

Comparative Study of Domestic Water Well Integrity to Coal Mine Blasting

Project: Office of Surface Mining
Contract CTO-12104
In progress

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Measuring yield using ultrasonic flow meters

The objective of this study is to observe the induced effects of blasting vibrations and normal household pumping on domestic water well integrity, water quality, and quantity. The response of domestic water wells to surface coal mine blasting is being characterized using chemical quality and yield measurements (in terms of flow quantity). Nine wells selected for study are located in the proximity of surface coal mines in Virginia, West Virginia and Kentucky.

Pre-, active-, and post-blast data being recorded include electrical conductivity (EC), pH, temperature, pore pressure, turbidity and



Inserting water level probe

volumetric flow. Continuous readings are taken to ensure that data are captured during the pumping of well water for domestic use. Seasonal variations in water quality/chemistry and well yield are also being evaluated.

Ground motions are recorded during each mine blast at the well head (surface) and at depth to determine the subsurface attenuation of blasting vibrations. Typical ground motion time histories are shown below. Ground motion amplitudes will be related to well performance in terms of quality/yield and pore pressure.

This project is being conducted Daniel B. Stephens & Associates, Inc. with Aimone-Martin Associates, LLC, serving as a sub-contractor.

