



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Pennsylvania

Plugged Gas Wells Improve Water Quality

Waterbody Improved

Step Run flows through a part of northwestern Pennsylvania that has been the site of oil and gas drilling since the early 1900s. Abandoned oil and gas wells have been degrading streams in this part of the state for the past 50 years. Artesian flows with high acid concentrations lower the streams' pH to below tolerable levels for many aquatic organisms. The Pennsylvania Department of Environmental Protection (PADEP) added Step Run to the state's 2006 Clean Water Act section 303(d) list of impaired waters due to low pH. After two local organizations partnered to plug four abandoned wells in the Step Run watershed, the pH increased to acceptable levels, and Pennsylvania removed one segment of Step Run from its 2008 303(d) list.

Problem

Step Run is a first-order stream in northern Clarion County that flows into Licking Creek and then several larger streams before eventually emptying into the Clarion River. In 2006 PADEP added 3.4 miles of Step Run's mainstem to the state's 303(d) list for failing to support its aquatic life designated use due to acidity. The source of acidity was groundwater flowing up (an artesian flow) through abandoned oil and gas wells and reaching the land surface.

PADEP estimates that as many as 200 abandoned oil and gas wells remain in Clarion County. Stream surveys completed in 2003 in the Licking Creek watershed found pH as low as 3.5. A stream needs to have a pH higher than 6.0 to support aquatic life. A biological stream survey conducted by PADEP in April 2004 noted that the stream had a sterile appearance, and that there was "low EPT diversity, abundance, no mayflies, no sensitive caddisflies and low pH." EPT is short for the order names Ephemeroptera, Plecoptera, and Trichoptera, and collectively refers to the families of mayflies, stoneflies, and caddisflies found in a stream.

Project Highlights

In 2003 the Lucinda Watershed Association/Lucinda Antler Club received a Growing Greener grant to conduct a Licking Creek Watershed Assessment. The watershed assessment found that the abandoned oil and gas wells must be plugged to raise the pH of the impaired streams in the Licking Creek watershed, including Step Run. In response, the Clarion County Conservation District and the Alliance for Wetlands and Wildlife plugged four wells along Step Run (Figure 1).

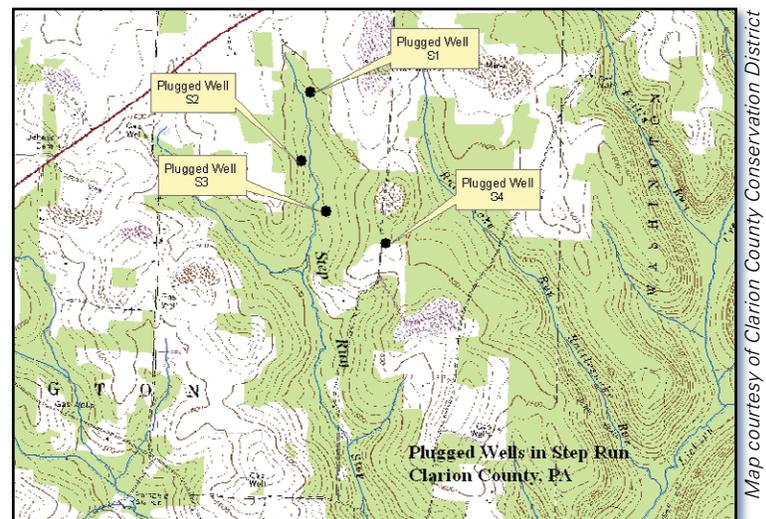


Figure 1. Black dots show the four plugged wells along Step Run.

PADEP did not develop a total maximum daily load (TMDL) for Step Run or any of the streams to which it flows on its way to the Clarion River; however, the TMDL endpoint for pH is a minimum of 6.0 in accordance with the state standard for pH.

Results

Plugging the abandoned wells along the mainstem of Step Run removed the source of acidity and allowed water quality to improve. Samples taken by PADEP's Water Quality and Assessment Division in the summer of 2007 showed an average pH of 6.7, which meets standards. Therefore, PADEP removed 3.4 miles of Step Run's mainstem from the state's 2008 303(d) list of impaired waters.

Partners and Funding

Two Growing Greener grants and a PADEP Environmental Alliance for Senior Involvement grant, awarded between 2001 and 2004, supported the watershed assessment, stream monitoring and well plugging. While no section 319 funds were specifically used for plugging the abandoned oil and gas wells, PADEP's Nonpoint Source Program provided \$131,025 as part of a Growing Greener grant. The Clarion County Conservation District and the Alliance for Wetlands and Wildlife coordinated efforts to plug the abandoned oil and gas wells.

Efforts to plug additional abandoned wells that are impairing waterbodies in the Clarion River Basin are ongoing. Most notably, the Clarion County Conservation District along with partners such as the Alliance for Wetlands and Wildlife continue to apply for and secure grant funding for this purpose.



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