Clover Run - AMD Abatement Project

Project Background:
Project Name: Clover Run
Project Number: AMD 33(2992)101.1
Problem Area: 2992
Municipality: Gaskill Township
County: Jefferson
Topographic Map: McGees Mills
Latitude/Longitude: 40° 56’ 10” N, 78° 51’ 30” W
Receiving Stream: Clover Run

Project Goals:
The goals of this project were to abate two acid mine drainage discharges from an abandoned deep mine in Gaskill Township, Jefferson County. This site also featured a flowing deep mine vertical shaft that needed to be taken care of to prevent any possible accidents from occurring. The project was initiated by the Jefferson County Conservation District in the late 1990s as part of their efforts to fix the damage done by AMD in their local watersheds. The two discharges that were to be abated are quite different in character. The main problem with the first being acidity and the second, more alkaline flow, having high levels of Iron.

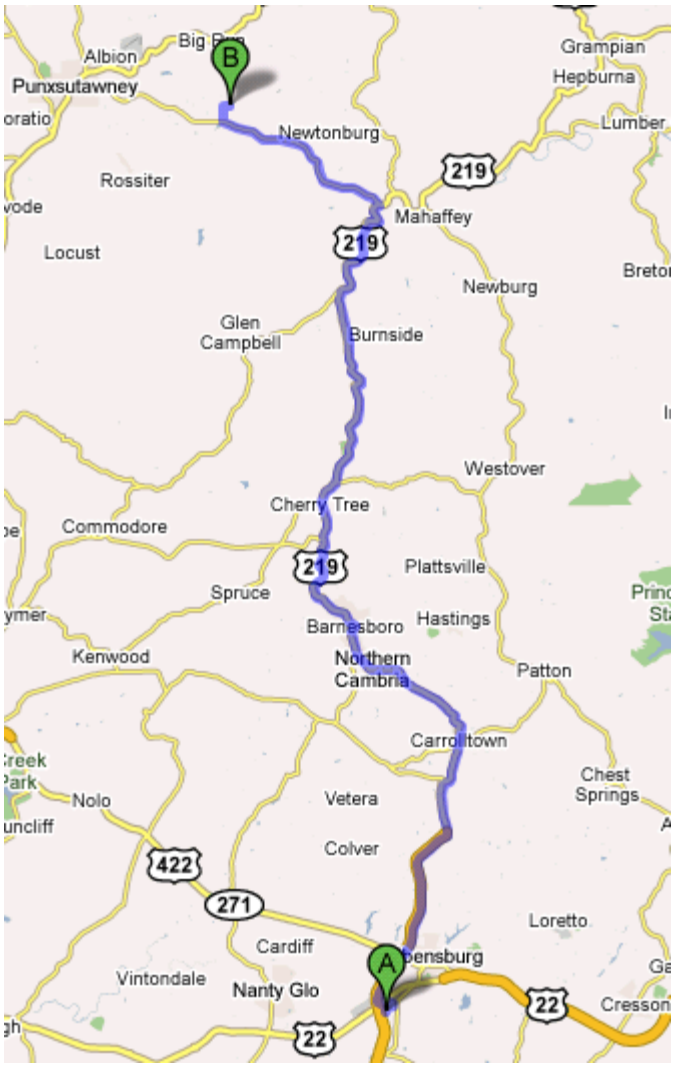
Project Information:
Following the abandonment of the deep mine in 1953, AMD discharges began to flow into an unnamed tributary to Clover Run, which flows into the Upper Mahoning Creek and eventually into the Allegheny River. The acidic and metallic contents in the water eventually negatively affected the aquatic life of this watershed, lessening to prospects of recreational fishing in the area. Upon the inception of the Jefferson County Conservation District, these issues were taken into account and plans went forward to deal with the pollutant discharges. With the help of the Pennsylvania Department of Environmental Protection's Bureau of Abandoned Mine Reclamation, development and planning began in 2000, with construction going under way in May 2004 until being completed in November 2004 at a final cost of $145,721.78.

Project Design Information:
The abandoned deep mine vertical shaft was backfilled with large diameter limestone in order to seal it and prevent accidents from occurring with people using the area for recreation. The acidic shaft discharge was treated by placing limestone lining on the floor of an existing box cut, which the drainage was already flowing through. Finally, the alkaline discharge required only sedimentation for removal of metals, since it contained little to no acidity. A sedimentation pond already happened to be in place on this site to reclaim a different surface mine, so that pond was used to treat this pollutant flow as well. Two finger dykes were installed in this pond to baffle the flow horizontally.

Project Description:
The acidic flow that emanates from the abandoned mine shaft is led through a limestone-lined box cut, which aids in adding alkalinity to the water before being put back into the stream. The alkaline flow from near the gas well is fed through an existing sediment pond, where any metallic content settles out. The two flows are then combined and released back into their original stream.

Property Owner Information:
The project site is located on land owned by Dean Barrett and his wife of Bowersville, who live on the property. This land is adjacent to State Game Lands #195.

Directions to Site:



Start – 286 Industrial Park Rd, Ebensburg

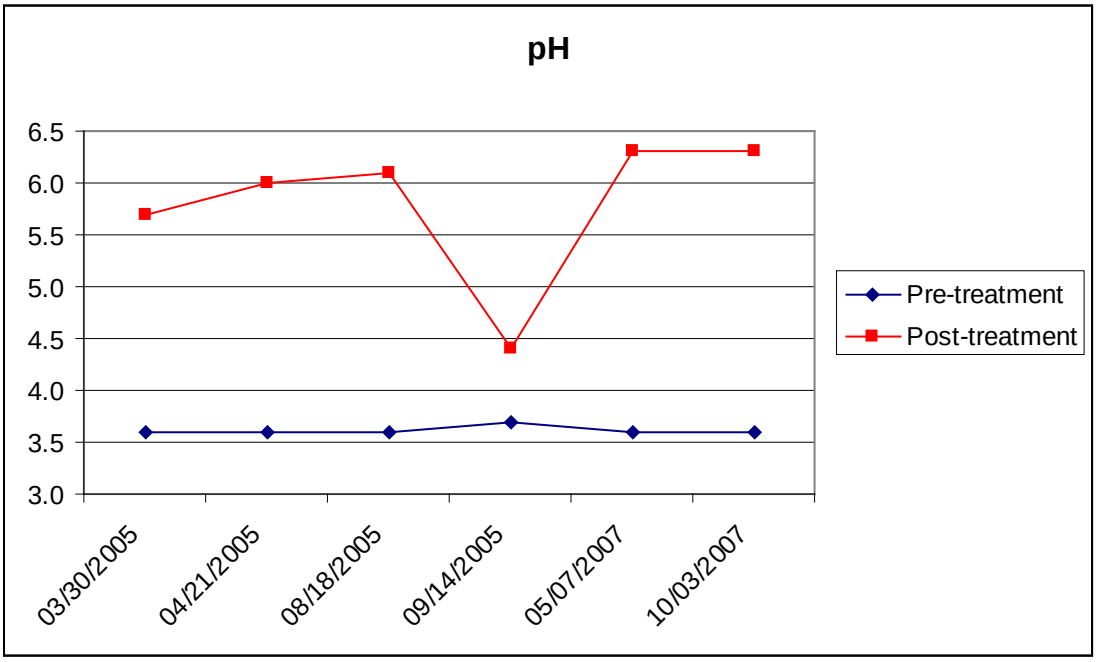
- Turn **left** at Mini Mall Road	0.3 mi
- Turn **left** at US-22	0.1 mi
- Take the **ramp** onto US-219 N	36.1 mi
- Turn **left** at PA-36	6.9 mi
- Turn **right** at Mill Rd	0.6 mi
- Turn **right** at Barrett Rd	0.2 mi

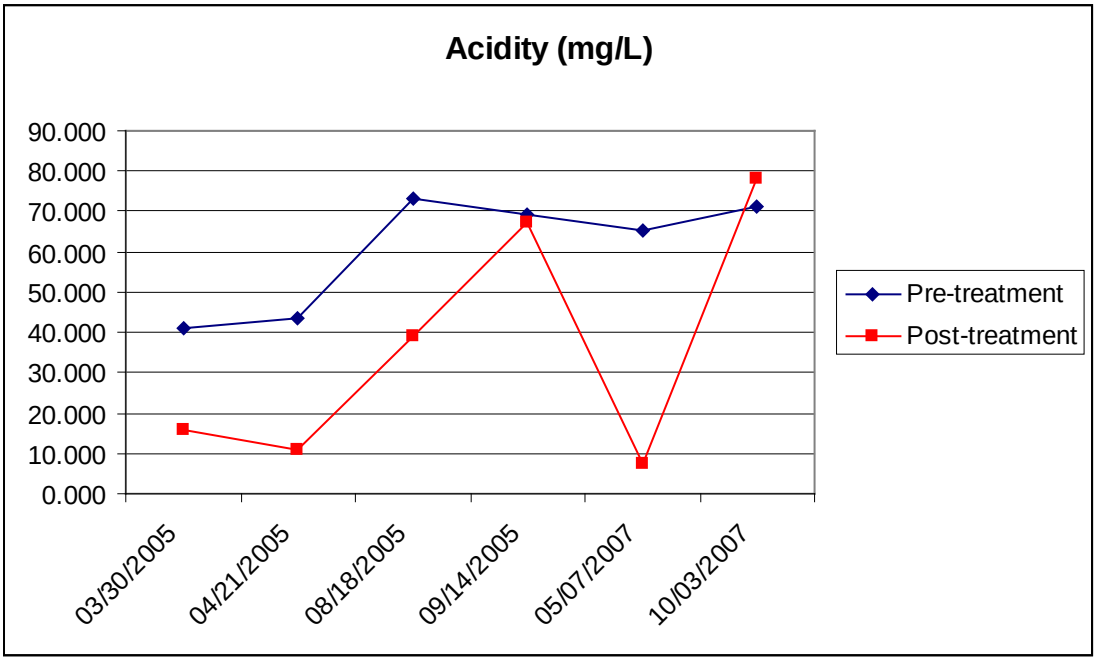
Follow gas well roads to site.

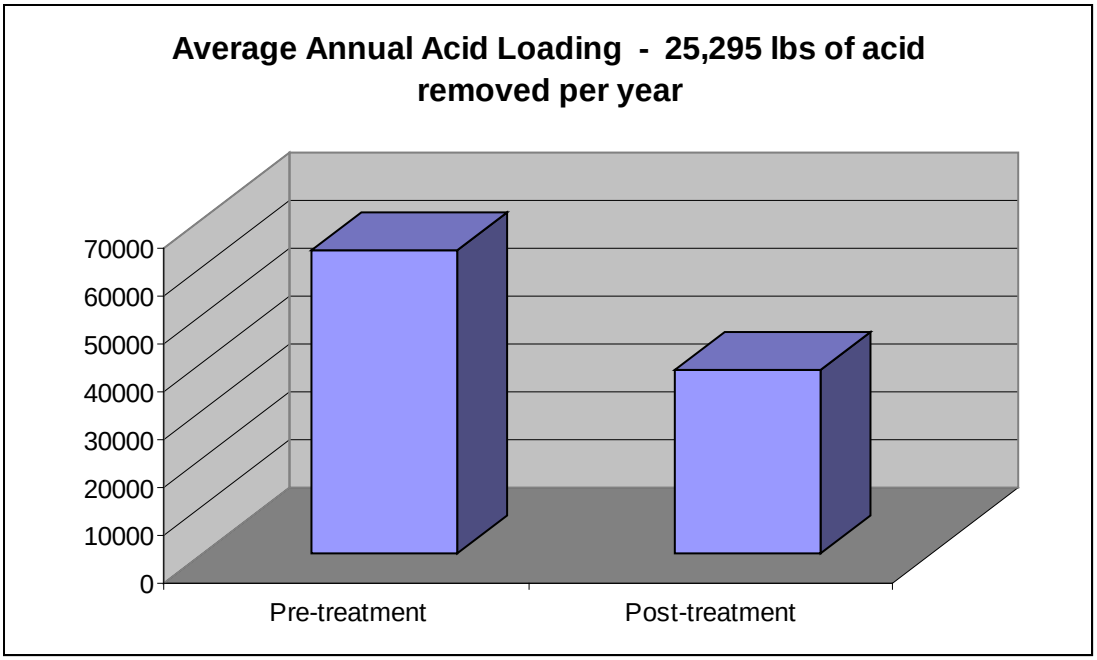
Data:
* Flow values not included in monitoring reports. Flow values taken from End of Job Construction Report (acidic flow – 240 gpm, alkaline flow – 80 gpm).

1) Acidic mine shaft discharge

* Negligible metallic content in this discharge.




Acidity (mg/L)
90.000
80.000
70.000
60.000
50.000
40.000
30.000
20.000
10.000
0.000
03/30/2005
04/21/2005
08/18/2005
09/14/2005
05/07/2007
10/03/2007
Pre-treatment
Post-treatment


Average Annual Acid Loading - 25,295 lbs of acid removed per year
70000
60000
50000
40000
30000
20000
10000
0
Pre-treatment
Post-treatment

2) Alkaline gas well discharge

* This is an alkaline flow, so pH and acidity values are unchanged with treatment.
* Negligible amounts of Al and Mn found.