit and the data you collect. In addition, the Advisory Team will be a valuable technical resource about ground water in your community, be able to assist you in the training sessions, and provide answers to any controversial issues that may arise.

This guide suggests that before you begin publicizing the inventory and recruiting volunteers your Advisory Team should have completed some preliminary steps critical to the success of the inventory. As Volunteer Coordinator, you will not be able to proceed without their support and their decisions related to each of these steps. These steps are described in greater detail in the

preliminary guide. However, below is a brief summary of what you should know regarding each step.

If your Advisory Team has not completed these steps:



If you have the skills, you may be able to facilitate discussion among the team members to answer any questions about these steps. In Appendix F, you will find a list of facilitation guidelines that could help you lead a group meeting to determine your community's specific needs. A copy of the decisions made by the Moscow/Puliman Advisory Team, that were used for the pilot of this project, are provided in Appendix C.

When you clearly understand your role and what has already been accomplished, it is time to begin the rest of the process. The following chapters will help prepare you to train volunteers to collect data.

Figure 6. Advisory Team Preliminary Steps

Preliminary Steps	Action Completed
1 Understand your state's wellhead protection guidelines.	The Advisory Team should be able to provide you with the state wellhead protection guidelines.
2 Organize a wellhead protection advisory team.	You should become well acquainted with each member of the team and attend their regular meetings. Initially, you may want to set up individual meetings with each member of the team.
3 Define clear goals and objectives for the inventory program.	The Advisory Team should be able to provide you with written goals and objectives for the inventory program, as well as an overall vision for their drinking/ground water protection program.
4 Delineate the wellhead protection area(s).	The Advisory Team should be able to give you a map of the protection area or areas.
5 Select the data collection procedure.	The Advisory Team should be able to clearly define the data collection procedures that will be used in your community.
6 Develop a publicity strategy.	The Advisory Team should have a publicity strategy in place with a publicity packet ready for use.
7 Recruit and train the volunteer coordinator.	By reviewing these steps with the Advisory Team, you will have the basic training needed to begin your role as Volunteer Coordinator.



Volunteer Coordinator's Guide

2 Planning for Data Collection

▲ Introduction

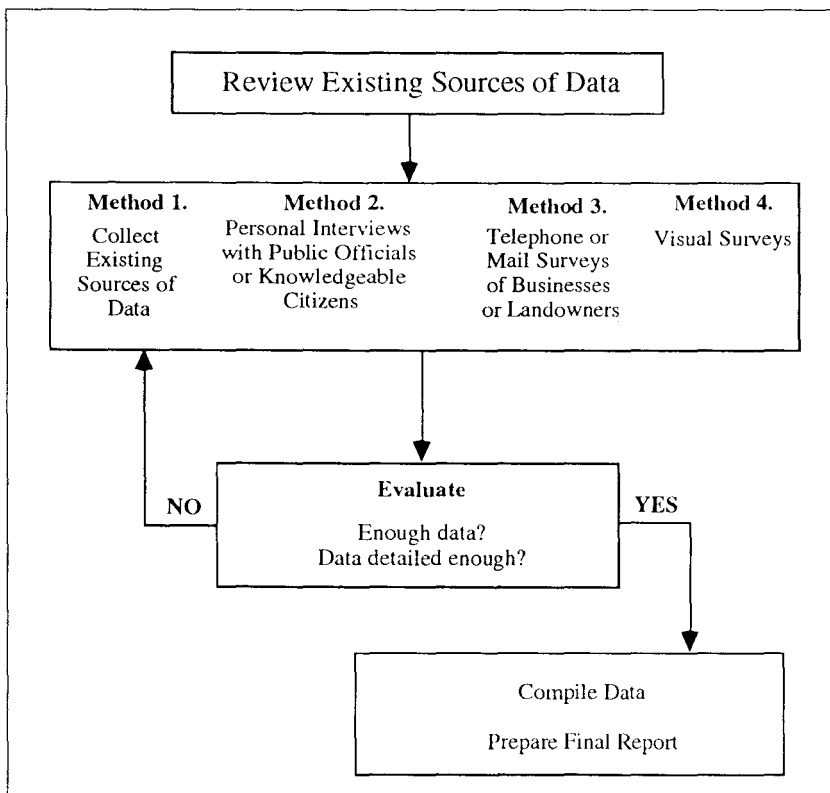
Once the groundwork of the Advisory Team has been completed, you will need to clearly understand all the details of the data collection procedures. This chapter will review data collection methods, describe how to collect existing sources of data and define volunteer needs. More details on each type of data collection are described in Chapter 4, Data Collection Details.

▲ Define the Data Collection Process

The Advisory Team has used the data collection chart, Figure 7, to begin to define the method of data collection and the type of information they are interested in having tabulated for the wellhead protection areas. Remember there are essentially four data collection methods.

1. Collect existing sources of data.
2. Personal interviews with public officials or knowledgeable citizens.
3. Telephone or mail surveys of businesses and landowners.
4. Visual surveys.

Figure 7. Choosing Data Collection Methods



In some cases your Advisory Team may be able to provide you with a specific list of where and what type of information you can obtain for your community. The list in Appendix A will help you find this information in Idaho. If your Advisory Team cannot provide you with much detail, you will need to do the groundwork to review and collect existing sources of data. The Advisory Team will then be able to make the appropriate decisions about what data and which method will be used. You will need to be familiar with the types of data you may receive, where it will be coming from and what format it will be in before you are ready to recruit and train volunteers.

▲ Review and Evaluate Existing Sources of Data

1. Find out where the data of interest is located. (Note: Appendix A provides a detailed list.)

Examples:

- Fire Station (Tier II Reports)
- County Disaster Services
- Safety Officer (at a university or college)
- Public Works Departments
- State DEQ Offices
- Information from local businesses

2. Find out what format the data is kept in by contacting the staff from the agencies that house the data.

This communication will allow you to develop a personal rapport with them, so that you can answer any questions that they have about the inventory and arrange a mutually convenient time for volunteers to work at their offices.

You may want to visit or at least call the places that house the data to find out how it is organized. This will allow you to describe the data to your advisory team and volunteers. Try to find an example of what the data will look like. You may want to ask questions like:

- What information does the agency have regarding _____ (city sewer layout, location of underground storage tanks, hazardous materials, etc.)?
- How is the data recorded?
- What specific data do they have (size, amount, location, chemical name, year installed, etc.)?
- How can the volunteers access the information (photocopy, visit and work in the agency's office, work with a computer data base, etc.)?

3. Develop draft data forms and a data base format.

Your Advisory Team will need to have some input in how the data collection forms should be organized, so that it will meet their needs. However, you will want to have a draft form on hand when you meet with them. This will allow them to make changes and additions, as they see necessary. See the example form used for the pilot project in Appendix E.

4. Meet with the Advisory Team to refine what data they want and what methods will be used to collect the data.

Once you have determined the detail of data available and what format it is in, you will want to meet with the Advisory Team to get a final decision on what information they are interested in and how they would like it organized in the final report. Some questions that you may want to ask are:

- How should the data be arranged? (by amount of contaminant, location, type of contamination?)
- Which contaminants are a priority?
- Which pieces of data about each potential source of contamination are they interested in?
- Who in the community should be interviewed to see if the existing sources list is adequate?
- Are they interested in historical data? If so, how would they like it to be collected.

▲ Define Volunteer Needs

This section will outline the major tasks that you, the Volunteer Coordinator will need to accomplish so that the volunteer time will be used efficiently and you will meet the data collection goals. The tasks related to data collection will vary depending on what data collection method your Advisory Team has defined. You may need to refer to Chapter 4, Data Collection Details to further define the procedures that will work best for your community.

1. Determine the number of volunteers that will be needed.

The type of data, amount of data, and the method of collection will determine the number of people needed. Try to get a general idea of the number of people you want to recruit. Base estimates on volunteers working 4-5 hours per week.

2. Define volunteer responsibilities and produce volunteer job descriptions.

It is important that before you recruit volunteers, you clearly describe their job responsibilities. Some of the job responsibilities may include data entry, conducting personal interviews, mapping data and general data collection. The volunteer position descriptions that were used in the pilot can be found in Appendix D. These will provide a guideline for the types of volunteer jobs you may need.

3. Consider organizing the volunteers into teams with a similar tasks.

Assignments can be made in several different ways and you will need to make this decision based on the type of data to be collected, the methods of collection, and the geographic area of your inventory.

Example 1: Assignment by geographic area. A team can be assigned to inventory potential sources of contamination within a specific wellhead protection area, by township/range, or by county.

Example 2: Assignment by one or more potential contaminant sources. A team can be given the assignment to collect data on large quantity generators, while others collect data on underground storage tanks, or geologic features.

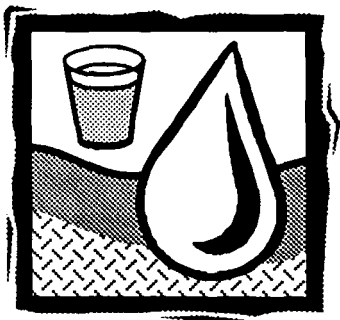
Example 3: Assignment by specialties such as data entry or mapping.

▲ Develop a Time Line

Before you begin recruiting volunteers, you should have a well developed time line for the completion of the project. Your Advisory Team will probably have some suggestions about when they need the data, etc. A proposed time line is provided in Figure 8. However, remember that the amount of time you will need will depend on the amount and detail of data desired.

Figure 8. Example Time Line for Completion of Wellhead Area Inventory Volunteer Training Project

Date	Milestone	Action
Week of April 3	Schedule Civic Group Presentations.	Contact Local Groups and set up a date to speak at one of their meetings.
By April 10	Schedule Volunteer Training Sessions.	Rooms and GWFM's reserved, guest speakers finalized.
Week of April 17	Begin Planning Press Conference.	Secure room, contact speakers.
April 27 - 31	Notify Press.	Send out press notifications, call to confirm attendance.
April/May	Give Civic Group Presentations.	Give presentations to interested groups to help publicize project as well as recruit volunteers.
May 3	Conduct Community Publicity Splash.	Hold a press conference to answer questions about the training workshops and data collections process.
May - June 15	Complete Volunteer Ground Water and Data Collection Volunteer Training.	Conduct the needed training sessions.
June 15 - August	Conduct Data Collection (Time needed here will vary dependent of size of inventory area(s), number of volunteers recruited and method of data collection).	Volunteers collect and compile data.
August 30	Complete Final Summary of Data.	Data turned over to Advisory Team.



Volunteer Coordinator's Guide

3 Recruiting Volunteers

▲ Introduction

This section will describe the following topics:

Benefits of Using Volunteers, and
Recruitment Strategies.

Remember that before you begin recruiting volunteers, you should have your time line well established. This means that your training sessions should already be scheduled and you should be able to clearly define job responsibilities. When you speak with potential volunteers you will need to let them know about the commitment involved in conducting the data inventory. You never want to waste the time of the volunteers, so you must be **well organized**.

▲ Benefits of Using Volunteers

Using citizen volunteers to conduct the wellhead protection area inventory is a form of outreach that increases awareness about protecting ground water resources through hands-on participation. Often, the number of people affected will be larger than the number of individual volunteers. Volunteers will most likely pass information on to their families, friends and acquaintances.

▲ Recruitment Strategies

Remember that your volunteers will come from a variety of places and with a variety of skills. The major criteria for volunteer participation are an interest and willingness to help. A technical background may be helpful, but it is not necessary.

1. Develop a list of potential volunteer outlets

It will be helpful to identify individuals or groups in your community that may be interested in public health, environmental issues or community service. Here are some potential groups to include:

- A. Public Works and Government Agencies-current employees and retirees
 - * Public utilities
 - * Gas and oil companies
 - * Environmental engineering and law firms
 - * Engineering firms and societies
 - * Army, Marine, Navy, Air Force associations
 - * Farmers and agricultural societies
 - * National Association of Retired Persons
 - * American Association of Retired Persons
 - * City, county, or state persons involved in planning, engineering, hydrology, geology, water and land use, agriculture, health.

- * Health departments
- * Department of natural resources
- * U.S. Geological Survey
- * County Agricultural Extension agent

B. Environmentally related organizations:

- * Sierra Club
- * Audubon Society
- * Idaho Conservation League
- * Garden clubs
- * Environmental issues councils
- * Environmental centers
- * Retail stores with an emphasis on outdoors (example: REI, Tri-State, etc.)

C. Other possible organizations:

- * Senior Centers
- * Local historical society
- * Gem and mineral society
- * League of Women Voters
- * Archaeological society
- * Museum groups
- * Service organizations, such as Lions, Rotary, Kiwanis, Knights of Columbus
- * Boy Scouts, Girl Scouts, Eagle Scouts, 4-H clubs

D. Schools, Colleges, and Universities

- * Local school districts, especially for middle and high school students
- * Community colleges
- * Colleges and universities, especially the departments of geology, hydrology, environmental science, engineering, urban planning.

2. Develop a volunteer recruitment package

An information packet could be sent to all the organizations listed above and to organizations or individuals expressing an interest in participating in the inventory. Many of the items that you use in this package may have already been developed by the Advisory Team.

Here is a suggested list of the items that could be included in the recruitment package.

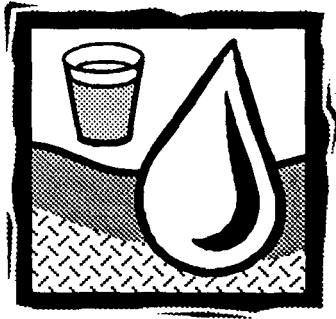
- * Explanation of the wellhead protection area inventory.
- * Brochure or a question and answer sheet
- * Detailed information about what volunteer participation may entail (use job descriptions).
- * Time line for completion of the project.

3. Publicize the volunteer recruitment

It will be beneficial to publicize the need for volunteers in a variety of ways. This publicity could go hand in hand with introducing the wellhead protection area inventory program in your community. Media releases, public service announcements, monthly water bills, press conferences and civic group presentations are all methods of publicizing and promoting the inventory.

Recruiting solely by letter is not productive. A well executed media campaign coupled with a presentation to local organizations and then followed up with a persuasive telephone call will ensure community participation in the training sessions and data collection.

Examples of flyers, letters and press releases advertising the training sessions are provided in the publicity packet, Appendix B.



Volunteer Coordinator's Guide

4 Data Collection Details

▲ Introduction

This chapter looks at each of the four methods of data collection and gives steps and examples to follow for the method(s) that are chosen.

▲ Method 1:

Collect Existing Sources of Data

Depending on the level of detail desired, much of information that you are interested in exists within public records and can be collected easily.

Procedure:

Step 1: Obtain the data that the Advisory Team decided was most important after the review of existing data as discussed in Chapter 2.

Step 2: Find out if the information at the source will be adequate, and find out how the information can be accessed. Appendix A provides a list that links potential contamination sources with the agencies that may have records that are useful to you.

In some cases, the agency that has the data may be able to send printouts of the desired data, whereas you may need to visit some agencies and look through the files. Other sources, such as telephone directories, are readily available without any special arrangements.

Note: If the volunteers will be visiting an agency, contact the person in charge of data records. Introduce yourself, explain what you are trying to accomplish, and schedule a mutually convenient date that the volunteers can perform their work.

Step 3: Design data base and/or purchase necessary maps. Write up straight forward directions for the volunteers to follow while recording/collecting data.

Step 4: Decide and plan how the time of each team of volunteers will be used. If the data can be sent to you, then perhaps the activity of the volunteers will be to locate the information on the map or input the data into a database. If a visit to an agency is necessary, go there yourself to figure out the procedure for accessing the information. Maybe you and/or your team leader should walk through the process so that you become very familiar with the material before you train volunteers.

▲ Method 2:

Personal Interviews with Public Officials or Knowledgeable Citizens

Often times valuable information, especially historical data, can be gathered through interviews with people in the community. Interviews can be conducted with:

- key officials,
- longtime residents, or
- other people who have valuable knowledge of contaminant sources.

It should be kept in mind that this method of data collection has the potential to cause concern in the community about how the data will be used. For this reason you must be very careful about who you interview and how it is approached. Try to assure people that the best option for all concerned is to know what the potential threats or hazards are and make informed decisions.

Interviewers and interviewees in the pilot test both expressed concern. They did not want to "get anyone in trouble" or to "cost anyone money" by possibly exposing a situation that needed to be remediated to protect drinking water. One interviewee decided against participating for these very reasons.

A strong educational program should help to reduce some of these concerns. People need to be aware that protecting the water that all the community members drink is more important than withholding information regarding possible leaking underground storage tanks or contaminant sources. A potential contaminant leaking into the ground/groundwater may cost more to clean up the longer it goes unnoticed. Besides the monetary costs to an individual or company, there are monetary costs to all citizens if the city has to invest in a new well or new water system. Additional repercussions may include costs to the businesses that operate in the area, drops in real estate values and quality of life may not be rated as highly.

A second way to help alleviate worry about this data collection method might be to guarantee anonymity to the interviewees. This way they can share any information they have without worrying that it will be

connected back to them. As far as business owners go, help them to realize that there is a certain responsibility that they have to run their businesses according to Best Management Practices.

Finally, when using historical interviews there is a chance that some facts or locations may be remembered inaccurately. For this reason, it is important to confirm locations with either another source, old records or old aerial photographs.

Procedure:

Step 1: Define the data that the Advisory Team would like to have collected through the interviews.

Step 2: Make a list of the potential interviewees.

Step 3: Develop an introductory explanation of why the interview is being conducted, what type of information is desired, how the information will be useful, and how the information will ultimately be used. You should be able to use the goals and objectives of the project developed by the Advisory Team.

Step 4: Develop a list of questions or a questioning strategy. Ask questions that are explicit and as simple as possible. Give examples wherever necessary to clarify your question. Below are some guiding questions.

Step 5: Choose the volunteer(s) for this activity carefully. Use people who are comfortable talking to those with whom they may not be familiar. Volunteers should be courteous, efficient and knowledgeable enough to record information on several different types of potential contaminant sources.

Sample Questions for Personal Interviews

- Do you remember any businesses or activities, that dealt with hazardous chemicals, that took place in the community and are no longer here?
- Where was the business or activity located?
- What were the years that it operated?
- Do you know much about the type of business or activity?
- Did it change to what we now see, or was there another change?
- If there was another change, what years did it operate and what was involved?
- Is there someone else who may have additional information about this business or activity?

If it was an old landfill or dump, you may want to include the following questions.

- What type of material was disposed of?
- Was it municipal wastes, industrial wastes, cull wastes?
- Do you know when the landfill or dump was closed?
- Did the owner work with the state to make sure it was closed properly?

Questions related to abandoned wells.

- Do you know of any wells that are no longer in use and where they are located?
- Do you know whether the well was filled in with concrete or if it only has a cover?
- Who owned the property when the well was drilled?
- Do you know who owns the property now?
- How old is the well and how deep is it?

Questions related to accidents.

- Do you remember any accidents in which substances like oil, gasoline, road salts, or chemicals were released?
- If so, where, when, and how did the accident happen?
- Is there someone who may have additional information on this accident?

Step 6: Schedule the interview(s). If needed and/or possible, send the introductory explanation and any other helpful material to your interviewee at least one week prior to the interview.

Step 7: Have volunteers practice mock interviews with you or another volunteer.

Step 8: Perform the interview. Have the volunteer(s) go over the explanation before starting and ask if there are questions. Once it is clear that the project is understood, proceed with the interview. Record and date the responses. Also, if there are no objections, record the name of the interviewee and if pertinent, their title. It may be useful to ask permission to tape record the interview.

Figure 9. Sample Interview Request Information Flyer

Interview Request Information Flyer

Why are we requesting an interview?

Our community is working on a project to help the process of planning growth and development so that our drinking water supplies are protected. To assist in this process we want to compile historical land use information. Facilities that are no longer in business sometimes may have used practices, which were acceptable at the time, that we are now finding to cause ground water contamination years later. This can affect the quality of our drinking water because all of our drinking water comes from ground water.

Since you have been a longtime resident of the community, it is felt that you may be able to help us identify this information.

What type of information are we looking for?

We are interested in information such as the location of former:

- gasoline stations because of the old underground storage tanks,
- landfill or dump sites,
- businesses that may have used chemicals, or
- wells that are no longer used.

These are by no means the only type of historical information of interest, but are common examples of past land uses within many communities.

How will the information be used?

(Have your Advisory Team help you write this)

Any information obtained will be used to protect the community's drinking water, either for use in planning future wells or to protect existing ones. If there are potential contaminants found leaking into the ground, the sooner they are found or cleaned up, the cheaper for all concerned.

If you are willing to be interviewed, or have additional questions, contact:

(Volunteer Coordinator's Name, Phone Number)

Step 9: Thank the interviewee both verbally and in writing. A sample letter is given (see Figure 10).

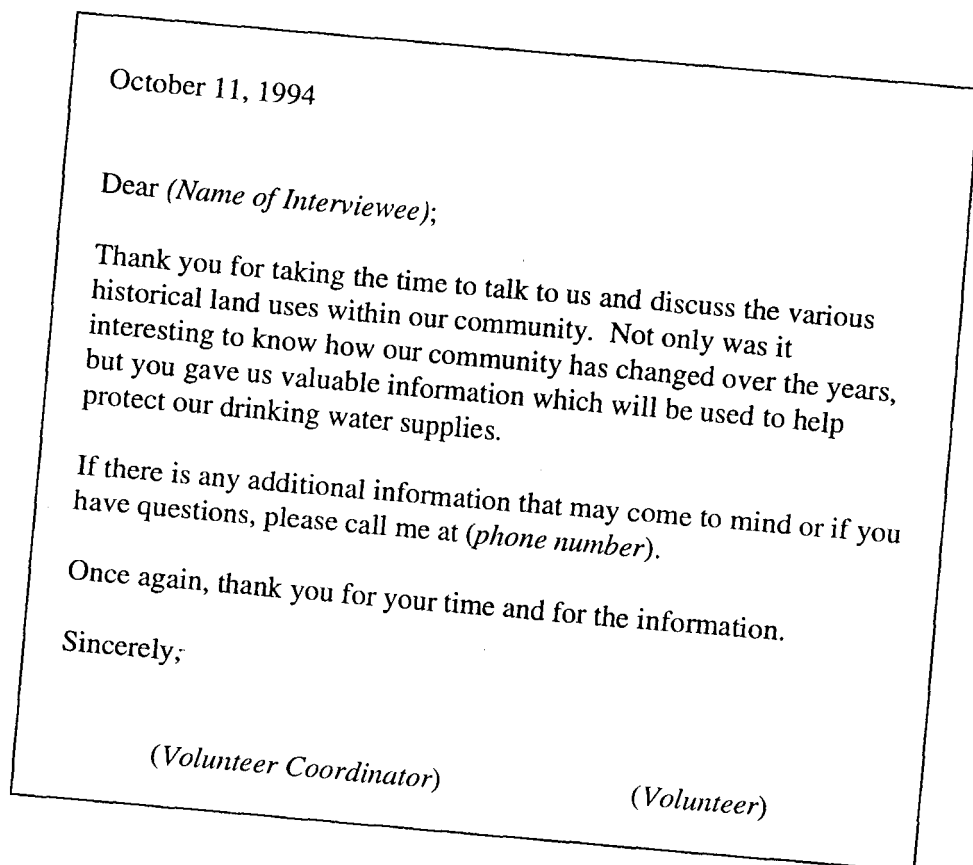
▲ **Method 3:**
**Telephone or Mail Surveys of
 Businesses and Landowners**

Be aware that methods, such as telephone and mail surveys, are labor intensive. Also, be aware that the "door-to-door" survey methods can generate uneasiness within the community because of the perception of how the information will be used and the general

sense of private property rights. Be sure to have the direction for data collection set by the Advisory Team and publicize the project very carefully if you choose these methods. Data collection using these methods was not used in the pilot test of this project. However, we have provided a sample telephone survey script and mail survey cover letter to start the process. If you are interested in these methods, the following reference may be useful:

Dillman, D.A. (1978). *Mail and Telephone Surveys - The Total Design Method*. New York: John Wiley & Sons.

Figure 10. Sample Thank You Letter to Interviewee



Sample Telephone Survey Script

Hello. My name is _____ and I am a volunteer with the (name of your community) Wellhead Protection Area Program. This program is designed to allow the citizens of our community to take an active role in maintaining our ground water quality. To do this (name of your community) has designated protection areas around our public water supply wells. As a volunteer, I would like to enlist your participation in this program this evening. May I ask you a few questions?

If they say yes:

We are conducting a telephone survey of a random sample of people in this Wellhead Protection Area to ask them questions about potential sources of contamination to the drinking water supply. The information collected this evening will be used to develop management strategies to protect the quality of our drinking water. I am going to ask you if you know about any potential contaminants such as abandoned wells or large quantities/releases of chemicals that exist on your property or in your neighborhood.

- Use the data collection form to ask the questions and to record their responses (see Appendix E).
- Begin with a question about the location and fill out the correct line at the top of the data form.
- Change the list of potential contaminant sources as necessary.

Thank you very much for your time and information. Do you have any questions?

Answer their questions to the best of your ability; use the information in your packet. You can take their phone number and ask someone you feel is more knowledgeable about the subject call them back if the questions are too technical.

If they say no:

I believe this will only take 5 minutes. Then proceed.

If they still do not have the time:

May I call you on name a date and time of the next scheduled telephone survey session? Thank you and Good Evening.

If they are resisting for other reasons than time:

May I mail you a survey with some information that you could fill out at your convenience? Let me make sure I have your address. Record address. Thank you and Good Evening.

If they are resistant to participating at all:

Thank you and Good Evening.

Figure 11. Sample Mail Survey Cover Letter

Date:

Dear Local Citizen,

In our community, we rely upon ground water as our primary source of drinking water. We are taking a pro-active approach to assure that the drinking water in our community maintains its good quality.

One important step towards protecting ground water is to inventory existing land uses within a defined area around our community drinking water wells. This inventory is an integral part of our local wellhead protection program.

Please read through the enclosed information and fill in the data form for your property. This information is critical to the development of an inventory map which is being prepared for ground water protection planning purposes only.

Please feel free to contact the Advisory Team chairperson (name) at _____ if you have any questions about the enclosed information or the wellhead protection program.

Thank you for your timely completion of this data form. Your participation will help us protect our drinking water supplies.

Sincerely,

▲ Method 4:

Visual Surveys

Visual surveys are often useful for confirming data collected from other sources or can be used to locate potential sources of contamination that are difficult to find through other methods. This method could be used, for example, to verify the location of abandoned wells when the well location was initially provided by the land owner or to ground proof geologic features plotted on a map. (Most geologic maps will have been field mapped to begin with, but there may be a need to see if anything has changed, especially if the map is old.)

In some cases it may be easier to map well locations and geologic features in the field. Instruments that will be useful in this work are an altimeter and/or a Global Positioning Satellite (GPS) receiver. Specific details for using these techniques for data gathering in a wellhead protection area can be found in Pierce (*in progress*).

Procedure:

Step 1: Define the purpose(s) for conducting a visual survey. Your Advisory Team should provide direction on this.

Step 2: Determine the area that will need to be covered in the survey. Anticipate whether much driving will be involved. If so, plan to have the volunteers record the mileage and plan to reimburse them.

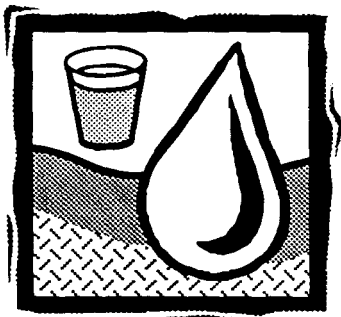
Step 3: Develop the necessary forms or checklists that will help the volunteers look for the proper information.

Step 4: Develop a volunteer packet that includes the form/checklist, paper for sketch maps, pens, pencils, erasers, clipboard, etc. Depending on the area, you may want to provide some change so that the volunteers can call to you to ask questions.

Step 5: Schedule the date to conduct the inventory. Select an alternative date if inclement weather may be a factor.

Step 6: Organize the volunteers in teams. Give each team a specific assignment(s) and review the materials in the volunteer packet. If needed, you may want to demonstrate data collection in the field before the volunteers disperse in groups.

Step 7: Conduct the visual survey.



Volunteer Coordinator's Guide

5 Volunteer Training & Recognition

▲ Workshop Goals

The volunteer workshops will be used to provide the information, tools and motivation needed to complete the inventory. The prospective volunteers should understand that this is their community's project and that the data collected by them will be used in a meaningful way.

The two overall goals for the training session are to:

- Increase the volunteer's understanding of basic ground water concepts and the importance of drinking and ground water protection in their community. (Workshop #1: Ground Water Education Workshop)
- Prepare the volunteers for the data collection process. (Workshop #2: Data Collection Training Workshop)

This chapter consists of three sections:

- General Workshop Information
- Preparing for the Volunteer Training Workshops
- Volunteer Recognition

Chapter 6, Ground Water Education Workshop provides the details needed for preparing and presenting Workshop #1. Each activity that you will use in the Ground Water Education Workshop is clearly explained with equipment lists and step by

step procedures. The Ground Water Education Workshop chapter consists of 8 activities. To use all eight of the activities in this format, it is suggested that the workshop occur during a 3 to 3 1/2-hour session.

▲ General Workshop Information

If you have never facilitated a workshop before, or have little experience in leading a group, the following provides good background preparation.

Workshop definition

A workshop is an organized instructional experience. Ideally workshops:

- are designed to meet the interests and needs of participants;
- are engaging, lively, and fun;
- develop the knowledge, skills and interests of those who participate;
- are based on credible, fair and accurate foundations of knowledge;
- are designed to honor diverse styles of teaching and learning; and
- prepare participants to do something real and of value as a result.

Know your audience

Every workshop should be designed for its intended audience. That may sound like common sense, however, too often, it's easy to fall into a frame of mind that lets us get so excited about what we have to offer, we forget to think about who might be interested. Design the communication and activities so that they will be interesting to a diverse group of people. The activities in Chapter 6 use a variety of teaching techniques to do this.

Communicate clearly

A good workshop is planned around three basic elements:

First, present a clear and simple overview of the project, covering only four or five major points. Use the workshop to help participants understand the complexity of ground water and provide time for discussion and exploration.

Second, provide tools that help individuals organize their thoughts and facts about the information. Provide educational tools to provide a conceptual framework (ground water flow model), then introduce research materials and/or speakers (brochures, overhead transparencies, slides, geologists, hydrologists) and techniques for taking action (skills necessary to perform the inventory).

Third, give the volunteers a sense that they can take action through this program and make a difference.

Present information in a variety of ways

Materials are presented in a variety of ways so that different types of learners in a group can become actively engaged. Early research by Malcolm Knowles explored how adults retain information.

He found that individuals who use hearing only in an experience will retain only 20 percent of what is presented. Using hearing and sight increases retention to 40 percent and participating in a process increases retention to 80 percent.

Be a good listener

Facilitators need to monitor participants during activities to make sure each person can participate and make allowances for special needs. For example, the facilitator might move a small group who has a hearing impaired member to a quieter area. If one or two participants seem to monopolize discussions, the facilitator could change the makeup of the small groups for each activity. This provides breaks and adds variety to discussion through different small-group dynamics.

▲ Preparing for the Volunteer Training Workshops

You will need to schedule one 3 1/2 hour time period for the first workshop and then several shorter training sessions to teach the various data collection tasks.

The objectives of the Workshop #1: Ground Water Education Workshop are to:

- Provide a general introduction about ground water and ground water contamination.
- Describe the specific volunteer opportunities and make assignments.

The objectives of the Workshop #2: Data Collection Training Workshops * are to:

- Orient volunteers to their specific duties.
- Prepare volunteers to conduct a specific piece of the inventory.

Figure 12. Suggested Workshop Agenda

Ground Water Education Workshop Agenda	
6:00 PM	Check in, welcome and introduction, Icebreaker Activity 1: Questions and Storytelling
6:15	Activity 2: An Incredible Journey Activity 3: A Drop in the Bucket
6:40	Activity 4: Predicting the Amount of Personal Water Use
6:50	Activity 5: Ground Water Flow Model
7:20	BREAK
7:30	Presentation by local expert
8:15	Activity 6: Potential Contaminant Sources
8:30	Activity 7: Review of Wellhead Protection Planning Process
8:45	Activity 8: Review of Potential Volunteer Jobs

** It is recommended that separate training sessions be scheduled for each group of volunteers who are assigned a specific task.*

Suggested Schedule Workshop #1:
Ground Water Education Workshop

Figure 12 shows the suggested workshop agenda. Please see Chapter 6 for the entire Ground Water Education Workshop packet. It contains a preparation checklist and detailed lesson plans.

Suggested Schedule Workshop #2:
Volunteer Data Collection Training Sessions

The agenda and content of information presented for these training sessions will be much different than Workshop 1. Conduct these training sessions in a location that will be pertinent to the tasks or techniques you need to teach (around a computer, in a map room, classroom, etc.). Regardless of the data collection procedures, here are some general guidelines that will help you prepare your training sessions.

1. Prepare an inventory packet for each volunteer team.

Chapter 4, Data Collection Details, should help you to determine what is pertinent to include in the packet. Develop packets that include items necessary for the teams to accomplish their assignments. The packet may include concise instructions, checklist(s), inventory form(s), map(s), and pens/pencils.

If the volunteers will have contact with the public, they will also need name tags, and program brochures or a question/answer sheet to help explain the project.

2. Plan a training session for each volunteer team.

A training session should be held before the team begins to work. Review the team assignment, and demonstrate the task that is to be accomplished. Be sure to allow plenty of time for questions and plan to bring in technical staff from private and/or government agencies to answer questions, if needed.

3. Consider choosing a leader for each team.

This person can help with the coordination efforts of the project by working with the other leaders and reporting progress to you, especially if you are using a large number of volunteers. Wherever possible, try to match the skills of the person with the assignment. For example, you may have a retired well driller that is familiar with well logs who can help direct a group in reading wells logs and locating public and non-public drinking water wells.

4. Schedule data collection activities on different days so you can focus your attention on supervising a few assignments at a time.

Remind the volunteers of the date, time, and location with a phone call to ensure participation.

5. If you are using team leaders, keep in regular contact with them.

Give team leaders feedback to encourage their progress, assist in solving any encountered problems, and keep their supplies stocked.

▲ Volunteer Recognition

Recognition for volunteers is an essential component of any successful volunteer project. Listed below are some ways that ground water protection volunteers have been recognized in other programs (Madarchik 1992).

1. Certificates of appreciation from the City, or the state water agency.
2. Recognition luncheon for all ground water participants.
3. Mileage reimbursement where possible.

4. Recognition of individual volunteers in the media, through TV, news, radio, and/or talk shows, and feature stories in newspapers and newsletters.
5. Submitting application as "Volunteer of the Year" with the city or other well known entity.
6. Offering opportunities to volunteers to speak about the project at environmental and other conferences.
7. Be sure to recognize all the participants. It could be a written thanks or a verbal thanks by an elected official, or could be an appropriate memento such as a mug, key chain, or T-shirt.
8. Personal letters of thanks could be sent from the state water agency director, the mayor, or other notables.
9. Offer opportunities for further research after the project with water utilities, environmental agencies, planning departments.

Figure 13. Sample Volunteer Thank You Letter

October 11, 1994

Dear *(Name of Volunteer)*;

Thank you very much for helping us to inventory various potential sources of contamination which are located over our drinking water aquifer. Your efforts have helped *(name of community)* save funds which would have otherwise been needed to accomplish this project. The information you helped compile will assist our local decision makers to plan the growth and development of our community and work to ensure the protection of our drinking water.

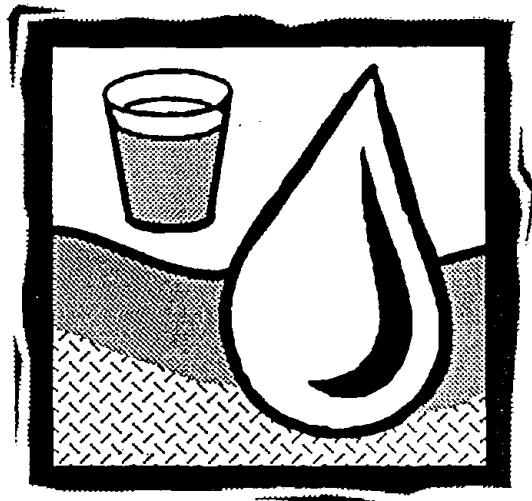
We hope that your time was well spent and you now have a better understanding of our valuable ground water resources. Please feel free to call me at *(phone number)* if you have any questions.

Again thank you for your help.

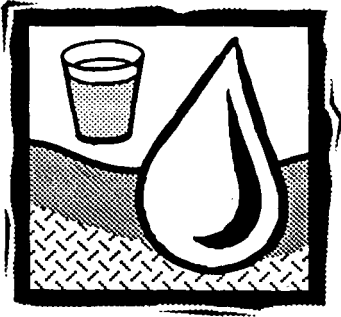
Sincerely,

(Volunteer Coordinator)

Volunteer Coordinator's Guide



This section of the manual is written for the Volunteer Coordinator to plan and carry out the wellhead area inventory with the assistance of volunteers.



Volunteer Coordinator's Guide

6 Ground Water Education Workshop

▲ Introduction

This chapter contains all the information necessary to plan, organize and conduct the Ground Water Education Workshop. The first section contains a series of check lists of organizational details. Following that you will find four workshop sections that contain lesson plans for a total of 8 activities for use in the workshop.

▲ What to do to be Ready for the Workshop

A specific list of what you will need to do to be ready to present the workshop is given below. Start planning and organizing early to guarantee success.

A month before the workshop

- Reserve the site for the workshop.
- Familiarize yourself with the lessons in the Ground Water Education Workshop packet and design the workshop schedule.
- Secure guest speaker(s).
- Reserve the equipment needed for the workshop, such as the ground water flow model and the equipment needed for the guest speaker, i.e. overhead projector, screen, slide projector.

- Make a comprehensive list of the equipment needed. Here is a beginning:
 - * Large pad or sheets of paper and easel(s).
 - * Large marking pens (multiple colors).
 - * Masking tape.
 - * A clock or watch for keeping time.
 - * Additional information about water quality, your organization, or other resources participants might be interested in as free or reference materials.
 - * Workshop packet for each participant.
 - * Extra pens and pencils.
 - * Name tags.
 - * Specific supplies as described for each activity. Look in the workshop packet for details.
- Plan refreshments.
- Seek funding assistance, if needed.
- Seek other people's assistance for workshop, if needed (i.e. bringing in refreshments, helping with set up and cleanup).

Two weeks before the workshop

- Reconfirm all the plans for the facility, equipment and food arrangements.
- Be sure you have all the equipment needed for each activity.
- Reconfirm speakers, send them an agenda.

One week before the workshop

- Remind your volunteers of the date and time of the workshops.
- Get an exact number of committed participants.
- Photocopy all the handouts needed for the workshop participant packets.
- Practice each lesson.
- View the ground water flow model video and practice your demonstration.
- Make name tags.
- Make signs for the door of the meeting place to let people know they are in the right place.

One or two days before the workshop

- Set up room with podium, refreshment table, registration table.
- Arrange tables for small groups - no more than 5 chairs per group.
- Gather supplies (from above list).
- Test equipment.

The day of the workshop

- Plan to arrive early to the workshop site to avoid delays in starting.
- Put up signs for the door of the meeting place to let people know they are in the right place.
- Set up registration table with sign-in sheets, pencils, name tags, and markers.
- Put easel with large writing paper pad (newsprint pads work well) at front of room where it will be visible to all participants.
- Post the workshop agenda at the front of the room.
- Set up supplies for the various activities.
- Arrange table and chairs so all participants will be able to see and hear.

- Set up refreshment area
- Set up information table.
- Put on your name tag.

During the workshop

- ***Start on time!***

If you've followed the above steps, you'll be prepared to conduct the training sessions. So relax, smile and have fun! The activities are set up to build a common understanding of what ground water is, how it can become polluted and why wellhead protection is needed.

- Facilitate the activities, follow the lessons in this chapter.
- Present certificates of participation .

After the workshop

- Remove all equipment and signs.
- Keep in touch with your volunteers to monitor progress on the project.
- Pat yourself on the back for a job well done.

▲ Rough Time Table for Activities

To accomplish all the activities at a reasonable pace, a 3 1/2 hour workshop is recommended. A three hour workshop is possible, but you will need to keep a close watch on the time and do shortened versions of some of the activities. During a three-hour pilot test with the following activities, participants worked on the ground water flow models through their 15 minute break. Participants had so many questions for the local hydrogeologist, that one of the later activities had to be dropped. Be aware that some of the activities will take longer with larger groups.

Figure 14. Proposed Time Table

Activity	Time
1. Sign-in and Ice Breaker/Introduction	15 minutes
2. Incredible Journey or Water Cycle Drawing and A Drop in the Bucket	20 - 30 minutes
3. Personal Water Use	10 minutes
4. Ground Water Flow Model	30 - 40 minutes
5. Local Expert	30 - 45 minutes
Break	10 - 15 minutes
6. Potential Sources of Contamination	15 - 20 minutes
7. Wellhead Protection Planning Process	10 - 15 minutes
8. Volunteer Opportunities and Conclusion	15 minutes

Section 1

Introductory Activities

Purpose:

To get the group working as a team and to introduce basic water concepts.

Instructions:

Begin with a short introduction about yourself, the Advisory Team as well as the importance of and misunderstandings about ground.

Introduce your group to the idea that this workshop is participatory.

The activities are set up to build a common understanding of what ground water is, how it can become polluted and why wellhead protection is needed.

The Introductory activities consist of:

Activity 1. Ice Breaker

Questions and Storytelling or Mini-Introductions

Activity 2. The Incredible Journey or Water Cycle Drawings

Activity 3. A Drop in the Bucket

Time Needed:

You should spend no more than 45 minutes (cumulative) on these three activities.

We encourage you to use all three of the activities. However, the amount of time you have may be a limiting factor.

If the group you are preparing the training for has never worked together, you should probably plan on doing Questions and Storytelling or Mini-Introductions as a mixer, before The Incredible Journey and/or A Drop in the Bucket.

If the group has worked together, you could probably move directly into The Incredible Journey/Water Cycle Drawings and/or A Drop in the Bucket.

Each activity has its own lesson plan for you to follow.

Activity 1A

Ice Breaker: Questions & Storytelling

▲ Introduction

This activity can be done while people are checking in. It requires everyone to get out of their seats to move around and ask questions of people they do not know.

NOTE:

It may be fun to offer an incentive for the first person who fills up the form. Incentives can include pins, T-shirts, stickers, etc. related to ground water.

▲ Purpose

To get the group acquainted.

▲ Preparation

1. Photocopy the "Questions and Storytelling" handout (Figure 15) on bright-colored paper.
2. Gather at least one pen or pencil for each person in the group.

▲ Procedure

1. Distribute "Questions and Storytelling" handout.
2. Introduce the game by explaining that the object is to collect signatures from the rest of the group. The only way to collect a signature is to ask a person questions. For example:

Person A asks person B: Have you ever been snorkeling in tropical waters? If Person B, says YES, Person B can sign the form of the Person A on line 23. If person B says NO, Person A can ask Person B another question.
3. A person can collect only one signature from each person.

Figure 15. Questions and Storytelling Handout

"Questions and Storytelling"

Please ask questions and have each person sign your form.

1. _____ drinks eight glasses of water a day.
2. _____ owns a boat and motor.
3. _____ knows how much his/her family paid for water last month.
4. _____ has witted for underground water or dug a well by hand.
5. _____ can tell a fish story or has caught a whopper of a fish.
6. _____ has come from more than 50 miles to this workshop.
7. _____ sings in the shower.
8. _____ was once a lifeguard.
9. _____ has hauled water with a bucket.
10. _____ has eaten a goldfish.
11. _____ can name a song that says something about water.
12. _____ has watched a fish spawning operation.
13. _____ has toured a water purification or waste water treatment plant.
14. _____ owns a lake cottage.
15. _____ did not water the lawn last summer.
16. _____ has water that tastes funny.
17. _____ irrigates his/her crops.
18. _____ is a dust bowl baby (1930-1940).
19. _____ has been in a flood.
20. _____ has a water right.
21. _____ leaves the water running when brushing his/her teeth.
22. _____ has a fishing license with them.
23. _____ has snorkeled in tropical waters.
24. _____ has lounged in a natural hot springs.

Activity 1B

Ice Breaker: Mini-Introductions

▲ Purpose

To get the group acquainted and to highlight the reasons why learning about and protecting ground water are important.

▲ Procedure

1. If possible arrange the group so everyone can see each other. Putting desks or chairs into a circle works well, or if the group is in a lecture hall type setting, perhaps have them all join you up front in a circle.
2. Ask everyone to think of no more than a 2 minute introduction for themselves including their name and the reason why they decided to participate in the Ground Water Education Workshop.
3. After you start the introductions off by introducing yourself, continue around the group until all have participated.

Activity 2A

The Water Cycle: An Incredible Journey

▲ Purpose

To review the water cycle and introduce the age of water.

▲ Materials

- * photocopy of the ticket masters
- * 7 signs as described below
- * tape
- * whistle
- * jar of water
- * glue sticks
- * scrap paper
- * flip chart paper/black board and appropriate writing utensils
- * 7 containers to hold tickets

▲ Preparation

1. Photocopy ticket masters on different colors of paper. The number of copies needed is indicated on the bottom of each ticket master page.
2. Cut tickets with a paper cutter.
3. Collect 7 containers to place the tickets in (margarine or yogurt containers work well). Place all Lakes and Rivers tickets in one container, all Oceans and Seas tickets in another container, continue until all tickets are sorted into their own container.

4. Prepare for a group of 30 by sorting some of the tickets in this way:

Tickets	Total	Begin
Clouds	144	4
Oceans and Seas	120	10
Glaciers and Icecaps	42	6
Ground water	24	5
Lakes and Rivers	18	2
Plants	08	2
People and Animals	18	1

Put the "Begin" tickets in an envelope. You will hand these out to start the game. If you have more or less than 30 people adjust the number of tickets in the envelope proportionately.

5. Make 7 signs, one of each of the following:

Clouds
Oceans and Seas
Glaciers and Icecaps
Ground water
Lakes and Rivers
Plants
People and Animals

- Before the group arrives, post the signs around the meeting room and place the matching containers with tickets in them, below the signs. Put your whistle in your pocket.

▲ Procedure

- Hold up jar of water and ask "How old is this water?"

Depending on the knowledge level of your group, there may be a range of answers and some discussion about how long it has been in the jar, where it came from, etc. Of course, someone will probably answer correctly and say, "As old as the earth itself." You can then suggest that the water is the same water the dinosaurs drank, etc. Water has been cycled through the system since the beginning of time, taking many journey's through the water cycle.

- Ask the group, "Where does water rest during the water cycle?"

As they brainstorm, write on flip chart paper what they say. You should end up with a list that is similar to the 7 signs that are posted around the room.

- Tell the group they are going to become water molecules and take a journey through time and the water cycle. Give out the tickets that you have prepared in the envelope and have each player stand by the sign that matches their ticket.

Explain the rules:

Each time the whistle blows, they must follow the directions on their tickets and move or stay put, as directed. When they arrive at a new place they should pick up a new ticket. As they move through the journey tell the players to keep the tickets they collect in the order in which they collected them. If a container runs out of tickets, the player should evaporate into the clouds.

- Ask for any questions and begin. Blow the whistle a total of 10 to 15 times.

Optional:

Place some black dots on some of the tickets before playing the game, to see how contaminated water moves through the system, where does it get cleaned, where does it impact something else?

- When the groups return to their seats, have them glue their journeys onto the scrap paper provided. Ask some questions: Did they all have the same journey? How long would these journeys really take? Ask some people to share their journeys or share the story in Figure 16.
- This activity leads nicely into "A Drop in the Bucket."

This activity is borrowed from Project WET Idaho.

Figure 16. Journey Story

It all started in Egypt where Little Richie the rain drop was flowing along happily in the Nile. He noticed he was starting to get hot and he tried to get to the bottom, but he was too late. He started to evaporate.






















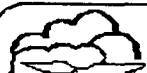

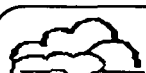
"Oh, man, I hate this," he said as he floated away and collected in a cloud. But it just wasn't his day, he was all the cloud needed and he started falling and fell into a Palace fountain. He immediately got scooped up by Old King Tut's drinking glass and got chugged right down.

"Growdy," said Little Richie. Once he got down he got in line and bought a first class ticket out. But first he had to make it through the super maze. It was a cinch. The next thing he knew, he was flying down an ancient toilet and was back in the Nile and tumbling into the Mediterranean Sea.

He was tired, so he went to sleep, when he woke up he was in a cloud somewhere above the Yukon, every raindrops worst nightmare. He was about to become a glacier. He started to fall and then he froze into a glacier and fell into a hopeless trance until he melted.

When he awoke, it was the year 2020, and he was floating somewhere in the middle of a skyway and got stuck in the bumper of a Buick. He then fell into Idaho and splashed into Spring Valley Reservoir and lived happily ever after, taking tours through fish.

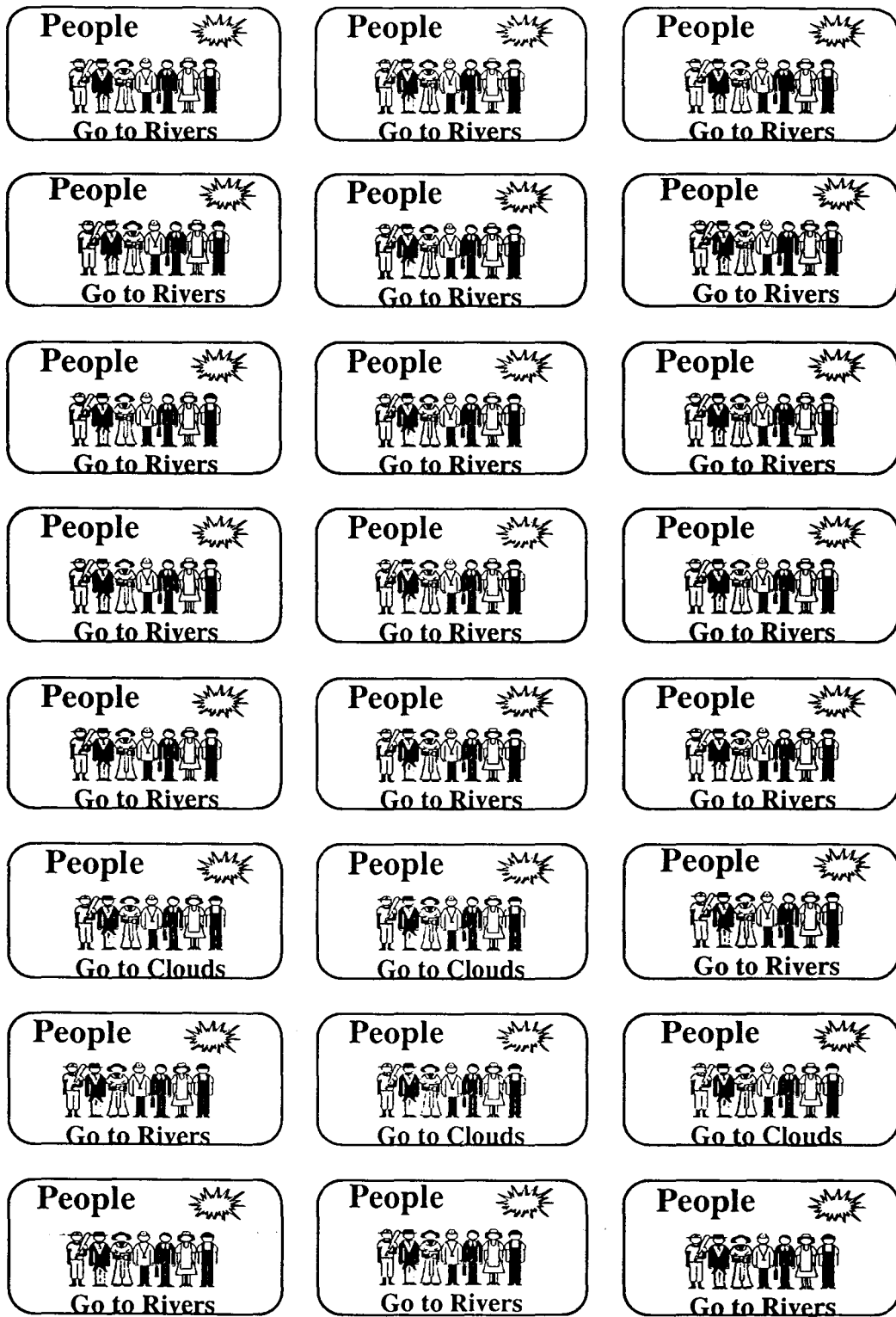
Justin Bortz, April 23, 1991

 Clouds Rain onto an Icecap	 Clouds Rain onto an Icecap	 Clouds Rain onto an Icecap
 Clouds Rain onto Plants	 Clouds Rain onto Plants	 Clouds Rain into a Person
 Clouds Rain and soak into the Ground	 Clouds Rain and soak into the Ground	 Clouds Rain into a Lake or River
 Clouds Rain and soak into the Ground	 Clouds Rain and soak into the Ground	 Clouds Rain and soak into the Ground
 Clouds Rain into the Ocean	 Clouds Rain into the Ocean	 Clouds Rain into the Ocean
 Clouds Rain into the Ocean	 Clouds Rain into the Ocean	 Clouds Rain into the Ocean
 Clouds Rain into a Lake or River	 Clouds Rain into a Lake or River	 Clouds Rain into a Lake or River
 Clouds Rain onto Plants	 Clouds Rain onto Plants	 Clouds Rain onto Plants

Make 6 Copies of this Page on White Paper

Plants Transpire to Clouds next turn.	Plants Transpire to Clouds next turn.	Plants Transpire to Clouds next turn.
Plants Transpire to Clouds next turn.	Plants Transpire to Clouds next turn.	Plants Transpire to Clouds next turn.
Plants Transpire to Clouds next turn.	Plants Transpire to Clouds next turn.	Plants Transpire to Clouds next turn.
Plants Transpire to Clouds next turn.	Plants Transpire to Clouds next turn.	Plants Transpire to Clouds next turn.
Plants Transpire to Clouds next turn.	Plants Transpire to Clouds next turn.	Plants Transpire to Clouds next turn.
Plants Transpire to Clouds next turn.	Plants Transpire to Clouds next turn.	Plants Transpire to Clouds next turn.
Plants Eaten by People or Animals	Plants Eaten by People or Animals	Plants Eaten by People or Animals

Make 1 Copy of this page.



Make 1 Copy of this page.



Oceans
Stay 2 turns then
Evaporate to
Clouds



Oceans
Stay 2 turns then
Evaporate to
Clouds



Oceans
Stay 2 turns then
Evaporate to
Clouds



Oceans
Stay 3 turns then
Evaporate to
Clouds



Oceans
Stay 3 turns then
Evaporate to
Clouds



Oceans
Stay 3 turns then
Evaporate to
Clouds



Oceans
Stay 3 turns then
Evaporate to
Clouds



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Evaporate to
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Evaporate to
Clouds



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Evaporate to
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Evaporate to
Clouds

Oceans
Stay 3 turns then
Evaporate to
Clouds



Oceans
Stay 4 turns then
Evaporate to
Clouds



Oceans
Stay 4 turns then
Evaporate to
Clouds



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Evaporate to
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Evaporate to
Clouds



Oceans
Stay 4 turns then
Evaporate to
Clouds



Oceans
Stay 4 turns then
Evaporate to
Clouds



Oceans
Evaporate to
Clouds



Oceans
Stay 5 turns then
Evaporate to
Clouds





















Oceans
Stay 5 turns then
Evaporate to
Clouds



Oceans
Evaporate to
Clouds

Make 5 Copies of this page.

 <p>Icecaps Stay 3 turns Go to River on 4th turn.</p>	 <p>Icecaps Stay 3 turns Go to River on 4th turn.</p>	 <p>Icecaps Stay 2 turns Go to River on 3rd turn.</p>
 <p>Icecaps Stay 3 turns Go to Ocean on 4th turn.</p>	 <p>Icecaps Stay 2 turns Go to River on 3rd turn.</p>	 <p>Icecaps Stay 2 turns Go to River on 3rd turn.</p>
 <p>Icecaps Stay 3 turns Go to Clouds on 4th turn.</p>	 <p>Icecaps Stay 3 turns Go to Clouds on 4th turn.</p>	 <p>Icecaps Stay 3 turns Go to Ocean on 4th turn.</p>
 <p>Icecaps Stay 4 turns Go to Ocean on 5th turn.</p>	 <p>Icecaps Stay 4 turns Go to Ocean on 5th turn.</p>	 <p>Icecaps Stay 4 turns Go to Ocean on 5th turn.</p>
 <p>Icecaps Stay 2 turns Go to Ocean on 3rd turn.</p>	 <p>Icecaps Stay 2 turns Go to Clouds on 3rd turn.</p>	 <p>Icecaps Stay 2 turns Go to Clouds on 3rd turn.</p>
 <p>Icecaps Stay 4 turns Melt into the Ground on 5th turn.</p>	 <p>Icecaps Stay 4 turns Melt into the Ground on 4th turn.</p>	 <p>Icecaps Stay 2 turns Go to Plants on 3rd turn.</p>

Make 2 Copies of this Page

Groundwater
Stay 3 turns
Go to People
on 4th turn.

Groundwater
Stay 3 turns
Go to People
on 4th turn.

Groundwater
Stay 2 turns
Go to People
on 3rd turn.

Groundwater
Stay 4 turns
Go to Rivers
on 5th turn.

Groundwater
Stay 4 turns
Go to Rivers
on 5th turn.

Groundwater
Go to River
next turn.

Groundwater
Stay 2 turns
Go to People
on 3rd turn.

Groundwater
Stay 2 turns
Go to People
on 3rd turn.

Groundwater
Stay 2 turns
Go to People
on 3rd turn.

Groundwater
Go to People
next turn.

Groundwater
Stay 1 turn
Go to People
on 2nd turn.

Groundwater
Stay 1 turn
Go to People
on 2nd turn.

Groundwater
Stay 2 turns
Go to People
on 3rd turn.

Groundwater
Stay 2 turns
Go to People
on 3rd turn.

Groundwater
Stay 2 turns
Go to People
on 3rd turn.

Groundwater
Go to River
next turn.

Groundwater
Stay 3 turns
Go to People
on 4th turn.

Groundwater
Stay 2 turns
Go to People
on 3rd turn.

Groundwater
Stay 4 turns
Go to Rivers
on 5th turn.

Groundwater
Stay 3 turns
Go to Rivers
on 4th turn.

Groundwater
Stay 1 turn
Go to Rivers
on 2nd turn.

Groundwater
Stay 4 turns
Go to Rivers
on 5th turn.

Groundwater
Stay 3 turns
Go to Rivers
on 4th turn.

Groundwater
Stay 2 turns
Go to People
on 3rd turn.

Make 1 Copy of this Page

Lake or River Go to People next turn.	Lake or River Go to People next turn.	Lake or River Go to People next turn.
Lake or River Go to People next turn.	Lake or River Go to People next turn.	Lake or River Go to People next turn.
Lake or River Go to Ocean next turn.	Lake or River Go to Ocean next turn.	Lake or River Go to Ocean next turn.
Lake or River Go to Ocean next turn.	Lake or River Go to Ocean next turn.	Lake or River Go to Ocean next turn.
Lake or River Go to Plants next turn.	Lake or River Go to People next turn.	Lake or River Go to People next turn.
Lake or River Go to Ocean next turn.	Lake or River Go to People next turn.	Lake or River Go to People next turn.
Lake or River Go to Ocean next turn.	Lake or River Go to Ocean next turn.	Lake or River Go to Ocean next turn.

Make 1 Copy of this Page

Activity 2B

The Water Cycle: Water Cycle Drawings

▲ Purpose

To review the water cycle and introduce the age of water.

▲ Materials

- * butcher paper
- * markers

▲ Procedure

1. Hold up jar of water and ask "How old is this water?"

Depending on the knowledge level of your group, there may be a range of answers and some discussion about how long it has been in the jar, where it came from, etc. Of course, someone will probably answer correctly and say, "As old as the earth itself." You can then suggest that the water is the same water the dinosaurs drank, etc. Water has been cycled through the system since the beginning of time - taking many journey's through the water cycle.

2. Break participants into small groups, give each group a piece of butcher paper and have them draw their picture of the water cycle. Do not give them a list, but ask them to include all possible components.
3. Use their drawings to begin a discussion of the places water travels and the processes it goes through. Be sure to acknowledge any groups that accurately depict ground water as being stored in the pores and cracks in rock or sediment and not in an underground lake or river. This activity will lead easily into "A Drop in the Bucket."

Activity 3

A Drop in the Bucket

▲ Purpose

To introduce the distribution of water on the earth and the amount of fresh water available for our drinking water use. This activity is borrowed from Project WET Idaho.

▲ Materials

- *one gallon jug (to fill with water)
- *one liquid measuring cup that has calibrations for ounces
- *one eye dropper
- *one tablespoon
- *one coffee cup or paper cup
- *one bucket (galvanized is great!) or a tin can or cup

▲ Preparation

1. Collect the equipment needed.
2. Before the group arrives, fill the gallon jug with water.
3. Make a handout or flip chart poster of the World's Water Distribution Chart (Figure 17).

▲ Procedure

1. Ask for 6 volunteers to stand in front of the group.
2. Give each person one of the following items and line them up in the order listed.
 - gallon jug (filled with water)
 - liquid measuring cup
 - eye dropper
 - tablespoon
 - coffee cup or paper cup
 - bucket
3. Explain to the group that the gallon container represents all of the water on the earth. Have the person holding the gallon jug, pour approximately 3.5 ounces of water into the measuring cup. Tell the group that what is left in the gallon jug is the water in the oceans and seas (this equals 97.2%).
4. Next, have the person with the tablespoon take one tablespoon full of water out of the measuring cup. What is left in the measuring cup is the water in the icecaps and glaciers (this equals 2.15%).
5. Have the person with the eye dropper take some water from the tablespoon. Put three drops in the coffee cup or paper cup. What is left in the tablespoon and the eye dropper is the ground water (this equals .62%) and what is in the cup is the amount of water in the freshwater lakes, rivers and streams (this equals .0171%).

6. Now, put one drop from the eye dropper in the bucket. This is approximately the amount of water available for drinking water in Idaho. Water: Our most precious resource. Ninety five percent of all drinking water in Idaho, comes from ground water.
7. This activity acts as a good transition into the next section on water use and ground water.

Activity Borrowed from Project WET Idaho.

Figure 17. The World's Water Distribution Chart

The World's Water Distribution Chart

Source	Percent of Total Water
Oceans / Seas	97.02%
Icecaps / Glaciers	2.15
Ground Water	0.62
Lakes	0.017
freshwater (0.009)	
inland seas / salt lakes (0.008)	
Soil Moisture	0.005
Atmospheric Water	0.001
Rivers / Streams	0.0001
TOTAL	100%

Section 2

Water Use and Ground Water

Purpose:

To relate people's everyday activities to ground water and introduce ground water concepts.

Instructions:

The Water Use and Ground Water section provides two activities to stimulate discussion:

Activity 4. Predicting the Amount of Personal Water Use

Activity 5. Using the Ground Water Flow Model to Introduce Ground Water Concepts

By having the volunteers look at the amount of personal water they use, they will have a better understanding of the importance of wellhead protection. The Ground Water Flow Model will open volunteers' eyes to the complexity and vulnerability of ground water.

Time Needed:

40 - 50 minutes

Background Information:

This background information provides an overview for you. You may want to summarize it on the flip chart and present it to your group.

Ground water is a life-sustaining resource for small communities throughout the United States. It supplies drinking water for 50 percent of Americans and 95% of rural communities.

Nearly all public water supplies in the United States provide water that is safe to drink. Incidents of ground water contamination, however, have been reported in every state. The following statistics demonstrate the need for communities to protect their ground water supplies from contamination (U.S. EPA, 1990a; U.S. EPA, 1990b):

- More than 200 chemical contaminants have been identified in ground water.
- Some 52,181 cases of illness associated with ground water contamination (mostly short-term digestive disorders) were reported between 1971 and 1985.

(Section 2 continued)

- Seventy-four pesticides have been detected in the ground water of 38 states.
- Approximately 10 percent of public water supplies derived from ground water exceed federal drinking water standards for biological contamination.

Ground water was once thought to be protected from contamination by layers of rock and soil that act as filters. We now know that ground water is vulnerable to contamination. Contamination can occur in a myriad of ways which will be discussed in Potential Sources of Contamination section. We are concerned about potential threats to water because:

- We are using water faster than nature can clean it.
- There is a potential to contaminate ground water in almost all human activities.
- Risks, such as illness, may occur if a drinking-water source is contaminated.
- Ground water cleanup is expensive.

Activity 4

Predicting Personal Water Use

▲ Purpose

To increase volunteers' awareness of the amount of water used each day for personal needs.

▲ Background Information

We use water throughout our daily activities. Luckily, in most parts of the country, we can turn on the faucet where and safe, adequate drinking water flows out. Unless you have lived in an area where there has been a water shortage or where water is expensive, you probably don't worry about water quantity problems. Conservation practices can slow down the rate of water use. This activity has been designed to help your participants understand just how much water they use on a daily basis.

▲ Materials

- *Newsprint
- *Markers
- *Photo copy of worksheets

▲ Preparation

Copy enough worksheets for the number of participants in your group, cut sheet into two halves.

▲ Procedure

1. Without making any calculations, ask each member in the group to guess how much water they use for their personal needs on a daily basis.

List the various answers on flip chart paper or the chalkboard.

2. Handout the first half of the Personal Water Use worksheet and ask them to tabulate how many times they did the following activities, during the last 24 hours.

Activity	# Times
Number of times the toilet was flushed_____	
Number of showers and length_____	
Number of baths_____	
Number of loads of wash _____	
Number of times dishes were washed_____	
Number of teeth brushings_____	
Number of hand washings _____	
Number of glasses of water or water based drink, such as coffee or tea_____	

3. After they have made their tabulations, hand out the water use chart and have everyone calculate their total water use. Write each person's calculation on the board or flip chart and calculate the group's average daily water use per person.
4. Compare these figures with their original predictions and ask if they can think of ways to cut down water use.

Figure 18. Personal Water Use Chart

Personal Water Use

Tabulate the number of times you did each of the following activities in the past 24 hours.

Activity	# of Gallons
Number of times the toilet was flushed	_____
Number of showers and length	_____
Number of baths	_____
Number of loads of wash	_____
Number of times dishes were washed	_____
Number of teeth brushings	_____
Number of hand washings	_____
Number of glasses of water or water based drink, such as coffee or tea	_____

Figure 19. Water Use Chart

Water Use Chart

Activity	# of Gallons
Flushing the Toilet Depends on the year your toilet was built: 1960's = 5 gallons/flush, 1970' - 80's = 3 gallons/flush, 1990's = 1.5 gallons/flush	3
Taking a Shower (5 gallons/ minute average; low flow 2.5 gallons per minute)	25
Taking a Bath	36
Washing Clothes (low - high setting)	19-45
Automatic Dish Washing	12
Washing Dishes by Hand*	10-20
Tooth Brushing*	0.5-2
Hand Washing*	0.5-2
*Depends on whether the water is running continuously or not.	

Activity 5

Using the Ground Water Flow Model

▲ Purpose

To improve the understanding of the properties of ground water that make it vulnerable to contamination.

▲ Materials

- * Ground Water Flow Model
- * red dye
- * rags or newspaper (for spills)

▲ Background information

The Dow Chemical Handout provides a clear overview of ground water concepts (page 1 - 6). There are some other references listed in the resource list, Appendix G, that are also very helpful. Below are some terms and concepts that you will use.

Concepts:

Ground water flows beneath the earth's land surface filling pores (open spaces) and fractures in rock or sediment. It can be collected by pumping from wells or it may flow naturally to the surface at springs. During dry periods, ground water also can sustain the flow of rivers and streams and fill lakes, ponds or wetlands.

The speed at which ground water flows is determined by the composition of the rock or sediment. In general ground water moves very slowly. In aquifers containing layers of clay or rock with little fracturing, ground water may move as slowly as a few inches

per year. In aquifers containing sand and gravel, it can move 800 feet or more a year. Ground water may move more rapidly through cavernous limestone formations.

▲ Note

One of the easiest ways to introduce ground water and ground water concepts is through the use of a Ground Water Flow Model. We strongly suggest using a Ground Water Flow Model since it is easy to use and very visual.

You can borrow Ground Water Flow Models from Project WET Idaho, Idaho Water Resources Research Institute, 106 Morrill Hall, Moscow, ID 83843-3011(208)-885-6429. The only cost involved is the cost of shipment back to Moscow. A video travels with these models that teaches you how to use them for demonstrations.

Be sure to call at least two weeks in advance to order your model.

If you are unable to get a ground water flow model for demonstration purposes, you can demonstrate similar concepts by using clear plastic cups, sand, gravel and straws.

Terminology

surface water - water on the earth's surface.

ground water - the water that infiltrates into the earth's surface.

saturated zone - the region below the ground surface in which all pore spaces full of water.

unsaturated (or vadose zone) - region between the ground surface and the water table that contains a mixture of both water and air.

water table - the upper surface of the saturated zone.

aquifer - a geologic formation (layers of loose or cemented sand or gravel, or porous or fractured rock) that is capable of storing and transmitting water.

confined aquifer - an aquifer that is bound, both above and below, by an impermeable layer, such as clay or bedrock. Confined aquifers are sometimes referred to as artesian aquifers, water flows from artesian aquifers when the pressure forces the water to rise above the land surface.

unconfined aquifer - usually occurs near the earth's surface with a relatively impermeable layer of clay or rock as its lower boundary.

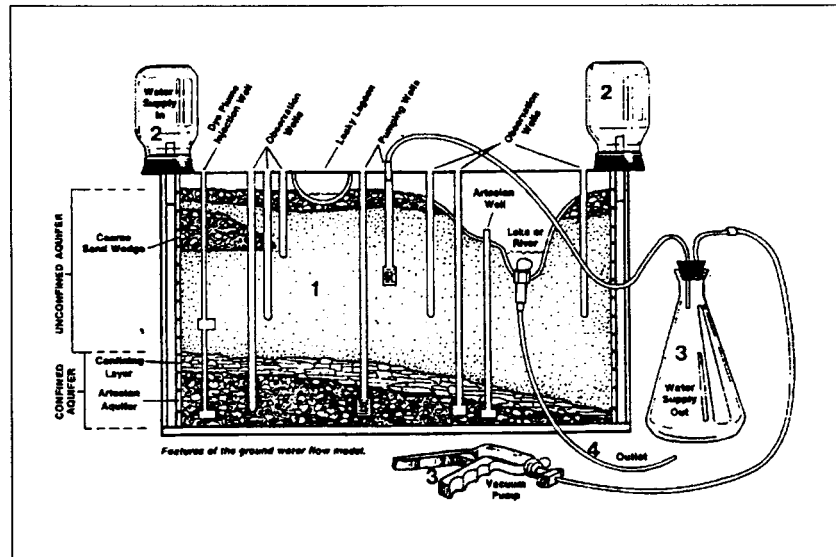
recharge areas - the area of land that serves as the primary source of water to replenish the aquifer. Precipitation, lakes and rivers serve as recharge areas.

discharge areas - the areas of land where ground water flows to the land surface, usually in topographically low areas. It may be expressed as lakes, rivers, oceans and other wetlands.

porosity - is measured as the ratio of pores or fractures (voids) to the total volume of soil or rock, the porosity ratio depends on the range of grain sizes and on the shape of the rock particles.

permeability - is the term used to describe how easily water moves through a material.

Figure 20. Ground Water Flow Model



▲ Procedure

1. Use the video that comes with the ground water flow model to help you prepare your presentation. Some of the concepts are difficult to understand. Be sure to review the background information before you begin. You may want to have a resource person to assist when you present the ground water flow model.
2. You can pick and choose from the following concepts that can be taught when using the model. If your group is small enough, you can let them try to demonstrate some of the concepts, themselves. Just remember that all the red dye that you put in the model will need to get flushed out before returning it!
3. Following are some of the concepts that can be demonstrated by using the model.

A. General ground water information

1. Ground water is contained underground in the spaces between soil particles and rocks, or in cracks and fractures in rocks.
2. Ground water is withdrawn from the ground by wells. It is then used in homes, farms, and industries.

3. Ground water is recharged by precipitation such as rain or snow melt, and surface irrigation water.
4. Human activities at or near the land surface can contaminate ground water.

B. Properties of aquifers

1. Definition of aquifers: The underground units of soil and rock which can yield water to wells are called aquifers. Aquifers are not always uniform in composition either horizontally or vertically. Aquifers may be separated by layers which do not normally transmit much water. These layers are called confining layers or aquitards.
2. The soil and rock below the earth's surface normally consists of both a saturated and an unsaturated zone. The top of the saturated zone is called the water table. A type of monitoring well called a piezometer can be used to define the top of the saturated zone.
3. In an artesian well the water level rises above the land surface and flows without pumping.
4. The texture of the materials in an aquifer effects the rate of flow through the aquifer.

C. Characteristics of water wells

1. Ground water is withdrawn through wells.
2. Flowing wells may result from artesian aquifers.
3. Pumping wells draw water toward them from all directions. In an unconfined aquifer, the water table gradually becomes lower around a well as water is withdrawn from the ground. The unsaturated zone around the well is called the cone of depression or drawdown cone.
4. Drawing water from a well can interfere with the ability of neighboring wells to produce adequate water.

D. Water quality

1. Contaminated surface water can pollute ground water.
2. Contaminated ground water may pollute surface water.
3. Water quality can vary within an aquifer.
4. Ground water pollution can be introduced through wells.
5. Once ground water becomes contaminated, the contamination may persist for long periods of time and over long distances.
6. Pollutants travel at different rates.
7. Ground water pollution can be introduced through wells.

Local information on ground water and ground water quality: Now is a good time to share information about local ground water conditions. Use your Advisory Team to help with the ground water flow models and presentation of ground water concepts. Other potential sources of information would be local soil and water conservation districts, water research centers located at universities, state environmental protection agencies, the U.S. Environmental Protection Agency, U.S. and State Geological Survey, U.S. Department of Agriculture Cooperative Extension Offices, a state environmental protection agency and environmental groups. Be sure to invite a speaker that represents all points of view and is not one-sided, if possible.

E. Wells

Wells are pits, holes, or shafts that are sunk or driven into the earth to tap an underground supply of water. Most modern wells are drilled by truck mounted percussion or rotary drill rigs. Drilled wells that penetrate unconsolidated material require installation of casing and a screen to prevent inflow of sediment. The space

around the casing must be sealed to prevent water draining from the surface downward around the outside of the casing. This surface water may contaminate the well.

Even though water is present at some depth at almost any location, the success of obtaining an adequate domestic supply (usually 5 gallons per minute) of water from a well depends upon the permeability of the rock. Where permeable materials are near the land surface, a shallow well may be adequate. In other locations, where clay directly overlies bedrock, a deep well extending into bedrock may be needed. Even then, the bedrock must be adequately fractured to produce water.

Pumping a well lowers the water level around the well to form a cone of depression in the water table. If the cone of depression extends to other nearby wells, the water level in those wells will be lowered. The cone develops in both shallow water-table and deeper confined-aquifer systems. In the deeper confined-aquifer system the cone of depression is indicated by a decline in the pressure and the cone spreads over a much larger area than in a water-table system. For a given rate of withdrawal, the cone of depression is steeper in low-yielding aquifers than in high-yielding ones.

The Ground Model Flow Model can be used to demonstrate the cone of depression.

▲ Alternate Activity

If a ground water flow model is not available, workshop participants can do a simple experiment that makes it easier to visualize what ground water is. This demonstration is not meant to be a sophisticated explanation of ground water principles. This experiment can also be used as an ice breaker for the small-discussion groups.

For the experiment you will need:

- * Clear soft/pliable/ plastic cups of two different sizes (9 oz. and 10 oz.) - 3 of each size (total of 6) for each small discussion group.
- * 1/4 measuring cups (can use the measuring cups that come in concentrated laundry soap) and a large glass of water for each small group.
- * 8 oz. of dirt, sand, and rocks; put each in a separate 9 oz. glass after puncturing 2 small holes in the bottom of the cup. Make sure the dirt and sand are dry.
- * At the workshop site, place the filled 9 oz. cups (these cups also have holes in the bottom to let water drain out) inside the empty 10 oz. cups.

The small groups will pour 1/4 cup of water into each filled cup and try to answer the following questions.

- Which material held the most water?
- Which material held the least water?
- In which material did the water move the fastest?
- In which material did the water move the slowest?

Section 3

Potential Contaminant Sources

Purpose:

To help the group to think about potential sources of contamination starting from what they already know.

Instructions:

Use Activity 6, Brainstorming, to stimulate discussion about potential sources of contamination.

Time Needed:

20 minutes

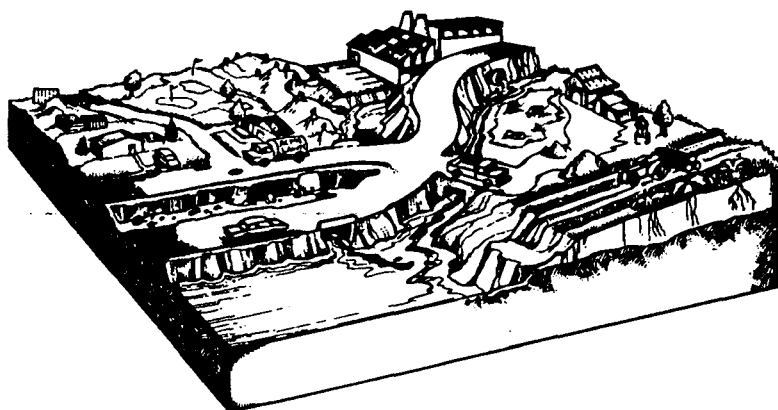
Background Information:

The following publication will provide additional background information.

US Environmental Protection Agency. (1993). *Wellhead Protection: A Guide for Small Communities*. Seminar Publication, Office of Research and Development, Office of Water, Washington, DC 20460. EPA/625/R-93/002.

Alternate Activity:

Borrow the ENVIROSCAPE™, pictured below, another educational tool from Project WET Idaho that teaches about potential nonpoint source pollutants. Contact: Project WET Idaho, 106 Morrill Hall, University of Idaho, Moscow, Idaho 83844-3011. Phone 208-885-6429.



Activity 6

Brainstorming

▲ Purpose

To introduce potential sources of contamination.

The easiest way to facilitate discussion about potential sources of contamination is through a brainstorm session. There are some specific directions that will allow everyone to be involved and everyone's suggestions considered

▲ Materials

- * 3 x 5 cards or pieces of paper
- * tape
- * markers

▲ Procedure

1. Give each person about ten 3 X 5 cards or pieces of paper and/or cards.
2. Allow three minutes for each person to write down as many potential sources of contamination that they can think of. Each potential source should be on a different card or piece of paper. Tell them that they can be as specific or as general as they would like.
3. After the three minutes are up, go around the group and allow each person to read one of the contaminants that they listed, tape it on flip chart paper (or wall) and then go on to the next person. Keep doing this round robin, until everyone has taped their contaminants up.
4. Now allow time for the group to list any additional contaminants.
5. Next tell the group that the cards should be grouped so that similar cards and concepts are connected. Allow the group time to get up and move the cards, grouping them as they see fit.
6. Come back as a group and discuss what they learned. As the leader you should add any insights and definitions that you learned from reading the information provided in the background information. Try to guide the group to list all the contaminant categories listed on the following page. This list is the way that The Idaho Department of Environmental Quality has categorized the contaminants.

▲ Sources of Ground Water Quality Degradation

A. Ground water quality problems that originate on the land surface

- Infiltration of polluted surface water
- Land disposal of either solid or liquid wastes
- Stockpiles
- Dumps
- Disposal of sewage and water-treatment plant sludge
- De-icing salt usage and storage
- Animal feedlots
- Fertilizers and pesticides
- Accidental spills
- Particulate matter from airborne sources
- Surface runoff
- Grain storage bins
- Industrial activities
- Above ground storage tanks

B. Ground water quality problems that originate in the ground above the water table

- Septic tanks, cesspools, and privies
- Holding ponds and lagoons
- Sanitary landfills
- Waste disposal in excavations
- Leakage from underground storage tanks
- Leakage from underground pipelines
- Artificial recharge
- Sumps and dry wells
- Graveyards

C. Ground water quality problems that originate in the ground below the water table

- Waste disposal in well excavations
- Drainage wells and canals
- Well disposal of wastes
- Underground storage
- Secondary recovery
- Mines Exploratory wells

Section 4

Wellhead Protection

Purpose:

To introduce the entire wellhead protection planning process and conclude by explaining the volunteer opportunities available.

Instructions:

This training package is devised to prepare volunteers to conduct wellhead protection area inventories however, it is important to introduce the entire wellhead protection planning process, so that the volunteers see how their work can fit into the bigger plan. The Advisory Team may provide some leadership in this discussion, since they will carry the plan through to completion. The activities included are:

Activity 7. The Wellhead Protection Program

Activity 8. Volunteer Assignments

Time Needed:

Approximately 15 minutes per activity

Activity 7

The Wellhead Protection Program

▲ Purpose

To introduce the wellhead protection planning process.

▲ Materials

* 5 x 8" cards

▲ Procedure

Provide the wellhead protection planning components on flip chart paper. Give an overview of the entire planning process and where your community is to date. If you would like to make this section more participatory, try the following:

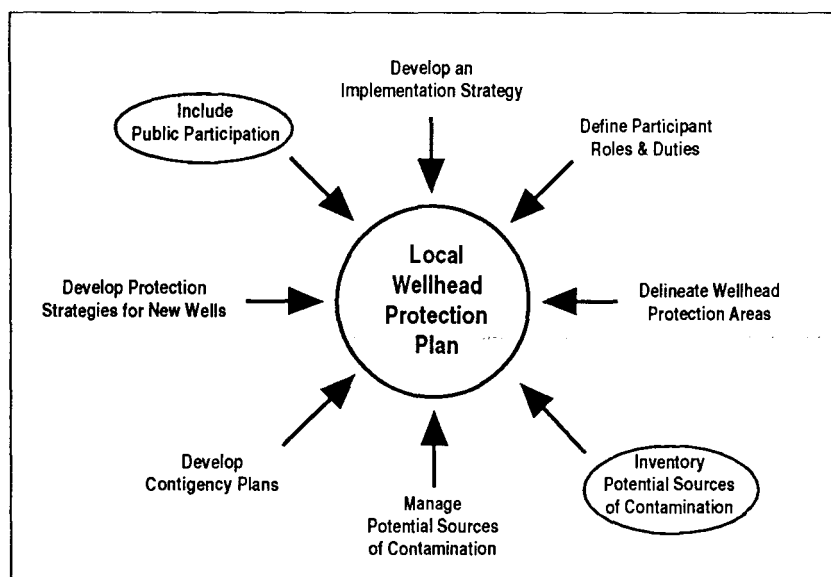
1. Before the session begins, put the components of a wellhead protection planning process on 5 X 8 cards. For each component add all the additional information that you know about your community in relation to these components.
2. Divide the large group into 7 smaller groups. Give each group a different card and have them read the card and present the information to the larger group.

▲ Background Information

The purpose of wellhead protection is to prevent the contamination of ground water which supplies drinking water. To accomplish this goal, a community should develop a plan that includes the components shown in Figure 21. Through this program, you can manage potential contamination sources on the land overlying the aquifer from which we pump our drinking water.

In Idaho, the wellhead protection plan is voluntary for local governments to develop and implement. The Idaho Wellhead Protection Plan provides the guidelines that a community should follow. The plan, however, does provide flexibility in developing a local wellhead protection plan that meets the needs of any community.

Figure 21. Components of a Wellhead Protection Plan
(From Idaho Wellhead Protection Plan - Draft)



▲ Components of the Idaho Wellhead Protection Plan

1. Define the roles and duties of the participants.

It is recommended that a steering committee be formed where each participant is given a specific responsibility and role to play throughout the development and implementation of a local wellhead protection plan. The types of participants may include representatives of:

- elected officials, such as the mayor, city council, county commissioners
- business and agriculture community
- city public works department
- city and county planning and zoning department
- tribal council
- environmental health district
- state water quality agencies
- technical experts in hydrogeology/hydrogeology
- general public

For example, the public works department will be able to provide technical information on the water system and the aquifer from which the wells produce, whereas the planning and zoning representative will be able to provide the insights on the development of ordinances, if that is a management strategy the community chooses.

Although this component is listed first, it does not necessarily need to occur first. Some communities have chosen to define their wellhead protection areas and then form their steering committee to decide how to proceed with the remaining components.

2. Delineate the wellhead protection area(s).

A wellhead protection area is the surface and subsurface area through which water will flow and eventually reach a well. If the ground water in this area is protected from contamination, then the likelihood of the well becoming contaminated is reduced.

There are different methods that the state of Idaho recommends for defining wellhead protection areas. A community can use one of the simple methods or may decide to use methods that require a substantial amount of data and technical expertise to determine the protection area. Please refer to the *Idaho Wellhead Protection Plan – Draft* for details on defining wellhead protection areas.

3. Inventory the potential sources of contamination within the wellhead protection areas.

Once a wellhead protection area is defined, then the potential sources of contamination within that area need to be inventoried. There are many different potential sources of contamination, and the list is much too long to include here. However, examples include septic systems, abandoned wells, underground storage tanks, pesticide and fertilizer application (farm and urban property), etc. See Appendix A for more details.

This manual has been written to assist communities in addressing this component.

4. Manage the potential sources of contamination to prevent ground water contamination.

When the inventory is complete, what is next? This component is where much of the actual prevention action takes place. There are regulatory and non-regulatory tools that communities can use to manage these sources. Examples of regulatory tools are ordinances and operating standards. Examples of non-regulatory tools are voluntary household hazardous waste collection and public education.

Remember that the physical presence of a potential source does not necessarily mean that it is a risk to the well. For example, if an underground storage tank has been constructed with secondary containment features, any leaks will be contained so that ground water will not become contaminated.

5. Develop contingency plans for loss of well(s) due to contamination or drought.

Although the purpose of the wellhead protection program is to PREVENT contamination of a well, that may not always be the case, and a well may become contaminated. Therefore, a community needs to be prepared and have plans to address such a crisis. The Idaho Wellhead Protection Plan - Draft outlines the issues that should be addressed under this topic.

6. Plan and develop protection strategies for new wells.

If a community plans to drill new wells, it is recommended that they locate it in an uncontaminated area and protect the future well sites. Also, once the well is drilled, the new wellhead protection area should be managed to prevent the well from becoming contaminated.

7. Include public participation.

Although public participation is at the bottom of this list, it does not mean that it occurs last. Public participation should be incorporated throughout the planning process and into implementation. An effective local wellhead protection program is the result of the desire of its citizens to take the responsibility to prevent the contamination of their drinking water supplies.

8. Develop an implementation strategy for the local wellhead protection plan.

An implementation strategy should be developed to keep the community on track in its efforts to turn the concepts of the plan into reality. There will be many factors that affect this strategy, such as community priorities, funding, staffing, political feasibility, just to mention a few. The actual implementation will take time... but keep in mind that the important part is to set a course of action and begin.

Activity 8

Volunteer Assignments

▲ Purpose

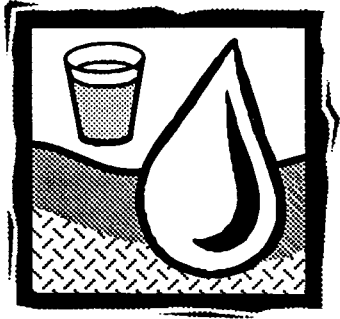
To review the types of volunteer assignments, further details about additional training and bring closure to the workshop.

▲ Materials

- * Overhead transparencies of position descriptions
- * Copies of where and when additional training sessions will be held
- * Certificates of participation
- * Sign-up sheets for each position

▲ Procedure

1. Review the volunteer assignments that you identified in Chapter 3. You may want to make overhead transparencies of the different position descriptions that you developed and use the overhead transparencies to review the specifics related to each assignment. Be sure to describe the training opportunities and training schedule related to the various assignments. By presenting all of the information to the entire group, each person will have a basis for making a decision about what assignment they are most interested in. As you go over the job descriptions, emphasize the important role that the volunteers will be playing and how the data will be used to protect the drinking water supply.
2. After providing an overview of the various assignments, ask the group if they have any questions about further clarification related to number of hours, type of work, etc.
3. Before you allow people to get up to move around and sign up for the various assignments, you may want to bring closure to the workshop by awarding volunteers with a certificate for participating in the workshop and thanking them for their participation.
4. Spread the volunteer sign-up sheets throughout the room with the job descriptions attached. Allow the participants to walk around and choose the assignment in which they are most interested.
5. Be sure that each person gets the specific information about where and when the next workshop will be held (based on what assignment they were interested in doing). You may want to position yourself near the exit when people start leaving, so that you can personally thank each individual, hand out information about the next training session(s) and tell them how much you appreciate their interest.



Volunteer Coordinator's Guide

7 Final Steps

▲ Introduction

Now that the data collection has been completed, there are a few last details to do to finalize your participation in the project. You should be sure that all of your volunteers have received the proper recognition. You should also thank any public officials, organizations or businesses that provided information, work space or special assistance. You may want to contact the press and provide them with a summary of what you found. Two tasks that must be completed are listed below.

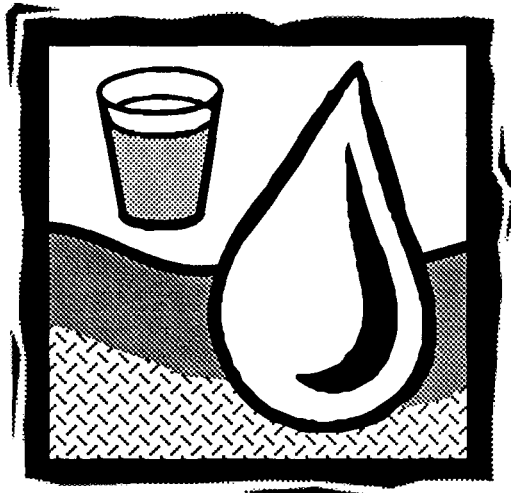
▲ Organize the collected data

Once all the data collection has been done, organize the data and the description of the collection methods into a format that will be useful to the Advisory Team. You may want to use a small team of volunteers to help accomplish this.

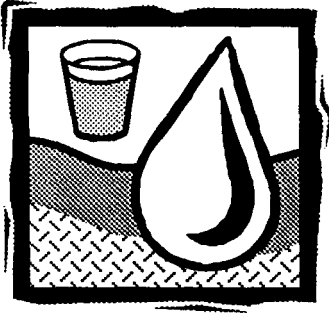
▲ Present the final report to the Advisory Team.

Arrange to give a brief presentation of the inventory program and data to the Advisory Team. Be concise, summarize the findings, and be prepared to offer recommendations on any further work that may be needed. You may want to invite the inventory team leaders and interested volunteers to the presentation.

Appendices



- Appendix A: Potential Sources of Contamination*
- Appendix B: Publicity Packet*
- Appendix C: Example Advisory Team Decisions*
- Appendix D: Volunteer Position Descriptions*
- Appendix E: Example Data Collection Forms*
- Appendix F: Facilitation Guidelines*
- Appendix G: Educational Resources*



Appendix A

Potential Sources of Contamination

▲ Contaminant Categories

▲ Category 1

Source designed to discharge substances

Subsurface percolation (e.g. septic tanks and cesspools)

Injection Wells

Hazardous waste

Nonhazardous waste (e.g. brine disposal and drainage)

Nonwaste (e.g. enhanced recovery, artificial recharge, solution mining, and in-situ mining)

Land application

Waste water (e.g. spray irrigation)

Wastewater by-products (e.g. sludge)

Hazardous waste

Nonhazardous waste

▲ Category 2

Sources designed to store, treat, and/or dispose of substances; discharge through unplanned release

Landfills

Industrial hazardous waste

Industrial nonhazardous waste

Municipal sanitary

Open dumps, including illegal dumping (waste)

Residential (or local) disposal (waste)

Surface impoundments

Hazardous waste

Nonhazardous waste

Waste tailings

Waste piles

Hazardous waste

Nonhazardous waste

Materials stockpiles (nonwaste)

- Graveyards
 - Animal burial
- Above ground storage tanks
 - Hazardous waste
 - Nonhazardous waste
 - Nonwaste
- Containers
 - Hazardous waste
 - Nonhazardous waste
 - Nonwaste
- Open burning and detonation sites
- Radioactive disposal sites

▲ Category 3

Sources designed to retain substances during transport or transmission

- Pipelines
 - Hazardous waste
 - Nonhazardous waste
 - Nonwaste
- Materials transport and transfer operations
 - Hazardous waste
 - Nonhazardous waste

▲ Category 4

Sources discharging substances as consequences of other planned activities

- Irrigation practices (e.g. returned flow)
- Pesticide applications
- Fertilizer applications
- Animal feeding operations
- Deicing salt applications
- Urban runoff
- Percolations of atmospheric pollutants
- Mining and mine drainage
 - Surface mine-related
 - Underground mine-related

▲ Category 5

Sources providing conduit or inducing discharge through altered flow patterns

Production wells

Oil (and) gas wells

Geothermal and heat recovery wells

Water supply wells

Other wells (nonwaste)

Monitoring wells

Exploration wells

Construction excavation

▲ Category 6

Naturally occurring sources whose discharge is created and/or exacerbated by human activity

Ground water-surface water interactions

Natural leaching

Saltwater intrusion/brackish water upcoming

(or intrusion of other poor-quality natural water)

Source:

Office of Technology Assessment, *Protecting the Nations Ground Water from Contamination*, October 1984.

▲ Where to Find Data

Well locations

IDWR - Ground Water Protection Section (State Office), regional offices

Public drinking water well locations

IDEQ - Community Programs, Central Drinking Water Information Management System

Right-to-know records

Local fire departments

Sewer hookups

Public works department

Leaking underground storage tanks & Registered underground storage tanks

IDEQ - Community Programs, Central Office, LUST- Data Management System, UST - Data Management System

Injection wells (Class V)

IDWR - Underground Injection Control Program, State Office

Pre-remedial Superfund sites

IDEQ - Community Programs, Central Office, CERCLIS

Specific chemical manufacturing facilities

IDEQ - Community Programs, Central Office, Toxic Release Inventory (TRI)

Hazardous waste generators, transporters, recyclers, and treatment, storage and disposal facilities

IDEQ - Planning and Evaluation, Central Office, RCRIS - Biennial Report System (BRS), State Quarterly Generator Report

Aerial photographs

IDOT - (along major arterials), Inland Mapping, SCS

Historical information

Idaho State Historical Library (Sanborn Fire Insurance Maps, city directories, city maps, etc.), property transfer records

Land application sites

IDEQ - Permits and Enforcement, Central Office

Businesses - General

Telephone books, chambers of commerce, city or county records and permit files

Industries that may produce hazardous or toxic waste streams that might be released to a wastewater treatment plant.

IDEQ - Community Programs, Central Office, POTW - Database

Geologic/hydrogeologic information
 USGS, IGS, universities, colleges, IDWR, IDEQ

Soil information
 SCS, SCC, SCD, universities, colleges, IDWR, IDEQ

Permitted septic systems
 Health districts

Solid waste sites
 Health districts

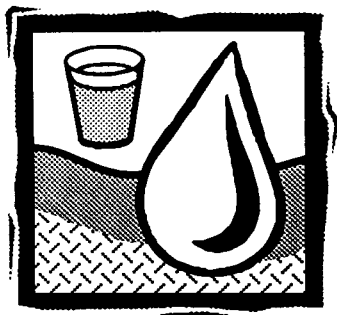
Road salt storage sites
 State, county, and city transportation dept.

Incidents involving an accidental release
 Local fire department, DEQ regional office

Animal feedlots or dairies
 EPA (Boise Operations Office, NPDES Permits), IDA (Bureau of Dairying),
 SCS, SCD

Acronyms Used

CERCLIS	Comprehensive Environmental Resource Compensation and Liability Information System
EPA	Environmental Protection Agency
IDA	Idaho Dairy Association
IDEQ	Idaho Division of Environmental Quality
IDOT	Idaho Department of Transportation
IDWR	Idaho Department of Water Resources
IGS	Idaho Geologic Survey
LUST	Leaking Underground Storage Tanks
NPDES	National Pollutant Discharge Elimination System
POTW	Publicly Owned Treatment Works
RCRIS	Resource Conservation and Recovery Information System
SCC	Soil Conservation Commission
SCD	Soil Conservation District
SCS	Soils Conservation Service
USGS	United States Geologic Survey
UST	Underground Storage Tanks



Appendix B

Publicity Packet

▲ Introduction

As the Advisory Team, it is important for you to read and understand the options for publicity so that you can decide on the direction for the Volunteer Coordinator.

As the Volunteer Coordinator, it is important for you to carefully read the procedures under each of the publicity options that the Advisory Team has chosen.

▲ Publicity Strategy Options

The approach and amount of publicity that you do is greatly dependent upon the size and location of your community, the size of your wellhead protection area inventory and the goals of your project. In a rural area, for example, the best approach might be to do a series of local town meetings. In a large city, on the other hand, starting the campaign off with a press conference and then giving presentations to clubs might be a better approach. This appendix describes and gives examples of the variety of options available for publicizing your wellhead protection area inventory. No matter where your program is located, it is highly recommended to use more than one approach.

The following list contains the most common options for publicity. Each of them is described in detail in the following section.

- Press Conferences (Example 1)
- Media Releases (Example 2)
- Civic Group Presentations
- Radio/TV advertising (Example 3)
- Flyers
- Monthly water bills
- Calendar listings (Example 4)

▲ Press Conferences

1. Plan to use this technique once to begin the campaign. However, if you have some earth shattering news you may want to plan another one.
 2. Find a suitable location - one that's convenient for reporters. It should be large enough to accommodate 25 comfortably. The electrical wiring should be sufficient to handle TV lighting equipment. Have some spare fuses ready if you're not sure.
 3. Schedule the news conference for a day and hour that allow time for reporters to meet deadlines. Mid-morning is usually the best time. Mondays, Tuesdays and Wednesdays are usually better than later in the week or weekends. To be sure to get the best turn out, check with your local papers for the time that is most convenient for them.
 4. Write and mail a press notification* a week before the conference to every reporter and editor who might be interested. Newspapers (including community newsletters), TV stations and radio stations are obvious targets, but don't forget other communication channels unique to your community that deserve attention.
- * A press notification is a very abbreviated news release that tells in a few words who, what, where, when and how. It is designed to get reporters to the event, rather than tell them the whole story first. See Example 1.)*
5. Telephone the recipients of the advisory the day before the conference to remind them of the time and place. You might tell them of a new development or speaker not mentioned before. Do not attempt to conduct a mini-news conference on the phone.
 6. Encourage photographers and TV crews to attend the news conference. Type the words "photo opportunity" on the advisory and prepare some photogenic "props" for display (i.e. a Ground Water Flow Model).
 7. If the speakers plan to read a prepared statement, which is strongly advised, distribute copies at the conference to all reporters. Also, hand out a list of participants, including name, address, and organization. Afterwards, bring or send the materials to any media not represented.

8. Three or four speakers is about right - each should make a 3-5 minute statement. People from your Advisory Team should be involved.
9. The day of the conference, arrive early, and make any last-minute changes in the seating. The coordinator's job is to greet reporters, supply information and advise on the positioning of cameras, while an assistant should stand by to pass out coffee, make a phone call, or locate a repairman.
10. Ask reporters to sign in so that you can contact them in the future. Start the conference on time. It should last 30-45 minutes. Keep speeches short and allow time for questions.

▲ Media Releases

Media releases should be sent to all newspapers, television and radio stations from your Advisory Team (see Example 2). Radio/TV talk show interviews can be arranged involving the technical adviser and a local official connected with ground water protection (i.e., public works director, local health district employee, etc.).

A second release to all media can be sent inviting the public to a Ground Water Education Workshop.

Tips for writing a successful news release:

- Include who, what, when, where, why, how in the first paragraph.
- Make the verbs active and the subject concrete. Cover the most important facts first and follow with details. Do not editorialize.
- Give the press release a catchy title.
- Be sure to include a contact name and telephone number, both day and evening.
- Include the date of your release in upper left hand corner and write "FOR IMMEDIATE RELEASE".
- Proofread everything at least twice.
- Try to limit your release to one page.
- At the bottom of the first page write "more" if necessary. Otherwise, write "end" or use the symbol "###" or "30".
- Send news releases to your key media contacts and to those responsible for making editorial decisions.

- After distributing your release, make follow-up calls to specific reporters to see if it has been received, if the paper or station will run the story, and if they plan to send a reporter to the event. Try to make calls to newspapers at their most convenient time, after their press time.

Tips for compiling a media list:

- Include all major daily and weekly newspapers in your area. Include minority or ethnic dailies or weeklies, as well as college, university, neighborhood and small community newspapers, and church bulletins.
- Include state or local specialty publications that might be interested in your project, such as natural resources and public health agency newsletters.
- Include television and radio stations with news and current event talk shows or environmental/natural resources programs. For broadcast news shows, send releases to the specific reporter covering your issue (or to the senior producer for smaller stations).
- Include civic associations, service clubs, business organizations, and any other organizations that might be interested in listing your project in their own publication or newsletter.
- Include the reporter in charge of newspaper community calendars. Nonprofits often get free listings in such calendars.
- Review *Broadcasting Yearbook, Editor and Publisher Yearbook, PBI Media Services, Bacon's* or *Gebbies* at your local library.

Tips for writing and submitting an op-ed:

- Monitor your paper's op-ed page (opposite the editorial) to see what kind of opinion pieces they publish. If a paper recently ran a piece questioning the need for a ground water management plan or land-use zoning, for example, you might be successful in placing a "taking exception" piece.
- Find out newspaper's length specifications for op-eds, and the name and fax number or address of op-ed editors.
- Work to capture the reader's attention in the first sentence of your op-ed. Try giving a strong local focus, so the reader can relate quickly and easily to your message.
- Print the op-ed on your organization's stationery, signed by your spokesperson. Name recognition will increase the chance that the paper will print it.

- Send the op-ed with a cover letter and background information on your wellhead protection project to the op-ed editor. Include your business card with both home and work numbers. Make a follow-up call a day or two after they have received it to ask if they intend to print it. If they do, find out when. Reproduce copies and distribute widely.

The previous three sections: Tips for writing a successful news release, Tips for compiling a media list, Tips for writing and submitting an op-ed are from Chapter 5 of *Protect Your Ground Water: Educating for Action*, © 1994, League of Women Voters Education Fund. Reprinted with permission.

▲ Civic Group Presentations

Publicizing the project will help you recruit volunteers. Begin advance publicity as soon as you have set the dates and location for the training sessions. Talking to civic groups will not only reach potential volunteers but also to help publicize your program. Be sure to tailor the presentation to meet the group's needs and the available time. Bring an information packet about the project to leave with the group. Information packets could include:

- Program brochure,
- Copy of news article,
- Volunteer job descriptions,
- Time and dates of training sessions and the inventory.

It is important to contact groups as far in advance as possible to be put on their agenda. Often, groups only meet once a month, or have their meetings planned well in advance.

Presentation guidelines

When making presentations to organizations in an attempt to recruit volunteers keep in mind the following points:

- Try to get fifteen minutes to one-half hour on the group's agenda.
- Adapt your presentation to the interest and skill level of the organization. For example, a presentation to the Rotary Club may focus on the pro-active stance this project encourages from the business community, while a presentation to the Geology Club may focus on the opportunity the project offers in the collection of useful information.

- Use one of the hands-on or interactive activities provided in the workshop presentation section of this manual.
- Use slides, videos, or overhead transparencies to bring a visual representation to your talk.
- Leave an information packet with each member of the organization.
- Pass around a sign-up sheet for people interested in attending one of the training sessions. Call later and confirm their attendance.
- Emphasize the collaborative nature of this project.

▲ Radio/TV Advertising

Radio/TV talk show interviews can be arranged to involve the technical adviser and a local official connected with ground water protection, (i.e. public works director, local health district employee, etc.).

▲ Flyers

Post flyers announcing the volunteer training sessions at strategic locations around your community. Be sure the type size is large enough to be read at a distance (see Example 5).

▲ Monthly Water Bills

Monthly water bills often have several lines of print available on them that could be used to announce the project and the volunteer training sessions.

▲ Calendar Section Listing

A shortened version of a news release can be sent to newspapers for listing in the calendar section to announce the Ground Water Education Workshops (see Example 4.)

Example 1: Press Conference Notification**Press Notification**

Subject: Press Conference on Groundwater Protection
Thursday November 3, 2:00 PM

Where: Federal Building, Second Floor Conference Room
220 East 5th Street, Moscow

Speakers: Don Huskey, Chair, Pullman-Moscow Water Resources Committee
Roy Mink, Director, Idaho Water Resources Research Institute
Gary Presol, Director, Moscow Public Works
Greg Teasdale, Regional Administrator, Idaho DEQ

**Moscow-Pullman Community Has Unique Opportunity
to Learn About Groundwater Protection**

Moscow has been selected to pilot test a volunteer-based drinking water protection curriculum. Volunteers will be involved with data collection and mapping of potential sources of groundwater contamination, and will conduct interviews with selected local officials to gather historical data. Data collected by community volunteers will help Moscow better understand the potential to protect their drinking water supply and what steps, if any, need to be taken to maintain sources of clean drinking water.

On November 3, local experts will put the project in perspective of the local geology, educational opportunities and potential use of this information in the Moscow-Pullman area.

The curriculum, being developed by a consortium of organizations, will provide guidelines for communities that wish to use volunteers to collect data, and begin protecting their community drinking water supply. The curriculum will be pilot tested in Moscow beginning November 14.

The organizations involved in the consortium are: Pullman-Moscow Water Resources Committee; Idaho Water Resources Research Institute, University of Idaho; Palouse-Clearwater Environmental Institute; Latah County Soil and Water Conservation District and Idaho Department of Health and Welfare, Division of Environmental Quality.

Photo opportunity:

A groundwater flow model, that will be used to teach volunteers about ground water, and a map of the Moscow-Pullman basin will be on display.

For further information, please call Sue Perin, Volunteer Coordinator at 885-6429.

Example 2: News / Media Release

News Release

Idaho Water Resources Research Institute
Palouse-Clearwater Environmental Institute
Contact: Sue Perin, 885-6429

For Immediate Release
November 3, 1994

**Moscow-Pullman Community Has Unique Opportunity
to Learn About Ground Water Protection**

Do you ever wonder about the water we drink?

Beginning November 14, anyone interested in learning about the protection of drinking water can attend a free education workshop on the mysteries of ground water. These workshops are the first step in the implementation of a volunteer-based drinking water protection program slated for pilot-testing in Moscow beginning next week.

The manual provides guidelines for using volunteers to protect a community's drinking water supply. It has been developed by a consortium of organizations through an Environmental Protection Agency education grant.

Volunteers will learn about clean drinking water while collecting and mapping information on potential sources of ground water contamination. Although the main purpose of collecting data in the Moscow area is to evaluate the program and revise the training manual, the information will be very useful in the future protection of Moscow's drinking water supply.

Moscow's municipal water supply comes from a deep aquifer system underlying Moscow and Pullman, according to Roy Mink from the Idaho Water Resources Research Institute at the University of Idaho. This aquifer is recharged by water that percolates down through the Columbia River Basalt. At a meeting of local water experts today at the Moscow Federal Building, Mink pointed out that the basalt, which provides permeability for ground water could also be susceptible to contamination.

Gary Presol of the Moscow Public Works Department said the information volunteers collect would be helpful to Moscow in several ways. It will help the city determine if there are potential sources of contamination around our wells, and help the city make zoning decisions for the areas surrounding existing and future wells, Presol said.

This is not to say Moscow has had problems with contamination. Other than two instances of bacterial problems in the past several years, there hasn't been any sign of contamination in any of the six city wells, Presol said.

-more-

Example 2: News / Media Release *(continued)*

Still, as Don Huskey of the Moscow-Pullman Water Resources Committee said, "Prevention of contamination is almost always more economical than cleanup." He also encouraged local water protection programs such as this.

"Any problems discovered may then be addressed at the local community level," Huskey said.

Two free Ground Water Education Workshops are being offered by Palouse-Clearwater Environmental Institute and Idaho Water Resources Research Institute. The dates are November 14 from 6:30 pm to 9:30 pm at the Latah County Courthouse or November 19 from 8:00 am to 11:00 am at 217 Morrill Hall, University of Idaho. The workshops are open to anyone interested in volunteering in the drinking water protection program, as well as those just wishing to learn about ground water. Preregistration is required.

The organizations involved in the consortium are: Pullman-Moscow Water Resources Committee; Idaho Water Resources Research Institute, University of Idaho; Palouse-Clearwater Environmental Institute; Latah County Soil and Water Conservation District; and Idaho Department of Health and Welfare, Division of Environmental Quality.

For more information about the Ground Water Education Workshops, contact Sue Perin at Palouse-Clearwater Environmental Institute, 882-1444.

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Example 3: Radio / TV Announcement

For KUOI Radio Billboard

Idaho Water Resources Research Institute
Palouse-Clearwater Environmental Institute
Contact: Sue Perin, 885-6429

For Immediate Release
November 8, 1994

Free Classes Offered on Ground Water Protection

Two free Ground Water Education Workshops are being offered by Palouse-Clearwater Environmental Institute and Idaho Water Resources Research Institute. The Dates are: November 14 from 6:30 pm to 9:30 pm or November 19 from 8:00 am to 11:00 am. For more information or to sign up for either class call 882-1444.

The workshops are open to anyone interested in volunteering in the drinking water protection program, as well as those just wishing to learn about ground water. Preregistration is required.

Example 4: Calendar Listing**News Release for calendar section**

Idaho Water Resources Research Institute
Palouse-Clearwater Environmental Institute
Contact: Sue Perin, 885-6429

For Immediate Release
November 7, 1994

Free Classes Offered on Ground Water Protection

Beginning November 14, anyone interested in learning about the protection of drinking water can attend a free education workshop on the mysteries of ground water. These workshops are the first step in the implementation of a volunteer-based drinking water protection program slated for pilot-testing in Moscow beginning next week.

The two free Ground Water Education Workshops being offered by Palouse-Clearwater Environmental Institute and Idaho Water Resources Research Institute will be held on:

November 14 from 6:30 pm to 9:30 pm at the Latah County Courthouse or
November 19 from 8:00 am to 11:00 am at 217 Morrill Hall, University of Idaho. The workshops are open to anyone interested in volunteering in the drinking water protection program, as well as those just wishing to learn about ground water. Preregistration is required.

For more information please contact Sue Perin at Palouse-Clearwater Environmental Institute, 882-1444.

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Example 5: Newspaper Article

Friday, November 4, 1994 MOSCOW-PULLMAN DAILY NEWS

Project will keep groundwater protected

BY BARBARA LABOE
Staff Writer

Concerned about the area's drinking water? Want to help residents of Moscow and the rest of the Northwest learn about groundwater protection?

Then plan to attend one of two workshops designed to educate and create a curriculum to be used throughout the state for water education.

The classes will teach people about groundwater contamination and protection and instructors will recruit volunteers for a public well-mapping program.

Volunteers will attend additional training sessions and then venture out to map public wells, identify areas around them that could be contaminated from outside sources and note any possible hazards near the wells. Officials said the inventory will help the city learn of any contamination as well as help the with zoning decisions that could affect wells.

Moscow's municipal water supply comes from a deep aquifer system beginning near Moscow and spreading all the way to Colfax. The aquifer receives water that comes through the Columbia River

Basalt, which is susceptible to contamination.

And while there have only been two instances of bacterial problems with Moscow's drinking water in the past several years, officials would rather be safe than sorry, said Don Huskey of the Moscow-Pullman Water Resources Committee.

"Prevention of contamination is almost always more economical than cleanup," he said.

See **Water** page 7A

Water from page 1A

In addition to creating an inventory of the area's public wells, the project also will create a training manual of sorts to be used in other communities, possibly throughout the Northwest.

Organizers will analyze the value of the project, make any needed changes in the manual and procedures and send the plans off to the Environmental Protection Agency to be used by other communities. They plan to

have the manual sent to the EPA by the end of December.

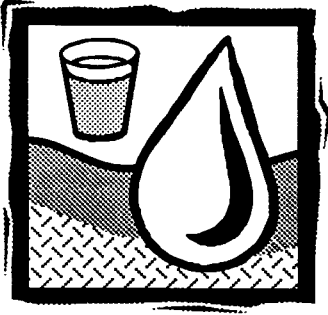
"So the finished product will give someone a real solid manual and instructions on how to do a similar mapping project," said Sue Perin, the volunteer coordinator for the program.

Moscow was chosen as the site of this pilot test for the manual by competing with other cities throughout Region 10, including those in Washington, Oregon, Idaho and Alaska. The project received a \$22,000 EPA grant to create the training man-

ual and procedures.

The classes, on Nov. 14 and 19, will be open to anyone interested in learning more about their area's groundwater, said Perin. The Nov. 14 class is from 6:30 to 9:30 p.m. at the Latah County Courthouse. The Nov. 19 class is from 8 to 11 a.m. at 217 Morrill Hall at the University of Idaho. Pre-registration is required.

For more information, contact the Palouse-Clearwater Environmental Institute at (208) 882-1444.



Appendix C

Example Advisory Team Decisions

▲ Summary of Advisory Team Decisions

These steps were developed by the Pullman–Moscow Water Resources Committee, who acted as the Advisory Team for the pilot project in the Moscow / Pullman area. The following descriptions correspond with the steps described in the preliminary guide.

▲ Step 1

Understand your state's wellhead protection guidelines.

The Idaho Wellhead Protection Plan and the Washington plan were gathered and reviewed to be used as guidelines.

▲ Step 2

Organize a wellhead protection Advisory Team.

The Advisory Team for the pilot project was made up of people from the following entities: University of Idaho, Washington State University, Idaho Division of Environmental Quality, Palouse-Clearwater Environmental Institute, Idaho Water Resources Research Institute, Moscow Public Works Department, Latah and Whitman County Commissioners.

▲ Step 3

Define clear goals and objectives for the inventory process.

The number one goal of the inventory program is to educate people and to collect data. Education of the community is the foremost concern and resource protection is just an added by-product of the process. At this point in time the committee feels resource protection is not really necessary.

The data needed to formulate a wellhead protection plan is the locations of public wells, basalt outcroppings and potential contaminant sources. It should be formatted as a map and data base.

As a final product, the community hopes to get a database of well locations, basalt outcroppings and potential contaminant sources that could be used if future decisions concerning water quality need to be made.

▲ Step 4

Delineate the wellhead protection area(s).

The wellhead protection area is the entire aquifer. The wells the public officials are interested in protecting are the public wells.

▲ Step 5

Select the data collection procedure.

The data that will be collected are basalt outcroppings, large quantity generators, large quantities of hazardous materials and public well locations.

The data collection methods will be Method 1, collecting existing sources of data and Method 4, personal interviews. It will be reported to the Advisory Team in the form of a data base and maps with plottings and written summary report.

▲ Step 6

Develop a publicity strategy.

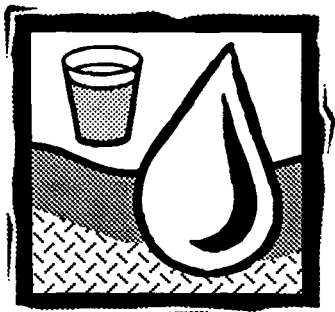
The publicity strategy is to:

- Develop a brochure about the program and the potential volunteer opportunities.
- Hold a press conference to announce the program and educate/inform the public about ground water.
- Make presentations to local organizations and groups about the program and the opportunity to volunteer.
- Advertise the ground water education workshops in the papers and see if a reporter wants to cover the event.

▲ Step 7

Recruit and train the volunteer coordinator.

A job description was developed and advertised. A volunteer coordinator was hired who carried out the responsibilities as described in the Volunteer Coordinator's Guide.



Appendix D

Volunteer Position Descriptions

Position 1: Data Collector

Volunteer Position Description

for the
Wellhead Protection Area Inventory

TITLE:
Data Collector

REPORTS TO:
Wellhead Inventory Volunteer Coordinator

PURPOSE:
To organize data concerned with potential sources of contamination of the Moscow area aquifer and drinking water supply. This data will be used in protecting and maintaining the high quality of drinking water in the Moscow area.

RESPONSIBILITIES:

- Read existing records on hazardous chemical storage and/or generation.
- Collect data from existing records and record on data forms.
- Visit public offices where data is housed to obtain copies and additional information.

LOCATION:
Work can be done in your own home or at the PCEI office.

TIME:
Two to five hours per week for 3 - 4 weeks.

QUALIFICATIONS:

- Accuracy in data recording.
- Legible hand writing.
- Desire to learn data collection and recording skills.

TRAINING PROVIDED:
Workshop in basic hydrology and ground water, data collection skills.

CONTACT:
Sue Perin
Palouse Clearwater Environmental Institute
112 West Fourth, Suite 1, Moscow, ID 83843
882-1444 / 885-6429

Position 2: Data Entry Specialist

Volunteer Position Description

for the
Wellhead Protection Area Inventory

TITLE:

Data Entry Specialist

REPORTS TO:

Wellhead Inventory Volunteer Coordinator

PURPOSE:

To enter numerical data collected about potential sources of contamination of the Moscow area aquifer and drinking water supply. This data will be used in protecting and maintaining the high quality of drinking water in the Moscow area.

RESPONSIBILITIES:

- Read data from data entry forms and enter into a computerized data base.

LOCATION:

Work must be done at the PCEI office.

TIME:

Two to five hours per week for 3 - 4 weeks.

QUALIFICATIONS:

- Accuracy in data entry.
- Experience with McIntosh computers or Excel helpful, but not required.
- Desire to learn data entry procedures.

TRAINING PROVIDED:

Workshop in basic hydrology and ground water, training in data entry and use of the Excel program in McIntosh.

CONTACT:

Sue Perin
Palouse Clearwater Environmental Institute
112 West Fourth, Suite 1, Moscow, ID 83843
882-1444 / 885-6429

Position 3: Team Leader

Volunteer Position Description

for the
Wellhead Protection Area Inventory

TITLE:

Team Leader

REPORTS TO:

Wellhead Inventory Volunteer Coordinator

PURPOSE:

To organize and coordinate a team of 3 to 4 other volunteers in collecting , entering and mapping of data concerned with potential sources of contamination of the Moscow area aquifer and drinking water supply. This data will be used protecting and maintaining the high quality of drinking water in the Moscow area.

RESPONSIBILITIES:

- Direct and organize a small group of other volunteers in collecting, entering and/or mapping data.
- Organize data, provide guidance and instruction to the group.
- Maintain communications with the Wellhead Inventory Volunteer Coordinator.

LOCATION:

Work can be done in your own home or at the PCEI office.

TIME:

Two to five hours per week for 3 - 4 weeks.

QUALIFICATIONS:

- Experience with and ability to coordinate groups, interest or experience in data collection.
- Experience with McIntosh computers helpful but not necessary.

TRAINING PROVIDED:

Workshop in basic hydrology and ground water, training in data entry and mapping.

CONTACT:

Sue Perin, Wellhead Inventory Volunteer Coordinator
Palouse Clearwater Environmental Institute
112 West Fourth, Suite 1, Moscow, ID 83843
882-1444 / 885-6429

Position 4: Interviewer

Volunteer Position Description

for the
Wellhead Protection Area Inventory

TITLE:
Interviewer

REPORTS TO:
Wellhead Inventory Volunteer Coordinator

PURPOSE:
To conduct interviews with selected individuals to obtain supplemental information on the contaminant sources entered into the data base and to obtain additional historical data.

RESPONSIBILITIES:

- Conduct interviews with selected individuals.
- Report interview information in legible and clear manner.
- Work closely with Volunteer Coordinator in setting up interviews.

LOCATION:
Work will be done at locations convenient for interviewees.

TIME:
Two to five hours per week for 3 - 4 weeks.

QUALIFICATIONS:

- Good understanding of ground water and potential contaminants.
- Ability to communicate clearly in spoken and written forms.
- Must enjoy working with people. Some background in public speaking helpful.

TRAINING PROVIDED:
Workshop in basic hydrology and ground water, training in interview skills.

CONTACT:
Sue Perin, Wellhead Inventory Volunteer Coordinator
Palouse Clearwater Environmental Institute
112 West Fourth, Suite 1, Moscow, ID 83843
882-1444 / 885-6429

Position 5: Data Mapper

Volunteer Position Description

for the
Wellhead Protection Area Inventory

TITLE:
Data Mapper

REPORTS TO:
Wellhead Inventory Volunteer Coordinator

PURPOSE:
Plot the locations of potential sources of contamination of the Moscow area aquifer and drinking water supply on a reference map. This data will be used in protecting and maintaining the high quality of drinking water in the Moscow area.

RESPONSIBILITIES:

- Review existing records on hazardous chemical storage and/or generation and plot information on final map.
- Visit public offices where data is housed to obtain copies and additional information, if necessary.

LOCATION:
Work can be done at the PCEI office.

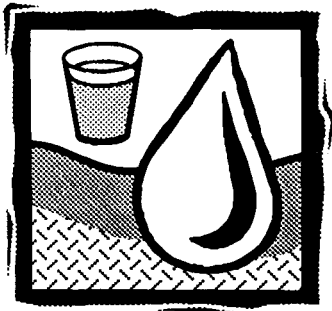
TIME:
Two to five hours per week for 3 - 4 weeks.

QUALIFICATIONS:

- Experience with or desire to learn basic map reading.

TRAINING PROVIDED:
Workshop in basic hydrology and ground water, training in map reading and mapping.

CONTACT:
Sue Perin, Wellhead Inventory Volunteer Coordinator
Palouse Clearwater Environmental Institute
112 West Fourth, Suite 1, Moscow, ID 83843
882-1444 / 885-6429



Appendix E

Example Data Collection Forms

Example A: Data Collection Form (Modified from: Madarchik, L.S. (1992). *How-To Manual for Ground Water Protection Projects.*)

Inventory of Potential Sources of Contamination

Source Code Number: _____ Inventory Person: _____

Public Water Supply Well #: _____

See Attached Map #: _____

Location: _____

Type of Land Use:

<input type="checkbox"/> Residential	<input type="checkbox"/> Agriculture	<input type="checkbox"/> Undeveloped
<input type="checkbox"/> Industrial	<input type="checkbox"/> Commercial	<input type="checkbox"/> Government Site
<input type="checkbox"/> Research		

Ownership:

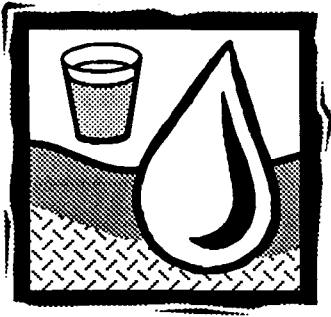
<input type="checkbox"/> City	<input type="checkbox"/> Private	<input type="checkbox"/> County
<input type="checkbox"/> School/University	<input type="checkbox"/> State	<input type="checkbox"/> Federal

Description of Location: _____

Historical Activity: _____

Potential Sources of Contamination:

Source	Qty.	Source	Qty.
Abandoned Water Well	()	Laundromat	()
Above-ground Storage Tank	()	Mine	()
Airport	()	Municipal Sewer Line	()
Animal Feedlot	()	Pipeline	()
Artificial Recharge	()	Print Shops	()
Asphalt Plant	()	Railroad	()
Auto Body Shop	()	Rural Dump	()
Auto Repair Shop	()	Septic Tank	()
Auto Salvage Yard	()	Service Station Disposal	()
Cemetery	()	Sewage Sludge Disposal	()
Chemical Storage Facility	()	Storm Water Disposal	()
Community Landfill	()	Stream, Creek, Lake, Pond	()
Drainage Canal	()	Underground Storage Tank	()
Drainage Well	()	Vehicle Maintenance	()
Dry Cleaner	()	Water Well	()
Feed Lot	()	Other	()
Fertilizer Application	()		



Appendix F

Facilitation Guidelines

▲ Facilitation Skills You Can't Live Without

A good teacher or workshop leader needs to be a good facilitator. A facilitator's role is to help individuals communicate with each other in ways that move the group toward specific goals and objectives. A facilitator can help bring out the best in students or participants and help them feel at ease. He or she can also encourage participants to clarify their thinking or feelings about a subject, talk more freely, and build their own understanding from workshop activities.

The following material is used with permission from the National Consortium for Environmental Education and Training. 1994. *Designing Effective Workshops*. In: *EE Toolbox—Workshop Resource Manual*. Ann Arbor, MI: School of Natural Resources and Environment. University of Michigan.

▲ Four Key Skills

Four key facilitation skills can help you deliver a more effective workshop. Each requires a lot of practice and excellent listening skills. Following is a brief summary.

1. Ask questions

Asking the right questions can do more to guide a discussion than any other facilitation skill. The best questions are open-ended - they help participants reflect on activities, elaborate on their thoughts and feelings, and dig deeper into the discussion. Unfortunately, most of us tend to ask questions that have one "right" answer. One way to help yourself ask good questions is to write them out before the workshop starts. This helps you avoid having to improvise at the same time you're trying to facilitate a discussion and keep the workshop on track.

Here are some examples of open-ended questions*:

- "How could this data be used by the community to help protect drinking water?"
- "How would you explain the program to the community members?"
- "What are the most important data to gather on potential contaminant sources?"

In some cases, you might want to encourage participants to think before they respond: "Think about this for a moment, then raise your hand," or "I'll ask a series of three questions and then we'll talk about all of them." Be sensitive to cultural differences among participants regarding direct eye contact and speaking in large groups - you may need to wait for answers or use small groups more frequently.

2. Paraphrase

This is an important facilitation skill for clarifying and ensuring comprehension, highlighting a point, or valuing a comment.

Paraphrasing means that you rephrase what someone else says. For example, you might say, "I hear you saying that . . ." or "Did I understand you to say . . ." By paraphrasing, you invite a participant to say, "Yes, that's what I meant", or "No, what I meant to say was..."

You can use paraphrasing to help quiet a persistent talker who is "hogging" the floor. For example, you might say: "Dale thinks the data could be used by the community to protect drinking water quality. Does anyone else have any thoughts?"* Paraphrasing can also help move the discussion along. For example, you might say, "If I could interrupt for a minute- You've made several important points and I'm afraid we're going to lose them."

Although paraphrasing is a key facilitation skill, it's important not to overdo it. Participants don't want to hear what they say parroted back continually.

3. Summarize

Like paraphrasing, summarizing takes a lot of practice. It allows you to pull important information together, guide a discussion, or make a transition from one-session or one-point to another. You can also summarize to help check for clarity and review progress.

* *These questions were modified from the original source.*

For example, if you feel that the participants are confused during a session, you might say something like "It sounds like the most important things we're coming up with here include . . . "; then list those points and ask, "Am I right? Does anyone have anything to add?"

You can also ask participants to summarize the discussion to get more people involved in helping to clarify what has happened during a session.

4. Offer encouragement

There are many techniques you can use to help participants feel at ease and to encourage discussion. Most are just good listening skills that people use naturally; others will take practice. Here are some examples.

- From the start, make sure the tone of the workshop is one of acceptance. Communicate to the participants that there are no "bad" questions. Answer every question with sincerity.
- Maintain eye contact with the participants who are speaking. Let them know you are listening.
- Use encouraging body language. Lean toward the person talking and pay attention to what he or she says.
- Call people by name. Also, refer to participants by name when you want to emphasize a point that they have made. For example, you could say, "Phil's comment about the most important contaminant sources to collect data on is what we are talking about now."*
- When asking open-ended questions or encouraging participants to summarize a discussion, make sure you give them enough time to think. Wait five seconds before calling on anyone.

* *These questions were modified from the original source.*

Ten Pitfalls of Facilitation

1. Being unprepared or disorganized.
2. Not saying "I don't know" when you ought.
3. Not establishing personal rapport with the group.
4. Apologizing for yourself or your organization.
5. Using poor audiovisual aids.
6. Not sticking to the schedule -- especially failing to end on time.
7. Not involving participants.
8. Using inappropriate humor.
9. Using sexist or racist comments.
10. Not using every workshop as a learning experience.

▲ Other Facilitation Tips

- Don't forget to introduce yourself and establish credibility, but be sensitive to the problem of setting yourself apart by overemphasizing your expertise. Make sure that the participants get a chance to introduce themselves and establish their own credibility with the group.

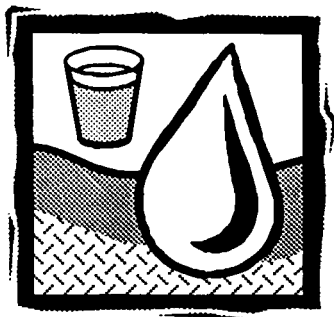
- Recognize the expertise of the group members and defer to them when you are able. Learn to say, "I don't know - What do others think?" without apologizing.

- Be flexible. Some things won't happen as planned. Just remember to "go with the flow." Make transitions without a big fuss.

- Try to avoid distracting habits, such as pacing back and forth, talking too fast or saying "um" or "uh" repeatedly.

- Write on newsprint or the chalkboard only when necessary, because it takes time and can slow the group down. However, it is very helpful to highlight key words or concepts as they come up.

- Dress for the part. Try not to be overdressed or under-dressed, but always look professional.



Appendix G

Educational Resources

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Project WET Idaho Activity Guide. (1991). Published by Idaho Water Resources Research Institute, 106 Morrill Hall, University of Idaho, Moscow, ID 83844-3011. Phone: 208-885-6429.

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US Environmental Protection Agency. (1990a). *Handbook—Ground Water, Volume I: Ground Water and Contamination.* Office of Research and Development, Washington, DC. EPA 625/6-90/016a

US Environmental Protection Agency. (1990b). *Citizen's Guide to Ground-Water Protection*. Office of Water, Washington, DC. EPA 440/6-90/004.

U.S. West. (1994). *Idaho Media Directory*. Compiled by U.S. West's Communications Public Relations Department, copies are available by calling (208) 385-2563, or writing P.O. Box 7888, Boise, ID 83702.

Wellhead Protection in Idaho. . . a plan to help your community protect its drinking water. Sponsored by Idaho Department of Health and Welfare, Division of Environmental Quality in cooperation with Idaho Water Resources Research Institute, 106 Morrill Hall, University of Idaho, Moscow, ID 83844-3011. Phone: 208-885-6429.



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