Northern Shenandoah Valley Water Resources Initiative

November 17,2004 Winchester VA







Multidisciplinary Assessment of the Northern Shenandoah Valley in Virginia and West Virginia

- The objective of this first integrated regional assessment is to better characterize the aquifer systems in the Northern Shenandoah Valley and provide relevant hydrogeologic information that can be used to guide the development and management of these water resources.
- This regional study of the karst and fractured-rock aquifer systems will use hydrologic, geologic, cartographic, and biologic information to improve the understanding of the aquifer systems, their relationship to surface features, and potential hazards over a multi-county area of Virginia and West Virginia.



Study Approach for Regional

- Characterize karst and fractured-rock aquifer systems
- Characterize ground-water/surface water interactions
- Develop numerical models to simulate the regional and local ground-water-flow systems
 - Characterize water quality and sources of degradation
 - Assess implications of water resources management decisions on aquatic ecosystems



Project Elements:

 Shenandoah River Minimum Instream Flow Investigation: - Main Stem - 1999 - North Fork - 2004 - South Fork - 2005 start County Studies - Frederick County -2001 Warren County – 2002 Clarke County – 2002 Berkeley County - 2002 - Jefferson County - 2004 Leetown Science Center Assessment - 2002



Sect Elements:

Interdisciplinary Assessment - 2003
– 10 Meter digital elevation models
– Sinkhole mapping
– GIS mapping
• Regional Ground Water Flow Model - 2004



Project Elements:

Interdisciplinary Assessment - 2004

- Ground water age dating
- Opequon ground water model
- Interdisciplinary Assessment 2005
 Geophysical Surveys
 Seismic imaging
 Electrical resistivity



Project Elements:

Bacteria Source Tracking - Berkeley Co.
Arsenic in Poultry Feed – Rockingham Co.
Orchard Arsenic Soil Reconnaissance
Real Time Ground Water Monitoring -ICPRB

Recent Products

U.S. Department of the Interior U.S. Geological Survey

Prepared in cooperation with

Northern Shenandoah Valley Regional Commission

Water-Quality Synoptic Sampling, July 12 - 30, 1999: North Fork Shenandoah River, Virginia

Scientific Investigations Report 2004-xxxx



U.S. Department of the Interior U.S. Geological Survey

Water-Quality Synoptic Sampling, July 12 - 30, 1999: North Fork Shenandoah River, Virginia

By Jennifer L. Krstolic and Donald C. Hayes Scientific Investigations Report 2004-xxxx

Prepared in cooperation with

Northern Shenandoah Valley Regional Commission

Richmond, Virginia 2004

Recent Products

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County of Frederick

Hydrogeology and Ground-Water Availability in the Carbonate Aquifer System of Frederick County, Virginia

Scientific Investigations Report 2004-xxxx



U.S. Department of the Interior

U.S. Geological Survey Hydrogeology and Ground-Water Availability in the Carbonate Aquifer System of Frederick County, Virginia

By George E. Harlow, Jr., Randall C. Orndorff, David L. Nelms, David J. Weary and Roger M. Moberg Scientific Investigations Report 2004-xxxx

Prepared in cooperation with

County of Frederick

Richmond, Virginia 2004

Internet Sites

- Water Resources of Virginia
 - http://va.water.usgs.gov/
 - Frederick County Project

http://va.water.usgs.gov/projects/va134.html

Clarke County Project

http://va.water.usgs.gov/projects/va146.html

Warren County Project

http://va.water.usgs.gov/projects/va142.html

- <u>Shenandoah River Minimum Instream Flow Project</u> http://va.water.usgs.gov/projects/va111.html
- <u>Great Valley Water-Resources Science Forum</u> http://va.water.usgs.gov/GreatValley/Index.htm