

# OUTSTANDING GEOLOGIC FEATURE OF PENNSYLVANIA

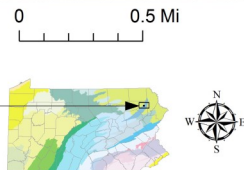
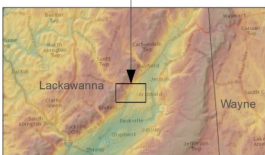
## ARCHBALD POTHOLE, LACKAWANNA COUNTY



Stuart O. Reese, 2016

### Location

Archbald Pothole State Park, Lackawanna Co., Archbald, lat: 41.51194, lon: -75.57371; Carbondale 7.5-minute quadrangle



### Geology

Archbald Pothole is located northeast of Scranton at Archbald Pothole State Park. In 1884, anthracite coal miners discovered then excavated the large cobble-filled hole. The hole is 38 feet deep and elliptical in shape. The largest part is 42 feet long and 24 feet wide. The natural pothole had cut through sandstone, shale, and coal of the Llewellyn Formation (Pennsylvanian age). Potholes are fairly common, circular holes found in bedrock in the streams of Pennsylvania and typically are a few feet deep at the most. The extremely large Archbald Pothole is likely a relict of glacial times, probably forming as the Laurentide Ice Sheet began its retreat from northeastern Pennsylvania about 20,000 years ago.

Water that is carrying sand and gravel is the main mechanism by which potholes are carved in hard rock. The water must be able to abrasively grind the rock in place for an extended period of time. Water vortices act as a drill, using the sand and gravel to cut through the rock.

For Archbald Pothole, two hypotheses provide possible settings for fast-flowing water to be able to carve such a large hole. The first hypothesis is that a stalled, melting glacier hundreds of feet thick developed a large stream of meltwater that plunged down with great force through an internal waterfall (called a moulin). Once started, a vortex armed with rock debris could rapidly cut through the rock. The second idea is that glacier meltwater flowing as a narrow gravel-filled subglacial torrent carried enough force to induce the formation of a pothole.



Left: Winter view of the pothole. Photograph by Gary Fleeger, Pennsylvania Geological Survey.

### Recommended Reading

Fleeger, G. M., Braun, D. D., and Inners, J. D., 2002, Plunge into the past or go with the flow—multiple hypotheses for the origin of the Archbald Pothole, Lackawanna County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 34, no. 1, p. 27.

McGlade, W. G., 1969, Archbald State Park—Archbald Pothole: Pennsylvania Geological Survey, 4th ser., [Trail of Geology 16-003.0](#), 3 p.

[Archbald Pothole State Park](#) web page of DCNR.