Source Water Assessment and Protection Program and Implementation Strategy for the State of Iowa

Prepared by the

Iowa Department of Natural Resources

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This implementation plan is intended to fulfill the State of Iowa's requirements of the 1996 Safe Drinking Water Act Amendments for state source water delineation and assessment (P.L. 104-182, Section 1453).

The EPA's objective for source water states, "By 2005, 60 percent of the population served by community water systems will receive their water from systems with source water protection programs in place." To achieve this objective, each State is required to prepare a Source Water and Assessment and Protection Program which includes the following four elements:

- Source water delineation
- Contaminant Source Inventory (CSI)
- Susceptibility analysis
- Distribution of assessment results to the public

Source water protection is key to the provision of safe drinking water in the future. Iowa intends to proactively participate in preventing the future pollution of our drinking water supplies by implementing the source water protection provisions of the 1996 Safe Drinking Water Act amendments. Government agencies, public water supplies, technical assistance providers, educational institutions, consumers, and citizens are all impacted by and encouraged to actively participate in source water protection planning.

The source water protection goal in Iowa is to ensure that by the year 2005, 60 percent of the State's citizens served by community public water supplies are served by systems with protection programs in place. This will entail the development of programs enabling public water supplies (PWS) and their customers to initiate and promote actions to protect their drinking water sources. The Iowa Department of Natural Resources (IDNR) will report progress with regard to this goal in an annual written report to the EPA.

The intent of this program is to 1) develop a working knowledge of all potential sources of contamination affecting water sources in the state, and 2) provide assistance to local governments in establishing guidelines for the purpose of minimizing the potential risk of contaminating public water supplies. These guidelines may be completely voluntary or mandated in the form of local zoning ordinances. Therefore, although initiated at the state level, this program will ultimately be put into practice at the local level where individuals can help shape the methods by which source water protection is implemented in their community. Although source water assessment data will be directed toward the public water supply operator and owner, IDNR encourages the use of local source water protection planning committees. The local committee would ideally be made up of various people representing all aspects of the community, and would be ultimately responsible for developing management practices to protect their drinking water source.

To achieve this goal, IDNR proposes to promote the voluntary implementation of source water protection through the use of training courses provided to PWS, presentations at technical and professional meetings, technical assistance, and printed educational material, such as brochures and newsletter articles. Initial source water delineations, assessments, and potential contaminant inventories will be completed by IDNR or a contracted assistance provider, as described below, and provided to PWS for their use in implementing source water protection programs. A third-party contractor will be used to assist PWS in updating existing wellhead protection plans to conform with current requirements and to provide assistance in developing new wellhead and source water protection plans. Local regulations to manage potential contamination sources will be left to local entities with zoning jurisdiction. This plan applies to all Iowa PWS, including community, nontransient noncommunity, and transient noncommunity supplies.

The availability of Drinking Water State Revolving Fund (DWSRF) loan funds will serve as an incentive for PWS to participate in the implementation of local source water protection programs. Assistance may be available to PWS undertaking source water protection programs through Section 319 or other non-point source pollution funds. Additional incentive may be available if EPA requires that PWS have approved source water protection programs in place as a condition of receiving contaminant monitoring waivers or reduced monitoring frequencies.

The four basic requirements for source water programs are listed below, followed by IDNR activities designed to fulfill them.

Source Water Delineation

The 1996 Safe Drinking Water Act requires IDNR or a contracted assistance provider to perform initial source water delineations for all Iowa PWS. Existing hydrogeologic data and maps will be used to complete these initial, or Phase 1, delineations. IDNR encourages PWS and their local communities to use the Phase 1 delineation as a basis for comprehensive source water protection planning. Refinement of the Phase 1 delineation for groundwater systems may be accomplished through methods described in the Iowa Wellhead Protection Plan, found in Appendix 1, and would be considered Phase 2 delineation. Phase 2 delineations for surface water systems might include such things as delineating beyond state boundaries or dividing the watershed into subwatersheds for the purpose of prioritizing local protection decisions.

Phase 1 delineations may be used by PWS without refinement as part of their local source water protection plan, but PWS may wish to consider Phase 2 delineation since it may provide beneficial information useful to source water protection efforts. Phase 2 delineation is the responsibility of PWS or local communities should they choose to pursue anything beyond the Phase 1 delineation provided by IDNR or a contracted assistance provider. IDNR will attempt to assist PWS with Phase 2 work as resources allow. Should the delineated source water protection area for a given system change significantly, IDNR or a contracted assistance provider, upon notification of the change, will update the original assessment to reflect the most current information.

For purposes of classification, systems have been divided into three categories: Groundwater Sources, Surface Water Sources, and systems using Groundwater under the Influence of Surface

Water. Iowa has completed the designation of all wells under the direct influence of surface water under the Surface Water Treatment Rule. The state used the identification of similarities between selected physical parameters in wells and in nearby surface water as the criteria for this designation. Wells are considered to be hydraulically connected to surface water if they have been designated as ground water under the direct influence of surface water. Phase 1 delineations will be performed for groundwater, surface water, and PWS with groundwater under the influence of surface water as follows:

Groundwater Sources

IDNR or a contracted assistance provider will perform Phase 1 source water delineations for all PWS using groundwater as a source. The northwest area of the state is to be delineated first, followed by the southwest area, the northeast area, the southeast area, the north central area, and the south central area. Supplies considered to be most vulnerable will be delineated first, in order of largest population to smallest. IDNR will attempt to delineate PWS that request immediate assessment, regardless of location, as soon as possible within the confines of resources.

Phase 1 groundwater source delineations will determine the hydrogeologic flow boundaries of the source water area if sufficient data is available concerning the hydrogeologic characteristics for the area. The source water area will be shown on a USGS 7.5-minute quadrangle or similar base map. Time of travel is an assessment of how quickly water and potential contaminants will move through an aquifer. The 2, 5, and 10-year time of travel estimations will be superimposed over the source water area to assist the PWS in making practical source water protection decisions. Upon request, IDNR or a contracted assistance provider will do a 20 or 25-year time of travel estimation for any interested PWS. The IDNR recommends that at a minimum, a two-year time of travel be used for protection from pathogens. A minimum 5-year time of travel is recommended for protection from chemical contaminants.

In the absence of complete hydrogeologic data, a calculated fixed radius will be used to define the local source water area. The 2, 5, and 10-year time of travel radii will be shown around the well on a USGS 7.5-minute quadrangle or similar base map to assist the PWS in prioritizing source water protection decisions. Upon request, IDNR or a contracted assistance provider will do a 20 or 25-year time of travel estimation for any interested PWS. Where applicable, a 2 and 5-year surface runoff area will be added to the delineation map. This will primarily apply to alluvial aquifers, since potential contaminant releases upland of the aquifer may travel down-gradient and infiltrate the source water.

If the hydrogeologic data for a PWS is extremely limited or completely lacking, an arbitrary fixed radius of 2,500 feet around the well will be shown on a USGS 7.5-minute quadrangle or similar base map. For PWS using a shallow groundwater source in a karst area, a one-mile radius, at a minimum, will be used to delineate the source water area. Since a one-mile radius may not provide the maximum protection for a well finished in a karst formation, the system will be encouraged to seek additional information during the Phase 2 assessment to improve the knowledge of areas that may contribute contamination to the source water. The quality and

quantity of hydrogeologic data available for a given PWS will determine the method of delineation, and the most accurate method, given the available data, will be used for each PWS.

Several of the aquifers in the state cover large geographical areas that lack known, defined boundaries. In Iowa, the concept of remote recharge areas only applies to regionally extensive bedrock aquifers, which may have numerous recharge zones. Identifying remote recharge areas implies extending time of travel zones well beyond 10 years, to what are often great distances and travel times. One cannot feasibly or accurately define which recharge areas for such extensive bedrock units are up-flow from particular wells. The great distances and travel times involved make remote recharge areas relatively unimportant factors in these regional aquifers. Delineations for PWS utilizing these large aquifers may be based on realistic recharge areas, or limited to the 2, 5, and 10-year time of travel radii, as opposed to delineating the entire recharge area. In cases where the recharge area is known to occur within the 10-year time of travel zone, IDNR will provide the recharge area on the delineation map for the system. As aquifers are delineated and more information becomes available, previously completed delineations may require updating to reflect new information. When data is lacking, estimates of parameters will be based on knowledge of the general geology of the state.

The Department recognizes that hydrogeologic assumptions may vary and that source water protection areas may vary as a result. If two assessments are performed by different entities and there is a discrepancy between the source water protection areas, the area developed using the most realistic assumptions or most accurate data should be used. The final decision on which assessment to use will be left to the water system. IDNR will assist in reviewing the assumptions or data upon request when possible.

Phase 1 delineations will be performed on PWS impacted by groundwater flow patterns or recharge areas outside Iowa's state boundaries, to the extent practicable. Supplies using inter-state groundwater sources will be encouraged to complete source water protection plans using available resources and assistance from adjoining landowners, regardless of state boundaries. The IDNR intends to participate in interstate partnerships concerning interstate source waters at some point in the future, and will provide assistance to supplies utilizing source waters originating in or affected by states other than Iowa at that time.

Surface Water Sources

For PWS using surface water as a source, the entire watershed area upstream of the PWS intake will be delineated to the state boundaries, denoting a Watershed Delineation Area (WDA). The Phase 1 WDA will be shown on a USGS 7.5-minute quadrangle or other appropriately scaled base map. Section 1452(k) set-aside funds will be used to fund the delineation of as many surface water supplies as possible by third-party contractors. IDNR will perform the source water delineations for any surface water supplies not delineated by a contractor. IDNR will ensure that delineations performed by contractors are adequate and similar in scope to the delineations provided by the Department.

Groundwater under the Influence of Surface Water

For PWS using groundwater under the influence of surface water, separate Phase 1 delineations for the groundwater and surface water sources will be performed. The surface water affecting the groundwater in question will be delineated from upstream of the surface water influence area to the watershed boundaries. The groundwater under the influence of surface water will be delineated using the most appropriate method, given available hydrogeologic data as detailed above. Where applicable, a 2 and 5-year surface runoff area will be added to the delineation map. This will primarily apply to alluvial aquifers, since potential contaminant releases upland of the aquifer may travel down-gradient and infiltrate the source water. These delineations will be provided to PWS on separate USGS 7.5-minute quadrangle or appropriately scaled base maps to provide a comprehensive picture of the source water being utilized. The IDNR recommends that at a minimum, a two-year time of travel be used for protection from pathogens. A minimum 5-year time of travel is recommended for protection from chemical contaminants.

As described in the draft work plans for the source water set-aside funds, IDNR will complete approximately 300 delineations in FFY99, and 550 delineations during each of the years FFY00, FFY01, and FFY02. The draft work plans are located in Appendix 2, FFY 1999 Work Plan. The computer hardware budget for the source water protection program is also included in Appendix 2.

The ability of IDNR to meet these goals is contingent upon receipt of the State's portion of the DWSRF source water set-aside, and on approval of the recommended State funding and number of full time equivalent staff provided to the Department by the Iowa legislature.

Contaminant Source Inventory (CSI)

A contaminant, as defined in Chapter 40 of the Iowa Administrative Code (567 IAC), is any physical, chemical, biological, or radiological substance or matter in water. The 1996 Safe Drinking Water Act requires IDNR or a contracted assistance provider to perform initial contaminant source inventories (CSIs) for all Iowa PWS. Existing databases and maps will be used to complete these initial, or Phase 1, CSIs. All potential contaminant sources included in the database will be reported to the PWS; there will be no distinction between regulated and unregulated contaminants. IDNR encourages PWS and their local communities to use the Phase 1 CSI as a basis for comprehensive source water protection planning. Refinement of the Phase 1 CSI for groundwater systems may be accomplished through methods described in the Iowa Wellhead Protection Plan, found in Appendix 1, or the "Guide to Conducting a Wellhead Contaminant Inventory," available through the IDNR Geological Survey Bureau, and would be considered Phase 2 inventory. Surface water systems would also be referred to the Iowa Wellhead Protection Plan or the "Guide to Conducting a Wellhead Contaminant Inventory," for Phase 2 refinement of the initial CSI.

Phase 1 CSIs will provide limited data, and are to be used by PWS as a basis for the Phase 2 CSI, which is voluntary. All contaminant source databases available to IDNR are listed in Table 1, Information on Potential Contaminant Sources Provided by IDNR. PWS should be able to supplement the Phase 1 CSI by using local knowledge of potential contaminant sources and their

locations. Systems identifying additional potential contaminant sources during the Phase 2 CSI are asked to submit the locations and types of those sources to IDNR, identified either on a 7.5-minute quadrangle map or provided in GPS coordinates. If resources are available, IDNR will construct a GIS coverage of the Phase 1 and Phase 2 potential contaminant sources and provide it to the system so that a complete CSI is available for source water protection planning.

Table 1. Information on Potential Contaminant Sources Provided by IDNR

Comprehensive Environmental Response Compensation Liability Act (CERCLA) sites
Underground Storage Tanks
Resource Conservation and Recovery Act (RCRA) sites (treatment, storage, disposal)
Wastewater Treatment Plants
State Permitted Agricultural Facilities
Solid Waste Disposal Facilities (landfill, transfer, land application)
Airports
Sinkholes
Mines, Quarries, Gravel Pits (coal and non-coal)
Wells (public and private)
Agricultural Drainage Wells
Highways
Railroads
Land Use Coverages
Standard County Soil Surveys
Pesticide/Fertilizer Dealerships
Pipelines
Bridges
Carbon Tetrachloride Sites (grain treatment sites)*
Toxic Release Inventories*
Commercial Businesses*

*IDNR does not currently have access to these databases, but has an interest in acquiring them and will make them available if possible.

A PWS or local community source water protection plan may include a Phase 2 CSI since the Phase 1 CSI contains unverified data. Phase 2 of the inventory process is the responsibility of PWS or local communities if they choose to pursue source water protection in their area. Although transient noncommunity (TNC) PWS will be provided with the same contaminant source inventory and location maps as community and nontransient noncommunity supplies, Phase 2 CSIs submitted to IDNR by TNC supplies as part of source water protection plans need only consider potential nitrate and microbiological contaminants. IDNR will attempt to assist PWS with Phase 2 work as resources allow.

Phase 1 CSIs will be performed for groundwater, surface water, and PWS with groundwater under the influence of surface water as follows:

Groundwater Sources
Phase 1 contaminant source inventories will be completed by IDNR or a contracted assistance provider for all PWS using groundwater as a source. Potential contaminant source locations will be identified by Geographical Information System (GIS) location or street address for point sources, or geographical area for non-point sources, depending on the information available in the selected database. IDNR or a contracted assistance provider will plot all known local potential contaminant source locations on a USGS 7.5-minute quadrangle or similar base map containing the 2, 5, and 10-year time of travel radii described in the previous section of this document.

Surface Water Sources
Phase 1 CSIs will be completed for all PWS using surface water as a source. Third party contractors will complete Phase 1 CSIs for as many surface water supplies as possible using the Section 1452 (k) set aside funds; IDNR or a contracted assistance provider will perform any remaining Phase 1 inventories for surface water systems. All known potential contaminant sources within the watershed delineation area will be shown on a USGS 7.5 minute quadrangle or appropriately scaled base map. IDNR will ensure that Phase 1 CSIs performed by contractors are adequate and similar in scope to the inventories provided by the Department. Third-party contractors are encouraged to use any other databases or information available to them during preparation of the contaminant source inventories for surface water supplies.

Groundwater under the Influence of Surface Water
For PWS using groundwater under the influence of surface water, IDNR or a contracted assistance provider will perform separate Phase 1 contaminant source inventories for the groundwater and surface water sources. Potential contaminant source locations for the groundwater source will be plotted on a USGS 7.5-minute quadrangle or similar base map and overlain with the 2, 5, and 10-year time of travel determinations. The surface water source will be shown on a base map and potential contaminant sources within the watershed delineation area will be superimposed over the base map.

The ability of IDNR to meet this goal is contingent upon receipt of the State's portion of the DWSRF source water set-aside, and on approval of the recommended State funding and number of full time equivalent staff provided to the Department by the Iowa legislature.

Susceptibility Analysis
The 1996 Safe Drinking Water Act requires IDNR or a contracted assistance provider to perform initial susceptibility analyses for all Iowa PWS. Existing hydrogeologic and land-use data available in IDNR databases will be used in conjunction with the Phase 1 delineations to complete these initial, or Phase 1, susceptibility analyses. IDNR encourages PWS and their local communities to use the Phase 1 susceptibility determinations as a basis for comprehensive source water protection planning. Refinement of the Phase 1 analyses for groundwater systems may be accomplished through methods described in the Iowa Wellhead Protection Plan, found in Appendix 1, and would be considered Phase 2 analysis. Phase 2 analyses for surface water systems might include such things as ranking potential contaminant sources beyond state

boundaries or assigning different susceptibility rankings for subwatersheds based on their location and land-use for the purpose of prioritizing local protection decisions.

Best management practices are practices designed to reduce the quantities of pollutants that enter surface or groundwater, and use of these practices may reduce the risk ranking of potential contaminant sources in a source water protection area. Information regarding the use of best management practices can be found on pages 56-57 of the Iowa Wellhead Protection Plan (found in Appendix 1), and should be incorporated into the Phase 2 susceptibility analysis.

Phase 1 susceptibility analyses will provide limited data, and are to be used by PWS as a basis for the Phase 2 analysis, which is voluntary. PWS should be able to supplement the Phase 1 susceptibility analyses by using local knowledge of well integrity, potential contaminant sources, and their locations.

A PWS or local community source water protection plan may include a Phase 2 susceptibility analysis since the Phase 1 analysis contains unverified data. Phase 2 of the susceptibility analysis is the responsibility of PWS or local communities if they choose to pursue source water protection in their area. Although transient noncommunity (TNC) PWS will be provided with the same susceptibility tables and narratives as community and nontransient noncommunity supplies, Phase 2 susceptibility analyses submitted to IDNR by TNC supplies as part of source water protection plans need only consider potential nitrate and microbiological contaminants.

IDNR will attempt to assist PWS with Phase 2 work as resources allow. If a system identifies additional potential contaminant sources during a Phase 2 CSI and submits the locations and types of those sources to the Department, IDNR will complete a revised susceptibility analysis and provide it to the system, if staff resources are available.

Phase 1 susceptibility analyses will be performed for groundwater, surface water, and PWS with groundwater under the influence of surface water as follows:

Groundwater Sources

A Phase 1 susceptibility analysis will be performed by IDNR or a contracted assistance provider for each groundwater well used by a PWS. Points assigned for land use type and the associated potential risk, the distance between potential contaminant sources and the well (capture zone), and aquifer vulnerability will be evaluated and added to determine the relative susceptibility of each well to potential contaminant sources located within the time of travel radii. Table 2, Potential Contaminant Source Prioritization Worksheet, illustrates how potential contaminant sources are scored. Each potential contaminant source receives a score, with a score of 12 indicating the highest potential for well contamination, and a score of 3 indicating the lowest potential for well contamination. Table 3, Land-Use Risk, shows the land use types and corresponding scores used for completing columns 2 and 3 of Table 2, and Table 4, Susceptibility Classifications by Hydrogeologic Setting, shows the aquifer vulnerability score used for completing column 5 of Table 2.

A table will be completed for each system, showing each potential contaminant source within a 2, 5, or 10-year time of travel radius. A narrative will be included in the report provided to the system to explain the results of the table. In addition, the overall susceptibility of the well(s) to potential contamination will be discussed, and the specific potential contaminant sources listed in the table will be generally described. For example, if a specific dry cleaning operation such as the Sunshine Dry Cleaner is listed in the table of potential contaminant sources, the narrative will explain that the water supply is vulnerable to dry cleaning operations. For further information, see Appendix 3, Sample Assessment for a Groundwater System.

Table 2. Potential Contaminant Source Prioritization Worksheet

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Potential Contaminant Source	Land Use Type (from Table 3)	Land Use Risk Potential (from Table 3) Score: 1 to 5	Capture zone 2-year/fixed radius = 3 5-year = 2 10-year = 1	Aquifer Vulnerability (from Table 4) Score: 1 to 4	Total Score Sum of Columns 3-5

Table 3. Land-Use Risk Potential

Least Risk ▲	Risk Score	Land Use Type
	1	Land surrounding a well or reservoir owned by a water company
	1	Permanent open space dedicated to recreation
	1	Federal, state, municipal, or private parks
	1	Woodlands managed for forest products
	2	Field crops: pasture, hay, grains, vegetables
	2	Low-density residential (Lots larger than 2 acres)
	2	Churches, municipal offices
	3	Agricultural production (Dairy, livestock, poultry, nurseries, orchards, berries)
	3	Golf courses, quarries
	3	Medium-density residential (Lots from 1/2 - 1 acre)
	4	Institutional uses (Schools, hospitals, nursing homes, prisons, garages, salt storage, sewage treatment facilities)
	4	High-density housing (Lots smaller than 1/2 acre)
	4	Commercial uses (Limited hazardous material storage, sole sewage disposal, permitted animal feeding operations)
	5	Improperly abandoned wells in the same aquifer as the supply well
	5	Retail commercial (Gasoline, bulk petroleum storage facilities, farm equipment, automotive, sales and services, dry cleaners, photo processor, medical arts, furniture strippers, machine shops, radiator repair, printers, fuel oil distributors)
	5	Industrial (All forms of manufacturing and processing, research facilities)
▼	5	Underground storage of chemicals, petroleum
Greatest Risk	5	Waste disposal (Pits, ponds, lagoons; injection wells used for waste disposal; landfills; hazardous waste treatment, storage, and disposal sites; agricultural drainage wells)

Table 4. Susceptibility Classifications by Hydrogeologic Setting

Hydrogeologic Setting	Aquifer Vulnerability
Confining Bed Thickness <25 feet	4 Highly Susceptible to Contamination
Confining Bed Thickness 25-50 feet	3 Susceptible to Contamination
Confining Bed Thickness 50-100 feet	2 Limited Susceptibility to Contamination
Confining Bed Thickness >100 feet	1 Little Susceptibility to Contamination

Surface Water Sources

Phase 1 susceptibility analyses will be completed for all PWS using surface water as a source. Third-party contractors will complete Phase 1 susceptibility analyses for as many surface water supplies as possible using the Section 1452(k) set-aside funds; IDNR or a contracted assistance provider will perform any remaining Phase 1 susceptibility analyses for surface water systems. The analysis will determine the susceptible area as the distance equivalent to a 72-hour time of travel upstream of the PWS intake and a 1,320-foot (1/4-mile) buffer zone along the edge of the surface water source. The buffer zone area need not be owned by the PWS. The 72-hour time of travel distance will be estimated under average flow conditions. If the surface water source is a reservoir, a 1,320-foot buffer zone around the perimeter of the reservoir will be considered the susceptible area. The susceptible area will be superimposed on the base map containing the locations of potential contaminant sources within the watershed.

A table will be completed for and provided to each system, showing each potential contaminant source within the susceptible area and the watershed. Potential contaminant sources that involve large volumes of liquid waste will also be noted in the table. Surface water sources will be considered highly susceptible to any potential contaminant sources located within the susceptible area, and to potential contaminant sources involving large volumes of liquid waste. A narrative will be included in the report provided to the system to explain the results of the table. In addition, the overall susceptibility of the source water to potential contamination will be discussed, and the specific potential contaminant sources listed in the table will be generally described. For example, if a specific dry cleaning operation such as the Sunshine Dry Cleaner is listed in the table of potential contaminant sources, the narrative will explain that the water supply is vulnerable to dry cleaning operations. The narrative will also discuss why the source water is vulnerable to potential contaminant sources with large volumes of liquid waste, and how those wastes might contaminate the source water in a relatively short amount of time. For further information, see Appendix 4, Sample Assessment for a Surface Water System.

Groundwater under the Influence of Surface Water

For PWS using groundwater under the influence of surface water, IDNR or a contracted assistance provider will perform separate Phase 1 susceptibility analyses for the groundwater and surface water sources. The analysis of the groundwater component of the system will be

evaluated using Tables 2, 3, and 4 as discussed previously. The susceptible area of the surface water component of the source will be determined using the 72-hour time of travel distance upstream of the surface water area of influence, and a 1,320 foot (1/4 mile) buffer zone. If the surface water source is a reservoir, a 1,320-foot buffer zone around the perimeter of the reservoir will be considered as the susceptible area of the surface water influence. The susceptible area will be superimposed on the base map containing the locations of potential contaminant sources within the watershed.

Groundwaters influenced by surface water sources will be considered highly susceptible to any potential contaminant sources located within the susceptible area of the surface water. Potential contaminant sources identified within the watershed will be included in the table along with those sources identified in the groundwater component of the assessment. A narrative description of the susceptibility as it relates to the groundwater and surface water components of the system will be included in the source water assessment report provided to each groundwater system under the influence of surface water. The narrative will combine the features described previously in the groundwater and surface water portions of this section.

The ability of IDNR to meet this goal is contingent upon receipt of the State's portion of the DWSRF source water set-aside, and on approval of the recommended State funding and number of full time equivalent staff provided to the Department by the Iowa legislature.

Distributing Assessment Results to the Public

IDNR or a contracted assistance provider will distribute source water assessment results to each PWS or their designated representative. Typical results will consist of a series of maps and a short report. The maps will include roads, rivers, townships, railroads, and surface topography. The maps will show the delineated source water area(s) for the PWS. They will also show the location of known potential contaminant sources and the locations of known existing or past water wells that may act as pathways of contamination to the source aquifer. The report will provide an initial susceptibility ranking and detail the source of the information provided, potential limitations of the data, and any hydrogeologic relationships or potential contaminant sources in need of further investigation. Specific language to be used in Consumer Confidence Reporting will be included in those reports prepared by IDNR or a contracted assistance provider. A sample report for a groundwater system is included in Appendix 3, Sample Assessment for a Groundwater System. A sample report for a surface water system is included in Appendix 4, Sample Assessment for a Surface Water System.

A notice of assessment results intended for the public will be sent to each PWS, with the intent that the PWS include the notice in future water bills, newsletters, or internet sites to notify their consumers of assessment results. This notice may be used by the PWS to fulfill the source water protection requirements of the Consumer Confidence reporting rule, finalized in August 1998. The rule stipulates that PWS are required to give public notice in the annual Consumer Confidence report of source water assessment results. Assessment results provided by IDNR or a contracted assistance provider for this purpose will be written for the general public, and will be formatted for direct use by the PWS in giving notice to their consumers.

A copy of the brochure, "Wellhead Protection in Iowa," written by IDNR's Geological Survey Bureau (GSB) to educate the general public on the potential for groundwater contamination and the benefits of wellhead protection will be enclosed with the source water assessment results of systems using groundwater.

At least twelve public meetings will be held for informational purposes as assessments for groundwater systems progress around the state. Additional meetings may be necessary to accommodate consumers and stakeholders in outlying areas. Prior to the public meetings, news releases will be issued, requesting that PWS in the assessed areas notify their consumers and stakeholders of the meetings that will be held to discuss assessment results.

Public meetings for surface water systems will be held as the assessments for these systems are completed. Since contractors will assess the majority of surface water systems, it is the contractors' responsibility to inform consumers of the assessment results. The contractors have different timelines for the completion of the assessments they are working on, and these will not necessarily coordinate with the timelines for the groundwater systems in the corresponding areas. As a result, public meetings for the surface water systems will be held at the contractors' discretion. If the contractor completes a surface water assessment in conjunction with the groundwater assessments in the area, it is possible that the public meetings for both types of systems could be held simultaneously, but this will be worked out as the assessments are completed.

The public meetings will afford the opportunity to ask questions, and will provide IDNR the opportunity to provide technical assistance on an as-needed basis. The GSB, field office and central office staff of the IDNR, a representative of the Citizen's Advisory Panel, and a representative of the third-party contractor (see Voluntary Program for Local Source Water Protection Planning, below) will be available to discuss the technical basis for the source water assessments.

The IDNR will make source water assessment information and maps available on the IDNR web site to facilitate use of the information by the public and governmental entities. Placement of source water assessment data on the IDNR website is expected approximately two years after the initial assessments are completed. The Department hopes that PWS will update their own information on the web, as it becomes available, so that relatively current data will be available to IDNR, public water supplies, consumers, and stakeholders on a constant basis.

In summary, initial (Phase 1) source water delineations, contaminant source inventories, and susceptibility analyses will be performed for every Iowa PWS by IDNR or a contracted assistance provider during the next four years. Each PWS will receive at least one map and a short report, in addition to a notice to be used in informing consumers of the source water assessment results. The information gathered will be presented at regional meetings throughout the state as the work progresses. The purpose of the meetings will be to answer any questions raised by PWS or the general public with regard to source water assessments, and to encourage communities to proceed with completing source water protection plans on a local level (Phase 2).

The State's plan to implement source water protection through a voluntary program is described below.

Voluntary Implementation for Local Source Water Protection Planning

The IDNR source water protection strategy involves the use of a voluntary program encouraging PWS to develop local source water protection plans following the distribution of locally specific source water information by IDNR or a contracted assistance provider. The program consists of three basic efforts: Contracted assistance to PWS developing or updating wellhead/source water assessment plans, training workshops held around the state promoting wellhead/source water protection, and general assistance provided by IDNR staff to encourage PWS to complete source water protection plans.

IDNR staff will promote wellhead/source water protection during the public meetings used to distribute source water assessment results (previously described), through presentations at water supply industry meetings, general technical assistance provided by telephone to interested parties, newsletter articles throughout the year, and an eight-page educational brochure developed by the GSB, entitled, "Wellhead Protection in Iowa." The brochure will be distributed by IDNR to each PWS using groundwater as part of their source water assessment report (previously described).

Coordination with existing IDNR programs, such as the leaking underground storage tank, uncontrolled sites, wastewater, and livestock programs will be important to PWS undertaking the process of developing wellhead/source water protection plans. The Water Supply Section distributed a memorandum of understanding on January 7, 1998, to supervisors in each of the related IDNR programs, informing them of possible impacts on their programs as a result of wellhead/source water protection plan implementation.

Groundwater Sources

The IDNR will use a third-party contractor to assist PWS in developing and implementing local source water protection programs over the next two years. It is expected that funding for this technical assistance program will continue in the future, as resources allow. Technical assistance set-aside funds from the DWSRF will be used to fund this portion of the program. The assistance will focus on two different areas: The updating of previously developed wellhead protection plans to meet current requirements and guidelines, and the development of new source water protection plans for systems which have not participated in this program in the past. Source water delineations, contaminant source inventories, and susceptibility analyses prepared by the contractor for PWS participating in this program will be accepted in lieu of those performed by IDNR.

Approximately 70 Iowa PWS have voluntarily completed local wellhead protection plans for their drinking water sources. Since these plans were developed prior to completion of the State wellhead protection plan, initial efforts will focus on the review and revision of these plans to incorporate changes necessary for consistency with the current wellhead protection plan and the new source water protection program. Additionally, a comprehensive assessment of these

systems will be conducted to determine the level of activities and accomplishments that have been achieved as a result of the wellhead/source water protection program.

The chosen third-party contractor will initially focus on PWS considered vulnerable by IDNR to encourage the participation of at least 40 systems without wellhead protection plans in the development of protection plans. These systems will be assisted in developing and implementing plans during the next two years to bring the total number of PWS with active source water protection plans to 110 by September 30, 2000. Invitations to participate in the program will also be sent to every Iowa PWS, placed on the contractor's web site, and placed in its quarterly publication. It is anticipated that funding for this portion of the program will continue beyond September 30, 2000, increasing the total number of PWS with source water protection programs in place by 2005 to a minimum of 310 systems. An effort will be made to ensure that the majority of assisted PWS consists of community and nontransient noncommunity systems.

The contractor will also develop and execute 15-20 training workshops to promote wellhead/source water protection and train water system personnel, local governments, industry officials, and any interested members of the general public in wellhead/source water protection planning and techniques. One workshop will be held in each of the six IDNR regions; additional workshops will be held in inter-regional areas of 15-20 counties as designated by IDNR.

The workshops will utilize both new and existing training materials such as the Wellhead Protection Assistance manual developed by the Des Moines Water Works (contracted by IDNR) in 1996. Existing materials will be updated to reflect new requirements of both the wellhead protection and source water protection plans. Workshops will cover topics such as SDWA requirements, state compliance requirements, wellhead/source water protection procedures, water system management practices, vulnerability assessments, potential contaminant source identification, financing options for repair/replacement of equipment, etc. The workshops will use the training materials to promote involvement in wellhead/source water protection planning on a community level, and will offer technical assistance to those PWS already in the process of preparing a plan. IDNR oversight will attempt to ensure compatibility with other state-sponsored source water protection efforts.

Surface Water and Groundwater under the Influence Sources

Currently, there are no funds available to assist systems using surface water or groundwater under the influence of surface water with implementation of source water protection programs. Surface water systems receiving funds for contracted source water assessment will be encouraged to put source water protection programs into place, and IDNR will assist these systems with coordinating funding for implementation, to the extent that resources allow.

Non-point source contamination is a major concern of the systems utilizing surface water as a source. In response to this concern, a list of resources available to systems interested in pursuing non-point source programs has been compiled and is included in Appendix 5, Non-Point Source Resource Guide.

In summary, IDNR's plan for implementing source water protection in the State of Iowa is to encourage PWS to voluntarily participate in wellhead/source water protection planning. As the agency responsible for directing the public water supply program, IDNR intends to provide source water delineations, maps, contaminant source inventories, and susceptibility analyses, or the equivalent in technical assistance, to every PWS in the state. Funding and staffing issues prohibit implementation of a mandatory source water protection program in the State of Iowa. Consequently, IDNR will encourage every PWS in the state to voluntarily take the baseline information provided by the Department and develop it into a dynamic, community-based source water protection plan.

Updating of Delineations, CSIs, and Susceptibility Analyses

Three years after the original delineation, CSI, and susceptibility analysis are prepared by IDNR or a contracted assistance provider and distributed to the PWS, and every three years thereafter, IDNR will send a letter to the PWS asking if any changes to the delineation results, CSI, or susceptibility analysis have occurred. IDNR will update Department records accordingly to reflect any changes in the source water protection area known to the PWS.

On a five-year cycle, IDNR will conduct a sanitary survey of each PWS. During the sanitary survey, IDNR personnel will review the status of the source water protection area information and document any changes. IDNR will update Department records accordingly to reflect any changes in the source water protection area known to the PWS or discovered during the survey.

Ten years from the final approval of this source water protection strategy document, and every ten years thereafter, IDNR will review and update this document to reflect any necessary changes. Changes to this document will be made on a more frequent basis if changes in regulation occur prior to the end of the ten-year review cycle.

Reporting Results to EPA

The Department will report the necessary information, detailed on page 2-27 of EPA's "State Source Water Assessment and Protection Programs Guidance," (EPA 816-R-97-009, August 1997) through the most efficient means possible. Possible means of reporting include annual work plan progress reports, annual reports on the use of the DWSRF set-aside funds, EPA's biennial reports on state wellhead protection efforts, or Oracle/SDWIS databases.

Goals

The EPA's core performance measure for source water states that by the year 2005, 60 percent of citizens served by community water systems will receive their water from systems with source water protection plans in place. IDNR's goal is aligned with this national goal, seeking to ensure that 60 percent of Iowa citizens served by community public water supplies are served by water systems with source water protection programs in place by the year 2005. To reach this percentage, IDNR has established the following sub-goals:

1. Obtain commitments from at least three of Iowa's 30 largest PWS to develop and implement source water protection programs by 2005.

   To achieve the State goal of source water protection for 60 percent of Iowa's citizens by 2005, it is essential that the larger PWS in the state participate in source water protection efforts. It is anticipated that a percentage of the State's DWSRF set-aside funds will be used to assist some of these systems in initiating their source water protection plans.

2. Ensure that at least 110 PWS complete and implement wellhead/source water protection plans through the efforts of a third-party contractor, employed by IDNR, by the year 2001.

3. Encourage a shift in public perception toward water quality protection through workshops, public meetings, and the distribution of printed educational materials.

Milestones

Four concrete milestones will be used to assess the success of IDNR's efforts in source water protection.

1. The number of PWS submitting completed source water protection plans, and the number of citizens served by those PWS.

   Tracking the number of PWS submitting completed source water protection plans and the number of persons served by each PWS will allow IDNR to evaluate the number of Iowa citizens served by PWS with source water protection plans in place. This milestone is important since it will allow IDNR to know if the 60 percent goal has been achieved. It will also help to evaluate each of the sub-goals above.

2. The number of local citizens involved in developing and implementing source water protections plans for their communities

   As citizens become more knowledgeable about the benefits of source water protection, they are more likely to participate in local efforts to protect their source water. Tracking the number of local citizens involved community source water protection will allow IDNR to measure the success of sub-goal number (3) above. This milestone will also measure the success of IDNR's and third party contractor's workshops and public outreach efforts.

3. The number of PWS or citizen requests for information related to source water protection.

   Again, as PWS and citizens become more aware of the benefits of source water protection, they will be more likely to inquire about how their community can become involved in such an effort. This will help to evaluate the success of sub-goal numbers (2) and (3).

4. The number of PWS applying for DWSRF loan funds to implement source water protection programs or solutions to previously existing source water problems.

This milestone will allow IDNR to assess the success of public outreach efforts by measuring the number of systems willing to undertake source water protection plans. In addition, this will be a measure of local water system knowledge regarding problems associated with unprotected source water, and the solutions that protection can provide.

Incentives

Several incentives will be provided by both the Environmental Protection Agency and IDNR during the next few years to encourage PWS to participate in source water protection planning

1. Systems pursuing adequate source water protection measures are eligible for bonus points when applying for DWSRF loan funds.

2. Up to 15 percent of the state's DWSRF funds will be used to provide loans for source water protection activities such as land acquisitions/easements, voluntary protection and petition activities, source water assessments, and wellhead protection.

3. Systems are required by EPA to provide source water assessment results to their consumers, as they become available, in the form of Consumer Confidence Reports. This requirement will encourage PWS to proactively develop a source water protection strategy for the community to assure consumers that their source water will maintain/achieve protected status in the future.

4. Systems with adequate source water protection strategies in place may be eligible for monitoring waivers in the future.

5. The viability assessment manual will stress the value of a source water protection plan, and will encourage PWS to take a proactive stance in protecting source water.

Public Participation

Public participation during the development of the State's Source Water Assessment and Protection Program is required by the Amended Safe Drinking Water Act of 1996. IDNR held two technical and citizen advisory group meetings in 1999 for the purpose of reviewing the proposed plan and receiving comments. Technical and citizen advisory group members included water supply operators, engineers, industry associations, environmental groups, soil conservationists, agricultural interests, public interest groups, medical associations, physicians working with vulnerable population groups, business interests, the Iowa League of Cities, the Meskwaki Nation, and others. A complete listing of technical and citizen participants, their comments, and the responsiveness summary are located in Appendix 6, Responsiveness Summaries from Public Participation Meetings.

Following the technical and citizen advisory group meetings, three public meetings were held across the state to receive comments on the proposed plan. A press release was issued prior to

the meetings to inform the public of meeting times and locations, and a notice of the meetings was mailed to every PWS operator in the state. A complete list of public meeting participants, their comments, and the responsiveness summary is located in Appendix 6. Several citizens and public water supply representatives were not able to attend the meetings, but were interested in receiving a copy of the proposed Source Water Assessment and Protection Plan. A mailing list of these citizens and supplies is included in Appendix 6.

Many comments were received during the public participation process, and several changes were made to the plan in response to these comments. IDNR appreciates the time and effort that technical advisors and citizens donated in assisting with the development of this plan. It is hoped that the awareness raised during the public participation process will continue through the development of source water protection plans in communities throughout the state.

Table 5. Implementation Timetable*

Time Period	Activity
Current	Develop IDNR Source Water Protection Strategy
April, 1999	Convene technical and citizen advisory committee for review of strategy
Current – June 2002	Develop delineations and contaminant source inventories for individual PWS
Current – March, 2001	Assist local communities with formulation and implementation of source water protection plans
June, 1999	Hold three public meetings on statewide strategy
June 1999 – December 2001	Make delineation maps, contaminant source inventories, and susceptibility analyses available on the internet
July, 1999	Incorporate public comments, submit updated source water protection plan to EPA
November, 1999	Submit source water protection plan to Environmental Protection Commission for information
December, 1999	Submit source water protection plan to Environmental Protection Commission for decision, submit final plan to EPA

*****The timetable assumes the acceptance of the State wellhead protection plan and the subsequent distribution of DWSRF source water set-aside funds.

Appendix 1

Iowa Wellhead Protection Plan

Appendix 2

Work Plans for FFY 1999, 2000, 2001, and 2002 Drinking Water State Revolving Fund Source Water Delineation/Assessment Program

Appendix 3

Sample Assessment for a Groundwater System

Appendix 4

Sample Assessment for a Surface Water System

Appendix 5

Non-Point Source Resource Guide

Appendix 6

Responsiveness Summaries from Public Participation Meetings