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Development of the Marcellus Shale—Water Resource Challenges

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Water Resource Aspects of Marcellus Shale Development

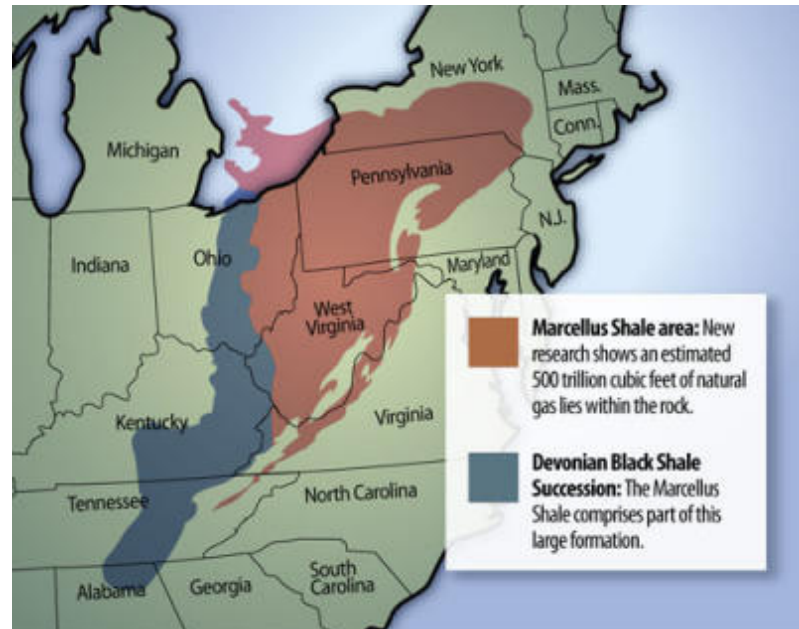
Development of the extensive natural gas reserves contained in the Marcellus Shale deposits promises to be one of the most important opportunities for the United States for the next several decades. At the same time, exploitation of this gas resource may pose interesting water resource and water supply challenges which the oil and gas industry has rarely faced before in the Appalachian Basin. Those engaged in Marcellus Shale development activities will confront common law water rights issues and water withdrawal regulatory regimes unlike those encountered in most historic oil and gas plays in the northeastern region. Clearly, understanding the applicable legal and regulatory questions and processes will be essential to charting a course to successful implementation of Marcellus development projects.

While some traditional oil and gas development has utilized, to a modest extent, water supplies in the drilling and fracing processes, Marcellus Shale exploitation will involve orders of magnitude greater water resource requirements. Horizontal drilling techniques, coupled with hydraulic fracturing of deep horizontal extensions, will entail water use multiple times greater than traditional wells. Based on experience in the Barnett Shale, approximately one to four million gallons of water are required for fracing each gas well, with slickwater frac techniques utilizing as much as 500,000 to 1,000,000 gallons of fluid in each of five to seven stages. To be sure, recycling of flowback water will likely be utilized to reduce disposal requirements, thereby reducing somewhat the draft on freshwater supplies. Literature indicates, however, that even in such water challenged jurisdictions as Texas, only a relatively small percentage of water needed for frac operations (typically 10-15%) is derived from recycled water. Thus, the challenge will be to secure adequate and reliable sources of water with appropriate quality characteristics in reasonable proximity to proposed well sites to meet the gas well development requirements.

Although eastern States have traditionally been viewed as water “rich,” particularly by those coming from drier regions, the Appalachian Basin States are not without their own significant water supply challenges and concerns. While supplies are relatively plentiful in “normal” years, the fact is that recurrent droughts have resulted in sometimes painful shortage conditions affecting, to various degrees, the region’s streams and groundwater aquifers, leading to sometimes heated controversy, conflict and litigation.

The Marcellus Shale spans the upper Appalachian Basin, cutting across several important watersheds, including the Delaware, Susquehanna, Ohio, and Great Lakes-St. Lawrence systems.

The eastern side of the Marcellus Shale lies within the upper Delaware Basin, in northeastern Pennsylvania and southern New York. The Delaware Basin watershed forms the major water source for some 15 million residents of the Northeast Metropolitan Corridor from New York City to Wilmington, Delaware, roughly five percent of the nation’s



population. In relative terms, the Delaware is a small watershed, encompassing only 13,539 square miles, draining one percent of the United States. The basin encompasses four states, 42 counties, and some 838 municipalities, while its service area extends to encompass the entire New York City and northern New Jersey region. Substantial portions of the upper Basin, including much of the area underlain by the Marcellus Shale, provide the headwaters of high quality streams valued for their trout fisheries, which flow into sections of the River mainstem designated as part of the National Wild and Scenic Rivers System. The juxtaposition of streams with high environmental qualities coupled with stresses placed by an intense and growing population has provided fodder for ample conflict, including several trips by the Basin States to the U.S. Supreme Court prior to enactment of a comprehensive multi-state regional water management regime. The Delaware River is at once one of most intensely developed and intensely regulated watersheds in the U.S.

Moving westward, the Susquehanna River Basin, which drains 27,500 square miles (including one-half of the land area of Pennsylvania, plus portions of New York and Maryland), represents the longest commercially non-navigable river in North America, and the 16th largest river in the United States. The basin hosts a population of some 4.1 million and supports a service area that extends to the City of Baltimore and many northern Maryland counties outside the basin. The Susquehanna Basin comprises 43 percent of the Chesapeake Bay’s drainage area, supplying a normal flow of about 18 million gallons per minute at Havre de Grace, Maryland. That flow represents 90 percent of the fresh water flow to the upper half of the Bay, and 50 percent of the Bay’s overall fresh water inflow. The basin is experiencing

growing volumes of consumptive use. The basin is a major center of electric energy production, from a combination of hydroelectric facilities in the lower basin, and both nuclear and fossil fuel fired steam electric stations throughout the drainage area. Without consideration of Marcellus Shale development, consumptive use of all forms is projected to increase to over 645 mgd by the year 2010.

The Ohio River Basin, and its major tributary components (including the Monongahela and Allegheny Rivers) which traverse much of the Marcellus Shale area, may be seen by some as less challenged from a water resource perspective. That perception may be based, in part, on the fact that recent decades have not witnessed droughts across the region anywhere near the intensity of either seen in the basins to the east or encountered in the earlier part of the 20th Century. Yet evaluations conducted by the recently completed West Virginia Water Use Survey and currently pending Pennsylvania State Water Plan highlight that the Ohio River watershed likewise faces some significant water resource challenges. With more than a few streams and aquifers affected by acid mine drainage, supplies of potable water are limited. In many areas, tight hard rock formations provide limited groundwater storage and transmissive capabilities, further limiting the ability to successfully develop large volume wells or providing highly variable yields between normal and dry years.

Western New York, northwestern Pennsylvania, and northern Ohio all lie within the Great Lakes-St. Lawrence Basin. While the Great Lakes are noted as representing the largest single fresh water resource in the world, nevertheless serious water resource controversies have arisen concerning the impacts of interbasin and interlake diversions and large consumptive uses, leading to the recent proposal of a regionwide compact to enact much more stringent water withdrawal regulation.

Against this backdrop, we face the key questions:

- What "water rights" may Marcellus Shale developers acquire, either in conjunction with mineral leases or otherwise, to procure the necessary water supplies to support well development? What do those "water rights" mean in practical terms of what you can withdraw, how much you can withdraw, and where the water can be used?
- What regulatory and permitting programs affect the procurement and development of water supplies to serve gas well drilling and operations?

- If water supply withdrawals (either via groundwater wells or surface water intakes) associated with Marcellus Shale development adversely impact other water users, what liabilities will be imposed on the gas well developer?
- If development of a gas well affects the quantity or quality of water supplies used by third parties, what are the gas well operator's responsibilities?

Water Rights and Water Withdrawal Regulation

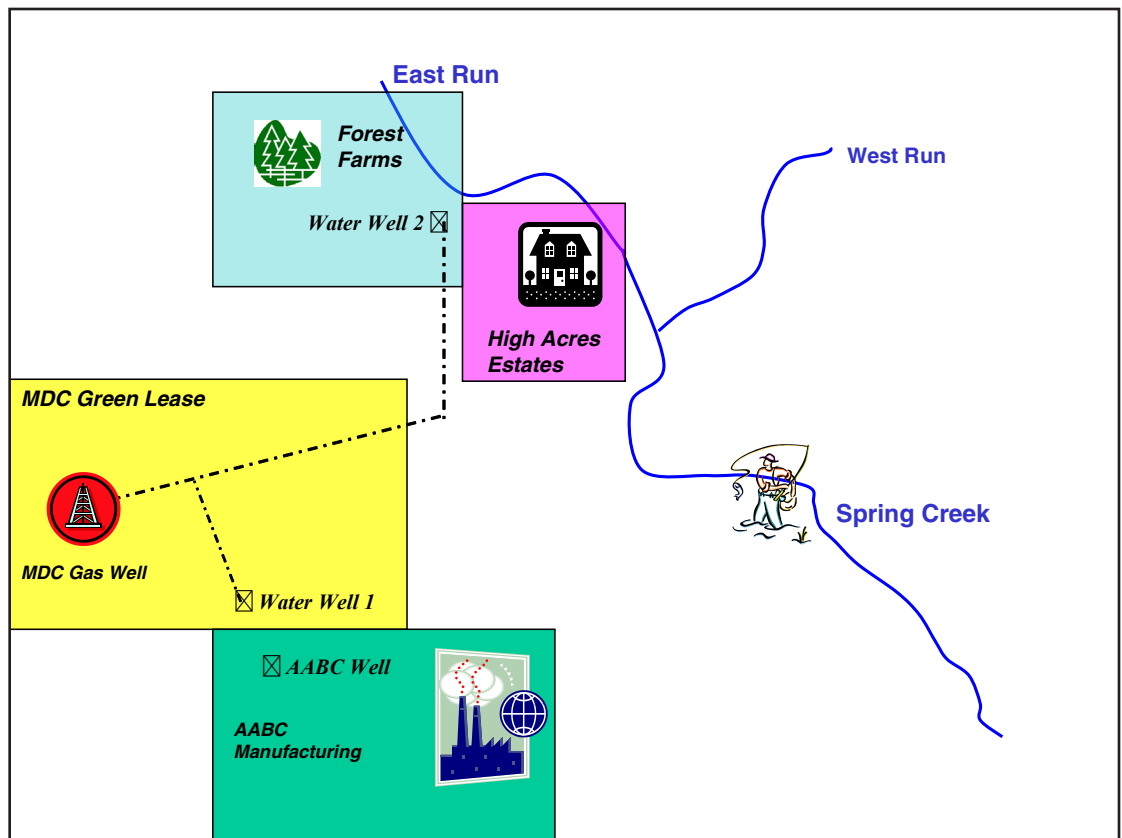
A. Overview – What Is the Meaning of Water Rights?

The concept of "water rights" in the east is subject to many misperceptions. The best way to define "water rights" is to ask two questions:

- (1) What can I do?
- (2) What can someone else do to me?

Consider a hypothetical potential well site development:

- **Marcellus Development Co. ("MDC")** has acquired a mineral lease on the 200 acre **Green Lease**. MDC drills Water Well 1 on the Green Lease, but Water Well 1 yields an insufficient supply. Further, operation of Water Well 1 causes interference with the well on the neighboring AABC Manufacturing property, causing the AABC well to produce less than AABC needs to operate.
- MDC seeks an additional source on the 100-acre Forest Farms property about two miles away in the upper watershed of Spring Creek. The Forest Farms property overlies an aquifer known to produce very high quality water with substantial yields. MDC's plan is to install a 200-foot deep well, with a capacity to extract up to 300,000 gpd.



- Forest Farms adjoins West Run, which joins East Run about two miles below Forest Farms to form the mainstem of Spring Creek. The bedrock aquifer underlying Forest Farms provides the source for a number of springs and baseflow in the West Run watershed.
- High Acres Estates, a 300-home development, obtains its water supply from a series of springs that are fed by the aquifer underlying the Forest Farms and High Acres area. High Acres is concerned that withdrawals by MDC's Water Well 2 could reduce the flow of water in the High Acres springs.
- The upper and middle portion of Spring Creek is inhabited with varying populations of brook and brown trout, and sections of Spring Creek are frequented by recreational fisherman during the permitted fishing season.
- Ripa Environmental Defenders & Development Opposition Group ("REDDOG") is concerned that the withdrawal and transfer of groundwater from Forest Farms to the East Spring Borough will (1) reduce stream flows in West Run and Spring Creek, and thereby impact downstream trout habitat and the aesthetic and recreational qualities of the Spring Creek watershed; (2) affect water quality in Spring Creek by reducing its assimilative capacity and causing a temperature increase as the result of reducing the amount of cool spring water flows entering the stream during the summer; and (3) reduce water levels in area wetlands, some of which may be habitat suitable for the Runamuck Turtle, a species listed as threatened by the Ripa Fish & Game Commission.

In this setting, who has what "water rights" and how are those "water rights" to be reconciled?

B. "Water Rights" Granted Under Mineral Leases

At the outset, with respect to the extraction of surface or ground water from the mineral lease premises to support drilling operations, one must look to the terms of the lease to determine what "rights" (as between the surface owner and mineral rights holder) the well developer may exercise. The specific lease terms will govern the relationship between the surface fee owner and mineral rights holder.

A "typical" lease may have only general language on the topic, such as a clause granting the Lessee "the privilege of using sufficient ... water for operating on the premises" Ostensibly, such generalized language may accord the Lessee with the right to drill wells and extract water from the leased land for use in drilling and operating a well. Given the large volumes of water involved in Marcellus Shale development, however, it may be wise to consider utilizing more specific and broader provisions.

Notably, a "typical" lease refers to the right to use water "for operating on the premises" – that is, for use on the leasehold.

Such a "right," by its terms, does not authorize extraction of water from one leased parcel for use on another leased parcel. If a developer wishes to obtain the right to withdraw water from one property and move it for use in drilling on another property, different and more explicit provisions must be crafted.

The lease is, of course, just a starting point. Whatever "water rights" may be granted via a lease, those rights will be no greater (although

they may be less) than the "water rights" of the landowner granting the lease. Whether operating as a fee owner or a tenant, the scope and nature of rights to withdraw and utilize water will depend on the nature and scope of "water rights" as defined under applicable state law.

C. Basis of "Water Rights" Under State Law – Common Law and Regulatory Programs

The law governing withdrawal and use of water in the eastern United States has substantially evolved from principles of common law, particularly riparian rights law, originally borrowed from English precursors. Over the past 250 years, such common law precedent has undergone considerable adjustment and refinement, reflecting the differing circumstances of hydrology in the new world, evolving understanding of hydrologic science, the pressures of the 19th Century's industrial revolution and development through the 20th Century. In a number of eastern states overlying the Marcellus Shale deposits, common law has been supplemented, and to a significant degree supplanted by, statutory enactments establishing regulatory permitting systems (so called "regulated riparian" regimes). In addition to State level legal regimes, a management of water withdrawals and uses is substantially affected by several existing and proposed interstate compacts. Thus, the following overview water rights law is, at best, a synopsis of major themes and concepts, providing an introduction to a framework of laws which is subject to numerous exceptions and nuances between jurisdictions.

D. Common Law Principles Applicable to Water Withdrawals

In large part, water rights in both surface and groundwaters in the eastern states overlying the Marcellus Shale are governed by common law, composed of the doctrines and precedents established by courts in cases decided over the past two plus centuries. Although regulatory programs adopted by some states or basin jurisdictions, such as the Susquehanna and Delaware River Basin Commissions, have displaced the courts as the arbiters of many water rights disputes, common law doctrines and traditions remain strong. Because common law rests on individual cases read together, rather than a cohesive code, gaps remain in the court decisions governing water rights, and the common law is always subject to refinement or modification as new cases are litigated.

1. Classifications of Water

Scientists generally consider all water as part of a unitary hydrologic cycle, and in general, most eastern basin's ground and surface waters are hydrologically connected and interdependent. However, for purposes of water rights and allocation, the common law of many states attempts to distinguish four different categories of water: (1) diffused surface waters (the sheet flow from rainfall); (2) surface waters in defined streams and lakes; (3) groundwaters in well-defined subterranean streams; and (4) percolating groundwaters.¹ Different rules have been developed for each classification in governing the diversion and use of such waters.

¹ WATERS AND WATER RIGHTS §§4.05, 19.05 (R.W. BECK ED. 2001); R.T. WESTON AND J.R. BURCAT, *LEGAL ASPECTS OF PENNSYLVANIA WATER MANAGEMENT, WATER RESOURCES IN PENNSYLVANIA: AVAILABILITY, QUALITY AND MANAGEMENT* (1990).

As aptly observed by one set of commentators:

Man has coped with the complexity of water by trying to compartmentalize it. ... [T]he legal profession ... has on occasion borrowed from the criminal code to term some waters "fugitive" and others a "common enemy." The legal classification of water includes "percolating waters," "defined underground streams," "underflow of surface streams," "watercourses," and "diffuse surface waters", [even though] all these waters are actually interrelated and interdependent.²

These classifications developed in the nineteenth century because of an early lack of adequate hydrogeologic knowledge, and particularly a perceived inability to predict groundwater behavior. Some courts went so far as to describe the movement of water to and within groundwater aquifers as "secret," "occult," and "concealed,"³ reflecting the view of the English court in *Acton v. Blundell*⁴ that there could be no liability for interference with percolating groundwater, since "the percolation and flow of underground water are out of sight and are not susceptible of actual observation and proof."⁵

Although hydrologic science has progressed substantially, legal doctrines have been slow to accommodate to the now not-so-new knowledge. Some courts have acknowledged, if not embraced, the development of modern hydrogeologic science. For example, even before the beginning of the twentieth century, a Pennsylvania court observed:

It is therefore clear, from the principles and reasoning of all the cases, that the distinction between rights in surface and in subterranean waters is not founded on the fact of their location above or below ground, but on the fact of knowledge, actual or reasonably acquirable, of their existence, location, and course. Geology is a progressive, and now, in many respects, a practical science; and ... since the decisions in *Acton v. Blundell*, and *Wheatley v. Baugh*, probably more deep wells have been drilled in Western Pennsylvania than has previously been dug in the entire earth in all time. And that which was then held to be necessarily unknown, and merely speculative, as to the flow of water underground, has been, by experience in such cases as this, reduced almost to a certainty.⁶

Improved scientific knowledge has led some eastern State courts to substantially modify, if not abandon, prior distinctions in the classification of surface and ground waters.⁷ Yet many other jurisdictions, even where courts recognize the much changed status of hydrologic science, still reflect outdated classifications of water developed in another era. While little hydrologic or other scientific justification can be offered

today for the distinctions between these various artificial classifications of water, a significant plurality, if not majority, of courts and legislatures have continued to adhere to distinctions developed in the nineteenth century.

2. Riparian Rights in Surface Streams, Lakes and Subterranean Streams

Under the common law of eastern states, rights to withdraw and use waters in surface streams is generally governed by the "riparian rights" doctrine. Although subterranean streams are a very rare occurrence in most jurisdictions, where they exist, the use of water in such subterranean streams, like its surface stream counterpart, is almost always treated under the "riparian" doctrine.⁸ The details of riparian doctrine vary somewhat from jurisdiction to jurisdiction, and while many of the fundamental principles are shared, subtle but important nuances exist between the laws of eastern states.

The fundamentals of a riparian right is the right of an owner of land adjoining a stream (a "riparian" landowner) to extract and use water from that stream on the adjoining "riparian" land. Each adjoining or overlying landowner has an equal and correlative right to make reasonable use of the water on the land which adjoins a stream. A riparian right is a right of "use" – not ownership of the water, but a right to use the water, subject to the rights of other riparian owners (upstream and downstream) to likewise use the water.

A. Measure of a Riparian Right – How Much Water Can Be Used

Two main common law doctrines have developed for dealing with riparian water rights in the east: the English common-law rule, also known as the natural flow doctrine, and the reasonable use doctrine.⁹ The prior appropriation doctrine, prevalent in the western U.S., has basically no application to water law in states east of the Mississippi.

Under the natural flow doctrine, each riparian proprietor of a watercourse has a right "to have the body of water flow as it was wont to flow in nature," qualified only by the right of other riparian proprietors to make limited use of the water.¹⁰ Put another way, under the natural flow theory, each riparian owner along a waterbody is entitled to have the water flow across the land in its natural condition, without alteration by others of the rate of flow, or the quantity or quality of the water.¹¹

The doctrine permits every owner to consume as much water as needed for "domestic" purposes, which generally means for personal human consumption, drinking, bathing, etc., and for watering domestic animals. Beyond this, the owner may use the water for "reasonable" artificial or commercial purposes, subject to the very large proviso that he may not substantially or materially

2 HAROLD E. THOMAS AND LUNA B. LEOPOLD, *GROUND WATER IN NORTH AMERICA*, 143 SCIENCE 103 (1964).

3 *CHATFIELD V. WILSON*, 28 VT. 49, 54 (VT. 1856); *FRAZIER V. BROWN*, 12 OHIO ST. 294, 311 (1861).

4 12 MEES. AND WELS. 324, 152 ENG. REP. 1223 (EX. 1843).

5 *FOREBELL V. CITY OF NEW YORK*, 164 N.Y. 522, 525, 58 N.E. 644, 645, *CITING ACTON*, *SUPRA*.

6 *COLLINS V. CHARTERS VALLEY GAS CO.*, 131 PA. 143, 159, 18 A. 1012 (1889)

7 *SEE, E.G., CLINE V. AMERICAN AGGREGATES CORP.*, 15 OHIO ST. 3D 384, 474 N.E.2D 324 (1984) (ABANDONING THE ABSOLUTE DOMINION RULE THAT HAD BEEN ADOPTED IN *FRAZIER V. BROWN* BASED UPON THE UNKNOWABLE AND OCCULT NATURE OF PERCOLATING GROUNDWATER, AND SHIFTING TO THE PRINCIPLES OF THE RESTATEMENT (SECOND) OF TORTS §858).

8 "RIPA" IS LATIN FOR RIVER BANK. A "RIPARIAN" OWNER IS A PERSON WHO OWNS THE LAND ALONG OR UNDER A DEFINED STREAM.

9 WATER AND WATER RIGHTS §§ 4.05, 7.02, 11.01; STOEBCUK & WHITMAN, *THE LAW OF PROPERTY* (3D ED), §7.4, PP. 422-425.

10 RESTATEMENT (SECOND) OF TORTS, INTRODUCTORY NOTE TO §§ 850 TO 857, P. 210.

11 1 WATERS AND WATER RIGHTS § 7.02(C), AND CASES CITED THEREIN AT FOOTNOTE 181.

diminish the quantity or quality of water. Certainly no water may be transported to land beyond the riparian land.¹²

While the natural flow theory may have served well in the agrarian society and areas of plentiful rainfall where it originated, the rule's proscription against alteration or diminution of flow was not found well suited when faced with the demands of the industrial revolution – where dams were erected to harness water power, and irrigation and industrial enterprises arose involving consumptive diversions that could measurably change flow volumes. As a result, courts evolved various exceptions and adjustments to the natural flow theory, sometimes retaining reference to its words, while failing to follow its explicit tenants.¹³

Faced with the realities of industrial and commercial development, many states moved from the strictures of the natural flow theory to what became known as the “American rule” or “reasonable use” doctrine. Under the reasonable use doctrine, “a riparian owner may make any and all reasonable uses of the water, as long [as] they do not unreasonably interfere with the other riparian owners’ opportunity for reasonable use.”¹⁴ Whether and to what extent a given use is allowed under the reasonable use doctrine depends upon the weighing of factors on the side of the prospective user, and balancing those considerations against similar factors on the side of other riparian owners. No list of factors is exhaustive, because “the court will consider all the circumstances that are relevant in a given case.”¹⁵ While in theory no single factor is conclusive, domestic uses are strongly favored and will generally prevail over other uses. Further, while the reasonable use doctrine as applied in some states may allow water to be transported and used on non-riparian lands, such uses may be disfavored over uses on riparian land.¹⁶

Thus, under the reasonable use doctrine, each adjoining or overlying landowner has an equal and correlative right to make reasonable use of the water on the land which adjoins a surface stream, or overlies the subterranean stream. As the reasonable use doctrine was explained by the Michigan Supreme Court, as between two riparian owners, the natural flow rule did not strictly apply because “it is manifest it would give to the lower proprietor superior advantages over the upper, and in many cases give him in effect a monopoly of the stream.”¹⁷ Thus, under the reasonable use theory, it is not a diminution in the water quantity or flow that will provide a right of action, if in view of all the circumstances, the withdrawal and actions that cause alleged injury “is not unreasonable.”¹⁸ What constitutes a reasonable use is

determined on a case-by-case basis, weighing a myriad of factors.¹⁹ The weighing of those factors may depend upon whether the dispute involves (1) two competing non-consumptive users; (2) a consumptive use competing (e.g., agricultural irrigation or industrial withdrawal) with one or more non-consumptive users (e.g., downstream boat liversies); or (3) competing consumptive users of similar or different nature.²⁰

Further, the courts in some states, faced with a choice between the English version of riparian doctrine (which favors protecting the natural flow of a stream), and the American rule (which focuses on the reasonable use of the actor, and the reasonable needs of others), have adopted a fusion (or perhaps confusion) of the two rules. For example, Pennsylvania precedent holds that a riparian owner may divert, use, and consume all of the water necessary for household and general domestic uses on the land, even if the flow of the watercourse/subterranean stream is measurably and materially diminished.²¹ If there is insufficient flow to maintain such domestic uses and other types of use, domestic uses have priority. Other uses, however, are classified as “extraordinary,” including diversions for manufacturing, power generation and recreational use. Under Pennsylvania case law, a riparian owner’s use of water for such extraordinary purposes is limited to that quantity which is reasonable in view of the rights of other riparian owners, and which will not materially or perceptibly diminish the flow of the surface or subterranean stream.²²

B. Can Water Be Transferred Off Riparian Land?

Depending on the jurisdiction, the right to transfer water off of the land adjoining the stream may be limited or even entirely proscribed. Some State cases treat off-land transfers of water withdrawn from a stream to be *per se* unreasonable,²³ while others view such uses as

12 STOEBUCK & WHITMAN AT 422, QUOTED IN MICHIGAN CITIZENS FOR WATER CONSERVATION V. NESTLÉ WATERS NORTH AMERICA INC., 269 MICH. APP. 25, 54-55, 709 N.W.2d 174, 194 (2005).

13 1 WATERS AND WATER RIGHTS § 7.02(C); SEE, E.G., DIMMOCK V. CITY OF NEW LONDON, 157 CONN. 9, 245 A.2d 569 (1968) (RECITING TO THE NATURAL FLOW THEORY, BUT REFUSING TO ISSUE INJUNCTION PROHIBITING CITY’S DIVERSION BASED UPON A BALANCING OF EQUITIES).

14 STOEBUCK & WHITMAN AT 423; 1 WATERS AND WATER RIGHTS § 7.02(D).

15 STOEBUCK & WHITMAN AT 423; ACCORD 1 WATERS AND WATER RIGHTS § 7.02(D)(3).

16 STOEBUCK & WHITMAN AT 424; SEE ALSO RESTATEMENT (SECOND) OF TORTS, INTRODUCTORY NOTE TO §§ 850 TO 857, PP. 211-212.

17 DUMONT V. KELLOGG, 29 MICH. 420, 422 (1874).

18 *Id.*

19 THE RESTATEMENT (SECOND) OF TORTS §850A ATTEMPTS TO LAY OUT THOSE FACTORS TO BE WEIGHED IN DETERMINING A REASONABLE USE, INCLUDING (1) ITS PURPOSE; (2) ITS SUITABILITY TO THE WATER BODY; (3) ITS ECONOMIC VALUE; (4) ITS SOCIAL VALUE; (5) THE HARM IT CAUSES; (6) THE POTENTIAL FOR COORDINATION WITH COMPETING USES; (7) ITS TEMPORAL PRIORITY RELATIVE TO COMPETING USES; AND (8) THE JUSTICE OF IMPOSING A LOSS ON THE USE. IT SHOULD BE NOTED THAT CONSIDERABLE DEBATE HAS OCCURRED AMONG LEGAL SCHOLARS AS TO WHETHER THE “REASONABLENESS” TEST IS TO BE DETERMINED IN THE ABSTRACT, BASED UPON SOME FORM OF “OBJECTIVE” STANDARD (AS ADVOCATED BY FRANK TRELEASE, ASSOCIATE REPORTER FOR THE RESTATEMENT (SECOND) OF TORTS), OR IS FUNDAMENTALLY GROUNDED UPON DETERMINATION OF REASONABLENESS AS A RELATIVE RELATIONSHIP BETWEEN DISPUTING PARTIES. SEE 1 WATERS AND WATER RIGHTS § 7.02(D)(1)-(2). AS NOTED BY PROFESSOR JOE DELLAPENNA IN HIS INSIGHTFUL SUMMARY OF THE ISSUE, THE DETERMINATION OF REASONABLENESS IN INDIVIDUAL CASES ALMOST NECESSARILY REQUIRES COURTS TO COMPARE THE BENEFITS AND COSTS OF ONE USE AGAINST THE BENEFIT AND COSTS OF ANOTHER, INCOMPATIBLE USE, TO DETERMINE WHICH USE IS “REASONABLE.” *Id.* §7.09(D)(3). SUCH RELATIVE ECONOMIC COMPARISONS MAY INCLUDE ADDITIONAL CONSIDERATIONS OF THE COSTS TO THE PLAINTIFF CAUSED BY THE DEFENDANT’S CONDUCT, COMPARED TO THE COST TO THE DEFENDANT OF MODIFYING THAT CONDUCT TO ACCOMMODATE OR MITIGATE IMPACTS UPON THE PLAINTIFF. *Id.*

20 *Id.* § 7.03.

21 PALMER WATER CO. V. LEHIGHTON WATER CO., 280 PA. 492, 124 A. 747 (1924) (DOMESTIC USES SUPERIOR TO MECHANICAL AND MANUFACTURING USES); PHILADELPHIA V. PHILADELPHIA SUBURBAN WATER CO., 309 PA. 130, 163 A. 297 (1932) (DIVERSION FOR DOMESTIC USES SUPERIOR TO PUBLIC RIGHT TO NAVIGATION).

22 PALMER WATER CO., 280 PA. AT 499-501, 124 A. AT 750-752 ; SEE ALSO GENERALLY BROWN V. KISTLER, 190 PA. 499, 42 A. 885 (1889); CLARK V. PENNSYLVANIA R.R., 145 PA. 438, 22 A. 989 (1891).

23 SEE SCRANTON GAS & WATER CO. V. DELAWARE L. & W. R.R., 240 PA. 604, 88 A. 24 (1913); IRVING’S EX’RS. V. BOROUGH OF MEDIA, 10 PA. SUPER. 132 (1899), *AFF’D*, 194 PA. 648, 45 A. 482 (1900).

merely disfavored or less favored than on land uses.²⁴ However, the common law in virtually all states limits the “riparian right” to use of water within the same watershed from which it was extracted. For example, in Pennsylvania, a series of cases have ruled that withdrawals for uses off the land of origin (e.g., for a nearby city) are not ordinary and natural.²⁵

At a common law approach where off-land uses are considered “unreasonable” and “unlawful,” liability for damages will be imposed if the withdrawal interferes with other users, and the water transfer may be enjoined by court order. Under this approach, development of a water supply well on one property to serve the needs of a Marcellus Shale development on another site would not be allowed, or would expose the enterprise to compensation claims or injunctive suits from other users in the area. The continued validity of this common law doctrine, however, is very much in question, particularly where basin commission permitting programs have been implemented that appear to largely displace the common law.²⁶

3. Common Law Rights in Percolating Groundwater

Most groundwater in the states overlying the Marcellus Shale is found in aquifers consisting of fresh water within saturated zones slowly percolating through the pore spaces and rock fractures.

As with riparian water law, three main common-law rights have developed with respect to ground water withdrawal disputes: (i) the English rule of absolute ownership; (ii) the American doctrine of “reasonable use”; and (iii) the so-called doctrine of correlative rights.²⁷

The first doctrine, referred to as the English rule or the absolute ownership rule, was first stated in *Acton v Blundell*.²⁸ Under this rule, a possessor of land may withdraw as much underground water as he or she wishes, for whatever purposes desired, without liability to neighboring property owners. This absolute ownership rule ostensibly remains the law in a very small minority of states,²⁹ and does not apply to the states encompassing the Marcellus Shale.

In the eastern U.S., including all of the states overlying the Marcellus Shale, the prevalent rule applicable to groundwater disputes is the doctrine of reasonable use, also sometimes called the American

Rule.³⁰ However, as interpreted by some state courts, the doctrine of reasonable use in the groundwater context is not actually dependent on the reasonableness of the use. Rather, as the doctrine has developed, it generally has been held that virtually all uses of water made upon the land from which it is extracted are “reasonable,” even if they more or less deplete the supply to the harm of neighbors, unless the purpose is malicious or the water simply wasted.³¹ The impact of the American Rule can sometimes be particularly harsh and surprising to laypersons. As late as 1957, for example, a Pennsylvania court ruled that a mine operator could dewater and lower water tables throughout an entire valley, with no responsibility for injuries to owners of domestic wells whose supply was thereby cut off.³²

Under the American doctrine of reasonable use, groundwater use on overlying land is virtually unfettered, but when the question is whether water may be transported off that land for use elsewhere, this is usually found “unreasonable,” though it has sometimes been permitted. As observed recently by the Michigan Court of Appeals, “[a]uthorities are not all agreed, but a principle that seems to harmonize the decisions is that water may be extracted for use elsewhere only up to the point that it begins to injure owners within the aquifer.”³³

The third doctrine is a variant of the reasonable use doctrine developed in California, often called the correlative rights doctrine.³⁴ Under the correlative rights theory, owners of land within an aquifer are viewed as having equal rights to put the water to beneficial uses upon those lands. However, an owner’s rights do not extend to depleting his neighbor’s supply, at least not seriously, and in the event of a water shortage, a court may apportion the supply that is available among all the owners.

Thus, for the developer of Marcellus Shale gas reserves who wishes to use groundwater as a source, the key question becomes what variant of common law does each particular state follow. If situated in a jurisdiction whose law prohibits or strongly disfavors transfer of groundwater off the land where the well is located, siting and development of supply sources may be challenging, unless one carefully addresses the concerns of the other stakeholders who may have standing to complain.

4. The Restatement Rules for Surface Water and Groundwater

Various efforts have been made to explain, codify and reform eastern water law, as most notably reflected in the RESTATEMENT (SECOND) OF TORTS. The RESTATEMENT (SECOND) OF TORTS tracks common-law “reasonable

24 *MICHIGAN CITIZENS FOR WATER CONSERVATION*, 269 MICH. APP. AT 57-58, 709 N.W.2D AT 196.

25 *ROTHRAUFF V. SINKING SPRING WATER CO.*, 14 A.2D 87 (PA. 1940); *HATFIELD TWP. V. LANSDALE MUNICIPAL AUTHORITY*, 19 PA. D.&C. 2D 281 (C.P. MONT. 1959), *AFF’D*, 168 A.2D 333 (PA. 1961); *FLOWERS V. NORTHAMPTON BUCKS CTY. MUNICIPAL AUTHORITY*, 57 PA. D.&C. 2D 274 (C.P. BUCKS 1972).

26 AS A RESULT OF *STATE COLLEGE BOROUGH WATER AUTHORITY V. BOARD OF SUPERVISORS OF BENNER TOWNSHIP*, 645 A.2D 394 (PA. CMWLTH. 1994) (“*BENNER I*”), AND *LEVIN V. BOARD OF SUPERVISORS OF BENNER TOWNSHIP, CENTRE COUNTY*, 669 A.2D 1063 (PA. CMWLTH. 1995), *AFF’D PER CURIAM*, 689 A.2D 224 (PA. 1997) (“*BENNER II*”), THE CONTINUING VIABILITY OF THE *ROTHRAUFF* AND *HATFIELD* APPROACH IS IN DOUBT. AFTER *BENNER II*, ALTHOUGH NOT YET STATED BY THE PENNSYLVANIA COURTS, THE BETTER VIEW MAY BE THAT APPROVAL OF A WATER ALLOCATION BY THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, SRBC, OR DRBC UNDER THEIR RESPECTIVE STATUTORY POWERS IS AN ACTION THAT ACCORDS AN EXCEPTION TO THE COMMON LAW RULE.

27 3 WATERS AND WATER RIGHTS CH. 20-22; STOEBCUK & WHITMAN, § 7.5, P. 427.

28 12 MEES & WELS. 324; 152 ENG. REP. 1223 (EXCH, 1843).

29 *SEE SIPRIANO V GREAT SPRING WATERS OF AMERICA, INC.*, 42 TEX. SUP. CT. 629; 1 SW 3D 75 (TEX, 1999); *MADDOCKS V GILES*, 1999 ME 63, 728 A.2D 150, 153 (ME. 1999).

30 *WHEATLEY V. BAUGH*, 25 PA. 528, 531 (1855); *WILLIAMS V. LADEW*, 161 A. 283 (PA. 1894); *PENCE V. CARNEY*, 52 S.E. 702, 706 (W.VA. 1905); *CLINE V. AMERICAN AGGREGATES CORP.*, 474 N.E.2D 324 (OHIO 1984) (OVERTURNING THE COMMON LAW THEORY OF ABSOLUTE OWNERSHIP IN *FRAZIER V. BROWN*, 12 OHIO ST. 294 (1861) AND ADOPTING § 858 OF THE RESTATEMENT (SECOND) OF TORTS).

31 *SEE, E.G., WHEATLEY V. BAUGH*, 25 PA. 528, 531 (1855); *WILLIAMS V. LADEW*, 161 A. 283 (1894).

32 *DI GIACINTO V. NEW JERSEY ZINC CO.*, 27 LEHIGH L.J. 307 (C.P. PA. 1957). WITH RESPECT TO MINING IMPACTS ON WATER SUPPLIES, THE *DI GIACINTO* APPROACH HAS BEEN EXPLICITLY REVERSED BY SUBSEQUENT LEGISLATION. FOR EXAMPLE, UNDER THE SURFACE MINING CONSERVATION AND RECLAMATION ACT AND THE NON-COAL SURFACE MINING CONSERVATION AND RECLAMATION ACT, THE MINE OPERATOR WHO CONTAMINATES OR DIMINISHES A PUBLIC OR PRIVATE WATER SUPPLY MUST RESTORE OR REPLACE THE AFFECTED SUPPLY. 52 P.S. §1396.4b(f); 52 P.S. §3311(g).

33 *MICHIGAN CITIZENS FOR WATER CONSERVATION*, 269 MICH. APP. AT 59, 709 N.W.2D AT 197, QUOTING STOEBCUK & WHITMAN AT 428-429.

34 3 WATERS AND WATER RIGHTS §21.01 *ET SEQ.*; STOEBCUK & WHITMAN AT 429.

use” principles for surface and ground water use and withdrawal. However, the RESTATEMENT’s enunciation of the principles have not met with universal approval. Some states have cited the RESTATEMENT with approval, while other jurisdictions have either rejected its tenants or only partly embraced its concepts.

As to uses of surface water, a “reasonable use” under the Restatement generally “depends upon a consideration of the interests of the riparian proprietor making the use, of any riparian proprietor harmed by it and of society as a whole.”³⁵ The RESTATEMENT also collects a series of common-law principles and sets forth a non-exclusive list of factors to consider in determining the reasonableness or unreasonableness of the proposed use, including: “(a) [t]he purpose of the use, (b) the suitability of the use to the watercourse or lake, (c) the economic value of the use, (d) the social value of the use, (e) the extent and amount of the harm it causes, (f) the practicality of avoiding the harm by adjusting the use or method of use of one proprietor or the other, (g) the practicality of adjusting the quantity of water used by each proprietor, (h) the protection of existing values of water uses, land, investments and enterprises and (i) the justice of requiring the user causing harm to bear the loss.”³⁶

Similar to the American Rule, “[a] riparian proprietor is subject to liability for making an unreasonable use of the water of a watercourse or lake that causes harm to another riparian proprietor’s reasonable use of water or his land.”³⁷ For “diffused” surface water, the Restatement provides that “[t]he possessor of land is not subject to liability for a use of surface water on his land that interferes with another person’s use of the water, unless the use is made for the primary purpose of causing the harm.”³⁸

Under Section 858 of the RESTATEMENT (SECOND) OF TORTS, landowners withdrawing groundwater generally have no liability for interfering with the use of water by another if the withdraw is “for a beneficial purpose.”³⁹ Liability attaches, however, if “(a) the withdrawal of ground water unreasonably causes harm to a proprietor of neighboring land through lowering the water table or reducing artesian pressure, (b) the withdrawal of ground water exceeds the proprietor’s reasonable share of the annual supply or total store of ground water, or (c) the withdrawal of the ground water has a direct and substantial effect upon a watercourse or lake and unreasonably causes harm to a person entitled to the use of its water.”⁴⁰

5. Interaction Between Surface and Ground Water

The separate common law doctrines developed to deal with disputes between competing users of surface water, or between competing uses of groundwater, face a major challenge when confronted with the interplay between surface and groundwater within the hydrologic system. As noted in our hypothetical above, a withdrawal of groundwater may impact springs or the baseflow of nearby streams. Conversely, the withdrawal from some surface water may impact the recharge of groundwater aquifers, or cause salt water movement in an estuary to come in contact with the recharge of a groundwater system (as has been the case with portions of the Potomac-Raritan-Magothy Aquifer in southern New Jersey).

35 RESTATEMENT (SECOND) OF TORTS § 850A.

36 *Id.*

37 *Id.* § 850.

38 *Id.* § 864.

39 *Id.* § 858.

40 *Id.* SEVERAL STATES HAVE EXPLICITLY ADOPTED THE RESTATEMENT’S VERSION OF THE RULE. *SEE STATE V. MICHELS PIPELINE CONSTRUCTION, INC.*, 63 WIS. 2D 278, 299, 217 N.W.2D 339, 349 (1974); *HENDERSON V. WADE SAND & GRAVEL CO.*, 388 So. 2D 900 (ALA. 1980); *CLINE V. AMERICAN AGGREGATES CORP.*, 15 OHIO ST. 3D 384, 387, 474 N.E.2D 324, 327 (1984).

Relatively few cases have tackled the nexus between ground and surface water, and those that have note the difficulty of reconciling sometimes diametrically inconsistent rules governing the two resources.

In **Pence v. Carney**,⁴¹ for example, the West Virginia Supreme Court tackled claims from a landowner whose surface spring (used in a hotel spa) was materially and directly impacted by the pumping of a new well on neighboring land. The evidence of an interconnection between the groundwater and spring/surface water was virtually undisputed. However, the court apparently viewed the matter as involving the application of groundwater law, and in the absence of evidence of an underground stream connecting the well and spring, the interference would not be actionable.⁴²

In contrast, several New York cases opt for a seeming more “absolutist” view toward protecting surface waters. For example, in **Stevens v. Spring Valley Water Works and Supply Company**, 247 N.Y.S.2d 503 (N.Y. App. Div., 1964), the New York court found a public water supply company liable for damages where evidence indicated that the pumping wells intercepted groundwaters that had formerly fed a stream crossing the plaintiff’s property, causing it to go dry. Resting on the premise that the “right to use and enjoyment of a stream, running in a defined and natural channel, *jure naturae*, appertains to the riparian landowner,” the court reasoned that the fact that the diversion and diminution of the stream was caused by collecting underground waters which fed the stream “does not affect the question.”⁴³ Thus, the New York court applied the riparian doctrine of protecting a stream owner’s interest to “natural flow” to impose liability on what would otherwise have been a fully legitimate groundwater withdrawal.

A recent decision by the Ohio Supreme Court, **Portage County Board of Commissioners v. Akron**,⁴⁴ provides a different view of the groundwater / surface water connection issue. The court rejected claims of trespass asserted by Akron, as the holder of state-granted rights to take water from the Cuyahoga River. Akron complained that a municipal well field operated by Shalersville drew from an aquifer that would otherwise flow to the river, and therefore, infringed on Akron’s water right. Reasoning that Shalersville had a property interest in the groundwater underlying its land, the court found no basis for Akron’s position that it had “ownership of the groundwater ... because it eventually finds its way into the Cuyahoga River”⁴⁵ Interestingly, the Ohio court framed the question solely in terms of “ownership” rights and trespass law, rather than relative use rights involving interconnected resources.

The diametrically opposed approaches of providing essentially no protection to spring flow interferences on the one hand, or absolute protection to stream natural flows on the other, underscore the clash between traditional surface water and groundwater doctrines. On the one hand, the West Virginia and Ohio decisions provide little

41 58 W.Va. 296, 52 S.E. 702 (1905).

42 THE CASE CONTAINS A DISCUSSION OF “REASONABLE USE” IN THE GROUNDWATER CONTEXT, BUT THE FOCUS APPEARS TO BE MORE UPON THE REASONABLENESS OF THE WELL OWNER’S USE FOR SUPPORT OF ACTIVITIES ON HIS LAND, NOT THE REASONABLENESS OF THE INTERFERENCE WITH THE SPRING OWNER’S RIGHTS OF FLOW.

43 247 N.Y.S. 2D AT 511, QUOTING *SMITH V. CITY OF BROOKLYN*, 160 N.Y. 357, 260-261, 54 N.E. 787, 788 (1899).

44 109 OHIO ST. 3D 106, 846 N.E.2D 478 (2006).

45 *Id.* AT 125, 846 N.E.2D AT 496, CITING *McNAMARA V. RITTMAN*, 107 OHIO ST.3D 243, 838 N.E.2D 640 (2005) (LANDOWNERS HAVE PROPERTY INTEREST IN GROUNDWATER UNDERLYING THEIR LANDS, AND GOVERNMENTAL INTERFERENCE WITH THAT RIGHT CAN CONSTITUTE A TAKING).

recognition of the essential support provided to surface flows from groundwater withdrawals. Conversely, the New York and Connecticut court decisions that accord protection against interference with natural stream flows by well pumpage seem to go beyond modern riparian doctrine – affording downstream riparian owners with more protection against stream diminution from well pumping than they might receive from diminution resulting from upstream direct surface water withdrawals.

The clash of doctrines problem is highlighted in the 2005 decision in *Michigan Citizens for Water Conservation v. Nestlé Waters North America Inc.*,⁴⁶ where Michigan’s intermediate Court of Appeals was confronted with claims that groundwater withdrawals for a new bottled water facility would impact water levels in certain wetlands and the flow of the most interestingly named “Dead Stream,” to the alleged detriment of recreational and aesthetic interest of an environmental group’s members. In *Michigan Citizens*, the court parsed a “reasonable use balancing test” to deal with such cross-resource impacts. The court started with the observation that “in our increasingly complex and crowded society, people of necessity interfere with each other to a greater or lesser extent. For this reason, the ‘right to [the] enjoyment of . . . water . . . cannot be stated in the terms of an absolute right.’”⁴⁷ The reasonable use balancing test recognizes that

virtually every water use will have some adverse effect on the availability of this common resource. For this reason, it is not merely whether one suffers harm by a neighbor’s water use, nor whether the quantity of water available is diminished, but whether under all the circumstances of the case the use of the water by one is reasonable and consistent with a correspondent enjoyment of right by the other.⁴⁸

Recognizing that the balancing test is a case-specific inquiry, the *Michigan Citizens* opinion suggests that under Michigan law there are three underlying principles that govern the balancing process. First, the law seeks to ensure a “fair participation” in the use of water for the greatest number of users, and accordingly a court would attempt to strike a proper balance between protecting the rights of the complaining party and preserving as many beneficial uses of the common resource as is feasible under the circumstances. Second, the law will only protect a use that is itself reasonable. Third, the law will not redress every harm, no matter how small, but will only redress unreasonable harms. Therefore, a plaintiff must be able to demonstrate, not only that the defendant’s use of the water has interfered with the plaintiff’s own reasonable use, but also that the interference was

substantial.⁴⁹ Applying these principles, the balancing test would involve a weighing of numerous factors, including (1) the purpose of the use; (2) the suitability of the use to the location, including the nature of the water source and its attributes; (3) the extent and amount of the harm; (4) the benefits of the use; (5) the necessity of the amount and manner of the water use; and (6) any other factor that may bear on the reasonableness of the use, such as the impacts on the quantity, quality, and level of the water.⁵⁰ The RESTATEMENT (SECOND) OF TORTS §850A recites a similar factor based balancing approach to determination of such water use conflicts.

E. Regulated Riparian Regimes

A number of states in the Appalachian Basin have moved away from a pure common-law, water-rights arrangement to what has been termed a “regulated riparian” system of water rights management. Traditionally, not many eastern states had regulatory schemes governing water rights; most relied (and many still do) on many of the common-law principles outlined above.⁵¹ Western states typically experienced more regulation. Now, however, even eastern states have moved to regulated riparian systems.

The American Society of Civil Engineers published THE REGULATED RIPARIAN MODEL WATER CODE, which provides a comprehensive code designed for adoption by state governments (particularly states east of the Mississippi) “for allocating water rights among competing interests and for resolving other quantitative conflicts over water.”⁵² As stated in the preface to the Model Code, a number of eastern states have adopted some type of “regulated riparian” system.

An exhaustive review of regulated riparian regimes in individual states (both statutory enactments and regulatory implementation) is well beyond the scope of this paper. The following sections briefly review the current regulatory programs in some jurisdictions within the Appalachian Basin. In addition to state-level regulated riparianism, the Delaware and Susquehanna river basin compacts, and the commissions created under those compacts, establish pervasive basinwide management of water quality and quantity issues, which are discussed below. Also, I have included a short discussion of the proposed Great Lakes – St. Lawrence River Basin Water Resources Compact, which (if finally adopted) will affect future management of the nation’s largest fresh water resource.

1. Kentucky

Kentucky is, by and large, a regulated riparian state but still relies to some degree on common law principles.⁵³ In Kentucky, surface water is either “diffused” (which is not “public water” of Kentucky⁵⁴) or “in a natural watercourse.”⁵⁵ Groundwater is either “percolating” or is an underground stream.⁵⁶

46 269 MICH. APP. 25, 709 N.W. 2D 174 (2005), *AFFIRMED IN PART AND REVERSED ON OTHER GROUNDS*, MICHIGAN SUPREME CT. NO. 130802, 130803 (JULY 25, 2007). THE MICHIGAN SUPREME COURT RECENTLY ADDRESSED ONLY ONE ASPECT OF THE COURT OF APPEALS DECISION, CONCERNING WHETHER THE PLAINTIFFS IN THAT CASE HAD STANDING TO BRING A CLAIM UNDER THE MICHIGAN ENVIRONMENTAL PROTECTION ACT (“MEPA”) AS RELATED TO CERTAIN LAKES, STREAMS AND WETLANDS. A CLOSELY DIVIDED STATE SUPREME COURT FOUND THAT WHILE THE PLAINTIFFS HAD SUFFICIENT STANDING TO ASSERT A MEPA CLAIM AS TO IMPACTS TO DEAD STREAM AND THOMPSON LAKE, THEY HAD FAILED TO ALLEGE INJURY IN FACT WITH RESPECT TO ANOTHER LAKE OR CERTAIN WETLANDS BECAUSE THERE WAS NO EVIDENCE THAT THEY USED THOSE AREAS OR THAT THEIR RECREATIONAL, AESTHETIC OR ECONOMIC INTERESTS HAD BEEN INJURED BY THE WATER COMPANY’S PUMPING ACTIVITIES. MICH. SUPREME CT. SLIP OP. AT PG. 31.

47 *MICHIGAN CITIZENS FOR WATER CONSERVATION*, 269 MICH. APP. AT 69, 709 N.W.2D AT 202 (QUOTING *HART V. D’AGOSTINI*, 7 MICH. APP. 319, 321, 151 N.W.2D 826 (1967)).

48 *Id.* (INTERNAL QUOTES OMITTED).

49 *MICHIGAN CITIZENS FOR WATER CONSERVATION*, 269 MICH. APP. AT 69-70, 709 N.W.2D AT 202-203.

50 269 MICH. APP. AT 71, 709 N.W.2D AT 202-03.

51 1 WATERS AND WATER RIGHTS § 9.01, AT 9-4 TO 9-5 (R.E. BECK ED. 2001).

52 AMERICAN SOCIETY OF CIVIL ENGINEERS, THE REGULATED RIPARIAN MODEL WATER CODE III (J. DELLAPENNA ED. 1997) (PREFACE TO THE MODEL CODE).

53 DAVID EDWARD SPENARD, *KENTUCKY*, IN 6 WATERS AND WATER RIGHTS 607 (R.E. BECK ED. 2005).

54 KY. REV. STAT. § 151.120(2).

55 KY. REV. STAT. § 151.100 (DEFINITIONS).

56 *Id.* § 151.100(5); *COMMONWEALTH, DEP’T OF HIGHWAYS V. SEBASTIAN*, 345 S.W.2D 46, 47 (KY. 1961) (GROUNDWATER PRESUMPTIVELY IS “PERCOLATING”).

The Water Resources Division of the Kentucky Environmental and Public Protection Cabinet regulates the use and transfer of “public water.”⁵⁷ “Public water” – defined as “water occurring in any stream, lake, ground water, subterranean water or body of water in the Commonwealth which may be applied to any useful and beneficial purpose”⁵⁸ – is subject to permit requirements; other water is not.

A. Permit System for Water Withdrawals

Since 1966, Kentucky has, by statute, required “any person, business, industry, city, county, water district or other political subdivision desiring to withdraw, divert or transfer public water” in excess of an average daily flow of 10,000 gpd⁵⁹ to register with the Cabinet and apply for a permit.⁶⁰ Exceptions to permit requirements include use of public waters by abutting landowners for domestic purposes⁶¹ and withdrawals for less than 10,000 gpd.⁶²

B. Criteria for Granting Permits

The Cabinet has a duty to issue a permit to an applicant if, after investigation, the applicant has demonstrated the following: (1) “the quantity, time, place or rate of withdrawal of public water will not be detrimental to the public interest”⁶³ (2) the withdrawal will not be detrimental to “the rights of other public water uses”;⁶⁴ (2) issuing the permit would be “consistent with the administrative regulations promulgated by the Kentucky River Authority”;⁶⁵ and issuing the permit would be consistent with “the long-range water resource plan and drought response plans developed by the authority.”⁶⁶

2. New York

A. Limited Statewide Permit Program for Certain Water Withdrawals

New York’s state level management program with respect to water allocation and withdrawals is limited. Currently, New York’s Water Resources Law (part of the Environmental Conservation Law) requires a permit from the New York Department of Environmental Conservation (“NYSDEC”) for the acquisition, development, use and distribution of water for (i) potable purposes (public water supply), (ii) agricultural irrigation,⁶⁷ (iii) projects undertaken pursuant to Article 5-D of the County Law (relating to projects by small watershed protection districts); or (iv) multi-purpose projects undertaken pursuant to N.Y. Environmental Conservation Law §15-1101 **et seq.**⁶⁸ Such permits are required prior to acquiring water supply or additional water supply from an existing source, using eminent domain to acquire new or additional sources of supply, commencing construction of projects in connection with proposed plans, and certain other activities associated with such regulated uses.⁶⁹ Notably, the statewide water withdrawal regulatory

⁵⁷ *Id.* § 151.120(1).

⁵⁸ *Id.*

⁵⁹ 401 KY. ADMIN. REGS. 4:010 (2006).

⁶⁰ KY. REV. STAT. § 151.150(1).

⁶¹ *Id.* § 151.210(1).

⁶² *Id.* § 151.140.

⁶³ *Id.* § 151.170(2).

⁶⁴ *Id.* § 151.170(2).

⁶⁵ *Id.* § 224.70-140.

⁶⁶ *Id.*

⁶⁷ ALTHOUGH THE STATUTE MENTIONS AGRICULTURAL IRRIGATION, THE NYSDEC REGULATIONS ARE NOTABLY SILENT REGARDING THE REGULATION OF WATER WITHDRAWALS FOR IRRIGATION.

⁶⁸ N.Y. ENVTL. CONSERV. LAW § 15-1501 (McKINNEY 2005).

⁶⁹ *Id.*

provisions of the Water Resources Law are limited to public water supply and agricultural irrigation, leaving a substantial range of water using enterprises (including those relating to gas well drilling) outside the purview of the statute.

Separately, New York purports to specially regulate surface and ground water withdrawal projects designed to transport water to points outside the state by establishing a separate permit program for interstate diversions.⁷⁰

B. Regional Permit Programs

In addition to these statewide permitting requirements, the Water Resources Law establishes several regional regulatory programs, including one addressing withdrawals within the Great Lakes/St. Lawrence River watersheds (which includes some sections of western New York covering the Marcellus Shales). New York requires reporting and registration of surface and ground water withdrawals exceeding 100,000 gpd within the Great Lakes basin.⁷¹ Currently, in-basin use is only subject to registration, although the Water Resources Law indicates that if the NYSDEC registers a withdrawal resulting in a consumptive loss in excess of 5 MGD averaged over any 30-day period, the Department is required to implement prior notice and consultation with other Great Lakes states pursuant to the Great Lakes Charter.⁷² Withdrawals involving an interbasin diversion, however, require state approval, as well as approval by the governor of each Great Lakes State pursuant to the Water Resources Development Act of 1986.⁷³

Recently, New York State ratified the Great Lakes-St. Lawrence River Basin Water Resources Compact, discussed below. Under that Compact, New York will be proceeding to develop broader implementing legislation more strictly regulating water withdrawals within the Great Lakes Basin.

3. Ohio

A. Common Law with Legislative Guidance

Ohio continues, in large part, to rely upon common law doctrines governing surface and groundwater withdrawals. An interesting development, however, is that Ohio’s legislature, in a 1988 statute, provided specific guidance to Ohio courts concerning the determination of “reasonable use.” Ohio Revised Code §1521.17 adopts the principles of the RESTATEMENT (SECOND) OF TORTS, declaring:

(B) In accordance with section 858 of the Restatement (Second) of Torts of the American Law Institute, all of the following factors shall be considered, without limitation, in determining whether a particular use of water is reasonable:

- (1) The purpose of the use;
- (2) The suitability of the use to the watercourse, lake, or aquifer;
- (3) The economic value of the use;
- (4) The social value of the use;
- (5) The extent and amount of the harm it causes;
- (6) The practicality of avoiding the harm by adjusting the use or method of use of one person or the other;

⁷⁰ *Id.* § 15-1505.

⁷¹ *Id.* § 15-1605.

⁷² *Id.* § 15-1607.

⁷³ PUB. L. 99-662, IMPLEMENTED BY N.Y. ENVTL. CONSERV. LAW § 15-1613.

- (7) The practicality of adjusting the quantity of water used by each person;
- (8) The protection of existing values of water uses, land, investments, and enterprises;
- (9) The justice of requiring the user causing harm to bear the loss.

This statute, however, does not authorize the issuance of permits, but simply provides guidance to courts in applying the common law to disputes that may arise.

B. Limited Regulatory Programs

Ohio has adopted a limited permit program focused on large withdrawals, applicable to new or increased **consumptive uses** of more than 2,000,000 gallons per day averaged over any 30-day period.⁷⁴ The criteria for permit issuance consider whether (1) public water rights in navigable waters will be adversely affected; (2) the facility's current and proposed use incorporates maximum feasible conservation practices considering available technology and the nature and economics of various alternatives; (3) if the proposed withdrawal and use will reasonably promote protection of public health, safety and welfare; (4) whether the withdrawal will have a significant adverse impact on the quantity or quality of water resources and related land resources; (5) consistency with regional and state water resource plans; and (6) the sufficiency of water available for the withdrawal and protection of other existing legal uses of water resources.

Ohio Rev. Code §1501.32 prohibits the transfer of water in excess of 100,000 gallons per day out of the Ohio portions of the Lake Erie and Ohio River basins without a permit from the Ohio Department of Natural Resources ("DNR"). Criteria for such permits largely parallel those applicable to large consumptive uses, with the additional element of a required showing that reasonable efforts have been made to develop and conserve water resources in the important basin and that further development of those resources would engender overriding, adverse economic, social or environmental impacts.

Finally, Ohio Rev. Code §1521.16, requires persons who own facilities capable of withdrawing more than 100,000 gallons per day of surface or groundwater to register with the Ohio DNR, and report annually on monthly withdrawal volumes.

4. Pennsylvania

In large part, the right to withdraw water from both surface and groundwaters in Pennsylvania is governed by common law, composed of the doctrines and precedents established by courts in cases decided over the past two centuries.⁷⁵ With the exception of state laws regulating the withdrawal of surface water by public water supply agencies, Pennsylvania has no statewide regulatory program mandating the acquisition of permits for withdrawing surface or ground waters. Basin level regulatory programs of the Susquehanna and Delaware River Basin Commissions have displaced the courts as the arbiters of water rights issues in the eastern two-thirds of the Commonwealth. However, common law doctrines and traditions remain strong. Because common law rests on individual cases read together, rather than a cohesive code, many gaps remain in the court decisions governing water rights.

⁷⁴ OHIO REV. CODE §1501.33.

⁷⁵ R.T. WESTON AND J.R. BURCAT, *LEGAL ASPECTS OF PENNSYLVANIA WATER MANAGEMENT, WATER RESOURCES IN PENNSYLVANIA: AVAILABILITY, QUALITY AND MANAGEMENT* (1990).

No state statute or regulatory program comprehensively addresses the allocation or use of ground or surface waters among competing users, or provides for long-term management of water resources. A few state statutes have attempted (or been interpreted) to impose regulations and permit requirements on withdrawals from specified sources and particular uses.

A. 1939 Water Rights Act

The 1939 Water Rights Act⁷⁶ requires that public water supply agencies wishing to withdraw water from surface sources, or to acquire rights in surface sources, first obtain a permit from the Pennsylvania Department of Environmental Protection ("PaDEP"). For these purposes, a "public water supply agency" is defined to include any corporation, municipal or quasi-municipal corporation, district or authority vested with the power, authority, right or franchise to supply water to the public. Traditionally, this has been interpreted to apply to those entities that supply water to the public via pipes (as opposed to bulk or bottled water suppliers). The 1939 Water Rights Act does not regulate industrial, commercial or agricultural water users, and the Act does not cover groundwater withdrawals. It has been estimated that the 1939 Water Rights Act regulates only about 10% of the total surface water withdrawals in the Commonwealth.

B. Safe Drinking Water Act

The Pennsylvania Safe Drinking Water Act⁷⁷ ("SDWA"), the state counterpart to the Federal Safe Drinking Water Act, was enacted primarily to address concerns regarding the quality of Pennsylvania's drinking water supply. While the regulations adopted under the Pennsylvania SDWA are focused on setting water quality, design, construction and operating standards to assure safe and sanitary potable water, recent case decisions have drastically reinterpreted the statute to include consideration of the impacts of water withdrawals by public water supply systems.⁷⁸ In terms of withdrawals by oil and gas well operators, however, the SDWA is not applicable.

C. Water Well Drillers License Act

The Water Well Drillers License Act⁷⁹ does not regulate water use, but focuses on the collection of groundwater information through the mandatory recording and filing of well location, penetrated strata, design and yield data. Water well drillers must obtain a permit from the Department of Conservation and Natural Resources, and each time they drill a well, licensed well drillers must file a completion report with DCNR's Bureau of Topographic and Geologic Survey.

D. Water Resources Planning Act

The Water Resources Planning Act ("WRPA"),⁸⁰ adopted in 2002, is focused on the preparation and updating of the State Water Plan and regional water plan elements to the state plan. The WRPA mandates the updating of the State Water Plan by March 2008, and periodic updating every five years thereafter. A part of that process involves the required registration and reporting of water use by more significant water users.

⁷⁶ 32 P.S. §§631-641.

⁷⁷ 35 P.S. §721.1 *ET SEQ.*

⁷⁸ *OLEY TOWNSHIP V. DEP AND WISSAHICKON SPRING WATER, INC.*, 1996 EHB 1098.

⁷⁹ 32 P.S. §§645.1 *ET SEQ.*

⁸⁰ 27 PA.C.S. §3101 *ET SEQ.*

The WRPA moves away from the top-down, agency-dominated process toward a more collaborative planning process, with strong input from the regional (basin) level. The Act recognized that with proper planning, Pennsylvania's water resources are capable of serving multiple uses in a balanced manner. Nothing in the WRPA authorizes or expands PaDEP's authority to regulate, permit or control water allocations or water withdrawals.

The planning process is built around a Statewide Water Resources Committee, working with six Regional Water Resource Committees and PaDEP, in a multi-step process toward development of water plans for each region and the state. The six Regional Water Resource Committees are aligned on the basis of major watersheds,⁸¹ each with a membership appointed to represent a cross-section of stakeholders in the respective basins. The Statewide Committee's membership includes a combination of six representatives from the regional committees, members appointed by the Governor from major interest segments, and certain state agency officials. The Statewide Committee, in consultation with PaDEP, has the lead in developing policies and guidelines for the preparation of the regional plans and State Water Plan. The regional committees, in turn, are to guide the development of regional components to the state plan. The State Water Plan and regional components are to include a number of mandatory elements, including:

- An inventory of ground and surface water resources.
- An assessment and projection of withdrawal and non-withdrawal demands.
- Identification of potential water availability problems or conflicts between users.
- Assessment of public water supply capabilities.
- Process of identifying projects and practices that conserve water, and process for giving recognition to such efforts.
- Identification of practical alternatives for addressing availability problems, adverse impacts, or use conflicts.
- Recommended actions, programs, policies, institutional arrangements, projects and management activities.

The WRPA further provides for the designation of "critical water planning areas," which are defined as any significant hydrologic unit where existing or future demands exceed or threaten to exceed the safe yield of available water resources.⁸² For these purposes, "safe yield" is defined on the basis of the amount of water that can be withdrawn from a water resource over a period of time without impairing the long-term utility of a water resource such as dewatering of an aquifer; impairing the long-term water quality of a water resource; inducing a health threat; or causing irreparable or unmitigated impact upon reasonable and beneficial uses of the water resources.⁸³ Such a safe yield is to be determined based upon the predictable rate of natural and artificial replenishment of the water source over a reasonable period of time. In each critical water planning area, the regional water resource committee is to create a special advisory body, and proceed to prepare a critical area plan.⁸⁴ That critical area plan must identify existing and future reasonable and beneficial uses, include

81 THE WRPA ESTABLISHES COMMITTEES FOR THE OHIO, GREAT LAKES, UPPER SUSQUEHANNA, LOWER SUSQUEHANNA, POTOMAC, AND DELAWARE BASINS. 27 PA.C.S. §3113.

82 27 PA.C.S. §3112(A)(6).

83 27 PA.C.S. §3102.

84 27 PA.C.S. §3112(D).

a water availability evaluation, assess water quality issues that have a direct and substantial effect on water availability, identify existing and potential conflicts among users and adverse impacts on uses, and recommend practicable supply-side and demand-side alternatives for resolving such issues.

Ultimately, each regional plan and the entire State Water Plan must be approved by both the Statewide Water Resources Committee and the Secretary of PaDEP. The adopted plan will have some degree of importance. The State Water Plan is already recognized as a mandatory consideration in some state regulations, such as in the preparation and approval of sewage facility plans under 25 Pa. Code Chapter 71. The WRPA further provides for the general use of the State Water Plan as a policy and guidance document, providing information, objectives, priorities and recommendations to be "considered and weighed" in a broad range of decisions.⁸⁵ Further, the plan is to be used to: (1) identify and prioritize water resource and water supply development projects; (2) provide information to public and private decision makers; (3) identify opportunities for improving operation of existing infrastructure; (4) guide development and implementation of policies and programs; and (5) guide policies on activities that directly and significantly affect the quantity and quality of water, with the objective of balancing and encouraging multiple uses of water resources.⁸⁶

To gather and maintain up to date information on water use across the Commonwealth, §3118 of the WRPA requires the registration and reporting of water use by (i) any person who withdraws more than 10,000 gallons per day averaged over any 30-day period from any surface water or groundwater source; (ii) all public water supply agencies regardless of withdrawal amount; and (iii) each hydropower facility regardless of the withdrawal amount.⁸⁷ The trigger withdrawal amounts are determined on the basis of the total amount withdrawn by a person from one or more points of withdrawal operated as a system. Thus, if a company has five wells in a given watershed, and uses them to supply a given facility, the total amount withdrawn over any 30-day period from those five wells must be counted together. Registrations must be filed with PaDEP on forms (hard copy or electronic) provided by the Department. The first round of "interim" registrations was due on March 16, 2004.

PaDEP is in the process of promulgating rules governing monitoring, record keeping and reporting of water use. The WRPA provides that all sources subject to registration will be required to periodically report the source, location and amount of their withdrawal, including the amount of consumptive and non-consumptive use, and the locations and amounts of waters returned or discharged. The WRPA does not mandate metering in all cases. Where alternative methods exist to obtain a reasonably accurate evaluation of withdrawals and uses, the rules to be developed are to allow for use of those alternative methods to obtain a reasonable estimate or indirect calculation.⁸⁸ For smaller withdrawals of less than 50,000 gpd (except public water supply systems), the statute requires that the rules provide for use of alternative methods of estimation or indirect calculation in lieu of direct metering or measurement.⁸⁹

85 27 PA.C.S. §3116.

86 *Id.*

87 27 PA.C.S. §3118.

88 27 PA.C.S. §3118(B)(1).

89 *Id.*

5. Virginia

A. Statewide Permit Program for Surface Water Withdrawals

Effective February 6, 2008, Virginia has adopted regulations implementing a statewide permit program for surface water withdrawals via the Virginia Water Protection (“VWP”) permit program.⁹⁰ Authorized by the Virginia Water Protection Act,⁹¹ and administered by the Virginia State Water Control Board (“VaSWCB”), the VWP permit program applies to virtually all new or increased surface water withdrawals involving greater than 10,000 gallons per day.⁹² Surface water withdrawals are divided into two categories: (1) “major” withdrawals involving greater than 90 million gallons per month,⁹³ and (2) “minor” withdrawals involving more than 10,000 gallons per day but less than the major threshold.

New or expanded surface water supply projects subject to the permit program must publish a preapplication public notice with information on the project, provide an opportunity for public comment, and assist in identifying public concerns and issues **prior to** filing a permit application.⁹⁴ Following the “preapplication” phase, a detailed permit application is required, including among other elements an evaluation of beneficial uses and assessment of potential impacts.⁹⁵ All VWP permits contain conditions mandating that the permittee take reasonable steps to minimize or prevent impacts which may have a “reasonable likelihood of adversely affecting human health or the environment,”⁹⁶ a phrase which may well expand to addressing impacts on neighboring wells or water supplies. Surface water withdrawal permits are specifically subject to conditions relating to protection of instream flows, with consideration given to the seasonal needs of other water users, seasonal availability of surface water flow, and the cumulative effect of all withdrawals and consumptive uses.⁹⁷ Surface water withdrawal permits may be issued if the withdrawal is not likely to have a detrimental impact on existing instream and off-stream issues, and will not cause or contribute to (i) significant impairment of state waters, fish or wildlife resources; (ii) adverse impacts on other existing beneficial uses; or (iii) violation of water quality standards.⁹⁸

B. Permit Program for Surface Water Withdrawals from Designated Water Management Areas

A separate permit system in Virginia governing surface water applies only to those areas designated as surface water management areas by the VaSWCB. A surface water management area is “a geographically defined surface water area in which the VaSWCB has deemed the levels or supply of surface water to be potentially adverse to public welfare, health and safety.”⁹⁹ Within a designated surface water management area, a permit is required for any person to make a withdrawal of surface-water,¹⁰⁰ subject to four specific exclusions and certain exemptions.¹⁰¹ Excluded and exempted from the system are any

90 9 VA. ADMIN. CODE § 25-210-10 *ET SEQ.*

91 VA. CODE ANN. §§ 62.1-44.15 AND 62.1-44.20

92 9 VA. ADMIN. CODE §§ 25-210-50.A (PERMIT REQUIREMENT) AND 25-210-60.B (EXCLUSIONS FOR CERTAIN SURFACE WATER WITHDRAWALS).

93 *Id.* § 25-210-10 (DEFINITION OF “MAJOR SURFACE WATER WITHDRAWAL”).

94 *Id.* § 25-210-75.B.

95 *Id.* § 25-210-80.

96 *Id.* § 25-210-90.C.

97 *Id.* § 25-210-110.A.

98 *Id.*

99 VA. CODE ANN. § 62.1-242 (WEST 2005).

100 *SEE* 9 VA. ADMIN. CODE § 25-220-70.A.

101 *Id.*

non-consumptive uses, withdrawals of less than 300,000 gallons per month, and withdrawals from a wastewater treatment system permitted by the VaSWCB or the Department of Mines, Minerals and Energy. In addition, a person who has entered into an approved agreement does not need a permit.¹⁰² One of the most important exemptions, and one which creates a gap in the effectiveness of the water management area approach, excludes withdrawal in existence as of July 1989, unless the rate of withdrawal is increased.¹⁰³

Currently, designated surface water management areas have not been established, and thus a special area surface water withdrawal permit program does not include any of the Appalachian western areas under which the Marcellus Shale formation is located. However, given the large quantities of water required for Marcellus Shale development, Virginia’s VWP statewide permit program would apply if surface water withdrawals greater than 10,000 gallons per day are contemplated.

C. Permit Program for Ground Water Withdrawals from Designated Water Management Areas

Virginia’s ground water withdrawal permitting program only applies within designated ground water management areas.¹⁰⁴ An area may be designated as a ground-water management area by the VaSWCB if the board finds that groundwater levels in the area are declining or are expected to decline excessively, wells of two or more users are interfering, or may reasonably be expected to interfere substantially with one another, the available ground water supply has been or may be overdrawn, or groundwater in the area has been or may become polluted. If one of those four criteria are met, and the board finds that public health, safety or welfare require regulatory efforts, the VaSWCB may proceed to define a ground water management area.¹⁰⁵ Within designated management areas, permits are required for any withdrawal of ground water greater than 300,000 gallons per month. However, a number of exceptions are provided, including exemptions for groundwater remediation projects, and groundwater withdrawals coincident with the extraction of coal, oil, gas or other minerals.¹⁰⁶

Currently, Virginia has designated ground water management areas only in Eastern Virginia and the Eastern Shore area. The areas overlying the Marcellus Shale formation are not encompassed by the groundwater permit program.

6. West Virginia

Presently, West Virginia has not adopted a regulatory program addressing either surface or ground water withdrawals.

The Water Resources Protection Act¹⁰⁷ establishes a water resource planning program, coupled with water withdrawal registration and reporting program. The West Virginia Department of Environmental Protection (“WVaDEP”) is entrusted with conducting a water resources survey of consumptive and nonconsumptive surface and groundwater withdrawals cross the state. Pursuant to those authorities, in December 2006, WVaDEP issued a **Final Report Water Resources Protection Act Water Use Survey**¹⁰⁸ summarizing water use trends and conditions in the state. The Act imposes an obligation on those withdrawing water

102 *Id.*

103 *Id.* §25-220-70.C.1.A.

104 VA. CODE ANN. § 62.1-257 (WEST 2005).

105 VA. CODE ANN. § 62.1-257.

106 VA. CODE ANN. §§ 62.1-258 – 62.1-259.

107 W. VA. CODE § 22-26-1 *ET SEQ.*

108 [HTTP://WWW.WVDEP.ORG/ITEM.CFM?SSID=11&SSID=722](http://www.wvdep.org/item.cfm?ssid=11&ssid=722).

in quantities greater than 750,000 gallons per month from one or more sources to register their water use and to provide VVaDEP with information regarding the location and quantity of water withdrawal, including seasonal withdrawal rates.¹⁰⁹ However, the Act does not establish a permitting program, or any standards restricting the withdrawal or use of water. Hence, water withdrawals remain the exclusive province of common law.

7. The Delaware River Basin Commission

A. Delaware River Basin Compact

When adopted in 1961, the Delaware River Basin Compact¹¹⁰ was a unique document. It was the first compact not merely consented to by Congress, but in which the Federal Government became a full signatory party. While Federal agencies resisted the proposal, the states persisted in the belief that Federal membership was requisite to the effectiveness of the new regional entity. Congress agreed. The Compact created a new institution, the Delaware River Basin Commission ("DRBC"), composed of the Basin State Governors and a Presidential appointee (each with one alternate). With few exceptions, a vote of the majority binds all.

DRBC is granted broad powers to plan, develop, conserve, regulate, allocate and manage the water and related land resources of the Basin. In providing for the "joint exercise" of the sovereign rights of the signatory parties "in the common interests of the people of the region,"¹¹¹ DRBC is directed to prepare and adopt a Comprehensive Plan "for the immediate and long range development and uses of water resources."¹¹² The Commission is further empowered to allocate water among the signatory states, providing the allocation could not constitute a prior appropriation of waters or confer any superiority of right.¹¹³

DRBC was created as a true management institution, with both regulatory and project development authority. The Compact explicitly recognizes that "[a] single administrative agency is ... essential for effective and economical direction, supervision and coordination of efforts and programs of federal, state and local governments and of private enterprise."¹¹⁴ The Compact further declares as one of its fundamental purposes the objective "to apply the principal [sic] of equal and uniform treatment to all water users who are similarly situated ... without regard to established political boundaries."¹¹⁵ With these objectives, DRBC is conferred the power to adopt and enforce standards and rules covering the broad spectrum of water quantity and quality issues.¹¹⁶

B. DRBC Project Review

As a central mechanism for implementing these regulatory powers, DRBC is authorized under §3.8 of the Compact to regulate and approve any "project" having a substantial effect on the water resources of the Basin, to assure consistency with the Commission-adopted comprehensive plan, and "the proper conservation, development, management or control of the water resources of the basin." The term "project" is very broadly defined by the Compact to include

¹⁰⁹ W. VA. CODE § 22-26-3.

¹¹⁰ DELAWARE RIVER BASIN COMPACT, PUB. L. NO. 87-328, 75 STAT. 688 (1961).

¹¹¹ DELAWARE RIVER BASIN COMPACT §1.3(B).

¹¹² DELAWARE RIVER BASIN COMPACT §13.1.

¹¹³ DELAWARE RIVER BASIN COMPACT §3.3.

¹¹⁴ DELAWARE RIVER BASIN COMPACT §1.3(C).

¹¹⁵ DELAWARE RIVER BASIN COMPACT §1.3(E).

¹¹⁶ DELAWARE RIVER BASIN COMPACT §§ 3.6(B) (STANDARDS FOR PLANNING, DESIGN AND OPERATION OF ALL PROJECTS AND FACILITIES IN THE BASIN WHICH AFFECT BASIN WATER RESOURCES), 5.2 (WATER QUALITY STANDARDS), 5.4 (WATER QUALITY ENFORCEMENT), 6.2 (FLOOD PLAIN ZONING).

any work, service or activity which is separately planned, financed, or identified by the commission, or any separate facility undertaken or to be undertaken within a specified area, for the conservation, utilization, control, development or management of water resources which can be established and utilized independently or as an addition to an existing facility, and can be considered as a separate entity for purposes of evaluation.¹¹⁷

Under this provision, DRBC regulates a broad spectrum of projects that may affect the quality and quantity of water resources within the basin. Projects subject to commission review and approval include, among others:

- All surface and groundwater withdrawals exceeding 100,000 gallons per day (gpd) in any 30-day period.
- Construction or alteration of industrial wastewater treatment facilities or domestic sewage treatment facilities involving a design capacity \geq 50,000 gpd.
- The diversion (exportation or importation) of water from or to the Delaware River Basin whenever the design capacity is greater than 100,000 gpd.
- Impoundment of water.¹¹⁸

The central criterion governing approval of projects is whether the project proposal is consistent with the Delaware River Basin Comprehensive Plan. More specifically, DRBC is required to approve a project if it determines that the project "would not substantially impair or conflict with the comprehensive plan."¹¹⁹ The Comprehensive Plan encompasses a wide range of regulations and policies, most of which are now compiled as part of the DRBC Water Code.¹²⁰ Project review with respect to withdrawals includes consideration by DRBC of such factors as the need for the proposed withdrawal, alternative sources available, impacts on other uses in the area and on instream uses downstream of the point of extraction, proposed mitigation measures, implementation of conservation measures, and other issues. DRBC's general approach to water withdrawals looks at not only individual withdrawal proposals, but the overall cumulative situation in the watershed or aquifer in question.

Fundamentally, DRBC allocates water based upon the doctrine of equitable apportionment.¹²¹ During drought emergencies, DRBC has established a series of water use priorities, with first priority being given to uses which sustain human life, health, and safety, and second priority to uses needed to sustain livestock. After those priorities, water is to be allocated based on equitable apportionment, among producers of goods and services, food and fibers, and environmental quality in a manner designed to sustain the general welfare of the basin and its employment at the highest practical level.¹²²

Water conservation policies applied to both new and existing uses. The basin Water Code requires maximum feasible efficiency in water use by new industrial, municipal and agricultural users, and eventual application by existing users of those water-conserving practices and

¹¹⁷ DELAWARE RIVER BASIN COMPACT § 1.2(G).

¹¹⁸ 18 C.F.R. §401.35(B).

¹¹⁹ *Id.*; *SEE ALSO* DELAWARE RIVER BASIN COMPACT § 3.8.

¹²⁰ THE DELAWARE RIVER BASIN WATER CODE IS CURRENTLY AVAILABLE ON LINE AT: WWW.STATE.NJ.US/DRBC/REGULA.HTM.

¹²¹ DELAWARE RIVER BASIN WATER CODE § 2.5.1.

¹²² *Id.* § 2.5.2.

technologies that can feasibly be employed.¹²³ Public water systems are mandated to adopt and implement water conservation plans, including source and service metering, leak detection and repair, water conservation performance standards for plumbing fixtures, and a water conservation pricing structure.¹²⁴

DRBC policy reflects a finding that the waters of the basin are limited in quantity and that the Basin is frequently subject to drought water and drought declarations due to limited water supply storage and streamflow during dry periods. Commission policy “discourages” the exportation of water from the basin. At the same time, because of limited assimilative capacity, Commission policy discourages the importation of wastewater into the basin that would significantly reduce the assimilative capacity of receiving streams, particularly with respect to conservative substances.¹²⁵

In review of projects involving import or export of water, DRBC considers assessments of the resource, the economic impacts of the project and of all alternatives to any export or import. Such projects are subject to evaluation of particular factors, including (1) effort to first develop, use and conserve the resources outside of the basin; (2) water resource impacts of each alternative available; (3) economic and social impacts of the import or export of water and each of the available alternatives; (4) the amount, timing and duration of the proposed transfer and its relationship to passing flow requirements and other hydrologic conditions; and (5) benefits that may accrue to the basin as the result of the proposed transfer.¹²⁶

Given these considerations, the fact is that a number of intra-watershed and interbasin transfers have been implemented, including New York City’s diversion of 800 mgd from the upper basin under the terms of the U.S. Supreme Court’s consent decree in **New Jersey v. New York**; a 100 mgd transfer by New Jersey to serve the northeastern New Jersey communities; a 60 mgd transfer from the Susquehanna Basin to the City of Chester area (west of Philadelphia); and various municipal system transfers involving communities that straddle the basin divides. Within the basin, numerous withdrawals involve transfers of water between the subbasins and watersheds that comprise the overall Delaware Basin, including transfers that have been specifically undertaken to relieve over-pumping of certain aquifers in developed areas. Thus, discouragement of basin transfers does not amount to a prohibition, and each project is judged on its own merits.

In addition to basinwide project review authority, the Compact grants the Commission special powers to designate “protected areas” where withdrawals are exceeding, or threaten to exceed, available resources or conflict with the Basin comprehensive plan. Growing concerns regarding potential overuse of aquifers in southeastern Pennsylvania led DRBC in 1981 to designate the Southeastern Pennsylvania Groundwater Protected Area.¹²⁷ Within the area largely defined by Triassic formations, new or increased groundwater withdrawals exceeding 10,000 gpd are subject to strict review, including the requirement for sophisticated pump testing and hydrologic analyses prior to permitting. The aggregate of new and existing withdrawals are managed within “withdrawal limits” for the affected aquifers or sub-basins, to assure that total takings do not exceed the rate of groundwater recharge during normal or dry periods. DRBC has undertaken to further define the

123 *Id.* § 2.1.2A-C.

124 *Id.* § 2.1.2.C.

125 *Id.* § 2.30.2.

126 *Id.* § 2.30.4.

127 18 C.F.R. PART 430.

“withdrawal limits.” DRBC has established numeric withdrawal limits for each significant sub-basin, based on the 1-in-25-year average annual baseflow rate. Where total withdrawals in a watershed exceed 75% of this value, the watershed is designated as “potentially stressed.” In such potentially stressed sub-basins, the rules require that applicants include one or more programs to mitigate the adverse impacts of a new or expanded withdrawal.

In addition, as part of a protected area permit application, the project sponsor must show that the proposed withdrawal will not “significantly impair or reduce the flow of perennial streams in the area.”¹²⁸ Under the Protected Area regulations, DRBC takes specific steps to consider and protect existing water users whose wells may be affected by newer, deeper and more powerful neighbors. Where interference is predicted or observed, new users are required to limit withdrawals in order to avoid interference, or to provide compensation (in the form of replacement water supplies) where interference is unavoidable.¹²⁹ Thus, DRBC attempts to promote efficient development of the resource, while protecting the reasonable expectations and investments of current users.

DRBC is further empowered to declare emergencies and impose restrictions on water withdrawals and diversions (including suspension of State-issued water rights) during such periods.¹³⁰ In both protected areas, and during emergencies, DRBC’s authority to grant, modify or deny permits is guided by standards found in Compact § 10.5, which calls for actions “so as to avoid such depletion of the natural stream flows and groundwaters ... as will adversely affect the comprehensive plan or the just and equitable interests and rights of other lawful users of the same source, giving due regard to the need to balance and reconcile alternative and conflicting uses in the event of an actual or threatened shortage of water of the quality required.” In effect, DRBC is granted plenary authority to reallocate and regulate waters within protected areas and during emergencies so as to balance all legitimate uses of water within the basin or particular affected area.

DRBC’s regulatory powers are complemented by project development authority. The agency is given authority to finance and construct a wide variety of water projects,¹³¹ or to jointly sponsor projects with other Federal and State agencies, and to assess and collect charges from those using Commission facilities and services.¹³² Specific powers were conferred for DRBC to oversee and coordinate the actions of any signatory agency affecting water resources, including all Federal and State projects.

8. Susquehanna River Basin Commission

A. Susquehanna River Basin Compact

The Susquehanna River Basin Compact¹³³ was developed nearly a decade after the Delaware Compact, stimulated in part by concerns among some that the thirsts of the eastern seaboard metropolis might

128 18 C.F.R., § 430.13(d)(4).

129 18 C.F.R. §§ 430.13(d)(5), 430.19.

130 DELAWARE RIVER BASIN COMPACT §§ 10.4, 10.8.

131 DELAWARE RIVER BASIN COMPACT §§ 4.1 (DOMESTIC, MUNICIPAL, AGRICULTURAL AND INDUSTRIAL WATER SUPPLY), 4.2 (STORAGE AND RELEASE OF WATERS, AND REGULATION OF FLOWS), 5.1 (POLLUTION ABATEMENT), 6.1 (FLOOD PROTECTION), 6.3 (FLOOD LANDS ACQUISITION), 7.3 (FISH AND WILDLIFE HABITAT MAINTENANCE AND IMPROVEMENT), 8.1 (RECREATION), 9.2 – 9.3 (HYDROELECTRIC POWER GENERATION AND TRANSMISSION).

132 DELAWARE RIVER BASIN COMPACT §§ 3.7, 4.3.

133 SUSQUEHANNA RIVER BASIN COMPACT, PUB. L. NO. 91-575, 84 STAT. 1509 (1970).

cause some (notably New York City) to look to the Susquehanna's headwaters as a new source for diversions. Indeed, at least one such "flood skimming" project was proposed to serve New York.

Although the Compact was adopted in 1970, the Susquehanna River Basin Commission (SRBC) actually came into being in 1972. SRBC is essentially modeled on DRBC, with membership by the United States, New York, Maryland and Pennsylvania.

Although SRBC's powers are nearly identical to those of the Delaware Commission, the emphasis of Commission activities and the development of Basin programs have been different. Notably, the Susquehanna is the largest U.S. river flowing into the Atlantic, and its mixture of urban, suburban, agricultural and forest areas presents a far less dense population distribution. However, major water users are found up and down the basin, and the river provides a major source of water for diversions and interbasin transfers that serve portions of the lower Delaware Basin and the Baltimore/northern Maryland metropolitan and suburban areas.

SRBC has developed a fairly sophisticated groundwater management program,¹³⁴ including regulation of all significant groundwater withdrawals in a program which considers both the aquifer and associated surface water impacts of all proposed well development projects.¹³⁵

For the past three decades, SRBC has expressed concern for the impact of growing consumptive uses in basin, and resulting lowering of drought flows for in-stream water quality and water balance in the Chesapeake Bay. Considerable effort has been expended in the past two decades on reallocation/reformulation of storage in existing reservoirs in order to make room for flow augmentation storage.

B. Project Review and Regulatory Powers

Specific SRBC regulatory programs target the management of new and increased withdrawals and consumptive uses. While the SRBC requires project approval for all surface and groundwater withdrawals in excess of 100,000 gpd in any 30-day period,¹³⁶ any new or increased consumptive water use in excess of 20,000 gpd requires SRBC approval, irrespective of its source of supply.¹³⁷ Although SRBC regulations provide a process for transfer of previously-issued project approvals upon change of ownership of the project, subject to prior notice to SRBC,¹³⁸ such a transfer may trigger a "review" and modification of the prior approval in a variety of situations, including where the prior approval was more than 10 years old, or where the prior project approval did not include all ground and surface water sources or uses (e.g., some were "grandfathered").¹³⁹ Where facilities that did not previously require a project approval because their withdrawal or consumptive use predated the SRBC compact regulations, the new

134 ON JULY 7, 2006, THE SRBC PUBLISHED A NOTICE OF PROPOSED RULEMAKING TO AMEND 18 C.F.R. PARTS 803, 804, AND 805. AFTER THE COMMENT PERIOD, THE SRBC MADE REVISIONS TO ITS PROPOSALS, ADOPTED A FINAL RULE ON DECEMBER 5, 2006, AND PUBLISHED NOTICE OF ITS FINAL RULEMAKING AT 71 FED. REG. 78,570 (DECEMBER 29, 2006). THE FINAL RULE WAS SET TO TAKE EFFECT ON JANUARY 1, 2007; HOWEVER, THE EFFECTIVE DATE WAS TEMPORARILY SUSPENDED AS THE RESULT OF LITIGATION. *PENNSY SUPPLY, INC. v. SRBC*, U.S. DIST. CT. M.D. PA., No. 1:06-CV-02454, ORDER (DEC. 29, 2006) (STAY PENDING FURTHER ORDER OF COURT). THE TEMPORARY SUSPENSION HAS BEEN LIFTED AND THE REGULATIONS HAVE TAKEN EFFECT.

135 18 C.F.R. § 806.23.

136 18 C.F.R. § 806.4(A)(2)(i).

137 18 C.F.R. § 806.4(A)(3).

138 18 C.F.R. §806.6.

139 18 C.F.R. §806.6(c)-(d).

owner must submit a project approval application to SRBC prior to the date of ownership change,¹⁴⁰ and the use by the new owner will be subject to SRBC's full project review process and standards.

SRBC has established particular "standards" governing consumptive uses of water within the Susquehanna Basin,¹⁴¹ which apply to all consumptive uses that involve more than 20,000 gpd over any 30-day period and that were initiated or increased after January 23, 1971. For these purposes, a "consumptive use" is defined to mean the "loss of water transferred through a man-made conveyance system or any integral part thereof (including such water that is purveyed through a public water supply or wastewater system), due to transpiration by vegetation, incorporation into products during their manufacture, evaporation, injection of water or wastewater into a subsurface formation from which it would not reasonably be available for future use in the basin, diversion from the basin, or any other process by which the water is not returned to the waters of the basin undiminished in quantity."¹⁴² Consumptive uses include, for example, situations where water is incorporated into a product (such as beer), or is evaporated as part of a process (such as steam generation or cooling). SRBC regulates such consumptive uses whether they derived their water directly from the surface or groundwater, or indirectly from a public water supply system or other connection. Thus, for example, a major commercial building connected to a municipal water system that uses water cooler air conditioning systems may be subject to SRBC consumptive use rules.

Under the SRBC rules, regulated consumptive users must either curtail their consumptive use during "low flow" periods (as may be designated by the Commission), or must provide compensation for that use.¹⁴³ In practice, such compensation may be provided by one of several methods, including development of storage facilities and provision of releases from those facilities during low-flow periods; purchase of available water supply storage from existing facilities; use of water from a public water supplier that maintains a conservation release or flow-by approved by SRBC; use of groundwater; or other means approved by SRBC.¹⁴⁴ In lieu of providing such compensation, a user may provide payments to SRBC under a set fee schedule, and SRBC, in turn, utilizes those funds for the operation of several storage facilities acquired by the commission to provide for streamflow augmentation during low-flow period.

C. Passby Flow and Conservation Release Requirements

As a guide used in administering its project review authority, in late 2002, the SRBC adopted guidelines governing the determination of passby flows and conservation releases for surface and ground water withdrawal projects.¹⁴⁵ The SRBC uses passby flows, conservation releases, and consumptive use compensation to protect aquatic resources, competing users, and instream flow uses downstream from the point of withdrawal.¹⁴⁶ Passby flow requirements mandate that, while water is being withdrawn, a specified amount of water must be allowed to pass a certain point downstream from the point

140 18 C.F.R. §806.4(c)

141 18 C.F.R. § 806.22.

142 18 C.F.R. § 806.3).

143 18 C.F.R. § 806.22(b).

144 18 C.F.R. § 806.22(b).

145 SRBC, *GUIDELINES FOR USING AND DETERMINING PASSBY FLOWS AND CONSERVATION RELEASES FOR SURFACE-WATER AND GROUND-WATER WITHDRAWAL APPROVALS*, POLICY NO. 2003-001 (NOVEMBER 8, 2002).

146 *Id.*

of withdrawal.¹⁴⁷ Approved surface-water withdrawals from small impoundments, intake dams, continuously flowing springs, or other intake structures in applicable streams **will** include conditions that require minimum passby flows.¹⁴⁸ Additionally, approved ground-water withdrawals from wells that impact streamflow, or for which a reversal of the hydraulic gradient adjacent to a stream (within the course of a 48-hour pumping test) is indicated, also will include conditions that require minimum passby flows.¹⁴⁹

There are three narrowly tailored exceptions to the SRBC passby flow requirements. First, an exception is provided in cases where the surface-water or ground water withdrawal, has only a minimal impact in comparison to the natural or continuously augmented flows of a stream or river.¹⁵⁰ The SRBC defines minimal impact as 10 percent or less of the natural or continuously augmented Q_{7-10} low flow of the stream or river.¹⁵¹ Second, an exception may be provided where the project in question requires Commission approval and a passby flow would be required under the guidelines, “but where a passby flow has historically not been maintained.”¹⁵² In these cases, withdrawals exceeding 10 percent of the Q_{7-10} low flow will be permitted whenever flows naturally exceed the passby flow requirement plus the taking.¹⁵³ When streamflows do not naturally exceed the passby flows, the rate of withdrawal and quantity allowed are reduced to less than 10 percent of the Q_{7-10} low flow. This procedure is allowed for a period of four years from the approval date, and during this period the project sponsor should develop additional storage or supplies that will allow for withdrawals while still maintaining the passby flow requirement.¹⁵⁴ In such cases, within two years from the SRBC approval date, the project sponsor will be required to file a plan outlining the proposed development of additional on-site storage or supplies.¹⁵⁵

The method of determining passby flow for streams that support trout populations is based upon the SRBC’s **Instream Flow Studies Pennsylvania and Maryland** (May 1998) publication. That publication reflects studies which applied Instream Flow Incremental Methodology (“IFIM”) to evaluate cold water fish habitat impacts in a sampling of streams in several hydrologic regions of Pennsylvania and Maryland, arriving at a surrogate model to be applied to other streams in assessment predicted “habitat loss.” The SRBC policy pegs the acceptable amount of habitat loss depending upon the classification of the stream. Less than 5% habitat loss is allowed for exceptional value streams. Generally, less than 5% loss (or at most 7.5% habitat loss) is allowed for high quality waters. Passby flows to prevent more than 10 or 15% habitat loss would be imposed on streams with lower classifications supporting trout populations. For areas of the basin that do not support trout populations, the SRBC passby flow policy sets levels generally ranging from 15 to 25 percent of average daily flow.¹⁵⁶ In no case is the passby flow less than the Q_{7-10} flow.¹⁵⁷

In lieu of the “desktop” methodology set forth in the SRBC passby flow policy, the policy allows a project sponsor to provide an instream flow

147 *Id.*

148 *Id.* (EMPHASIS ADDED).

149 *Id.*

150 *Id.*

151 *Id.* AT PG. 2.

152 *Id.*

153 *Id.*

154 *Id.*

155 *Id.*

156 *Id.* AT PG. 6.

157 *Id.* AT PG 3-4.

study to demonstrate that lower passby flows and releases will provide an acceptable level of aquatic habitat protection. Exceptions may also be provided if the applicant can demonstrate that there are no viable alternative supplies available, or if after coordination, another acceptable passby flow criterion can be established.¹⁵⁸

Conversely, pursuant to SRBC regulations §§ 803.43(a)(1) and 803.44(a)(1), the Commission may increase the passby flow requirement for any project when water quality or sensitive environmental resources may be adversely effected.¹⁵⁹

Conservation releases only come into play with surface-water withdrawals made from a large impounding structure.¹⁶⁰ A conservation release imposes a requirement to actually augment stream flows by releases from storage. Such augmentation may occur not only during low flow periods, but also during more normal flow regimes. When this is the case, “the conservation release shall be equal to, or greater than, the Commission’s low flow criterion.”¹⁶¹

9. Proposed Great Lakes – St. Lawrence River Basin Water Resources Compact

On December 13, 2005, the Governors and Premiers “signed” two documents, intended to establish an expansive regional approach to managing water withdrawals from the Great Lakes Region. These two documents – the Great Lakes-St. Lawrence River Basin Water Resources Compact (“Compact”) and the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement (“Agreement”) – seek to implement the lofty goals of cooperation and conservation described in the Great Lakes Charter signed by the Governors and Premiers in 1986.¹⁶²

Since adoption of the Great Lakes Charter in 1986, the Great Lakes jurisdictions have been grappling with issues of how best to manage, husband and conserve the region’s water resources for both economic benefit and environmental protection. In 2001, the States and Provinces adopted an Annex to the Charter outlining further measures they would consider to foster greater regional cooperation and consistency. The Compact and Agreement signed in December 2005 are intended to implement the principles of Annex 2001. The Compact would only become effective upon adoption by the legislatures of the eight Great Lakes States, and consent by Congress. The Agreement, in contrast, is an undertaking by the governors of the respective states and the premiers of Quebec and Ontario to carry out state/provincial laws in a coordinated manner following certain common principles, utilizing a regional body to coordinate consultation and cooperation.

The Compact and Agreement seek to establish a statutory and regulatory framework for imposing substantial additional regulatory controls on water withdrawals involving Great Lakes Basin waters, including withdrawals from the lakes themselves, streams within the basin, and groundwaters within the Great Lakes and St. Lawrence River watersheds. The key elements of this program include:

- **Registration.** All existing water withdrawals greater than 100,000 gallons per day in any 30-day period

158 *Id.* AT PG. 7.

159 *Id.* AT 2.

160 *Id.*

161 *Id.*

162 COPIES OF BOTH DOCUMENTS ARE AVAILABLE AT THE COUNCIL OF GREAT LAKES GOVERNORS WEBSITE: WWW.CGLG.ORG.

would be required to register with their states or provinces. Criteria applied through this process will be used to define the “grandfathered” amount of those existing withdrawals (thereby establishing a baseline defining future increases that may trigger permit requirements).

- **Water Withdrawal Permitting.** States and provinces are required to establish permitting programs regulating new or increased withdrawals above to-be-defined trigger levels. In the absence of arriving at another trigger, the default would be 100,000 gallons per day over any 30 day period. Such withdrawals may be approved only if they meet prescribed minimum criteria (referred to as the “decision-making standard”).
- **Decision-Making Standard.** The Agreement and Compact embrace a decision-making standard, with the commitment that each jurisdiction would review regulated withdrawals consistent with that standard. The decision-making standard in §4.11 of the Compact requires a determination that the proposed use is reasonable, considering a series of factors, including (a) whether the withdrawal is planned in a fashion that provides for efficient use of the water and will avoid or minimize waste; (b) whether efficient use is being made of existing water supplies; (c) the balance between economic development, social development and environmental protection; (d) the supply potential of the water source, considering quantity, quality, reliability and safe yield of hydrologically interconnected water sources; and (e) the probable degree and duration of any adverse impacts to other lawful consumptive or non-consumptive water uses or to the quantity or quality of the waters and water dependent natural resources, and proposed plans or arrangement for avoidance or mitigation of such impacts. Other criteria require that each withdrawal or consumptive use incorporate “environmentally sound and economically feasible water conservation measures”; and mandate that the withdrawal and consumptive use be implemented so as to ensure that the proposal will result in “no significant individual or cumulate adverse impacts” to the quantity or quality of waters and water dependent natural resources of the basin on the applicable source watershed.

Notably, some aspects of the decision-making standard have proven controversial as the proposed compact has been introduced and debated in several of the state legislatures. In particular, the meaning and scope of the “no significant impact” language has raised considerable questions and concern.

- **Out-of-Basin Diversions and Intra-Basin Water Transfers.** With limited exceptions, the Compact and Agreement would prohibit out-of-basin diversions of water; and transfers of water between the subbasins of the Great Lakes will be restricted. Subject to some high regulatory standards, use of basin waters by straddling communities will be permitted. Under the Agreement, all proposals involving out-of-basin diversions or transfers between subbasins of the Great Lakes would be subject to review by a regional body (involving the states and provinces), with a determination of findings to be presented back to the host state or province.

If the Compact is ultimately adopted, out-of-basin diversions and transfers between the lakes would be subject to review and approval by a newly-formed Regional Council.

- **Significant Consumptive Water Uses:** Where withdrawals involve significant consumptive uses of water (> 5,000,000 gpd in any 90-day period), the host state/province is obligated to provide notice to the other jurisdictions, and invite their comments, which then would be considered in the applicable state/provincial permitting agencies.
- **Water Conservation Measures.** States and provinces are required to develop and implement voluntary and/or mandatory water conservation measures applicable to both existing and new users. New or increased withdrawals must implement environmentally sound and economically feasible water conservation measures.

Liability of Gas Well Operators for Impacts on Other Water Users

Marcellus Shale development operations may impact upon other water users (such as neighboring well or stream owners) via several different modes. First, the process of installing and using water sources, whether from surface streams or wells, may affect downstream flows or aquifer supplies to neighboring wells. Second, the process of drilling, fracing or otherwise developing the gas well may theoretically impact the quantity or quality of water supplies, such as by interrupting or causing a change in groundwater flow patterns, or by contributing pollution via improperly controlled movement of gas or well fluids into freshwater horizons.

A. Liability for Impacts Caused by Water Supply Development

As indicated by the discussion in Part II, the question of liability for impacts caused by water supply development and withdrawals rests largely on the applicable state law governing “water rights” and water allocation, and substantially is affected by the location and nature of the withdrawal involved.

In those jurisdictions governed primarily or exclusively by common law (western Pennsylvania, Ohio, West Virginia, and Virginia), exposure to liability will depend upon “reasonable use” determinations and point of withdrawal versus use. In situations where adequate water sources can be developed on the same leasehold as the gas production well, the gas developer will enjoy “riparian” rights as to surface waters and “reasonable use” rights as to groundwater. Surface water impacts are more likely to involve a weighing of factors, while the groundwater doctrines in most states are less likely to lead to imposition of liability for impacts on other wells unless the impact is reasonably foreseeable and the developer fails to take reasonable steps to avoid or mitigate the impact. On the other hand, where water supplies must be obtained off of the mineral leasehold, old rules in many jurisdictions view water transfers as *per se* unreasonable, and could readily lead to broader exposure to claims for interference with other water users.

Although “regulatory” regimes governing water withdrawals pose an additional administrative step, they may in the long run serve to benefit major energy developments. Regulated riparian systems, such as administered by SRBC and DRBC, have tended to displace antiquated common law rules that disfavor off-land transfer of water, thereby allowing the tapping of sources which may not be available at the

immediate site of use. These permit programs will almost always require consideration of impacts on neighboring wells, springs or surface water supplies, but also provide a more predictable avenue by which such impacts can be assessed and mitigated through appropriate provision of replacement supplies or compensation.

B. Liability for Impacts Caused by Gas Well Development and Operation

1. Common Law Liabilities

Absent special statutory arrangements, liability for water supply quantity and quality impacts occasioned by gas well development will rest substantially on common law tort doctrines – principally trespass, nuisance and, where applicable, strict liability rules. Since these and related issues are being addressed by another panel, suffice that we mentioned them here for the sake of completeness.

2. Special Statutory and Regulatory Requirements

Some jurisdictions, such as Pennsylvania, have adopted special statutory and regulatory provisions that act as an overlay to, or displacement of, common law rules in regard to impacts from oil and gas well development.

A. The Pennsylvania Oil & Gas Act – Water Supply Protection Provisions

Section 208 of the Pennsylvania Oil and Gas Act¹⁶³ imposes an affirmative obligation on well operators to restore or replace affected water supplies. Specifically, section 208(a) declares:

(a) Any well operator who affects a public or private water supply by pollution or diminution shall restore or replace the affected supply with an alternate source of water adequate in quantity or quality for the purposes served by the supply.

Section 208(a) is notably silent in terms of what activities by a well operator might lead to such an obligation. Section 208(b) provides further clarification, however, in describing the procedures by which any “landowner or water purveyor suffering pollution or diminution of a water supply **as a result of the drilling, alteration or operation** of an oil or **gas well**”¹⁶⁴ may notify the Pennsylvania Department of Environmental Protection (“PaDEP”) and request an investigation be conducted. Read together, it would appear that the statutory obligation to replace or restore water supply attaches when the impact results from the drilling, alteration or operation of the gas well, and not to impacts resulting from a gas well owner’s development of a separate water supply source on or off the mineral lease area. There are, however, no cases or agency guidance addressing this point.

The Pennsylvania Act sets up a specific process to be followed.¹⁶⁵ After receipt of a complaint, PaDEP must undertake an investigation within 10 days. The agency must render a determination within 45 days. If the agency fines or “presumes” that the pollution or diminution of the water supply was caused by drilling, alteration or operation activities, then PaDEP will issue an order to the gas well operator to restore or replace the affected supply, and if necessary provide a temporary replacement.

¹⁶³ 58 P.S. §601.208.

¹⁶⁴ 58 P.S. §601.208(b) (EMPHASIS ADDED).

¹⁶⁵ *Id.*; 25 PA. CODE §78.51.

The Pennsylvania law creates a presumption that the gas well operator is responsible for **pollution** of a water supply within 1000 feet of the gas well, where the pollution occurs **within six months** after completing drilling or alteration of the well.¹⁶⁶ This presumption can be overcome if the well operator affirmatively proves one of five defenses:

- (1) The pollution existed prior to the drilling or alteration activity as determined by a pre-drilling or pre-alteration survey.
- (2) The landowner or water purveyor refused to allow the operator access to conduct a pre-drilling or pre-alteration survey.
- (3) The water supply is not within 1,000 feet of the well.
- (4) The pollution occurred more than six months after completion of drilling or alteration activities.
- (5) The pollution occurred as the result of some cause other than the drilling or alteration activity.¹⁶⁷

To utilize either of the first two defenses, the well operator must retain the services of an independent laboratory to conduct a pre-drilling or pre-alteration survey of water supplies in the area, and results of that survey must be provided to PaDEP and each water supply owner. Regulations detail the required elements of such a survey, including the notice to be provided to neighboring landowners in the area and specific information which must be collected regarding each well.¹⁶⁸

The statute does not create a presumption about impacts on the **quantity** of neighboring supplies or call for a pre-drilling or pre-alteration survey of the **quantity** aspects of neighboring wells. Nevertheless, a pre-development survey of water supplies for both water quantity and quality may be prudent as a prophylactic defensive measure.

B. West Virginia’s Water Protection Regulations

Like Pennsylvania, West Virginia imposes affirmative obligations on well operators that require operators to generally “prevent surface and underground water pollution,”¹⁶⁹ as well as imposing specific operational requirements.¹⁷⁰ West Virginia also has a waste prevention rule that requires operators “to prevent the pollution of the waters of the state in drilling and producing operations, or in transporting or distributing such products.”¹⁷¹

In addition to the general pollution prevention requirements imposed in state rules, West Virginia imposes a water supply testing requirement on well operators. Under this rule, operators generally must test water from any wells or springs located within 1000’ from any proposed well.¹⁷² Such operators must provide notice to owners of property within 1000’ from any proposed well to give such owners the opportunity

¹⁶⁶ 58 P.S. §601.208(c).

¹⁶⁷ 58 P.S. §601.208(d).

¹⁶⁸ 25 PA. CODE §78.52.

¹⁶⁹ WEST VIRGINIA CODE OF STATE RULES (“CSR”) TITLE 35, SERIES 4-16.5.

¹⁷⁰ FOR EXAMPLE, 35 CSR 4-11.3 CONTAINS “OPERATIONAL CRITERIA” THAT INCLUDE THE USE OF FRESH WATER CASINGS FOR ANY DRILLING THROUGH “THE DEEPEST FRESH WATER HORIZON (THAT BEING THE DEEPEST HORIZON WHICH WILL REPLENISH ITSELF AND FROM WHICH FRESH WATER OR USABLE WATER FOR HOUSEHOLD, DOMESTIC, INDUSTRIAL, AGRICULTURAL, OR PUBLIC USE MAY BE ECONOMICALLY AND FEASIBLY RECOVERED).”

¹⁷¹ 35 CSR 4-17.1.

¹⁷² 35 CSR 4-19.

to request testing of well or spring water.¹⁷³ The rules require specific sampling and analysis methods.¹⁷⁴ And, the rules provide for a right of entry for operators in order to allow such operators to obtain samples for analysis.¹⁷⁵

Finally, if a well operator causes or contributes to groundwater contamination, the operator is required to make “every reasonable effort shall be made by the operator to identify, remove, or mitigate the source of such contamination.”¹⁷⁶ Such efforts can include developing a groundwater remediation plan and conducting groundwater monitoring.¹⁷⁷

C. Ohio’s Water Protection Requirements.

Like West Virginia, Ohio requires well operators to conduct operations “in a manner which will not contaminate or pollute the surface of the land, or water on the surface or in the subsurface.”¹⁷⁸

Ohio imposes operational requirements on well operators that are intended to protect groundwater. Ohio, for example, requires operators to construct and maintain drilling pits in such a manner so as to prevent the escape of brine.¹⁷⁹ Ohio prohibits brine disposal in surface or ground water or on land in such quantities that it causes or could reasonably be anticipated to cause damage or injury to public health or safety or the environment, including damage or injury to drinking water.¹⁸⁰ In addition, Ohio requires well operators in urban areas to use “best management practices” to minimize and control surface flow of water, sedimentation and erosion.¹⁸¹ Finally, in response to an incident in which methane gas leaked from a well into 26 homes through domestic water well, Ohio’s Department of Natural Resources has implemented new permit conditions requiring operators to prevent the accumulation of unsafe gas pressure in the annulus of a well, thereby preventing such gas from entering domestic water supplies.¹⁸²

Ohio regulations require applicants for well drilling permits to sample all water wells within 300’ of the proposed well locations in urbanized areas, but this sampling requirement is not directly tied to a provision creating liability for specific groundwater impacts that may be identified through such sampling. OAC Ch. 1501: 9-1-02(F). Instead, the general provision prohibiting operators from contaminating groundwater apply.

173 35 CSR 4-19.2.

174 35 CSR 4-19.3.

175 35 CSR 4-19.4. THIS RIGHT OF ENTRY INCLUDES THE RIGHT TO GET A COURT ORDER ALLOWING ENTRY IF AN OWNER PROTECTS OR BLOCKS ENTRY WHEN REQUESTED. 35 CSR 4-19.4b.

176 35 CSR 4-20.

177 *Id.*

178 OHIO ADMINISTRATIVE CODE (“OAC”) CHAPTER 1501: 9-1-07.

179 OHIO REVISED CODE (“ORC”) § 1509.22(C)(3). OHIO ALSO REQUIRES THE INSTALLATION OF PROTECTIVE CASING TO PREVENT SURFACE OR GROUNDWATER FROM ENTERING “FRESH WATER STRATA.” ORC § 1509.17.

180 ORC § 1509.22(A).

181 OAC CH. 1501: 9-1-07(B).

182 *SEE* OHIO DEPARTMENT OF NATURAL RESOURCES PRESS RELEASE, JANUARY 18, 2008 ([HTTP://WWW.DNR.STATE.OH.US/HOME_PAGE/NEWSRELEASEFEED/TABID/18276/ENTRYID/326/DEFAULT.ASPX](http://www.dnr.state.oh.us/home_page/newsreleasefeed/tabid/18276/entryid/326/default.aspx); [HTTP://WWW.OHIODNR.COM/MINERAL/DEFAULT/TABID/10352/DEFAULT.ASPX](http://www.ohiodnr.com/mineral/default/tabid/10352/default.aspx))

FINAL WORDS

Leaving the sagebrush plains of Texas above the Barnett Shales for the “green” climes of the Appalachian Basin and the Marcellus Shale, one might have the impression that water resource issues are left behind. If this paper has one point, it is – tis not so. The Marcellus Shale represents a marvelous and exciting energy development opportunity, and also a water resources challenge that will require strategic planning and legal/regulatory finesse.



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