Qualifying Source Water Systems for the SWP Program

Features of a Priority Source Water System

√ Nitrate levels above 5 milligrams per liter and increasing

√ Shallow alluvial wells

√ Highly susceptible public wells to groundwater contamination

√ Willing stakeholders

√ Willing community

√ Other contaminant concerns

Funding provided from the U.S. Environmental Protection Agency allows the Iowa DNR to support up to three community SWP projects each year.

The Iowa DNR website for proiority communities with contaminant risk in their source water is: www.iowadnr.gov/sourcewaterprotection

Water with nitrate levels above 10 milligrams per liter can be unsafe for infants to drink, as it could lead to Blue Baby Syndrome (a condition that causes oxygen starvation and suffication). Pregnant women and nursing mothers should also avoid consuming unsafe levels of nitrate.

Terms and Acronyms Used in Source Water Protection

Aquifer: an underground layer of permeable soil (such as sand or gravel) that contains water and allows the passage of water.

Capture zone: also referred to as the wellhead protection area, a caption zone is land surrounding a well from which the well's groundwater is drawn.

CPT: Community Planning Team

CWS: Community water supply

Nitrate: water soluble, the chemically active form of nitrogen causes Methemoglobinemia or Blue Baby Syndrome, a life threatening condition in infants. Nitrite reacts with hemoglobin (the oxygen carrier in the blood) and changes it to methemoglobin. Methemoglobin cannot carry oxygen, leading to oxygen starvation and suffication.

NPS: Non-point source means any source of water pollution that does not meet the legal definition of "point source" in the Clean Water Act.

PS: Point source pollution is water pollution that comes from a single, discrete place — typically a pipe — and generally flows to a river, stream or lake. Agricultural storm water discharges and return flows from irrigated agriculture are legally excluded as point sources in the Clean Water Act.

SDWA: The Safe Drinking Water Act set national health-based standards for drinking water to protect against both naturally-occurring and man-made contaminants.

SWP: Source Water Protection is the act of preventing contaminants from entering public drinking water sources. SWP includes both ground water (wellhead) protection and surface water protection.

Susceptible systems: Susceptibility is based on the geologic characteristics of the aquifer and is independent of well vulnerability. Aquifer susceptibility is determined by examining the geologic logs for the public wells being modeled and other nearby wells for the thickness of impermeable material — referred to as confining beds — above the aquifer.

TAT: Technical Assessment Team comprised of geologist, hydro geologist, engineers and agricultural professionals.

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SOURCE WATER PROTECTION FOR PRIORITY WATER SUPPLIES

A voluntary program to reduce drinking water contaminates for communities with shallow alluvial wells containing contaminant levels of concern

This program is the only one that provides a groundwater site investigation for priority community water supplies

Communities Control Source Water Protection Programs

Geoprobe boring samples help determine contaminants in the soil and ground water.

Phase 1 in the Source Water Protection (SWP) program begins with a commitment from the community to perform a SWP project. Next is putting together the Community Planning Team. Their first responsbility is assessing current and historic local knowledge of land use where groundwater contamination will be investigated.

Next, a DNR SWP investigator conducts the investigation with the assistance of the SWP Technical Assessment Team (TAT), made up of a DNR geologist, engineer, hydro geologist and physicist. The investigation includes determining the source water area of contamination susceptibility, an inventory and ranking of potential contamination sources, and sampling and analyses depending on the situation. A technical report of the findings is presented to the TAT for review and approval.

Contaminants and possible sources

Contaminants can be from many sources. The objective of the SWP site investigation is determining if the contaminant of concern — often nitrate, polychlorinated biphenyls (PCBs), or petroleum — is from a regulated point source or a non-point source. The investigator also seeks the extent of the contamination and its route through the soil and groundwater. This information is very important to develop a viable SWP plan.

If the contamination is from a regulated point source, remedial action is necessary and the DNR's contaminated sites section takes over.

If contamination is from a non-point source, the Community Planning Team will then use the technical report for development of a viable SWP Phase 2 Plan.

Site investigation results steer plan for Phase 2

With this technical and objective information in hand, the local planning team members, with representatives from NRCS and the Division of Soil Conservation, local landowners and city leaders develop viable options and resources and create a timeline for implementation.

The local team may also consider how to handle short-term and long-term losses of drinking water sources.

Opportunities to add community-use features

As project plans come together, often features are added to the SWP plan for community enjoyment and use. Outdoor classrooms, bike trails, and public wildlife habitat have been added to community source water protection projects.

DNR assistance continues

As the effort develops, the DNR program coordinator helps the team gather partners such as county supervisors, city leadership, a local historian, stakeholder organizations, landowners and operators in the priority area and other pertinent resources to accomplish the SWP team's planned project.

After the SWP plan is implimented, the local team will annually evaluate and update its project. The DNR may monitor the raw water data to evaluate effectiveness of installed practices.

Source water protection program steps

1. A priority community commits to perform a source water protection project.
2. A Community Planning Team is organized.
3. An investigation plan is determined.
4. SWP investigator identifies sources of local contamination and priority areas, as well as works with the community team to develop options.
5. Best management practices are identified by the Community Planning Team.
6. Community Planning Team develops source water protection plan.
7. Available resources (partners, funding, in-kind assistance and volunteers) are confirmed.
8. Plan is implemented.
9. Results are evaluated and the plan is updated as needed.

It took a couple of years to get to breaking ground on our source water protection project — re-establishing a wetland to remove nitrate. We gathered every stakeholder we could think of to partner with us and kept our ears open for available resources. Golden Hills RC&D helped us figure out where we could apply for grant funding. Then there were approvals to wait on. In the end we're solving our nitrate problem naturally, without passing any costs on to our customers. And just as important, this solution will last a long time into the future.

— Stephen C. Howell, Mayor of Elliott

To learn more

For more information about the SWP program, contact SWP Coordinator Becky Ohrtman by telephone at 515-725-8332, or by email: Rebecca.Ohrtman@dnr.iowa.gov.

Ohrtman will explain the SWP project process, provide information about other SWP community planning team projects in Iowa, and present the program to community stakeholders. During the program she is a resource for help with funding the project, gathering partners and finding in-kind assistance.