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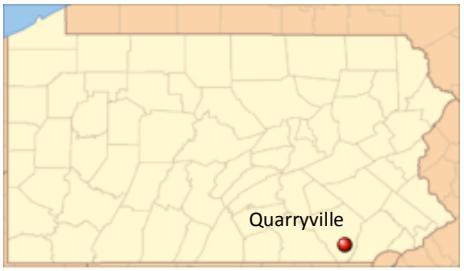
WREN AUGUST 2014 WATER POLICY NEWS FEATURE

Third in a Series Profiling Small Water Systems

Quarryville Sees Value in Reviving Dormant Source Water Protection Plan

By Lynda Ginsparg

In this Water Policy News feature, we continue our profiles about source water protection efforts by small water systems. This month we share the story of the Quarryville Borough Water System in Lancaster County and why they took action to implement their source water protection plan to ensure safe, reliable drinking water for their community.



Mention Lancaster County, Pennsylvania and thoughts turn to picturesque farmland, Amish-made quilts, good old-fashioned Pennsylvania Dutch food…and geothermal wells. This progressive energy source is what motivated one official in Quarryville Borough to push for passage of a source water protection plan (SWP) that had laid dormant for years.

Protecting safe drinking water from potential sources of contamination in this southcentral Lancaster County borough became the leading factor in revisiting a source water protection plan that was originally begun 15 years ago. William "Bill' Mankin, President of the Borough Council, credits the persistence of William 'Bill' Lamparter as the driving force in bringing the plan back to life. Lamparter is the maintenance superintendent for Quarryville Borough and the licensed water operator who has run the water system for the past 20 years.

Quarryville Quick Facts: The Borough owns and operates the water system for its nearly 2,600 residents. Most of the water comes from the North Church Street well, which went online in 1994 and now pumps 180,000 gallons of water a day, Lamparter said. A smaller portion of the water is supplied through an interconnection with the Pennsylvania American Water Company (PAW.) Prior to Quarryville digging its own well, water for the Borough was purchased from PAW, which remains the back-up supplier for the Borough's water. Quarryville's water storage tank can hold up to 630,000 gallons of water for the Borough at any one time, though it's typically not filled to that capacity. It is known as a pressure tank – the more the water is filled, the more pressure in the system. Assisting Bill Lamparter in operation of the water system are two other licensed operators, Ron Munro and Clint Herr. Munro and Herr handle the daily work including starting the well to ensure it is running efficiently, charting daily flows to record how much water is being pumped out of the well and adding the chlorine and other chemicals to disinfect the water. Munro and Herr rotate these jobs seven days a week, with Lamparter sharing the weekend rotation schedule.

QUARRYVILLE'S SOURCE WATER PROTECTION PLAN – STARTED AND FORGOTTEN

The initial framework of a SWP plan was outlined in a June 1999 document titled the "Management Program for Wellhead Protection Area for the Quarryville Water System" but this plan was never presented to the Department of Environmental Protection (DEP) for approval, Lamparter recalled. He added that the plan *"wasn't what a wellhead protection plan should have been. It did include information about the well, some mapping and zones, but it wasn't what it is today."* Lamparter said this version of the plan was never formally adopted by the Borough and was set-aside for years. Four years later, the Borough made some progress and adopted a Wellhead Protection Ordinance on December 1, 2003.

In 2006, the SWP plan was revisited again briefly by Lamparter to see if it could be restarted, but the effort did not go very far. *"It was not a top priority at the time,"* he said. When Mankin came on board as a member of the Quarryville Authority and later as a borough council member, the two gentlemen agreed that it was important to get the plan up and running. In 2012, the duo got the plan back on its feet through the Borough's affiliation with Pennsylvania Rural Water Association (PRWA). PRWA was instrumental in helping the Borough modernize its formal SWP plan. PRWA also developed maps of the Borough's water distribution system using a Geographic Information System (GIS) and helped coordinate requests to DEP, including securing engineering services for their source water protection plan, according to Lamparter. He credits Nate Merkel, who at the time was a source water protection specialist with PRWA, with guiding Quarryville officials through the process to develop a full-fledged SWP plan.

Bill Lamparter, right, maintenance superintendent for Quarryville Borough, accepts a certificate of approval for completion of the Borough's source water protection plan from the DEP's Cathy Port during a meeting in June 2014.
(Photo courtesy of Debbie Wygent, LancasterOnline, Lancaster, PA)

"He was a great guy all around with this SWP plan for Quarryville," Lamparter said of Merkel. The Borough later worked with Robin Montgomery at PRWA, who took over Merkel's position, as well as Catherine Port, geologic specialist in the DEP'S Safe Drinking Water office for the southcentral region, to help complete the plan.

Merkel was equally complimentary of the work done by the Quarryville committee. *"I have never seen a Source water protection committee bond together as well as Quarryville did. Everything they did from buying a groundwater model to educate the public, to looking at options to protect their water, to trying to get source water protection education into local schools was incredible, and I applaud their efforts,"* Merkel said when contacted. *"Not to mention the need to update their water distribution system maps using PRWA's GIS capabilities was also realized by members of Quarryville's SWP Committee,"* he added.

After years of work, the SWP plan for the Borough of Quarryville was officially approved by DEP in December 2013, and adopted by the Borough Council in April 2014. This past June, the DEP officially commended the Borough with presentation of a certificate of approval recognizing the Borough's completion of the wellhead protection program that is the core of its SWP plan.

Lamparter said he is not sure what sparked initial interest in a SWP plan in 1999. He said he took an interest in the idea beginning in 2006 when the Borough began to experience an increase in the number of requests coming in for permits to drill geothermal wells.

Lamparter explained that some geothermal wells are not a 'closed system.' His concern was the potential for the system's chemicals to leach back into a groundwater aquifer where they could contaminate the water source. He further explained that a closed-loop geothermal energy system is a type of geothermal heating and/or cooling system that utilizes a pressurized heat exchanger consisting of pipe, a circulating pump, and a water-source heat pump in which the heat transfer fluid is not exposed to the atmosphere. The heat transfer fluid is potable water and may have approved antifreeze added. There are two kinds of closed-loop systems, vertical and horizontal.

The Borough did take action with adoption of a geothermal well ordinance on November 7, 2011. However, Quarryville had already seen an increased number of requests, during the six years between 2006 and 2012, from homeowners looking for alternative sources to heat and cool their homes. There were no regulations at the time to allow the Borough to oversee what was being drilled, which is one factor that led to the 2011 geothermal well ordinance. By 2012, Lamparter said there was a major concern that these geothermal wells were being drilled too close to the Borough's water source. It was then that he and Mankin began to ramp-up their push for passage of a source water protection plan. With adoption of the SWP plan, there are now guidelines as to what other wells can be drilled in each zone surrounding the Quarryville well, allowing Borough officials to govern the activity. In looking for answers, Lamparter said he was simply *"trying to protect our water source altogether."*

QUARRYVILLE'S SUCCESSFUL SWP STEERING COMMITTEE

As part of the process of bringing the SWP plan back to the table for good, Lamparter and others on the SWP committee worked with DEP and its state-wide SWP contractor, SSM Group, Inc., for the geological and engineering work to map the area around the well head to be protected. Zones around the well outline the most protected areas, then radiate further into the adjacent townships and beyond based on time of travel, Lamparter said. Since mapping included land inside neighboring Eden, East Drumore and Providence townships, supervisors from each are members of Quarryville's SWP plan steering committee.

This image shows one example of how a geothermal well system can be installed at a residence.

Others filling out the roster of steering committee members include a water engineer from The Arro Group, a Lancaster-based engineering firm; the chair of Pequea Watershed Association (some of Pequea's streams run through the Borough, Lamparter said, and the association has done some work planting along stream banks near Quarryville's well) and the emergency management coordinator for the Borough. *(To receive DEP approval, contingency planning is a required element of a source water protection program. In Quarryville Borough, no spill emergencies have occurred to date. However, Mankin noted that there is expertise on their committee, if needed.)*

The committee meets quarterly to address water-related concerns of businesses, including the location of possible toxic contaminants, such as gas stations and a local farm store that sells pesticides. Merkel added that the major Potential Sources of Contamination (PSOCs) for Quarryville are agricultural runoff, commercial

and industrial uses and residential stormwater runoff. Lamparter said the major risk that the Borough wanted to address through the SWP plan was the possibility that the Borough's well would become contaminated either by chemicals or spills in the wellhead protection area, especially zone 1, which is closest to the well. Lamparter said the combination of the formal SWP plan, the well protection ordinance and public education efforts in the community have finally resulted in the right mixture of protective measures for the Borough's water supply.

"*We're the only municipal water system in southern Lancaster County. Others in the area are on private wells, so they do not have a plan,"* Lamparter said*. "We do get together to make other townships aware of what could potentially contaminate their wells (so they can) reach out to their residents. A private well can be contaminated as well as our system could be,"* he added

"In undertaking a source water protection plan, what I would recommend is to do a very thorough job," said Mankin. "*We had plenty of help, to know what's in the different zones, to know what could contaminate your well and understand what's out there and keep track of that as times goes on. To develop your plan you have to know those things. The next thing is to educate the people. That becomes the bigger part of the program. Everyone (who) has their own personal well, they have to take care of their well, even if it's a private one,"* Mankin advised.

Top photo: Source Water Protection information is readily available at the Solanco Fair in Quarryville, Lancaster County. This popular fair draws visitors from throughout the county and is the perfect opportunity for the Quarryville Borough Water System to share information about practices to preserve clean water. Bottom photo: A young visitor stops to look at the groundwater model at the Solanco Fair.

Source water protection plans benefit private well owners located within the SWP recharge area. Well owners become the beneficiaries of the protection measures outlined in these plans.

PUTTING AN EMPHASIS ON EDUCATION

"Our biggest thing is education, education, education – getting it out there," said Lamparter.

One of the prime opportunities for educating the public is at the Solanco Fair. This annual event, held in September, draws between 20,000-30,000 people during its three days. (This year's Fair will be held September 17-19. Visit the ***Solanco Fair*** website for more information.) At the Fair, members of the Borough's administration and staff can attract the attention of visitors with eye-catching displays. They also incorporate demonstrations of the enVision 3000 Bedrock Simulator groundwater model, and provide brochures and other printed materials to help raise community awareness about the sources and effects of water contamination. An EnviroScape® model is also used for display and teaching purposes. Capitalizing on this large gathering to educate the public about source water protection is key: "*A lot of borough residents were there and stopped at the booth to ask questions,"* Lamparter said of the annual Fair.

Borough leaders are also working to bring education into the classroom, including demonstrations of the groundwater model at schools. Mankin said they are working with teachers at the Solanco School District's two middle schools to incorporate use of the groundwater and EnviroScape® models into the science curriculum. Though still in the planning stages to set up the program, Mankin said they are hoping to begin the program for the upcoming school year. The first step they are taking is creation of a video explaining and demonstrating the groundwater model. Later, they plan to go into the schools to expand on the video lesson. Lamparter explained that students at the middle school level were chosen as the target audience for this program because 6th-8th graders are at an optimum age to readily understand how easy it is to contaminate a water source at home, particularly if the family has its own well.

"For us, we look at it that they're curious at that age, and they can understand (how the model works). We think it fits in better with their curriculum for environmental science," Lamparter said. *"(We can get them) thinking about how something can filter down into the ground and into the sewer system to contaminate the water."*

In the future, Mankin said he is hoping to use the Borough's website as another outlet for educating the public. Currently, educational information about conserving water is sent to customers with their water bills. The Borough also annually distributes a Consumer Confidence Report, a drinking water quality report that includes water system updates and lists the sources of water from the well and contaminant testing results.

Above: William Mankin, left, President of the Quarryville Borough Council, demonstrates how water moves through the ground using the* groundwater *model at the 2013 Solanco Fair. (Photo supplied by Bill Mankin)

In reflecting on his persistence in pursuing adoption of a source water protection plan for his community, Lamparter offered this final bit of advice: *"Be wise to what you're dumping in the ground and how it can contaminate your water source. Water is a very precious thing to us and if you contaminate it, you don't have it, it's not usable for a drinking source,"* he cautioned.

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For More Information on Drinking Water Protection:

Please visit WREN's Source Water Protection website at http://www.sourcewaterpa.org/. Click on the "Your Status" tab to see if your local water supplier has a PADEP-approved SWP PLAN. Download PA DEP's Source Water Protection Technical Assistance Program (SWPTAP) Fact Sheet. To read about source water collaborative efforts in Pennsylvania, click here and the WREN Features page Profiles.
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The Water Resources Education Network (WREN) is a statewide source water protection partner. A project of the League of Women Voters of Pennsylvania Citizen Education Fund, WREN offers assistance and funding for public education about PA water resources. Subscribe to WREN's free e-newsletter, ***Water Policy News****, to stay up to date on news and resources. Also see National Source Water Collaborative website and EPA Source Water Protection website.*

PA Rural Water Association (www.prwa.com) *is also a valued Source Water Protection Partner with PADEP and offers assistance to medium and small public water systems for drinking water protection strategies. PRWA is a member-supported non-profit organization that provides technical assistance and services and certified training to water and wastewater utilities throughout the Commonwealth to assure safe drinking water for communities.*

The American Water Works Association (AWWA) has established an industry standard known as the ANSI/AWWA G300-07 AWWA Standard for Source Water Protection in 2007 and has a guidebook available.

WREN WILL OFFER SOURCE WATER PROTECTION EDUCATION GRANTS BEGINNING IN JANUARY 2015

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