

# Susquehanna River Basin Commission Information Sheet

## Natural Gas Well Development in the Susquehanna River Basin



### Marcellus Shale Formation

The Marcellus shale is a very large and deep geologic formation – 4,000 to 8,500 feet under ground – that underlies most or portions of eight states. Most of the Marcellus formation is in New York, Ohio, Pennsylvania, and West Virginia, with smaller areas in Maryland, Kentucky, Tennessee and Virginia.

The Marcellus shale contains abundant amounts of compressed organic materials with natural gas trapped within the shale’s formation. The formation is regarded as holding potentially the most productive natural gas reserves in the lower 48 states.

### Marcellus Shale Formation in the Susquehanna River Basin

More than 72 percent of the Susquehanna River Basin, which covers portions of New York, Pennsylvania and Maryland, is underlain by the Marcellus formation.



### Natural Gas Development in the Marcellus Shale Formation



Given the nature of the shale formation with its compressed layers and low permeability, it had not been cost-effective for the natural gas industry to work in the Marcellus shale until recent improvements in horizontal drilling technologies. The improved technologies allow drillers to create horizontal openings deep underground where the gas can be released and captured. To create these openings, the drillers inject large amounts of water under pressure several thousand feet underground to fracture the formation and stimulate the flow of gas.

## **SRBC's Regulation of Natural Gas Well Development in the Susquehanna River Basin**

Water withdrawal and consumptive water use activity undertaken by the natural gas industry in the Susquehanna River Basin is generally subject to the Susquehanna River Basin Commission's (SRBC) regulatory program requirements.

SRBC regulates water withdrawals meeting or exceeding 100,000 gallons per day (gpd), and consumptive use of water meeting or exceeding 20,000 gpd. Both of these thresholds are based on a 30-day average. If a project meets the regulatory threshold for consumptive use, any withdrawals associated with the project are likewise subject to review and approval, regardless of whether they meet the standard (100,000 gpd) regulatory threshold for withdrawals.

Marcellus shale gas well development activity usually requires the use of considerable quantities of water, particularly for hydraulic fracturing, which can range from hundreds of thousands of gallons for vertical well fracture treatment, to millions of gallons for horizontal well fracture treatment. As exploratory well development of the Marcellus got underway in the basin in 2008, SRBC saw a dramatic increase in the number of applications seeking approval for water withdrawals and consumptive water use. It also saw the potential for this activity to create adverse, cumulative adverse or interstate effects to the water resources of the basin, regardless of whether individual projects met or fell below SRBC's regulatory thresholds.



### **Approval By Rule**

In response to this wave of development activity, SRBC undertook a number of steps to simultaneously be responsive to the needs of the industry and be protective of the basin's water resources. First, it activated a previously unused rule SRBC had adopted in 2006 that authorized an administrative Approval by Rule (ABR) process for projects consumptively using water obtained solely from public water supply systems.

Although SRBC adopted the ABR prior to any contemplated use by the natural gas development industry, the rule was established with the rationale that the impacts of withdrawals were analyzed at the time approvals were issued to the water supply systems, thus allowing expedited administrative review for consumptive users tied into those systems.

Given the time sensitive nature of staging drilling and hydrofracture infrastructure, and because SRBC only meets quarterly to act on project applications, it utilized this provision to establish a natural gas industry-specific ABR procedure that enabled a turnaround time for consumptive use approvals of generally less than 30 days. ABRs were issued on a drilling pad basis, authorizing the use of water from specific public water supply system(s) for an 18-month term. The use of water sourced from public water supply systems may have some long-term viability, but this was seen as a short-term measure to allow activity to continue while requests for surface water approvals underwent SRBC review.

For those industry members seeking to use water from sources beyond public water supply systems, SRBC also issued area-wide consumptive use approvals (generally on a county-by-county basis), allowing flexibility in the use of water from multiple sources at drilling pads within the area.

### **Notice of Determination – Effective October 15, 2008**

In response to the potential impact on water resources from projects falling below SRBC's standard regulatory thresholds, SRBC's Executive Director exercised his regulatory authority to issue a Notice of

Determination that all natural gas well development projects in the Susquehanna River Basin targeting the Marcellus or Utica shale formations, and involving the withdrawal or consumptive use of water, are subject to SRBC's review and approval regardless of whether they otherwise meet SRBC's existing regulatory thresholds.

The determination provided clarity; if project involves drilling a Marcellus or Utica shale formation well, an approval was necessary.

### **Final Rulemaking – Effective January 15, 2009**

In support of the executive determination, and to formalize its incorporation into SRBC's regulatory program, SRBC took action in 2008 to propose and adopt final rulemaking subjecting all Marcellus or Utica shale well development to regulatory review. The final rulemaking also incorporates a number of other changes directed at the natural gas industry:

- Requires requests for consumptive use approvals to go through a new administrative ABR process, rather than SRBC's existing ABR process or its standard consumptive use application and docketing process.
- Expands the current ABR process by allowing project sponsors to utilize a broader range of water sources as part of their approval, including public water supplies, discharges from wastewater treatment facilities and other lesser quality water sources, and withdrawals from other sources approved separately by SRBC.
- Regulates projects on a drilling pad basis, versus the current docket approvals that address consumptive use on a company lease-area basis.
- Requires projects to certify compliance with all state and federal laws for the treatment and disposal of flowback fluids or produced brines.
- Provides for a 5-year approval term.



The effective date of the final rulemaking is January 15, 2009. Consumptive use approvals issued in 2008 will be transitioned into the new rule during 2009 as follows:

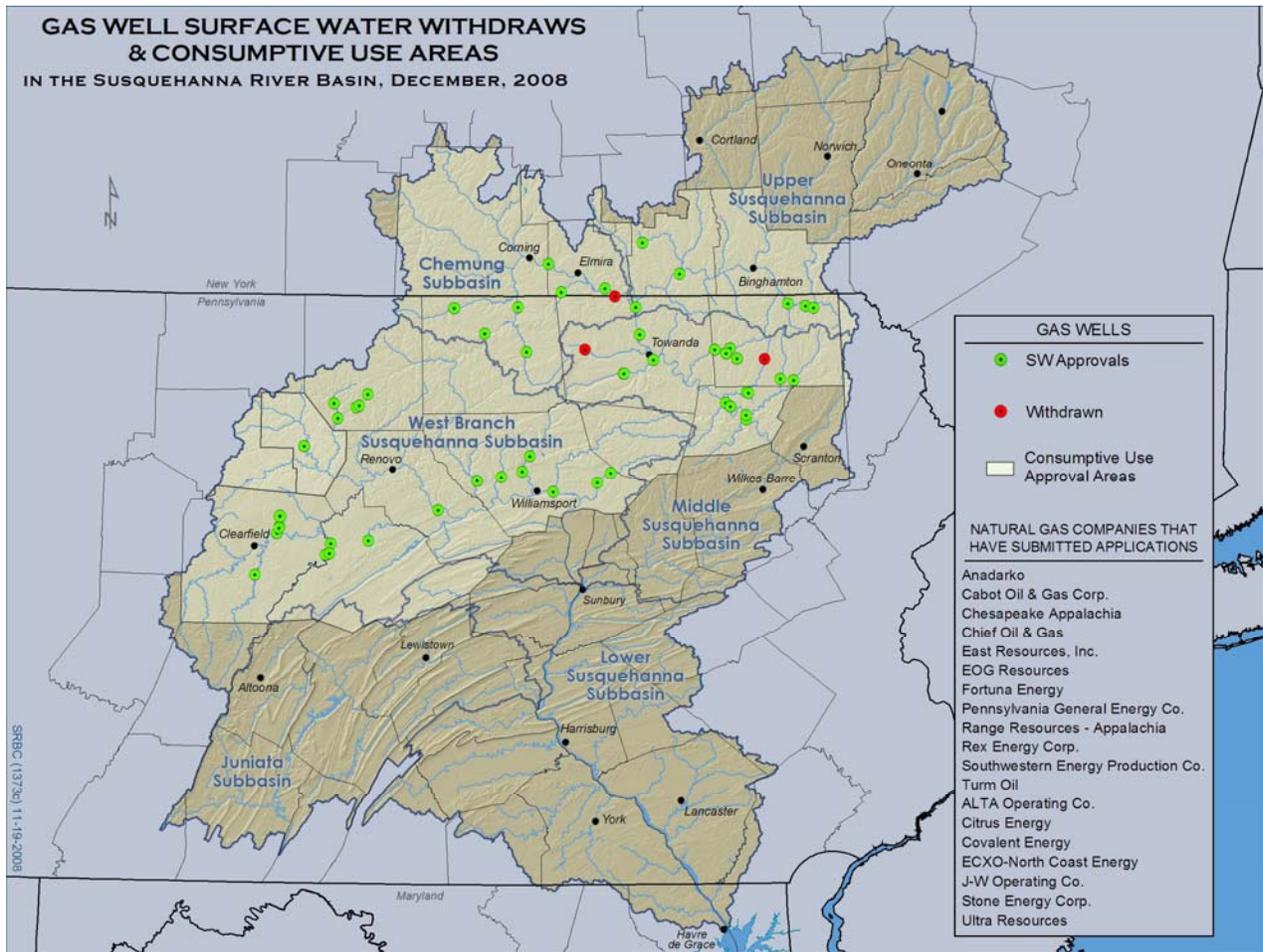
- Existing ABRs will be reissued under the new ABR rule, after notice and without cost to the project sponsor, with a new 5-year term for the subject drilling pad. Currently approved public water supply systems or surface water withdrawals would be included in the list of approved sources upon issuance. Project sponsors will have the opportunity to add new water sources over the life of the approval.
- For previously issued area-wide consumptive use approvals, new ABRs will be issued for all drilling pads constructed on or before December 31, 2009 at no cost to the project sponsors and would include all previously approved water sources. The existing consumptive use approval would then terminate on December 31, 2009, after which project sponsors would need to seek approval for any new drilling pads under the new rule. To effectuate this transition, the existing approvals will be modified by SRBC, upon proper notice, establishing the new termination date and incorporating all appropriate transition conditions.

A major objective of the new rule is to streamline the approval process for consumptive use, yet simultaneously require all consumptive water users in the basin to comply with monitoring, reporting and mitigation requirements. This allows SRBC to better manage the cumulative impact of such consumptive use.

Also, the new rule does not modify any of the current standards or requirements associated with the review and approval of water withdrawals. They will continue to be subject to the same standards all withdrawals across the basin are subject to, and that SRBC believes are appropriate to protect the basin's water resources and concurrently allow for their utilization to support this important new industry.

For more information on SRBC's regulation of natural gas well development projects, go to SRBC's web site at [www.srbc.net/programs/projreviewmarcellus.htm](http://www.srbc.net/programs/projreviewmarcellus.htm).

# Surface Water Withdrawal, Consumptive Water Use and Approval By Rule Actions Taken by SRBC in 2008



Surface Water Withdrawal Applications <i>[data displayed as points on map]</i>	Consumptive Water Use Applications <i>[data displayed as areas, not as points on map]</i>	Approval By Rule (Notice of Intent Applications) <i>[data not displayed on map]</i>
Total Submitted: 77	Total Submitted: 21	Total Submitted: 113
June Approvals: 5	June Approvals: 3	Total Approved: 74
September Approvals: 33	September Approvals: 7	Pending: 21
December Approvals: 13	December Approvals: 6	Combined: 2
Total Approved: 51	Total Approved: 16	Withdrawn: 16
Pending: 23	Combined: 4	
Withdrawn: 3	Withdrawn: 1	

