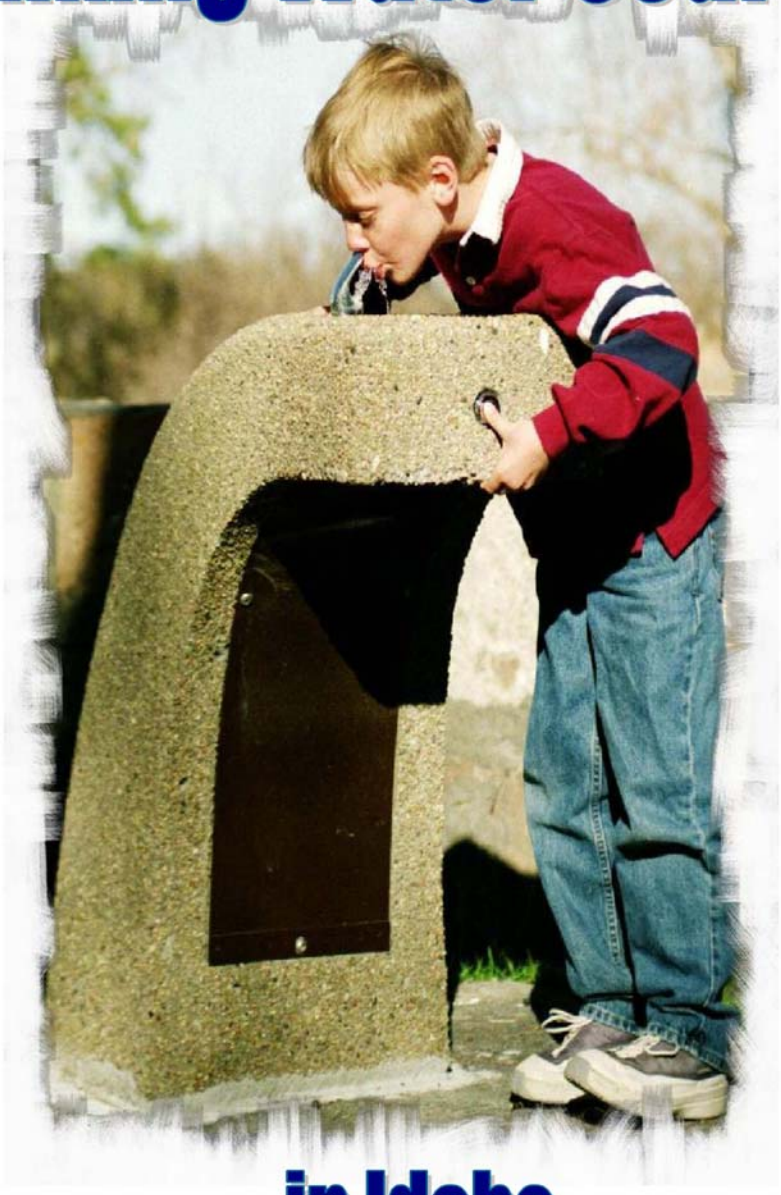
Protecting Drinking Water Sources in Idaho



August 2000
Revised April 2007

Identification of revision in April 2007

Only one item was changed in the April 2007 revision of this document, specifically:

> The certification discussed in Section 11, if obtained, now covers a period of five (5) years, as stated in this document in the last paragraph on p. 28. (Previously, it was a period of three (3) years.)

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Acknowledgments

This guidance was prepared by the Department of Environmental Quality (DEQ) staff and reflects the thoughtful contribution of many people.

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1 INTRODUCTION

Ground water is the source of drinking water for an estimated 96% of Idaho's citizens. Idaho ranks among the top two states in the nation that depend on ground water for drinking water purposes. The rest of Idaho citizens that rely on public water systems to supply their drinking water needs are using surface water or a combination of ground and surface water. We now know that ground and surface water used for drinking water supplies are often vulnerable to contamination. Most public water supply wells and surface water intakes are located in or around the communities using them as drinking water sources. Therefore, preventative measures must be taken to minimize the possibility that land uses will contaminate the water used by public water systems.

In 1996, Congress amended the Safe Drinking Water Act (SDWA) to emphasize the protection of surface and ground water sources used for public drinking water. The amendments require that each state develop a source Water Assessment Plan for public drinking water sources, conduct the assessments on all public water systems, and make the assessments available to the public. In Idaho, the Source Water Assessment Plan (SWAP) was developed by the Idaho Department of Environmental Quality (IDEQ). The completion of source water assessments for all public water systems should be completed by May of 2003. It is the responsibility of the IDEQ to ensure that source water assessments are completed in accordance with the SWAP.

Many agencies and entities are concerned and involved in the national attempt to provide protection to the nation's drinking water sources. Nationally, the U. S. Environmental Protection Agency (EPA) is committed to ensuring that by the year 2005 at least 40% of all public drinking water systems will be implementing source water protection measures. Toward this end, EPA, Region 10 entered into a Memorandum of Understanding (MOU) with the U.S. Department of Housing and Urban Development, Northwest, Idaho Department of Commerce, and Idaho Housing and Finance Association to ensure that federally funded projects are protective of sole source aquifers. Idaho has 3 sole source aquifers: Spokane Valley-Rathdrum Prairie, Lewiston Basin, and Eastern Snake River Plain aquifers. Community water systems drawing water from any of the 3 sole source aquifers and requesting federal financial assistance must be participating in Idaho's Wellhead Protection Program as a condition of receiving funding.

In conjunction with the nation-wide effort, the primary goal of Idaho's source water assessment process is to develop information that enables public water systems owners and operators, consumers, and others to initiate and/or promote actions to protect their drinking water sources. The source water assessment process produces a number of useful products that can be used to implement protection measures, but it is not an end product.

Source Water Assessment Products

A source water assessment will include several products that a group can use to help implement source water protection. These products include a delineation, a potential contaminant inventory, a susceptibility analysis, and a final report. Each of these products and their connections to source water protection are described below.

Delineation of the Land Area to be Protected

The IDEQ will ensure that delineations are performed for all public water systems existing as of November 1999. The delineated area defines the part of the watershed or ground water area that may contribute pollution to the water supply and will be referred to in this document as the source water protection area.

Identification of Potential Contaminant Sources

The potential contaminant source inventory process is broken into two phases during source water assessment. These two phases are the primary potential contaminant source inventory (primary inventory) and the enhanced potential contaminant source inventory (enhanced inventory). The primary inventory involves searching electronic databases and other files to identify potential sources of contamination within the delineated area. As part of the primary inventory, base maps will be produced showing the delineated source water protection area(s) along with the potential contaminant sources. The IDEQ will ensure that a primary inventory is performed for all public water systems existing as of November 1999.

The enhanced inventory builds on the primary inventory. The enhanced inventory focuses on performing an on-the-ground survey, reviewing local records and other information, and incorporating local experience and knowledge to identify additional potential contaminant sources not identified during the primary inventory. The completion of the enhanced inventory is a voluntary portion of the source water assessment and is primarily a local or community responsibility. This provides an excellent opportunity for the community to start implementing source water protection through involvement in the source water assessment process.

Susceptibility Analysis

The susceptibility analysis identifies the relative risk of system contamination by evaluating the type and number of potential contaminant sources, drinking water system construction, and natural conditions such as the type of soil in the vicinity of a drinking water well. The IDEQ will have this analysis performed to provide information that the community can use to help manage the source water protection area and to help build a contingency plan.

Source Water Assessment Final Report

The IDEQ will issue a final report summarizing the above assessment products. It will be made available to each public water system and to the public. The final report will also include a map(s) showing the delineation and significant contaminant inventory results. This map and the final report represent an important educational tool and reference material that the community can use for implementing source water protection activities.

The products developed by IDEQ and its contractors through the assessment process are foundational to the implementation of future source water protection activities. This manual is designed to provide guidance to parties interested in protecting drinking water sources in Idaho. It provides specific instruction for developing, certifying, and/or implementing the protection plans.

2 PROTECTING DRINKING WATER SOURCES IN IDAHO

No one wants to drink contaminated water. To prevent this from happening, a community may want to implement source water protection. In Idaho, source water protection involves voluntary drinking water protection activities implemented at the local or community level. The community may include any group of people served by a public drinking water system or responsible for supplying drinking water through a public water system. This can be citizens of a city or small town, residents of a subdivision, or the owner and employees of a business.

Preventing contaminants from entering a public water system supply greatly benefits the community by minimizing the problems that can occur from contaminants in the water supply. These problems can include increased health risks, expanded drinking water monitoring requirements, additional water treatment requirements, system replacement, or expensive environmental cleanup activities. Contaminant prevention through source water protection is not new to Idaho; it is the same as wellhead protection for public water systems supplied by ground water. The State has had a wellhead protection program, approved by the EPA, for several years. Many communities throughout Idaho have pursued voluntary wellhead or source water protection efforts. Source water protection builds upon wellhead protection by including surface waters--lakes, reservoirs, and streams--which are used to supply public drinking water systems.

Source Water Protection Scenarios

As discussed in the Introduction, certain source water protection steps will be completed or partially completed as part of Idaho=s source water assessment program, and will therefore lead to three general scenarios for source water protection in Idaho:

1) A local planning team may choose to pursue source water protection in conjunction with source water assessment work. The source water assessment process is specifically tailored to this approach, with the enhanced contaminant inventory providing an opportunity for additional local participation.

2) The source water assessment process may be pursued concurrent with ongoing source water protection efforts that the local planning team had started prior to source water assessment. This is the case for many of the communities currently involved with wellhead protection. Under these circumstances, existing delineation and contaminant inventory work will be incorporated into the source water assessment processes. In some cases, the existing protection area delineation may be modified to provide a more technically accurate basis for source water protection.

3) The source water assessment work may be completed prior to a community=s or planning team=s decision to pursue source water protection. In this situation, the community or team will be able to use the source water assessment results for the development of their source water protection plan, although certain aspects of the source water assessment, such as the contaminant inventory, may need to be updated in order for the information to be effectively used for source water protection purposes.

Under each of the above scenarios, a planning team may be formed after delineation of the area to be protected, or even after completion of the contaminant inventory. Although it is best to form the planning team early and have the team involved with all steps of the source water assessment and protection processes, an attempt should be made to form a community planning team prior to making decisions about managing the source water protection area and developing the associated protection strategy.

3 SOURCE WATER PROTECTION STEPS

The main goal of the source water assessment process is to provide a foundation to help communities protect their drinking water supply through source water protection. Some of the activities performed by the state during the source water assessment process can be equivalent to activities performed for source water protection. Please review specific steps below for further discussion on this issue. In general, Source Water Protection is composed of five steps:

Step 1: Formation of a Planning Team;

Step 2: Delineation of the Land Area to be Protected;

Step 3: Identification of Potential Contaminant Sources;

Step 4: Development and Implementation of a Management Plan for the Source Water Protection Area; and

Step 5: Planning for the Future: Development of a Contingency Plan and Planning for Future Drinking Water Sources.

This document will discuss each of these steps in detail.

4 FORMATION OF A PLANNING TEAM

To ensure success, a local source water protection program requires the cooperative efforts of people within the community. This includes the input and ownership of people who live and work in the community, make decisions that affect the community, are interested in the quality of their drinking water, and/or will be affected by source water protection activities. A community planning team should be established to help develop the local source water protection program. As part of this effort, the planning team should develop an overall protection strategy and a written plan. The planning team will also be responsible for initiating many of the protection activities and for updating the written plan.

Planning Team Membership

The makeup of the planning team will vary depending on the nature of the community. Planning team membership may include city officials, county officials, water system operator(s), business community representatives, agricultural community representatives, environmental representatives, members of the public, and technical experts from within the community or various local, state or federal agencies. In some areas, a planning team may have already been formed to address wellhead protection for ground water systems. In these situations, the existing wellhead protection planning team, with possible new additions as discussed above, should be considered the source water protection planning team. Also, there may be other existing groups such as a watershed advisory group formed to address similar water quality protection or other environmental issues. When other groups exist, much can be learned from their experiences, and efforts should be made to coordinate with them.

Inter-jurisdictional cooperation may be essential for effective source water protection since many of the delineated source water protection areas will lie, at least in part, outside of the jurisdiction of the community developing and implementing the protection plan. This is especially true for homeowner associations or smaller public water systems which may not have any jurisdictional land use control. To help reduce potential jurisdictional conflicts, the planning team should include representatives from those jurisdictions with land use controls over the source water protection area. These may include local, city, county, state, tribal government, or federal agency representatives. In addition, it may be beneficial for neighboring communities to work together or exchange information on overlapping source water protection areas in shared aquifers or watersheds.

Within the planning team, there should be at least one person designated as the coordinator and/or primary contact. This could be the water system operator, the mayor, the city clerk, a city council member, the city engineer, the city utilities manager, or a respected member of the community.

All individuals interested in source water protection should be given the opportunity to participate as planning team members. Efforts should be made to obtain involvement from members of the community through a variety of approaches:

- a newspaper article;
- a television or radio advertisement;
- a flier at the local library, community center or town hall;
- a flier in the water bill;

- announcements at local business group meetings or other community meetings;
- direct contact or meetings with individuals; and/or
- through an Internet announcement.

Planning Team Logistics

Once a planning team has been formed, the planning team should address the following logistical questions:

- How often and where will the planning team meet?
- Who will arrange the meetings, prepare the meeting agenda, and chair or facilitate the meetings?
- What is the most appropriate time to conduct the meetings?
- Will meeting minutes or summaries be produced and made available to the public?
- How will public participation be incorporated into the process such as in public comment on proposed plans and allowing for new planning team membership?

Preparing for Source Water Protection

The planning team will first need to become familiar with the source water protection and source water assessment processes as described within this guidance. In addition, the planning team may want to address the following questions to help get started:

- Has our water system=s source water assessment been completed? If not, what is the schedule for completion? If it is completed, where can we get a copy and does it need to be updated?
- Does the planning team need additional information on source water protection, water quality, the potential for system contamination, or ground water flow and contaminant transport?
- Are there existing city or county ordinances which address source water or wellhead protection for the water system?
- What is the quality of our drinking water in comparison to the Safe Drinking Water Act Maximum Contaminant Levels and in comparison to other systems in Idaho?
- Is the water quality getting better or worse?
- Are the water system operators currently performing water treatment or operational controls such as mixing source waters to ensure compliance with Safe Drinking Water Act regulations?
- How would a contaminated water supply impact the community?
- Does the planning team want to develop a written source water protection plan for the community, and will State certification be pursued?
- Does the community have an updated contingency plan in case of water system failure or contamination?
- Does it look like the community may need more drinking water sources in the future to address growth?

The planning team should discuss what forms of outside assistance the community may want to pursue. Many state and federal programs offer some form of water quality protection assistance. The IDEQ provides assistance through their wellhead protection and source water assessment programs. In addition, the Idaho Rural Water Association (IRWA) offers source water protection assistance to communities that have populations under 10,000 and obtain the drinking water from ground water sources. The assistance provided by IDEQ, IRWA, and other state and federal programs includes guidance or educational documents, community presentations, examples of other community plans and protection efforts, water quality information, and technical assistance.

Source Water Protection Strategy Development

One of the most important planning team responsibilities is development and implementation of a source water protection strategy for the community. This strategy outlines how source water protection will be implemented within the community and how the source water protection area(s) will be managed. Strategy development is discussed further under *Step 4: Development and Implementation of a Management Plan for the Source Water Protection Area*.

5 DELINEATION OF THE LAND AREA TO BE PROTECTED

The delineation of the land area to be protected for each public water system will be completed by IDEQ, or a contractor to IDEQ, as part of the source water assessment process. However, some public water systems may have the available resources to complete all or part of the source water assessment themselves, and may choose to complete their own delineations. In these instances, the IDEQ will review the final products for consistency. In all situations, the community, water system owner, and/or planning team members will have the opportunity to assist with this effort by providing IDEQ with information such as well logs or pump test results.

Different delineation approaches are used for the different major categories of drinking water sources: ground water, springs, surface water, and conjunctive sources. Although this work will likely be performed by the IDEQ or a contractor to the IDEQ, the planning team and members of the community involved with source water protection should be familiar with the delineation approach(es) used for their drinking water sources. These delineation approaches are described within Appendix A.

6 IDENTIFICATION OF POTENTIAL CONTAMINANT SOURCES

Once the source water protection area has been delineated, the next step is to identify the potential contaminant sources found within this delineated area. A potential contaminant source is simply a location where there is an activity having the potential to release contaminants into the environment at a level of concern. The activity may be associated with a business, industry, or operation involving the use, transport, storage, or manufacture of the potential contaminants. Identification of a business, industry or operation as a potential contaminant source does not mean that the business, industry or operation is out of compliance with any local, state, or federal regulation, and it does not necessarily mean that the business, industry or operation has or will cause contamination. What it does mean is that the potential for contamination (or pollution as it is sometimes called) exists due to the nature of the business, industry, or operation.

An inventory of potential contaminant sources can:

- Provide an effective means of educating the public about potential contaminants;
- Provide information on the locations of potential sources, especially those that present the greatest risks to the water supply; and
- Provide a reliable basis for developing a local management plan to reduce the risks of contamination to the water supply.

The potential contaminant source inventory is structured in two parts for source water assessment purposes. The first part, called the primary potential contaminant source inventory, will be performed by the IDEQ for all public water systems. The second part, called the enhanced potential contaminant source inventory, is a recommended activity for any community interested in pursuing source water protection.

Potential Contaminant Sources

Ground water and surface water can be contaminated from a point source(s) or a nonpoint source(s). Point sources are discrete, direct sources of potential contaminants that can be identified by a point on the map. For example, an effluent pipe from a wastewater treatment plant that discharges directly into a stream is a point source of potential surface water contamination. An example of a point source to ground water is an injection well where contaminated water from a service garage is allowed to drain into ground water. Nonpoint sources are diffuse and indirect, often spread over large areas. An example of a nonpoint source to surface water is stormwater drainage from parking lots and other developed locations. An example of a nonpoint source to ground water is leaching of contaminants, such as pesticides, from agricultural fields.

Table B-1 in Appendix B provides an overview of potential contaminant sources, both point and nonpoint, and the contaminants that may be associated with each source. These sources represent many of the businesses, industries, operations, land uses, and environmental conditions that handle, generate, store, apply, dispose of, or provide a pathway for the contaminants of concern. The potential contaminant sources can apply to either ground water or surface water, and many can apply to both.

Primary Potential Contaminant Source Inventory

The primary potential contaminant source inventory (primary inventory) is performed by the IDEQ and involves identifying potential sources of contamination using information readily available from existing local, state, and federal databases, files, and Geographical Information System (GIS) map coverages. The primary inventory will identify many of the potential contaminant sources that can generally be described as point sources. These include many of the businesses or activities where potential contaminants are stored or used. In addition, land uses which can act as nonpoint contaminant sources will be included as part of the primary inventory. Examples include both irrigated and non-irrigated agriculture, urban or commercial development, and golf courses. Areas that have many point sources of similar risk, such as a large number of septic systems within a given density, will be addressed as a nonpoint source or land use rather than trying to identify each and every individual source. In some instances, surface water bodies may be identified as potential sources of bacteria and other pathogens to ground water systems.

A product of the primary inventory will be a base map showing the delineated source water protection area, the public water system wells or intakes, and the potential contaminant sources. General descriptive information and corresponding map reference numbers will be provided for the potential contaminant sources. For communities interested in source water protection, the base map and reference information provides a working draft for performing the enhanced inventory.

Enhanced Potential Contaminant Source Inventory

The enhanced inventory provides an opportunity for community involvement with the source water assessment process. The enhanced inventory will create an improved awareness of potential contaminant sources due to the hands-on experience and the possibility of identifying sources not previously identified during the primary inventory. Once the enhanced inventory has been completed, the information is provided to IDEQ where it will be combined with the existing primary inventory. The information obtained from the enhanced inventory will then be used by IDEQ for the susceptibility analysis portion of the source water assessment, and by the community to more effectively implement source water protection.

The enhanced inventory should involve the community planning team to the extent possible. It can also involve community organizations such as the local scout troops or retired community members. Enhanced inventories can be done as a combined effort among several systems or communities in areas where there are overlapping source water protection areas.

The enhanced inventory should, at a minimum, include an on-the-ground survey and an attempt to identify historical sources of potential contamination. The on-the-ground survey simply involves a reconnaissance of the source water protection area. It includes field checking locations of potential sources identified from the primary inventory as shown on the base map and noting any new potential contaminant sources located during the survey. Table B-1 in Appendix B should be used as a reference guide for identifying potential contaminant sources during the enhanced inventory process.

The level of actual field reconnaissance during the Aon-the-ground@ survey will depend upon the complexity and size of the source water assessment area. Those conducting the on-the-ground survey should use the inventory forms provided in Appendix C (Figures C-1 and C-2) in conjunction with the base map(s). Although no form is provided for land uses, if they differ from those identified in the primary inventory the updated information should be entered directly on the land use base map.

In addition to those identified in Table B-1, potential contaminant sources to look for during the on-the-ground survey include old gas stations (evidence of pump islands), lagoons or basins where water is ponding, machine shop or auto repair sites, and obvious storage areas for chemicals, pesticides, wastes, etc. Also, it may be desirable to document additional potential contaminant source characteristics observed during the inventory. These characteristics are those conditions beyond what is suggested by the inventory forms and can include secondary containment details for chemical storage, evidence of spills, evidence of poor water quality protection practices, or evidence of management practices that appear to set good examples of water quality protection. This additional information does not have to be sent to the IDEQ as part of the enhanced inventory, but should be kept by the community to assist with source water protection efforts.

A review of aerial photographs and historical property uses, and the interviewing of knowledgeable residents are additional approaches that should be used to identify existing and historical potential contaminant sources. The on-the-ground survey can then be used to verify locations where necessary. Changing land use dynamics may make it impossible to field-verify certain information. However, this information should still be included on the base map(s) and documented on the corresponding inventory forms.

Frequency of Potential Contaminant Source Inventories

IDEQ will perform the primary inventory only once for each public water system. The community will typically have only one opportunity to incorporate information from an enhanced inventory into the source water assessment process.

After the source water assessments have been completed by IDEQ, it will be the responsibility of the community to review and update their potential contaminant source inventory on an as-needed and voluntary basis as part of their source water protection plan implementation. For those communities pursuing source water protection for ground water systems, the IDEQ recommends that the inventory within Zones 1A (sanitary setback distance) and 1B (the remainder of 3 year time-of-travel) be updated on a regular basis and that the inventory within Zones II (6 year time-of-travel) and III (10 year time-of-travel) be updated at least once every three years. Routinely updating the potential contaminant inventory can be desirable for communities experiencing rapid growth or for areas experiencing dramatic land use changes.

7 DEVELOPMENT AND IMPLEMENTATION OF A MANAGEMENT PLAN FOR THE SOURCE WATER PROTECTION AREA

The management of the source water protection area may best involve a phased approach at the local level, especially for those communities new to source water protection. A community may wish to only undertake or plan certain activities in their first year, and then add additional activities as time goes on, while communities with more experience may wish to plan and implement several activities based on a prioritized schedule.

Management Tools
Drinking water quality can be protected through a combination of **management tools**. Each management tool is often applicable to several potential contaminant source types. The management tools can apply to existing or future potential contaminant sources.

Table 1 provides a list and description of many of the management tools available for source water protection purposes. Management tools fall into two categories: 1) regulatory and 2) non-regulatory. Regulatory tools could include such items as zoning ordinances or site plan review requirements. The application of regulatory tools may be limited to political boundaries that may not correspond with source water protection area boundaries. In those cases, it will become important for the planning team to meet with representatives from outside the local jurisdiction, if they are not yet members of the team, to establish how the source water protection plan may be best developed and implemented.

Non-regulatory tools might include items such as educational or pollution prevention activities. At a minimum, every community=s source water protection plan should include a *public education and information* component.

Protection Measures
Some of the management tools in Table 1 are applicable to a specific type of potential contaminant source. For example, *household hazardous waste collection* helps prevent the improper disposal of hazardous wastes by homeowners. Other management tools have broad applications for numerous potential contaminant sources. One example is *best management practices,* which can apply to a large number of potential contaminant sources and vary significantly between potential contaminant sources. To help communities with source water protection, the IDEQ, in conjunction with other agencies, is identifying specific examples, referred to as **protection measures**, of how management tools can be applied to potential contaminant sources more commonly found in Idaho. These sources are typically identified during the potential contaminant source inventory and within the Source Water Assessment Final Report. An example list of protection measures for injection wells, along with agency contact information, is provided in Appendix D.

As shown by the Appendix D example, potential contaminant source types can have distinct lists of protection measures from which a community can pick and choose for source water protection purposes. The list of protection measures may include both regulatory and non-regulatory options. A given protection measure can be applied throughout the whole source water protection area, or within a given delineation zone such as a 3-year time-of-travel zone for ground water protection or a stream buffer zone for surface water protection. The selection of protection measures, and

associated management tools, should be tailored to the needs of the community and the anticipated support from within the community. Source water protection plans which incorporate the use of multiple management tools and protection measures for potential contaminant sources, especially for the high priority sources, will provide increased protection of the community=s drinking water quality.

Source Water Protection Strategy Development

The major part of a planning team=s strategy development revolves around how the source water protection area will be managed and what management tools and protection measures will be used. One key strategy element that the planning team will need to consider is whether source water protection will include both regulatory and non-regulatory management tools. As mentioned above, non-regulatory management tools, such as public education, should always be included within a community=s source water protection program. Regulatory management tools can be an effective addition to any source water protection strategy. Regulatory management in Idaho typically involves a city and/or county ordinance requiring specific protection measures within the different capture zones.

How the community will protect the different zones within a source water protection area (reference Step 2) is another strategy element. Generally, the zones closest to the ground water well or spring, or the buffer zone for a surface water supply, should have greater focus and possibly stricter regulatory requirements.

The overall strategy that the planning team pursues may involve a phased approach for certain protection efforts. For example, Year 1 efforts may focus on education and pollution prevention, and Year 2 may continue with these efforts and have an additional focus on developing and passing a city ordinance. Regardless of the approach a community takes, the planning team, once established, should attempt to implement a variety of local projects (such as storm drain stenciling, road signage, etc.) to keep source water protection on the minds of the community.

It is important to remember that source water protection strategy development and planning activities should be an evolving process which addresses the community=s need for clean drinking water. As the community begins implementing its source water protection activities, the planning team may need to modify its strategy based on new information, new ideas, and/or increased public input.

Prioritizing Potential Contaminant Sources

In many situations, it may be impractical for a community to address all the potential contaminant sources within the delineated source water protection area at one time. As such, the community may look to implement a phased approach based on a prioritization of potential contaminant sources. This prioritization of potential contaminant sources will help with the development of appropriate management tools and protection measures, and can be considered a significant planning team responsibility. The Source Water Assessment Final Report, particularly the susceptibility analyses results, will provide important information that a community/planning team can use to help prioritize potential contaminant sources and associated threats to their drinking water supply. The following considerations can be helpful for prioritization:

- When there are a large number of potential contaminant sources, a rating scheme--such as high/medium/low--may help to prioritize the list.

- The closer a potential contaminant source is to the well or intake, the higher its priority should generally be.

- Potential contaminant sources which use, store, or apply large amounts of a material of concern should generally be higher priority than those with small amounts.

- Ranking can be based on detections of known contaminants at the public water supply source or within the source water protection area. For example, if nitrate contamination is a concern, then potential contaminant sources that could be contributing to the nitrate contamination should be rated higher.

- If there are many potential contaminant sources, it may work best to group them by type and/or by zone. For example, small businesses in the 3 year time-of-travel zone may be grouped together. Grouping can be effective for those source types that would generally be managed in a similar manner for source water protection purposes.

Table 1: Management Tools for Source Water Protection

REGULATORY TOOLS[1]	
Zoning Overlay	Overlay zones can be used in conjunction with conventional zoning and to create special districts to protect the source water protection area. Overlay zones are applied to areas singled out for special protection, such as the source water protection area itself, and add regulations to those controls already in place. This method helps address Agrandfathered@ potential contaminant sources in source water protection areas.
Zoning Ordinances	Zoning ordinances typically are comprehensive land-use requirements designed to direct the development of an area. Many local governments have used zoning to restrict or regulate certain land uses, which have the potential to contaminate water within source water protection areas.
Subdivision Ordinances	Subdivision ordinances are applied to land divided into two or more subunits for sale or development. Local governments use this tool to protect source water areas in which ongoing development is causing contamination. An example of a subdivision ordinance would be to require a minimum lot size for single family homes using septic systems so as to limit septic system density and subsequent ground water contamination.
Potential Source Prohibitions or Restrictions	Source prohibitions or restrictions are regulations that prohibit or place restrictions on the use of certain chemicals that pose a high risk to water contamination such as Atrazine or trichloroethene; or prohibit or place restrictions on the placement of some high-risk potential contaminant sources such as underground storage tanks, underground injection wells, lagoons, feedlots, and/or landfills.
Building Codes	Local building codes offer protection through special standards applicable to facilities which are remodeled or constructed in the source water protection area. Building codes can require low flow fixtures, backflow preventers and other design features to conserve and protect water quality.

Design Standards	Design standards typically are regulations that apply to the design and construction of buildings or structures. This tool can be used to ensure that new buildings or structures placed within a source water protection area are designed so as not to pose a threat to the water supply, such as requiring an impermeable liner on a settling pond.
Operating Standards	Operating standards are regulations that apply to ongoing land-use activities to promote safety or environmental protection. Such standards can minimize the threat to the source water protection area from ongoing activities such as the storage and use of hazardous substances through requirements such as secondary containment and spill response capabilities, or requiring that septic systems be properly maintained.
Site Plan Review	Site plan reviews are regulations requiring developers to submit for approval plans for development occurring within a given area. This tool ensures compliance with regulations or other requirements made within a source water protection area.
Performance Standards	Performance standards are used to regulate development within source water protection areas by enforcing predetermined standards for water quality. They may be applied at a predetermined ground water monitoring compliance point, at the point of injection, or through the use of contaminant source modeling. One example is the requirement that the amount of storm water runoff be the same before and after construction when developing or improving a site.
Special Permitting or Reviews	Special permits or reviews are used to set conditions for certain uses and activities that pose a high risk to water contamination within source water protection areas if left unregulated. One example is to require that new feedlots within certain source water protection area zones be required to have a city or county permit or review that requires ground water quality monitoring and/or the use of certain water quality protection management practices.
Bonding	Facilities may be required to post a bond prior to operation in a source water protection area. Bonds can cover costs associated with spill response or remediation efforts.
Transport Prohibitions	The transport of chemical compounds which pose a high risk to water quality if spilled can be restricted within a source water protection area by requiring alternative transportation routes.

NON-REGULATORY TOOLS[2]

Public Education and Information	Public education and information should be an important component of any source water protection program. Public education often consists of brochures, pamphlets, seminars or presentations, such as to a local school or business group, which address water quality protection. This tool promotes the use of voluntary protection efforts and builds public support for a community protection program.
Water Conservation Program	Implementing water conservation measures can significantly benefit ground water (wellhead) protection efforts by reducing pumping rates. Lower pumping rates mean reduced flow rates and less risk of moving contamination toward the wellhead. Conserving water for ground or surface water systems may also help reduce the need for additional water sources in the near future. Water conservation can be accomplished through steps such as promoting the use of native vegetation, improved irrigation methods, and through public education.
Household Hazardous Waste Collection	Establishing a permanent location or holding one-day events to collect hazardous wastes from community residents is an effective way to reduce risks posed by storing hazardous materials within the source water protection area. This would reduce the risk of improper disposal into septic systems not designed to handle such wastes or from improper disposal to the ground or nearby surface drainages, and may also help protect a community's wastewater treatment plant from harmful chemicals.

Pollution Prevention	A pollution prevention program can include reducing the amount of chemical wastes or reducing the usage of certain chemicals by replacing them with chemicals that are less threatening to water quality. Pollution prevention is often accomplished through education and information, such as through the distribution of pollution prevention booklets specific to a type of source such as an automobile repair shop, car washes, dry cleaners, etc.
Purchase of Development Rights or Property	The purchase of property or development rights is a tool used by some localities to ensure complete control of land uses in or surrounding key locations within a source water protection area. This tool may be preferable if regulatory restrictions on land use are not politically feasible and the land purchase is affordable.
Spill Response Planning	Local governments can develop their own emergency spill response programs to minimize potential impacts of spills to water quality.
Best Management Practices (BMPs)	BMPs are practices or combinations of practices which ultimately prevent or reduce contamination to water. Although often associated with agricultural activities, BMPs can apply to any activity that has the potential to impact ground water or surface water. BMPs can be encouraged through voluntary methods or can be required through regulations that may further define what a BMP is and how it is to be used.
Water Quality Monitoring	Water quality monitoring includes selecting appropriate sampling sites upgradient of the well or intake, and developing an ongoing water quality monitoring program. Monitoring can also be a regulatory requirement for high risk contaminant sources within a source water protection area.
Training and Demonstrations	These programs can complement many of the regulatory or non-regulatory tools. Examples include training of local emergency response teams or demonstration of agricultural BMPs.
Inspection Programs	Inspection of facilities and other contaminant sources can be developed as a voluntary program or through regulatory requirements. Voluntary inspection of businesses for pollution prevention and contaminant control ideas and recommendations is one example of a non-regulatory approach.
Groundwater Guardian Program[3]	A community can participate in the Groundwater Guardian Program through the Groundwater Foundation, which is a non-profit foundation dedicated to educating the public about the conservation and protection of ground water. This program incorporates a results-oriented approach to ground water quality protection.

NOTES:

1: Local governments have the authority to manage potential sources of contamination within their jurisdiction, and can therefore implement regulatory tools which protect water quality. In Idaho, zoning ordinances that apply to a community-s wellhead (source water) protection area represent one of the more commonly used regulatory tools. Several counties have also developed or are developing ordinances which apply to the portion of a delineated source water protection area that happens to fall within county jurisdiction. Additional information on planning and zoning related management tools can be found in the Idaho Local Planning Act of 1975 which provides authority to local communities for local land use planning (Idaho Code Title 67, Chapter 65).

2: Some of the management tools that are generally considered nonregulatory can become regulatory if required by city ordinance or through other methods.

3: Communities in Idaho that have been or are designated as Ground Water Guardian Communities include the following Cities: Boise, Hansen, Pocatello, and Chubbuck.

8 DEVELOPMENT OF A CONTINGENCY PLAN

IDEQ encourages the planning team, local governments, and water systems to adopt a contingency plan. A contingency plan is a blueprint outlining roles and responsibilities in the event that the system experiences a disruption due to contamination, loss of power, natural disasters such as drought or flooding, or other circumstances where it cannot provide services. The contingency plan will help local officials make well thought-out, educated decisions even under the most adverse conditions. For example, a contingency plan could outline options for a community if a large fuel spill were to occur near one of the community=s drinking water sources, or when sampling indicates contaminant levels above the Safe Drinking Water Act Maximum Contaminant Level. The development and implementation of a contingency plan increases the likelihood that correct and immediate action will be taken and that any damage or potential health risk, both in the long and short term, will be minimized.

Components of a Local Contingency Plan

One of the most important contingency plan components is a list of everyone to notify in case of an emergency. This list is often the community=s emergency response team and also may be included as part of a larger local emergency response plan. The list should include the names of the most current contacts, their resources and responsibilities, and their contact information (phone, pager, fax, etc.). Contingency plans may also identify agencies, departments and consultants beyond those on the immediate emergency response team. The listing should include their scope of services and the expertise of each contact. In some cases, sources of financial support, such as Federal Emergency Management Agency (FEMA) and U.S. Department of Housing and Urban Development (HUD), will be needed and can be identified in the contingency plan. The nature of the emergency will determine exactly who will be needed in a particular case. This information must be kept current and serve as a Aliving@ document. Out-of-date information is of little use in an emergency situation.

The contingency plan should list the various resources, materials, tools, and personnel that are available for emergency response purposes. This list also must be kept current and should address maintenance needs and maintenance responsibilities for critical tools and equipment.

The contingency plan should include information on how to obtain emergency sources of water for drinking and possibly for other uses such as fighting fires. A priority list of uses should be developed to best utilize limited water availability under emergency conditions.

In addition to emergency water supplies, the contingency plan should address the potential need for long-term replacement of the existing drinking water supply. This part of the plan would identify the alternative drinking water sources, where they are located, and how they can be obtained. The costs of replacing the current source of drinking water should be analyzed. This analysis often clearly shows local decision-makers and the community exactly how valuable the current, clean, safe drinking water supply is to the community. Source water protection actions taken to maintain drinking water quality may, in the long run, keep the community from making costly investments in an alternative drinking water source.

A contingency plan should include the following planning items:

- A description of water system characteristics.

- An identification of potential threats to the drinking water source. These can include natural disasters such as flooding or significant contaminant threats. The susceptibility analysis from the source water assessment report, if available, can help with this effort.

- A response to various threats based on a variety of scenarios, or Awhat if@ type statements developed to help the community decide what to do under certain emergency situations.

- An identification of triggers or signals of when to respond, such as a certain level of flooding or a given level of contamination. It is important that the community accurately recognize the nature of the threat and tailor the response accordingly.

The use of monitoring data as an early-warning system can be an effective component of a contingency plan. When significant contamination is detected or an increasing trend is identified, it may be possible to take preventive actions prior to losing or having to shut down a public drinking water source. Safe Drinking Water Act Maximum Contaminant Levels and health advisory levels can be used to help evaluate monitoring data. In addition to the data from the public water system sources, other monitoring locations, such as other public water sources or domestic wells in or near the source water protection area, can be used to assist with this effort. The IDEQ and/or local district health department can be contacted to help determine trends and potential contaminant problems for the water system sources, and to help identify additional monitoring locations and monitoring results in the source water protection area. When contamination is identified as a significant concern, the information should be shared with other water purveyors in the area since the contamination problem may impact other systems.

If a contingency plan already exists, the community planning team should review and update the plan as needed to help ensure full protection of the public drinking water supplies. In addition, contingency plans should address the need for periodic reviews and updates.

Table 2 provides a summary list of topics and approaches for local contingency plan development, many of which were discussed above.

Contingency Plan Development Responsibilities

The water purveyor and/or the local government should be responsible for developing a local contingency plan. This can be accomplished through the community planning team or in cooperation with the community planning team. The contingency plan should be coordinated with State agencies involved with emergency response activities and with the local emergency response planning committee. In certain instances, it may be feasible to include the contingency plan as part of the community=s local emergency response plan.

Those who are most likely to be directly involved in any emergency response should be those who help in the development of the contingency plan. These may be the people who work with or transport hazardous chemicals, especially those in the source water protection areas. More than likely, they will be the ones reporting any spill, and they will be the ones who should have the materials and expertise on hand to manage a spill.

Getting the community involved in the early stages of contingency plan development also means that the community will be aware of their role and civic responsibilities under the plan. This sense of civic responsibility should lead to greater cooperation and sharing of resources.

Table 2: Local Contingency Plan Topics

Topic	Recommended Approach
Water system characteristics	Ë Compile current plans and specifications showing the location of all components (source, treatment, distribution and type piping, valves, storage tanks, etc.) Ë Assess component sizes and capabilities. Ë Assess system use demands.
Identification of potential emergency situations	Ë Identify potential disruptive events such as contamination, power outage, flood, earthquake, water shortage, loss of pressure, etc.
General response procedures for each emergency situation.	Ë Develop incident assessment guidance to determine the severity and appropriate response to a particular emergency. Ë Develop step-by-step procedures to be followed in response to a particular emergency. Include a list of names and phone numbers for all federal, state, and local officials that need to be contacted. Ë Develop guidance on the level of service to be sustained during an emergency and prioritize the uses. This guidance should involve the curtailment of all non-drinking water related activities not needed for emergency purposes Ë Develop a procedure by which the system users will be notified of the extent of the emergency, actions being initiated, and precautions to be taken. Ë Assess equipment and manpower needs for specific situations. Assess in-house capabilities to respond and identify additional sources of assistance which may be needed. Ë Identify funding source(s).
Response procedure for emergency contingency plans. (Emergency contingency plans should cover the time period of 1-2 months following the loss or potential loss, as indicated by trends and health advisories, of a water supply.)	Ë Develop a problem identification procedure. Ë Develop procedures to provide emergency water supplies[1]. Ë Identify funding sources. Recommend using readily available resources.
Response procedure for short term contingency plans. (Short term contingency plans should cover the time period of up to 2 years following the loss or potential loss of a water supply.)	Ë Develop a problem identification procedure. Ë Develop procedures to implement interim solutions[2]. Ë Identify funding sources[3].

Table 2: Local Contingency Plan Topics

Topic	Recommended Approach
Response procedure for long term contingency plans. (Long term contingency plans should cover the time period required to implement a permanent solution for the loss of a water supply.)	Ë Develop a problem identification procedure. Ë Develop procedures to implement long term solutions. Long term solutions may involve development of alternative sources of drinking water or water treatment. Ë Identify funding sources[3]. Ë Develop a procedure for ongoing assessment of the situation and for documentation of actions taken in regard to the incident. This will be important if enforcement actions are needed. Ë Begin implementation of the contingency plan to the extent possible before an emergency[4]. Ë Provide for annual review and possible updating of contingency plans.

[1] Examples include bottled water, use of boil orders, use of surface water, state actions from the State Bureau of Disaster Services. The State Bureau of Disaster Services is responsible for coordinating the response, recovery, and mitigation operations of all state agencies during a disaster and coordinates all requests from local governments for disaster assistance.

[2] Examples include water conservation measures, replacement of equipment, connection to an adjacent system, and rehabilitation of an abandoned well.

[3] Examples include community block grants (U.S. Department of Commerce or the Idaho Department of Commerce), Farmers Home Administration, bonding, Idaho Legislature, or the Idaho Water Resource Board (Revolving Development Account or Water Management Account).

[4] Examples of pre-emergency actions include finalizing administrative agreements, developing engineering plans, having specification plans reviewed and approved, proceeding on construction, etc.

Coordination with Other State and Local Emergency Response Activities

The contingency plan should be distributed to agencies/entities involved with local emergency plans, local planning officials, regulatory agencies, and district health departments.

Responsibilities of various agencies that pertain or could pertain to drinking water emergencies are listed in Table 3. The EPA Technical Assistance Document titled "Guide to Ground Water Supply Contingency Planning for Local and State Governments" (1990) provides additional information to assist both local and state governments in establishing, maintaining, and updating emergency response procedures in the event of a loss of public water supplies.

Table 3: State Agencies with Relevant State Emergency Plan Roles

State Agencies	
Agency	**Roles**
Department of Agriculture	Ë Provide technical information on pesticides, herbicides, fertilizers, and other agricultural chemicals used in Idaho.
Department of Fish and Game	Ë Act as auxiliary police in the event of a major disaster.
Department of Environmental Quality	Ë Assess and evaluate incident environmental risks. Ë Forewarn users of potentially affected public domestic water systems. Ë Coordinate environmental investigation and monitoring programs. Ë Oversee the cleanup and disposal of hazardous wastes, radioactive wastes, and other deleterious materials.
Department of Health and Welfare - Division of Health	Ë Assist in providing technical and health services in the event of a major disaster. Ë Investigate waterborne disease outbreaks
INEEL Oversight Program	Ë Advise agencies in the cleanup and disposal of radioactive wastes. Ë Direct and coordinate investigations and assess risk to the public from radiation incidents.
Department of Law Enforcement -Idaho State Police	Ë Provide law enforcement actions related to a hazardous materials incident.
Public Utilities Commission	Ë Review costs and assist water companies with implementation of corrective actions.
Transportation Department	Ë Assist in providing materials for the containment of hazardous materials.
Department of Water Resources	Ë Assist in the development of emergency or alternate drinking water sources. Ë Responsible for the Idaho Drought Plan, which includes information on federal and state drought-related and emergency assistance programs.
Executive Office of the Governor-Idaho Emergency Response Commission	Ë Provide technical assistance to local emergency planning committees. Ë Administer the Idaho Regional Hazardous Materials Response Teams.
Executive Office of the Governor-Bureau of Disaster Services	Ë Coordinate state activities when a state disaster declaration is imminent or declared. Ë Coordinate all requests for National Guard Support.
Executive Office of the Governor-Idaho National Guard	Ë Assist in providing emergency drinking water sources.
District Health Departments	Ë Forewarn users of potentially affected individual and public domestic water systems under the jurisdiction of the District Health Departments.

Table 3: State Agencies with Relevant State Emergency Plan Roles	
Federal Agencies	
Agency	**Roles**
U.S. Agriculture Department	Ë Has jurisdiction over the National Forest System lands in Idaho.
U.S. Department of Defense	Ë Act as the lead response agency within designated National Security areas.
U.S. Department of the Interior	Ë Has jurisdiction over the National Park System, National Wildlife Refuges and Fish Hatcheries, Department of Interior public lands, and certain water projects in western states.
U.S. Environmental Protection Agency	Ë Initiates containment and cleanup activities, at the request of the state, when the responsible party is unable or unwilling to initiate a cleanup. Ë Provide environmental response and support, as requested by local or state personnel, to significant spills of hazardous materials.
U.S. Bureau of Reclamation	Ë Administers the Small Reclamation Projects Act Loan Program, Distribution System Loans Act Loan Program, which provides loans for projects that include municipal water supplies.
U.S. Army Corps of Engineers	Ë Provide emergency water supplies when all other reasonable means have been exhausted, during a drought.
U.S. National Weather Service	Ë Disseminate to the public and mass news media both weather and other civil emergency response messages when conditions pose an immediate threat to human life and property.
Other Entities	
Indian Tribes	Ë Have sovereign powers within federally recognized reservations and will respond to incidents that occur on their reservations. The state will respond if requested by the Indian tribe. Ë Indian tribes must notify the Emergency Medical Services of incidents that occur on reservations but may impact populations or the environment outside the reservation.

9 PLANNING FOR FUTURE DRINKING WATER SOURCES

Source water protection not only applies to existing drinking water sources, but also applies to new or planned sources. An example might be a new drinking water well that a community must drill to address an increase in population and consequent increase in water demand. The source water protection planning team should be actively involved in the effort to plan, site, and protect future locations for drinking water sources. Future wells, springs, or surface water system intakes should be located in areas with as few potential contaminant sources as possible. Ideally, the future site could be reserved and protected as part of the community=s source water protection program.

When planning for new drinking water sources, three topics that should be considered are:

- Planning, siting, and protecting future sites;
- Proper source construction; and
- Incorporating the new source into the existing local source water protection plan.

Planning, Siting, and Protecting Future Sites

Local governments and water purveyors should cooperate in the effort to plan, site, and protect future drinking water source sites. These future sites should be located in areas with as few potential sources of contamination as possible and the site should be reserved and protected for this specific use. The community should be careful to avoid areas with known problems where contaminant levels may be above or near the Safe Drinking Water Act Maximum Contaminant Levels. The water quality problem can be from human activities, or can be naturally occurring. The IDEQ, IDWR, Idaho State Department of Agriculture, and U.S. Geological Survey are all agencies that may have information on water quality in the area where a new source is being investigated. If the potential for contamination is high based on the number and types of potential contaminant sources or based on existing water quality problems, then the community may want to investigate other locations.

The Rules Governing Public Drinking Water Systems require that new community water systems constructed after July 1, 1985, have a minimum of two sources if they serve more than 25 homes. It is recommended that these two sources be located as far apart as possible to reduce the possibility of losing both the primary and backup source to the same contamination event.

Source Construction

The process for constructing a new water source, whether it is a new well or surface water intake, involves several agencies. These agencies and responsibilities are listed in Table 4. At a minimum, sources must be constructed in accordance with existing rules. For example, new wells must be constructed such that the surface seal prevents the movement of surface contaminants into the well.

In areas where a new well may be the source and where multiple aquifers or aquifer layers exist, it may be worthwhile to design the well so that water is not obtained from the upper aquifer zone to reduce the risk of contamination from human activities. The community may want to first verify

that there will not be any naturally occurring water quality problems and to ensure an adequate water supply in the deeper aquifer zones.

Table 4: State Agency Responsibilities in Constructing a New Public Drinking Water Source

Agency	Role
Idaho Department of Water Resources	Ë Issues drilling permits. Ë Administers the Idaho Well Construction Rules. Ë Responsible for administering water rights. Ë Can petition for drilling areas of concern.
Idaho Department of Environmental Quality	Ë Reviews and approves plans for public water supplies with 15 or more connections. (Idaho Code defines public water *supplie*s as *systems* which serve 15 or more connections.) Ë Approves well lot locations. Ë Provides advice on source water protection concepts, as requested.
District Health Departments	Ë Responsible for non-public water systems under the Idaho guidelines for Non-Public Water Systems. Ë Responsible for release of sanitary restrictions for water supplies, sewage disposal, and solid waste. The conditions of approval are based on current rules and regulations for water systems and sewage disposal. Ë Issues permits for new and replacement septic systems under the authority of the Rules for Individual and Subsurface Sewage Disposal.

Source Water Protection for the New Source

The newly identified source water protection area should be incorporated into the existing source water protection plan for the community. This may involve many of the same management tools and protection measures currently in place for the existing drinking water sources in the community. This may even involve expanding regulatory measures to protect the new or planned well, spring, or surface water intake.

10 DEVELOPING A WRITTEN SOURCE WATER PROTECTION PLAN

It is recommended that a community develop a written plan to document the different aspects of the community=s source water protection activities and to use the written plan as an informational and educational tool for the public. Key elements of the written plan should include:

- a description of the drinking water sources being protected;
- a description of the planning team formation and responsibilities;
- a map showing the delineated source water protection area(s);
- information on results from the potential contaminant inventory and identification of the potential contaminant sources that appear to be of the highest priority or greatest concern;
- a summary of the susceptibility analysis results from the Source Water Assessment Final Report;
- a summary of the management tools and/or protection measures that will be implemented along with a proposed implementation schedule and responsibilities (this essentially defines the community=s implementation strategy);
- an identification of source water protection activities that have been started or completed to date;
- the contingency plan (it may be desirable to keep the contingency plan as a separate document since it needs to be readily available for emergency response purposes);
- a discussion of the potential need for new drinking water sources to address growth in the community and how protection efforts will be pursued for these new sources;
- information on how often the written protection plan and its key components will be reviewed and updated; and
- information on how the public participated in plan development and how the public will continue to be involved with plan implementation.

Many of the above plan components are or will be addressed by the Source Water Assessment Final Report, which can be attached to or otherwise incorporated into a community=s written plan.

In addition, the following items could be incorporated as part of the written plan:

- a summary of the community=s goals and reasons for pursuing source water protection;
- introductory and general information that can be used to introduce the reader to the source water protection process;
- a description of the system=s drinking water quality and any existing or historical contamination or other water system problems;
- other key documents or information used to help make management decisions such as reports on a nearby contaminant plume, identification of other water quality activities in the area, copies of ordinances or other regulatory tools which apply to the source water protection area, or sanitary survey results.

- discussion on the rationale for specific planning team strategies and approaches, and
- identification of agencies and other entities that the planning team will contact for implementation assistance.

To assist with a community=s effort in developing a written source water protection plan, the IDEQ will make example plans available for review. In addition, the IDEQ has developed a source water protection plan template with instructions (Appendix E). This template is available from IDEQ as a fill-in-the-blank hard copy or as an electronic version available via computer disc or e-mail.

11 ACHIEVING STATE CERTIFICATION

A community can gain official recognition for their source water protection plan by pursuing State certification. This certification is available through the IDEQ. For a community to have its plan certified, the plan must address eight protection elements and be technically appropriate. The eight protection elements are:

Element 1 Description of Planning Team Participant Roles and Duties (reference *Step 1: Formation of a Community Planning Team*)

Element 2 Delineation of the Source Water Protection Area (reference *Step 2: Delineation of the Land Area to be Protected*)

Element 3 An Inventory of Potential Sources of Contamination (reference *Step 3: Identification of Potential Contaminant Sources*)

Element 4 Management Tools and Protection Measures that will be Pursued to Manage Potential Sources of Contamination (reference *Step 4: Development and Implementation of a Management Plan for the Source Water Protection Area*)

Element 5 A Contingency Plan (reference *Step 5a: Development of a Contingency Plan*)

Element 6 A Protection Strategy for New Wells or Intakes (reference *Step 5b: Planning for Future Drinking Water Sources*)

Element 7 A Public Participation and Education component

Element 8 An Implementation Strategy (what will be done, when it will be done, and by whom)

If a plan is found to satisfy all eight elements, then the community will be recognized by IDEQ as having a "State Certified Plan". This certification will cover a five year period, after which recertification can be pursued. Recertification will include an evaluation of a community's success in implementing source water protection as a measure of the community's implementation strategy (Element 8).

12 CONNECTIONS BETWEEN VARIOUS ORGANIZATIONS AND SOURCE WATER PROTECTION

There are numerous state, federal, and other organizations with water quality protection responsibilities. Many of these organizations are available to assist with local source water protection efforts, especially in the area of voluntary and non-regulatory efforts. Appendix C of the Idaho Source Water Assessment Plan provides descriptions of many of these organizations along with their connections to source water assessment and protection. A copy of the complete Source Water Assessment Plan is available by contacting your local IDEQ office or on IDEQ=s webpage at http://www2.state.id.us/deq/water/water1.htm.

Some public agency programs, such as the IDEQ Wellhead (Source Water) Protection Program, and organizations such as the Idaho Rural Water Association (IRWA), are focused directly on helping coordinate source water protection efforts and activities. IDEQ and IRWA will continue to promote the development of local source water protection programs through technical assistance, training, education, and demonstration projects.

IDEQ and IRWA can be contacted as follows:

- Idaho Rural Water Association, 1916 >G@ Street, Lewiston, ID 83501, (208) 743-6142
  http://users.lewiston.com/IRWA/

- Idaho Department of Environmental Quality:

  State Office:

  1410 N Hilton, Boise, ID 83706 (208) 373-0502
  http://www2.state.id.us/deq/water/water1.htm

  Coeur d=Alene Regional Office:

  2110 Ironwood Parkway, Coeur d=Alene, ID 83814 (208) 769-1422

  Lewiston Regional Office:

  1118 F Street, Lewiston, ID 83501 (208) 799-4370

  Boise Regional Office:

  1445 N. Orchard, Boise, ID 83706 (208) 373-0550

  Twin Falls Regional Office:

  601 Pole Line Rd., Suite 2, Twin Falls, ID 83301 (208) 736-2190

  Pocatello Regional Office:

  224 South Arthur, Pocatello, ID 83204 (208) 236-6160

  Idaho Falls Regional Office:

  900 N. Skyline, Suite B, Idaho Falls, ID 83402 (208) 528-2650

13 WATERSHED MANAGEMENT

The drinking water quality protection approach outlined in this document focuses on the delineated source water protection area, and can be considered one component of watershed management. However, effective watershed management includes consideration of numerous interconnected components such as protecting the quality of ground water, surface water, and fish and wildlife habitat for a variety of beneficial uses and other purposes. Many communities recognize the benefits of providing at least some level of protection to all ground and surface waters as a component of their source water protection program. Although some of the protected waters may not end up in the community=s drinking water supply, they may very well provide drinking water to downstream or down-gradient communities or private homeowners, in addition to supporting a variety of other interrelated beneficial uses.

In addition to the source water protection efforts that a community decides to undertake, there may be other protection activities, often implemented through State and/or Federal programs, underway in and around the community as part of an overall effort to protect the watershed. A community may wish to identify and participate in these watershed protection activities in addition to, or as part of, their source water protection program. At the very least, any source water protection plan developed for surface water drinking sources should be made available to other existing watershed groups in existence (e.g., watershed advisory groups, basin advisory groups).

14 IDAHO CASE STUDIES

Several communities in Idaho have implemented source water protection programs. Below are a few of the experiences that highlight the obstacles and successes of various communities.

Twin Falls--Jurisdictional Concerns

Wellhead protection has been an ongoing activity for the City of Twin Falls for a number of years. However, the wellhead protection area delineation for Twin Falls extended into Jerome County creating conflict between local governmental entities. City employees and members of county Planning and Zoning met to try and establish objectives that would meet the needs of Twin Falls and Jerome County. Though many attempts to achieve consensus have been tried, successful resolution has yet to be achieved. Jerome County contends that the city of Twin Falls has no jurisdiction within the county boundaries of Jerome County. Twin Falls developed a city ordinance that encompasses portions of the land in Jerome County. It is unlikely that this ordinance would successfully be upheld if challenged in court. Both entities agree that source water protection is a function of local government. Communities members of the planning team believe that for source water protection to be meaningful for both Twin Falls and Jerome County, IDEQ or others must provide scientific data on the ground water flow direction, soil and migration rates of various contaminants, and the types and amounts of contaminants already locked in soil. For additional information contact: Alex LaBeau, Idaho Association of Realtors, 208 342-3585.

Nez Perce--Tribal Strategies

High nitrates from nonpoint sources on the Nez Perce Tribal Reservation were identified in areas potentially impacting drinking water source wells. In response, the Tribal Executive Council requested a strategy be developed to ensure that drinking water was protected. The water quality tribal experts have been working with IDEQ to complete source water assessments so that protection activities can be implemented. Several obstacles make this effort particularly onerous for the Tribal participants: (1) federal funding for tribes for source water activities is severely limited and tribes are not able to access state set-aside funding; (2) some of the Nez Perce reservation land has been sold to non-Indians causing regulatory and jurisdictional difficulties; (3) technical assistance necessary to conduct assessment and protection activities is limited. For additional information contact: Amy Owen, Nez Perce Tribe, 208 843-7368.

Pocatello--Lower Portneuf River Valley Aquifer Protection Group

The communities of Pocatello and Chubbuck, and residents of northern Bannock County have been working together for several years to focus attention on protecting the quality of their drinking water. Early in the process interested community members formed the Lower Portneuf River Valley Aquifer Protection Group (Group). The Group plays an important role in developing aquifer protection policies and improving management methods through Regional Geographic Initiatives. The Group has focused aquifer protection in several key areas which include: chronic ingress of salts through urban storm water runoff disposal in dry wells; chlorinated solvent contamination; major fuel spill and widespread problems with leaking fuel storage facilities; and elevated nitrate levels in the Lower Portneuf River Valley Aquifer and adjacent tributary aquifers from septic effluent in unsewered areas of the valley. Through a special legislative appropriation, the Group

has been granted the resources to initiate a study of the potential socioeconomic impacts of applying a higher differential level of protection to the Lower Portneuf River Valley Aquifer by recategorizing it from a General Resource category to a Sensitive Resource category. A Sensitive Resource categorization would require *best available methods* be applied to contaminant source activities when *best management practices* have been implemented but have failed to provide sufficient protection. The study will be conducted during the Fall of 2000. For additional information contact: John Welhan, Idaho Geological Survey, 208 236-4254.

Ferdinand--Elevated Nitrates in Drinking Water System

The City of Ferdinand was one of five communities in Idaho to receive technical assistance from IDEQ and EPA to investigate the cause of elevated nitrates in its drinking water system. Previous investigations established that nitrate-degraded ground water is widespread throughout the Camas Prairie. Potential sources included domestic septic systems, small cattle feedlots, fertilizer storage and distribution and organic (manure) and inorganic chemical fertilizer. The shallow basalt aquifer underlying much of the area appears to contain the highest concentrations of nitrate. The scientists who conducted the study recommend that regional ground water protection, as well as local wellhead protection efforts should focus on management practices to reduce leaching of commercial fertilizer from agricultural land. These lands are outside the direct jurisdiction of the City of Ferdinand so partnerships with tribal, state and county governments is needed. Additional recommendations include extending existing wells used for drinking water into deeper water bearing zones in the basalt and sealing the wells to prevent hydraulic connection with the shallow nitrate impacted aquifer. Subsequent to the water quality study a Community Planning Team was formed to develop a protection plan for the City of Ferdinand. The plan consists of both regulatory and nonregulatory activities and an implementation schedule. For additional information contact: Lance Holloway, Idaho Association of Soil Conservation Districts, 208 332-8650.

Hansen--Idaho=s First Certified Wellhead Protection Plan

The City of Hansen developed a community Drinking Water/Wellhead Protection Plan during 1998 and 1999 with the cooperation of Idaho Rural Water Association and IDEQ. The plan was prepared in accordance with IDEQ=s Wellhead Protection Plan and followed the entire 5-step process. Since 100% of Hansen=s drinking water is supplied by ground water, having a viable plan for protecting the source and providing for contingencies was critical to the community planning team. Part of Hansen=s plan calls for utilizing the Twin Falls County Wellhead Protection Ordinance to protect the portion of the wellhead protection area located outside the jurisdiction of the City of Hansen. Other options for protection call for nonregulatory approaches including: public education, pollution prevention, membership in the Groundwater Guardian Community Program, best management practices, water conservation, and periodic reviews of water quality monitoring data by the planning team. In 1999 Hansen became the first community to receive formal certification from IDEQ for its wellhead protection plan. For additional information contact: Jim Etherington, Public Works Supervisory, 208 423-5158.

Newport, Washington/Oldtown, Idaho--Interstate Cooperation

Early in the wellhead protection process and with the assistance of funding from the Washington Department of Ecology and IDEQ, Newport and Oldtown entered into an intermunicipal agreement to prepare a wellhead protection plan. Both cities provided matching funds for the planning project.

A Wellhead Advisory Board was formed which included elected officials, staff, regulatory agencies, and consultants representing both the Washington and Idaho communities. Most of the water serving both communities comes from the Idaho springs located southeast of Oldtown. A wellfield on the south edge of Newport supplements the spring source production during the peak water demand periods each summer. In January 1993, Welch, Comer & Associates, Inc. in association with Dr. John Riley were retained by the communities to complete the preliminary work necessary for a wellhead protection plan. Phase I, including delineated protection zones, potential contaminant inventories, and recommendations for contingency planning, was completed in 1994. To date, Phase II (a final wellhead protection plan with definitive steps for implementation, coordination, and jurisdictional strategies) has yet to be developed for Oldtown. For additional information contact: Lonnie Orr, Chairman, West Bonner Water District No. 1, 208 437-3833.

GLOSSARY

Aquifer - A geological formation of permeable saturated material, such as rock, sand, gravel, etc., capable of yielding economically significant quantities of water to wells and springs.

Best Management Practice (BMP) - A practice or combination of practices determined to be the most effective and practical means of preventing or reducing contamination to ground water and/or surface water from nonpoint and point sources to achieve water quality goals and protect the beneficial uses of the water.

Community Water System - A public water system with at least 15 service connections used by year-round residents of the system area or which regularly serves at least 25 year-round residents.

Contaminant - Any chemical, ion, radionuclide, synthetic organic compound, microorganism, waste or other substance which does not occur naturally in ground water or which naturally occurs at a lower concentration.

Contamination - The direct or indirect introduction into ground water or surface water or source water of any contaminant caused in whole or in part by human activities.

Delineation (delineate) - The process of defining or mapping a boundary that shows the areas that contribute water to a particular water source used as a public water supply. For surface waters, the land area usually consists of the watershed for a reservoir or stream. For groundwater sources, the boundary typically encompasses the areal extent of the aquifer that contributes water to the public water supply.

Geographic Information System (GIS) - An organized collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced information.

Ground Water - Any water of the state which occurs beneath the surface of the earth in a saturated geologic formation of rock or soil.

Ground Water Under The Direct Influence Of Surface Water (GWUDI) - Any water beneath the surface of the ground with (1) significant occurrence of insects or other macroorganisms, algae, or large diameter pathogens such as Giardia lamblia, or (2) significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions.

Hydrogeologic - Those factors that deal with subsurface waters and related geologic aspects of surface waters.

Maximum Contaminant Level (MCL) - Maximum permissible level of a contaminant in water that is delivered to the users of a public water supply system. MCL is defined more explicitly in Safe Drinking Water Act regulations (40 CFR Section 141.2).

Monitoring- the process of watching, observing, or checking (in this case water). The entire process of a water quality study including: planning, sampling, sample analyses, data analyses, and report writing and distribution.

Noncommunity Water System - A public water system that is not a community water system. There are two types of noncommunity water systems: transient and non-transient.

Nonpoint Source - A potential source of contamination having diffuse or multiple discharges of contaminants that are spread over a large area.

Nontransient Noncommunity Water System - A water system that does not meet the definition of a community supply and which serves at least 25 of the same persons, four hours or more per day, for four or more days per week, for 26 or more weeks. Examples of nontransient noncommunity systems include schools, offices, and factories.

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are, or may be, discharged. This term does not include return flows from irrigated agriculture, discharges from dams and hydroelectric generating facilities or any source or activity considered a nonpoint source by definition.

Potential Contaminant Source Inventory - The process of identifying and inventorying contaminant sources within delineated source water areas. Inventory steps include: using existing contaminant sources locations and description data, identifying likely sources for further information and verifying accuracy and reliability of the data sets.

Public Drinking Water System - A community, noncommunity, or nontransient noncommunity water system which provides piped water to the public for human consumption. The system must have at least 15 service connections or regularly serve at least 25 individuals daily for at least 60 days.

Safe Drinking Water Act (SDWA) - The federal law which authorizes the U.S. Environmental Protection Agency and states to oversee public water systems and set standards for drinking water.

Source Water or Water Source - Any aquifer, surface water body, or watercourse from which water is taken either periodically or continuously by a public water system for drinking or food processing purposes.

Source Water Assessment - A source water assessment provides information on the potential contaminant threats to public drinking water sources. Each source water assessment consists of a delineation of the water source area, a contaminant inventory, and a susceptibility analysis.

Source Water Assessment Area - The part of the watershed or ground water area that contributes to the water supply.

Surface Water(s) - All water which is open to the atmosphere and subject to surface runoff. Lakes, ponds, streams, rivers, and other water bodies which lie on the surface of the land. Surface waters may be partially or fully supplied by groundwater.

Susceptibility Analysis - An evaluation of conditions in the source water area to determine the potential for contaminants to impact water quality at the wellhead or surface water intake.

Time of Travel (TOT) - The time required for a contaminant to move in the saturated zone from a specific point to a well.

Watershed - A drainage area or basin in which all land and water areas drain or flow toward a central collector such a stream, river, or lake at a lower elevation. The whole geographic region contributing to a water body

APPENDICES

APPENDIX A: DELINEATION APPROACHES

Delineation Approaches for Ground Water Sources

The Idaho SWAP outlines two delineation approaches that will be used for ground water sources associated with drinking water wells. The first approach is the delineation of multiple time-of-travel zones and the second approach is a single travel zone of a fixed radius. Each of these two approaches is further described below.

Multiple Time-of-Travel Zones Approach

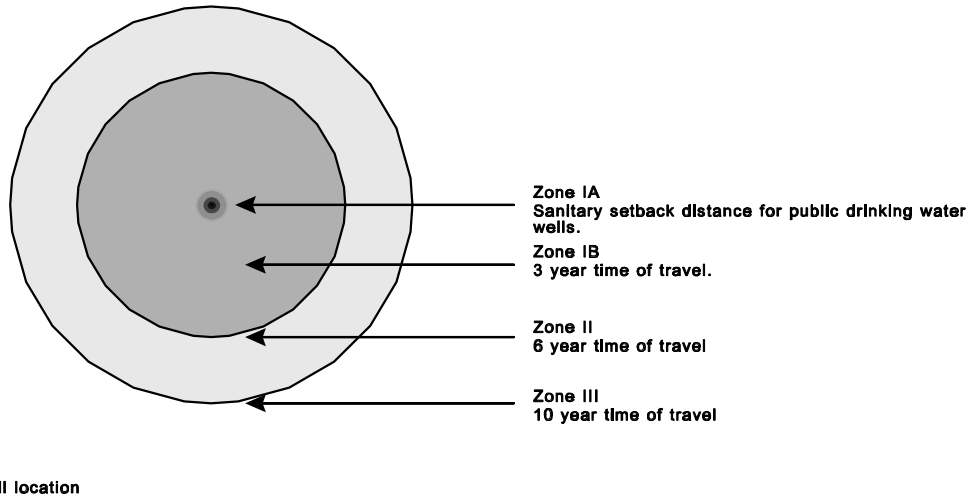
This approach will be used for all community public water supply wells and for all noncommunity nontransient public water supply wells. It typically involves the delineation of three time-of-travel zones, also referred to as capture zones. These zones include the 3 year time-of-travel zone (Zone I); the 6 year time-of-travel zone (Zone II); and the 10 year time-of-travel zone (Zone III). Zone I is split into two zones. The first portion, Zone 1A, is the sanitary setback distance which can vary from 50 to 100 feet depending on potential contaminant source types as outlined by Idaho Code. The remainder of the 3 year time-of-travel zone is considered Zone 1B.

The 3 year time-of-travel zone (Zone I) includes the land area overlying that portion of an aquifer that will theoretically contribute ground water to a pumping well in a 3 year time period. Zone II is a similar land area for a 6 year travel time, and Zone III is a similar land area for a 10 year travel time.

Dividing source water protection areas into various time-of -travel zones allows flexibility in the management of potential sources of contamination. Sources that lie in the zones closest to the well may need to be managed more stringently than zones further away, as indicated by longer travel times to reach the well. For example, a community may decide to pursue both regulatory and nonregulatory approaches in Zones I and II, and only nonregulatory approaches in Zone III.

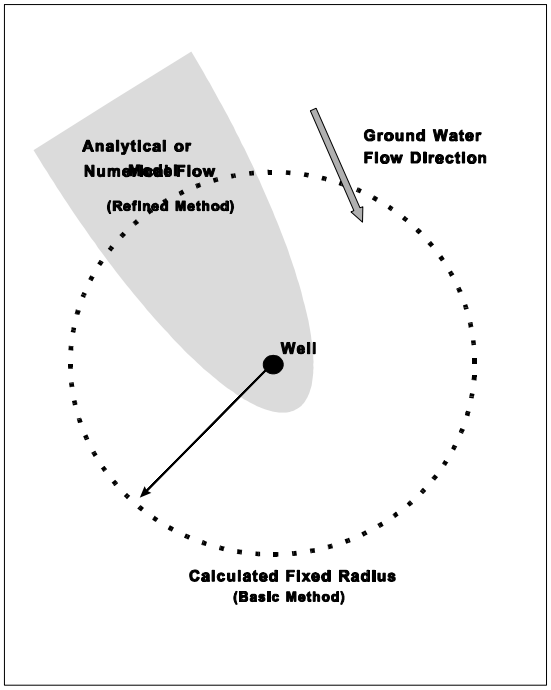
Ground water time-of-travel delineations reflect a number of hydrogeologic factors which vary in complexity and availability from one general area of the state to another. To deal with this variability, two general methods will be used to develop the time-of-travel zones. Where little or no site-specific information is available, the Abasic@ or calculated fixed radius delineation method, based on average aquifer parameters, may be utilized for delineating the zones. The resulting delineation from this method includes a series of circles around a well as shown by Figure A-1.

Figure A-1.Multiple Time-of-Travel Zones Approach Using the ABasic@ (Calculated Fixed Radius) Method



Locations with additional site-specific data will utilize a more sophisticated Arefined@ delineation method that will typically result in a capture zone that is smaller in size and more scientifically accurate. Figure A-2 is a comparison of basic versus refined method shapes. The final refined delineation will often incorporate safety factors to account for uncertainties in ground water hydrogeologic parameters such as flow direction and flow velocity.

Figure A-2.Comparison Between the Refined and Basic Methods for Zone 1B



Single Travel Zone - Fixed Radius Approach

This approach applies to all noncommunity nontransient public water supply wells. It involves the use of a fixed 1000 foot radius around the well. It is anticipated that protection measures developed for a fixed radius source water protection area will primarily focus on potential contaminant sources such as bacteria and other pathogens that are associated with short term (acute) contaminant exposure.

Delineation Approaches for Springs

The delineation of springs will be accomplished utilizing one of two approaches. The first approach will be to use a Arefined@ method similar to that discussed above under the multiple time-of-travel zones approach for ground water. The second approach, referred to as hydrogeologic mapping, will be to map the recharge area boundaries for the spring based on the locations of surface water divides, geologic structures (faults and folds), and the geologic origin, relationship and distribution of the water-bearing materials. The resulting spring delineation from hydrogeologic mapping generally will not be divided into time-of-travel zones.

Surface Water Delineation Approaches

For public water systems using surface water as the drinking water source, the entire drainage basin is delineated upstream from the intake to the hydrologic boundary of the drainage basin. Since an intake on a large water body can have an extensive drainage basin, the larger drainage basins are segmented into smaller areas, or buffer zones. These buffer zones serve as the primary focus for the potential contaminant inventory, and also provide the area where protection measures can be focused.

Overall, there are three general surface water delineation approaches which apply to small watersheds, rivers or streams with large watersheds, and lakes. Each of these approaches is further described below:

Small Watershed Delineation Approach

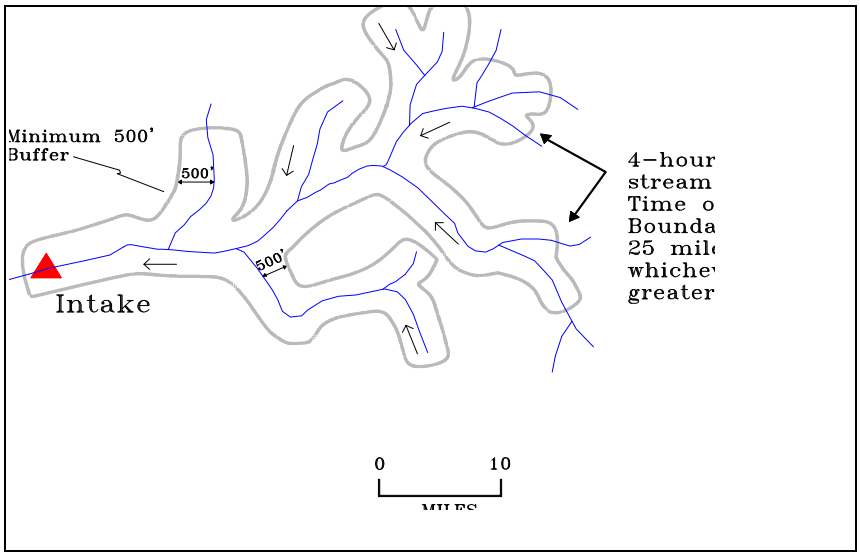
Where surface water intakes are downstream from a small, easily-defined mountain watershed, the whole watershed to the topographical boundary will be delineated. No buffer zones will be identified in these situations. Figure A-3 is an example of a watershed delineation where there are no buffer zones.

Figure A-3. Small Watershed Delineation - No Buffer Zone

River Buffer Zone Approach

For rivers with large watersheds, the delineated area will include a buffer zone extending from the drinking water intake to a distance 25 miles upstream or to a distance represented by the 4-hour streamflow time-of-travel boundary, whichever is the greater of the two. The 4-hour streamflow distance is based on the 10 year flood event. This buffer zone will extend out 500 feet parallel to each side of the river bank, for a total delineated width of 1000 feet plus the width of the river. River buffer zones will also extend up tributaries to the remainder of the 25 mile boundary, or the 4-hour streamflow time-of-travel boundary, whichever is greater. Figure A-4 is a river buffer zone delineation example.

Figure A-4. River Buffer Zone Delineation Example



Rivers will be further delineated to facilitate emergency-response activities. If a contaminant spills directly into a water body, the drinking water utility will need appropriate notification in order to turn off an intake, or switch to an alternative drinking water source. Therefore, for each river or large stream intake, an additional emergency response area will be delineated on a map. This will include an emergency-response distance, based on the 24-hour average streamflow time-of-travel, that will extend up the river and major tributaries.

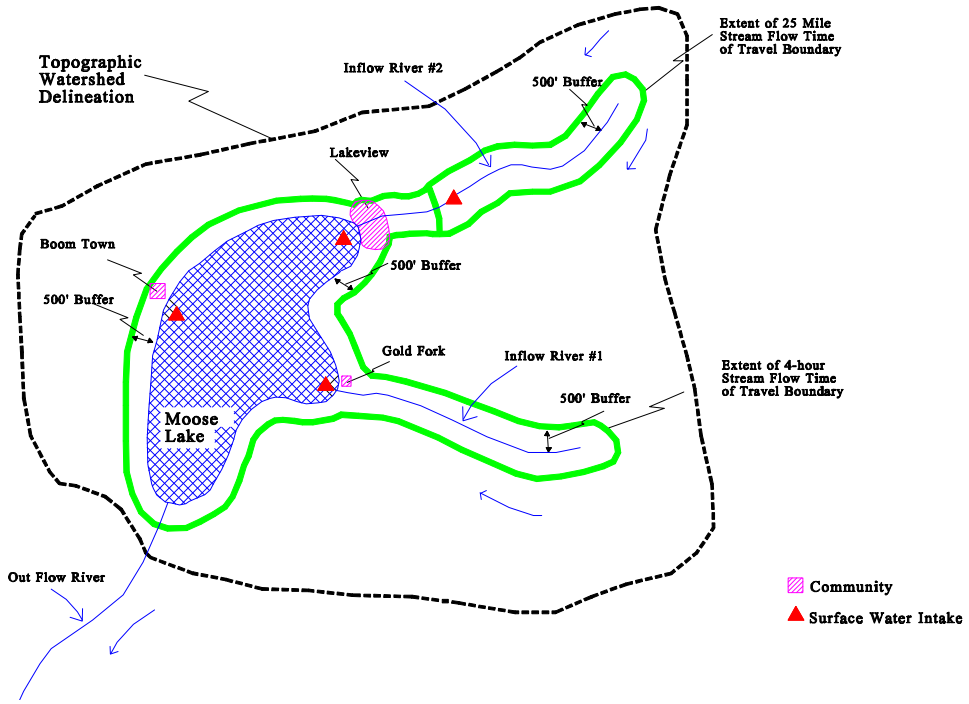
Lake Buffer Zone Approach

For intakes located on a lake or reservoir, the delineation will include the lake and a buffer zone extending 500 feet inland around the circumference of the lake. In addition to the buffer zone around the lake itself, tributary streams that discharge directly into the lake or within the 500 foot lake buffer zone will also have a delineated buffer zone. This buffer

zone will extend out 500 feet parallel to each side of the stream bank, for a total delineated width of 1000 feet plus the width of the steam. The tributary streams' buffer zones will extend upstream in a manner similar to the river buffer zones described above. For lakes, the 24-hour emergency response delineation does not apply. This is because the existing delineation of the entire lake and its corresponding buffer zone should satisfy emergency response needs. Figure A-5 is an example of what a lake delineation may look like.

Figure A-5.Lake Buffer Zone Delineation Example

For river and lake buffer zone delineations, the State or local governments may extend the width of a particular river or lake buffer zone as needed, based on local knowledge, features specific to the lake or stream, and best professional judgement.



Delineation

Approaches for Conjunctive Sources

In addition to the obvious surface water or ground water sources, there are ground water sources that either have a direct hydraulic connection to a surface water body or derive a portion of their water from a nearby surface water body. To delineate these conjunctive sources, the approaches will be similar to those previously described for either the surface or ground water sources, or a combination of both.

However, conjunctive sources are complex, and some modifications of the delineation processes may be required by site-specific conditions. The two most common types of systems in this conjunctive source category are: ground water with direct hydraulic connection to surface water, and ground water under the direct influence of surface water. Each is further discussed below:

Ground Water with Direct Hydraulic Connection to Surface Water

Some ground water sources have a direct unfiltered hydraulic connection to a surface water body, but are not at risk of certain pathogens being transported to the well via this surface water because of the natural filtration provided by soil and rock. This category is called ground water with direct hydraulic connection to surface water. In this category, source water assessment areas for wells will generally be limited to the ground water delineation area.

Ground Water Under the Direct Influence of Surface Water

Other ground water systems have a direct hydraulic connection to a surface water body. This provides an additional risk that certain pathogenic such as *Cryptosporidia* can be transported in a viable state to the spring, infiltration gallery, or well intake. This category is known as ground water under the direct influence of surface water. Source water protection areas for these systems will be delineated using the appropriate ground and surface water delineation methods. For example, wells located in smaller stream and river watersheds could have the source water protection area initially delineated by ground water methods. From where the delineated area intersects the surface water body, the topographic method could be used to delineate the entire watershed upstream of the smaller stream or river.

The final determination of whether a water source may or may not be under the direct influence of surface water will be made by IDEQ or the appropriate health district. Further information on this determination is available from either IDEQ or the appropriate health district.

APPENDIX B: POTENTIAL CONTAMINANT SOURCES

Table B-1 provides an overview of potential contaminant sources and the contaminants that may be associated with each source. These sources represent many of the businesses, industries, operations, land uses, and environmental conditions that handle, generate, store, apply, dispose of, or provide a pathway for the contaminants of concern. The sources are separated into four categories:

1) Commercial/Industrial,

2) Agricultural/Rural,

3) Residential/ Municipal, and

4) Miscellaneous.

These sources can apply to either ground water or surface water, and many can apply to both ground and surface water. Where a potential contaminant source generally applies to only ground water or surface water, it is noted within Table B-1.

Table B-1. Potential Contaminant Sources (Ground Water and Surface Water)

Source		Potential Contaminants [1,2,3]
Commercial/Industrial		
Automobile	Body Shops/ Repair Shops	Waste oils, gasoline and diesel fuels; solvents, acids, paints, automotive wastes[4], miscellaneous cutting oils.
	Car Washes	Soaps, detergents, waxes, miscellaneous chemicals, hydrocarbons.
	Gas Stations	Petroleum fuels, oil, solvents, miscellaneous wastes.
Boat Services/Repair/Refinishing		Gasoline and diesel fuels, oil, septage from boat waste disposal area, wood preservative and treatment chemicals, paints, waxes, varnishes, automotive wastes[4].
Cement/Concrete Plants		Diesel fuel, solvents, oils, miscellaneous wastes.
Chemical/Petroleum Processing/Storage		Hazardous chemicals, solvents, hydrocarbons, heavy metals.
Dry Cleaners		Solvents (tetrachloroethylene, petroleum solvents), spotting chemicals (trichloroethane, methyl chloroform, ammonia, peroxides, hydrochloric acid, rust removers, amyl acetate).
Electrical/Electronic Manufacturing		Cyanides, metal sludge, caustic (chromic acid), solvents, oils, alkalis, acids, paints and paint sludges, PCBs.
Fleet/Trucking/Bus Terminals		Waste oil, solvents, gasoline and diesel fuel from vehicles and storage tanks, fuel oil, other automotive wastes[4].
		Nitrates, salts, phosphorous, miscellaneous food wastes, chlorine,

Source	Potential Contaminants [1,2,3]
Food Processing	ammonia, ethylene glycol.
Furniture Repair/Manufacturing	Paints, solvents, degreasing and solvent recovery sludges, lacquers, sealants.
Hardware/Lumber/Parts Stores	Hazardous chemical products in inventories, heating oil and fork lift fuel from storage tanks, wood-staining and treating products such as creosote, paints, thinners, lacquers, varnishes.
Home Manufacturing	Solvents, paints, glues and other adhesives, waste insulation, lacquers, tars, sealants, epoxy wastes, miscellaneous chemical wastes.
Junk/Scrap/Salvage Yards	Automotive wastes[4], PCB contaminated wastes, any wastes from businesses[5] and households[6], oils, lead.
Machine Shops	Solvents, metals, miscellaneous organics, sludges, oily metal shavings, lubricant and cutting oils, degreasers (tetrachloroethylene), metal marking fluids, mold-release agents.
Metal Plating/Finishing/Fabricating	Sodium and hydrogen cyanide, metallic salts, hydrochloric acid, sulfuric acid, chromic acid, boric acid, paint wastes, heavy metals, plating wastes, oils, solvents.
Mines/Gravel Pits	Mine spills or tailings that often contain metals, acids, highly corrosive mineralized waters, metal sulfides, metals, acids, minerals sulfides, other hazardous and nonhazardous chemicals, petroleum products and fuels.
Photo Processing/Printing	Biosludges, silver sludges, cyanides, miscellaneous sludges, solvents, inks, dyes, oils, photographic chemicals.
Plastics/Synthetics Producers	Solvents, oils, miscellaneous organic and inorganics (phenols, resins), paint wastes, cyanides, acids, alkalis, wastewater treatment sludges, cellulose esters, surfactant, glycols, phenols, peroxides, etc.
Research/University/Hospital Laboratories	X-ray developers and fixers[7], infectious wastes, radiological wastes, biological wastes, disinfectants, asbestos, beryllium, solvents, infectious materials, drugs, disinfectants, miscellaneous chemicals.
Wood Preserving/Treating	Wood preservatives: creosote, pentachlorophenol, arsenic, heavy metals.
Wood/Pulp/Paper Processing and Mills	Metals, acids, sulfides, other hazardous and nonhazardous chemicals, organic sludges, sodium hydroxide, chlorine, hypochlorite, chlorine dioxide, hydrogen peroxide, methanol, paint sludges, solvents, creosote, coating and gluing wastes.
Agricultural/Rural	
Livestock Auction Lots/Boarding Stables	Nitrates, phosphorous, bacteria, and viruses, total dissolved solids.
Confined Animal Feeding Operations Slaughter House and Butcher Facilities	Nitrates, phosphorous, chloride, chemical sprays and dips for controlling insect, bacteria and viruses, total dissolved solids.
Farm Machinery Repair	Automotive wastes[4], solvents, fuel.
Crops - Irrigated and Non-irrigated	Pesticides[8], nitrate & phosphorous (from fertilizers), salts, sediment

Source	Potential Contaminants [1,2,3]
	(from runoff)
Wastewater/Sludge/Manure Land Application or Disposal Locations	Nitrates, metals, salts, bacteria and viruses.
Lagoons/Liquid Wastes	Nitrates, livestock sewage wastes, salts, bacteria.
Pesticide/Fertilizer/Petroleum Storage & Transfer Areas	Pesticides[8] , nitrate, phosphorous, petroleum residues.
Residential/Municipal	
Airports (Maintenance/Fueling Areas)	Jet fuels, deicers, diesel fuel, chlorinated solvents, automotive wastes[4], heating oil, building wastes[5].
Camp Grounds/RV Parks, Marinas	Septage, gasoline, diesel fuel from boats, pesticides[8], household hazardous wastes from recreational vehicles (RVs)[6].
Drinking Water Treatment plants	Treatment chemicals
Golf Courses	Pesticides[8], nitrate, phosphorous, arsenic.
Landfills/Dumps	Organic and inorganic chemical contaminants; waste from households[6] and businesses[5], nitrates, oils, metals, solvents.
Motor Pools	Automotive wastes[4]: solvents, waste oils, fuel storage.
Railroad Yards/Maintenance/Fueling Areas	Diesel fuel; herbicides for rights-of-way[8], creosote from preserving wood ties, solvents, paints, waste oils.
School Maintenance Facilities	Machinery/vehicle serving wastes, gasoline.[4].
Septic Systems (only identify large community systems or areas where there are more than 10 individuals systems in any 40 acre tract of land)	Bacteria, viruses, nitrates, salts, dissolved solids, improperly disposed of household or business wastes[5,6,9].
Utility Stations/Maintenance Areas	PCBs from transformers and capacitors, oils, solvents, sludges, acid solution, metal plating solutions (chromium, nickel, cadmium).
Waste Transfer/Recycling Stations	Residential and commercial solid waste residues.
Wastewater Effluent to Surface Waters (primarily surface water concern)	Municipal wastewater, sludge[10], treatment chemicals[11], nitrates, heavy metals, bacteria, nonhazardous wastes
Miscellaneous	
Above Ground Storage Tanks	Diesel fuel, gasoline, other chemicals.
Construction/Demolition Areas (Plumbing, Heating, and Air Conditioning, Painting, Carpentry, Flooring, Roofing and Sheet Metal etc.)	Solvents, asbestos, paints, glues and other adhesives, wastes insulation, lacquers, tars, sealants, epoxy waste, miscellaneous chemical wastes, explosives, sediment.
Historic Gas Stations	Diesel fuel, gasoline, kerosene.
Historic Waste Dumps/Landfills	Leachate, organic and inorganic chemicals, waste from households[6],

Source	Potential Contaminants [1,2,3]
	and businesses[5], nitrates, oils, heavy metals, solvents.
Injection Wells/Dry Wells/Sumps (primarily ground water concern)	Storm water runoff, spilled liquids, used oils, antifreeze, gasoline, solvents, other petroleum products, pesticides[8], and a wide variety of other substances.
Storm Water Drainage to Surface Waters (primarily surface water concern)	Storm water runoff, oils, antifreeze, metals, sediment, and pesticides, and a wide variety of other substances.
Military Installations	Wide variety of hazardous and nonhazardous wastes depending on the nature of the facility, diesel fuels, jet fuels, solvents, paints, waste oils, heavy metals, radioactive wastes, explosives.
Surface Water - Stream/Lakes/Rivers/Recharge Sites	Ground Water: bacteria and viruses, cryptosporidium Surface Water: nitrates, pesticides, sediment from agricultural return drains.
Transportation Corridors	Herbicides in highway right-of-way[8], road salt (sodium and calcium chloride), road salt anti-corrosives (phosphate and sodium ferrocyanide), automotive wastes[4], nitrate or phosphorous from fertilizer use.
Forest Roads /Logging (primarily surface water concern)	Sediment, fuel spills.
Landslides/Burn Areas (primarily surface water concern)	Sediment.
Underground Storage Tanks	Diesel fuel, gasoline, heating oil, other chemical and petroleum products.
Unsealed or Abandoned Wells, and Test Holes (primarily ground water concern)	Storm water runoff, solvents, nitrates, septic tanks, hydrocarbons, and a wide variety of other substances.

1 In general, surface or ground water contamination stems from the misuse and improper disposal of liquid and solid wastes; the illegal dumping or abandonment of household, commercial, or industrial chemicals; the accidental spilling of chemicals from trucks, railways, aircraft, handling facilities, and storage tanks; or the improper siting, design, construction, operation, or maintenance of agricultural, residential, municipal, commercial, and industrial drinking water wells and liquid and solid waste disposal facilities. Contaminants also can stem from atmospheric pollutants, such as airborne sulfur and nitrogen compounds, which are created by smoke, flue dust, aerosols, and automobile emissions, fall as acid rain, and percolate through the soil. When the sources list in this table are used and managed properly, water contamination is not likely to occur.

2 Contaminants can reach ground water from activities occurring on the land surface, such as industrial waste storage; from sources below the land surface but above the water table, such as septic systems; from structures beneath the water table, such as wells; or from contaminated recharge water.

3 This table lists the most common potential contaminants, but not all potential contaminants. For example, it is not possible to list all potential contaminants contained in storm water runoff or from military installations.

4 Automobile wastes can include gasoline; antifreeze; automatic transmission fluid; battery acid; engine and radiator flushes; engine and metal degreasers; hydraulic (brake) fluid; and motor oils.

5 Common wastes from public and commercial buildings include automotive wastes; and residues from cleaning products that may contain chemicals such a xylenols, glycol esters, isopropanol, 1, 1, 1, -trichloroethane, sulfonates, chlorinated phenols, and cresol.

6 Households wastes include common household products which can contain a wide variety of toxic or hazardous components.

7 X-ray developers and fixers may contain reclaimable silver, glutaldehyde, hydroquinone, potassium bromide, sodium sulfite, sodium carbonate, thiosulfates, and potassium alum.

8 Pesticides include herbicides, insecticides, rodenticides, and fungicide. EPA has registered approximately 50,000 different pesticide products for use in the United States. Many are highly toxic and quite mobile in the subsurface.

9 Septic tank/cesspool cleaners include synthetic organic chemicals such as 1, 1, 1,-trichloroethane, tetrachloroethylene, carbon tetrachlorine, and methylene chloride.

10 Municipal wastewater treatment sludge can contain organic matter, nitrates; inorganic salts; heavy metals; coliform and noncoliform bacteria; and viruses.

11 Municipal wastewater treatment chemicals include calcium oxide; alum; activated alum; polymers; ion exchange resins; sodium hydroxide; chlorine; ozone; and corrosion inhibitors.

Source: Adapted from EPA (1993).

APPENDIX C: ENHANCED INVENTORY FORMS

There are two forms that have been developed to assist with the enhanced inventory process. These are the Potential Point Source Inventory Form and the Historical Potential Contaminant Source Inventory Form. These forms, along with instructions for each, are provided below.

Potential Point Source Inventory Form Instructions

Figure C-1 is the form used to identify those potential contaminant sources generally considered a point source within the delineated area. A point source generally includes potential contaminant sources that can best be identified by a point on a map. Examples include a gas station or any business or industry, a feedlot, a landfill, a discharge location to surface water, or an injection well. Essentially the only thing not included for the purposes of this form are large land use categories such as urban or agriculture and historical sources. Each of these other categories of potential contaminant sources can be captured either by the Historical Potential Contaminant Source Inventory Form (Figure C-2 below) or by making corrections on the Land Use Base Map and associated primary inventory forms.

The Potential Point Source Inventory Form is to be filled out primarily during the on-the-ground-inventory. Database searches, aerial photograph reviews, and interviews with knowledgeable residents can also provide new potential contaminant sources and additional information to be added to the form. The following is a description and explanation for each column on the form.

Map Number- Enter the map number that corresponds to the number used to identify the potential contaminant source on the base map(s). It is recommended that all point source sites should be identified with a "P" prefix followed by the number of the site, starting with P-1, P-2, and so on.

Type of Facility- Enter the type of facility as identified in Table B-1. This helps determine the types, general quantities, and uses of potential contaminants at the location. If the facility type is not included in Table B-1, but it still appears to represent a potential contaminant source, then provide a descriptive name or information under the *Comments/Description* column that may help determine the types of chemicals associated with the potential source.

Facility Name/Address- Provide the name of the company, organization, or individual and the street address. The address may be used to cross-reference primary inventory database information. If there are or have been multiple names for the facility, provide the more recent facility name and any other previous facility names that could provide important information concerning potential sources of contamination.

Comments/Description- Include any comments, such as quantities of certain potential contaminants stored or used, about the site that could be used to help identify the potential contaminants of concern if the information is different than what one would generally find in Table B-1. For example, a small private repair shop may have a large fuel tank that may not normally equate to such a business. Also note additional significant information concerning historical uses of the site that may be useful for source water protection purposes.

Historical Potential Contaminant Source Inventory Form Instructions

Figure C-2 is used to list and identify historical sources or other existing situations that have not been identified in the primary inventory, on the Potential Point Source Inventory Forms (Figure C-1), or through the land use mapping efforts. Examples of historical sources might include an old landfill or an old dumping ground, a former food processing plant, a former gas station, a disposal site for failed crops, or a historical spill of significance. It is desirable to interview and include knowledgeable citizens for this part of the enhanced inventory. Reviewing aerial photographs or researching historical records can also be beneficial.

Map Number- Enter the number that corresponds to the appropriate site or area on the delineation map. It is recommended that all historical sites be identified with a "H" prefix followed by the number of the site, starting with H-1, then H-2, and so on.

Type of Facility/Historical Use- Enter the type of facility or historical land use, using Table B-1 where possible. This will help determines the types, general quantities, and uses of potential contaminants at the location.

Map Identification- Use your judgement to determine whether the site was a point or nonpoint source. If the source can be identified by a point on the map, then consider it a point source and identify it on the map as such. If the source is best identified by a polygon encompassing the area of concern, such as an old landfill, then consider it a nonpoint source and identify it on the map by drawing a polygon around the area involved.

Years in Service- Input the approximate dates that the facility/business was in service or that an area had been used. Example: Joe=s Garage operated from 1952 -1973 (estimated).

Comments/Description - Include comments about the site including present and other historical uses of the site and any observations made during the field survey that may be useful for source water protection purposes.

FIGURE C-1. POTENTIAL CONTAMINANT INVENTORY FORM -POINT SOURCE FORM

Point Source - Potential Contaminant Inventory Form			
System Name:		**Source Name/ID:**	
PWS #:		**Source Tag #**:	
Inventory Completed By: Date:			
Map #	**Type of Facility**	**Facility Name & Address**	**Comments/Description**
P -			
P -			
P -			
P -			
P -			
P -			
P -			

Note: When a facility or property is identified as a potential contaminant source it does not mean the facility or property is in violation of any local, state, or federal environmental laws or regulations.

FIGURE C-2. POTENTIAL CONTAMINANT INVENTORY FORM - HISTORICAL SOURCE FORM

Historical - Potential Contaminant Inventory Form

System Name:	**Source Name/ID:**
PWS #:	**Source Tag #:**

Form completed by: Date:

Map #	Type of Facility/Historical Use	Map Identification (Point Source or Nonpoint Source)	Yrs in Service	Comments/Description
H -				
H -				
H -				
H -				
H -				
H -				

Note: When a facility or property is identified as a potential contaminant source it does not mean the facility or property is in violation of any local, state, or federal environmental laws or regulations.

APPENDIX D: AN EXAMPLE OF PROTECTION MEASURES

Protection Measures for Injection Wells (includes dry wells)

a) Prevent the use of high risk injection wells within all or specific zones of a source water protection area; these may include drains within manufacturing facilities, auto service bays, or any location where chemicals are routinely stored or used.

b) Require spill prevention and response planning for businesses with injection wells.

c) Require that any new injection wells use design standards and other BMPs including maintenance where necessary.

d) Supply injection well owners with information on BMPs that can be incorporated into existing injection wells, including maintenance of certain injection well designs.

e) Educate injection well owners on the water quality threats associated with injection wells and their improper use through literature, films, and/or presentations.

f) Label injection wells (such as ADrains to Your Drinking Water Supply@) to help educate the public and/or workers on the threats associated with illegal disposal of oil, antifreeze, and other wastes.

g) Ensure that injection wells are inventoried with the Idaho Department of Water Resources as required by Idaho injection well rules (IDAPA 37, Title 03, Chapter 3).

h) Ensure consistency with injection well rules regarding large-capacity cesspools, industrial waste disposal wells, and motor vehicle waste disposal wells (these types of injection wells are generally prohibited).

Contacts:

Idaho Rural Water Association

Example ordinance language, film on injection well threats and other educational support, spill prevention planning information, examples of what other communities are doing.

Idaho Department of Water Resources Injection Well Program Personnel

Injection well regulatory requirements, injection well risks/categories, public education assistance and literature, injection well BMPs and design criteria, injection well maintenance.

Idaho Department of Environmental Quality Source Water Protection Personnel

Example ordinance language, spill prevention information, injection well labeling templates.

Idaho Department of Environmental Quality Storm Water Program Personnel

Injection well BMPs associated with storm water, public education assistance, design standards.

U. S. Environmental Protection Agency Underground Injection Control Program Personnel

Injection well regulatory requirements, injection well risks/categories, public education assistance and literature, injection well BMPs and design criteria, injection well maintenance.

APPENDIX E: SOURCE WATER PROTECTION TEMPLATE WITH INSTRUCTIONS AND SUGGESTIONS

(Title Page)

SOURCE WATER PROTECTION PLAN FOR

_____(*community or system name*)

Notes:

1. To help with the development of this section, the community should reference the *Idaho Source Water Protection Guidance* document.

2. Source Water Protection (SWP) and Wellhead Protection are the same for ground water systems or springs; however, IDEQ is moving to call all protection program efforts source water protection. This way when communities speak of source water protection, confusion will be minimized.

3. Each section has recommended items to address, recommended language, or recommended references. A blank template without the corresponding instructions is also available. This and the blank template are also available via computer disc or e-mail. The community can use attachments as necessary.

4. Section headings in Bold identify generally required information for State Certification.

5. Reference the June 1999 Drinking Water/Wellhead Protection Plan for the City of Hansen, and other community source water protection plans for potential wording and guidance.

1.0 INTRODUCTION

1.1 PWS Number - _____

Community Population Served by this PWS System - _____

1.2 PWS Sources Protected By This Plan

List the PWS sources protected by this plan and whether they are ground water, ground water under the direct influence of surface water, spring, or surface water for each source (contact local IDEQ regional office or health district for this information if unknown)

1.3 (Optional) Additional materials associated with the PWS sources such as:

a) Well logs for ground water sources

b) Status of the sanitary survey for each source

c) Status of the Ground Water Under Direct Influence of Surface Water determinations for wells and springs

d) Water quality information and water quality or operational problems associated with any of the sources (IDEQ and/or the health districts can provide water quality information)

1.4 (Optional) Background

This section is a good place to discuss City goals, existing water quality and any water quality problems, concerns about future growth, problems with the system in general (such as needing a new well for example), and other introductory materials. Below are examples of potential subheadings under this section:

- Community Source Water Protection Goals

- Source Water Protection Steps

2.0 COMMUNITY PLANNING TEAM

2.1 List Methods Used to Obtain Planning Team Members

2.2 Planning Team

List the planning team members and other source water protection participants; identify the team coordinator; provide phone numbers that the public can use to reach key planning team individuals

2.3 (Optional) Meeting Information

Provide information on when meetings are held or planned, whether meeting notes are available, and other information that may be interesting to the public.

2.4 Planning Team Protection Strategy

Summarize general strategy elements such as management tools the community will use and to what extent they will pursue outside assistance to help with source water protection implementation.

3.0 SOURCE WATER PROTECTION AREA

3.1 (Optional) Hydrogeology (Ground Water or Spring Sources) or Hydrology (Surface Water Sources)

This section may reference or incorporate existing reports, the source water assessment susceptibility analysis, well logs, watershed description, ground water flow direction, or other information as necessary.

3.2 Source Water Protection Area Delineation

Attach a copy of a map of the delineated source water protection area and provide reference to how the delineation was performed. Most delineations are done by the IDEQ in support of Source Water Assessment and/or Source Water Protection efforts.

3.3 (Optional) Source Water Protection Area Description

This section may include a narrative description of the source water protection delineated area, description of major land uses, or other pertinent data which may help in the development or implementation of the source water protection plan.

4.0 POTENTIAL SOURCES OF GROUND WATER CONTAMINATION

4.1 Potential Contaminant Source Inventory

Need to identify:

- Person(s) or organizations who conducted the field inventories
- Person(s) and references used to assist with identification of historical potential contaminant sources

Attach the contaminant inventory results map(s) and associated list(s) of potential contaminant sources:

Notes:

1) Those systems that performed an enhanced inventory in conjunction with Source Water Assessment can use the maps and lists from the Final Report.
2) If a system only has the computer-generated primary contaminant inventory done as part of the source water assessment report, the system will need to perform the equivalent of the enhanced inventory which, at a minimum, includes an on-the-ground survey of the source water protection area and identification of significant historical potential contaminant sources for the area.

4.2 Prioritization of Potential Contaminant Sources

This section should utilize the susceptibility analysis from the source water assessment report, if available, and list the prioritization results along with the methodology used to develop the priority list.

5.0 SOURCE WATER PROTECTION MANAGEMENT TOOLS

Describe the management tools/approaches that the community will pursue as part of the overall source water protection strategy. Each management tool or general approach is a separate section, with the first section addressing public education and information, which is a required element for any community seeking State certification. Attachments, such as an existing ordinance, are recommended where necessary to further describe a given management tool. Some communities may wish to treat regulatory and non-regulatory management tools as separate subsections. Most

communities will have several management tools as part of their source water protection strategy.

5.1 Public Education and Information

Describe public education and information efforts, including efforts focused on potential contaminant source owners or operators, and the public in general. Also reference how the source water assessment for the system will be made available, and how this source water protection plan will be made available to the community.

5.2 Management Tool #2 (Ordinance for example)

5.3 Management Tool #3 (Household Hazardous Waste Collection for example)

5.4 Management Tool #4

6.0 MANAGEMENT TOOLS AND PROTECTION MEASURES FOR PRIORITY POTENTIAL CONTAMINANT SOURCES

This section should identify how the community is or will be applying management tools and/or specific protection measures to the significant or high priority potential contaminant sources or source types/groups. Potential contaminant sources can be grouped together under one section if they are all being treated the same. For example, promoting the use of nutrient management as a best management practice can apply to urban residents, the local golf course, small feedlots, and farmers located within the source water protection area.

6.1 Management Tools/Protection Measures for (High priority potential contaminant source(s)) - an example might be the protection measure(s) that will be pursued for small businesses handling hazardous materials.

6.2 Management Tools/Protection Measures for (High priority potential contaminant source(s)) - an example might be the protection measure(s) that will be pursued for injection wells.

6.3 Management Tools/Protection Measures for (High or medium priority potential contaminant source(s)) - an example might be the protection measure(s) that will be pursued for gas stations with above ground storage tanks.

7.0 CONTINGENCY PLAN

Reference or include the system=s or community=s contingency plan for drinking water emergencies. The contingency plan must identify:

- Potential emergencies;
- Key contact personnel;
- Alternate sources of drinking water;
- Where copies will be located; and

- Opportunities for public review.

8.0 PROTECTION STRATEGIES FOR NEW DRINKING WATER SOURCES

Discuss the potential need for new drinking water sources, taking into account projected population growth, new industry, and other relevant factors. If it appears new sources may be needed, identify potential locations and discuss how likely areas for new drinking water sources will be protected from significant contamination.

9.0 IMPLEMENTATION STRATEGY

The following subsections identify implementation items that need to be addressed for the five source water protection steps. This information can be identified in this section, or in the corresponding section(s) above, or both.

9.1 Community Team

The following questions need to be addressed here or elsewhere in the plan:

- How often will the planning team meet?
- How often will this source water protection plan be formally reviewed and updated?
- How will members of the community be allowed to participate?
- What are the long-term goals and objectives?

9.2 Delineation

How will new drinking water sources be delineated and incorporated into the plan? Suggested wording for here or elsewhere in the plan:

New drinking water sources will be delineated in a manner consistent with the delineation process for existing drinking water sources. If there are major changes to an existing source's construction, discharge rate or pumping rate, then the existing delineation should be reviewed to ensure that it still represents the appropriate source water protection zones. Delineations may be updated or modified if significant new information becomes available.

9.3 Contaminant Inventory

The following questions need to be addressed either in this section or elsewhere in the plan:

- How often will the contaminant inventory be formally updated through an on-the-ground survey for new potential contaminant sources?
- Who will do this work?
- How will the revised information be incorporated into the source water protection plan?

9.4 Contaminant Management Practices

Discuss the roles, responsibilities and tasks for implementing the management tools/approaches and protection measures. It will be especially important to note how public education and information will be carried out. It may be necessary to identify agencies and organizations that will have a significant role in implementing a particular management tool or protection measure. If implementation has already begun for any given management tool or protection

measure, then this information should be included.

Discuss how the planning team will review the success of the different management tools and protection measures and make modifications or add new tools or measures to the plan. Also, it is recommended that this section identify methods that will be used to keep the community and the planning team involved, interested, and challenged.

A year by year schedule for implementing key management tools and protection measures should be identified in this section. It is anticipated that many communities will wish to use a multi-year phased approach, such as the example below.

Implementation Schedule (Example)	
Year 1	- Education in ground water flow concepts, community source water protection, and contaminant threats. - Development of a community source water protection plan. - Water Awareness Day for local 6th grade students and other school educational projects
Year 2	- Stormwater injection well stenciling - Information campaign for septic system users - Information campaign for underground storage tank (UST) owners/operators - Continue with school educational projects - Draft ordinance developed to address high priority Zone 1 threats (or those portions of the source water protection area contained within the community=s jurisdiction).
Year 3	- Update contaminant source inventory - Information campaign for dry cleaners, automotive and machine shops - Continue with school educational projects - Hazardous waste clean up day & related educational campaign - Pass ordinance for high priority Zone I threats
Year 4	- Continue with school educational projects - Identification and closure of abandoned wells - Repeat Year 2 informational campaigns - Work with the County and other communities to develop a regional source water protection program to help address portions of the source water protection areas within County jurisdiction

9.5 Contingency Plan

This section should discuss how often the contingency plan will be reviewed and updated (recommend yearly at a minimum).

10.0 PUBLIC PARTICIPATION

This section should include the methods used to involve the public and obtain input during the development of this source water protection plan. This section should also address how future public participation and involvement will be developed.

11.0 REFERENCES

The final source water assessment report, if it has been completed, should be referenced here, along with any other important documents or material. The reference should include information on how the public can obtain copies or otherwise view the material.