

January 2006

Demanding Beneficial Use: Opportunities and Obligations for Wyoming Regulators in Coalbed Methane

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MacKinnon, Anne and Fox, Kate (2006) "Demanding Beneficial Use: Opportunities and Obligations for Wyoming Regulators in Coalbed Methane," *Wyoming Law Review*. Vol. 6: No. 2, Article 7.
Available at: <https://scholarship.law.uwyo.edu/wlr/vol6/iss2/7>

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WYOMING LAW REVIEW

VOLUME 6

2006

NUMBER 2

DEMANDING BENEFICIAL USE: OPPORTUNITIES AND OBLIGATIONS FOR WYOMING REGULATORS IN COALBED METHANE

Anne MacKinnon and
Kate Fox**

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I. INTRODUCTION

The production of methane gas from coal beds has grown dramatically in Wyoming since the late 1990s, with 2003 gas production valued at about \$1.5 billion, translating into some \$257 million in tax and royalty income to the state and counties.¹ Most of the production has come from Wyoming's Powder River Basin.²

Coal bed methane (CBM) development has some unique features, new to Wyoming's experience of the oil and gas industry. One of those features is that the coal seams which hold the gas are also aquifers, and water is pumped from the aquifers in order to release and recover the target methane gas. What to do with the water produced from the gas wells has been a festering problem and a source of conflict among producers, landowners, regulators, and environmental advocates. State agencies charged with overseeing Wyoming's water resources have failed to address adequately the water issues that have arisen in the unfamiliar context of CBM production.³ As will be discussed in greater detail below, the volumes and chemistry of water produced, concentrated in the Powder River Basin where the streams and soils are unaccustomed to such volumes or to such regularity of flow, have damaged the environment and existing uses of that basin in a variety of ways.

Wyoming Governor Dave Freudenthal in fall 2004 called for more intense attention to the water issues associated with coal bed methane production. He requested the University of Wyoming to provide data and recommendations on a series of items under the heading of the general question: "What are the options for dealing with water produced through CBM development?"⁴

1. University of Wyoming, Ruckelshaus Institute of Environmental and Natural Resources, *Water Production from Coalbed Methane Development in Wyoming: A Summary of Quantity, Quality and Management Options 8-9* (Dec. 2005,) [hereinafter IENR 2005 REPORT] (citing R. DeBruin, *Coalbed Methane in Wyoming* (2004), presented at the First Annual CBM Research, Monitoring and Applications Conference, Univ. of Wyoming, Laramie, Aug. 17-19, 2004). The IENR 2005 REPORT is also available at www.uwyo.edu/enr/ienr/cbm.asp.

2. IENR 2005 REPORT at 10, Tbl.2.

3. Federal agencies, specifically the U.S. Bureau of Land Management, have also struggled and fallen short in addressing water issues; they are not, however, the subject of this article.

4. The governor's questions are contained in Appendix A of the IENR 2005 REPORT.

The Governor's staff has noted that the governor is concerned that the entire CBM industry in Wyoming, with its considerable economic value to the state, could be shut down by court injunction. The fear is that a challenger could win an injunction based on the inadequacy of state regulation to control the adverse impacts of the industry, especially those impacts caused by disposal of produced water. That argument, of course, also suggests that improved Wyoming regulation of CBM-produced water will allow uninterrupted increases in CBM production.

Meanwhile, the state of Montana has raised concerns about the quality of water flowing into Montana from Wyoming via the Powder River and Tongue River, if significant volumes of water produced with CBM continue to be disposed of in the rivers and their tributaries.⁵ In late March 2006, the Montana Board of Environmental Review adopted a rule strictly controlling the water quality flowing into the state.⁶ Uncertainty about whether regulatory reactions to CBM water concerns will seriously restrict CBM production in Wyoming are among the factors cited by industry for a drop of about five percent in Wyoming CBM production already seen from 2003 to 2004.⁷ In fall 2005, in response to concern over Montana's potentially stricter water quality rules, the U.S. Department of Energy, in concert with the Governor's Office, undertook a study on "water handling options" for the Wyoming CBM industry. The Phase one Report, issued in January 2006, examined the feasibility of water management options from subsurface drip irrigation to coal slurry pipelines.⁸ The 2006 Legislature authorized a state study of coal-bed methane water gathering, treatment and transportation,⁹ and a task force to study alternative uses of CBM water.¹⁰ The perceived risk to such a valuable industry has apparently helped prompt the executive and legislative branches into continued exploration of how water production by the industry should be addressed.

The water volume involved is significant: approximately 380 thousand acre-feet of groundwater were produced by the industry in the Powder

5. IENR 2005 REPORT at 40.

6. MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY, COAL BED METHANE RULE UPDATE, *available at* <http://www.deq.mt.gov/ber/doc/cbmsummary.pdf>, summarizing actions of the Montana Board of Environmental Review (last visited Mar. 23, 2006).

7. *Id.* at 3, 5.

8. Feasibility Study of Expanded Coal Bed Natural Gas Produced Water Management Alternatives in the Wyoming Portion of the Powder River Basin, Phase One, Prepared for: U.S. Department of Energy National Energy Technology Laboratory, Wyoming State Planning Office; Prepared by: ALL Consulting, January, 2006. "Statement of Work, Expanded Feasibility Study for Wyoming CBNG Water Handling Options," January 2006, Governor's Office. On file with the authors.

9. House Enrolled Act. No. 54, §3, 58th Leg. (Wyo. 2006).

10. Senate Enrolled Act No. 55, §21, 58th Leg. (Wyo. 2006).

River Basin from 1987-2004 (with most of that produced since 1997).¹¹ Over the course of the expected CBM production, total water production from the Powder River Basin is expected to approach 5.7 million acre-feet.¹² That is five times the amount of water required to fill Pathfinder Reservoir – and enough to fill Wyoming’s statewide surface water irrigation demand for about two years.¹³ Accordingly the spotlight the governor has put on CBM water is both appropriate and timely. Since these best-estimates show that some ninety-five percent of the production of both gas and water is yet to come, new state agency policies adopted now could head off many of the problems associated with water production that Wyoming faces.

In this article, we take the view that the question asked should not be simply “how to deal with CBM produced water.” Rather there are two questions: first, “how to reduce the amount of water produced by the CBM industry” - and only then, “how to deal with the minimum produced.”¹⁴

It is important to emphasize that the approach advocated here does not require statutory change. Rather, we highlight authority and responsibility inherent in existing statutes governing two key state agencies in water management—the Wyoming State Engineer’s Office (SEO) and the Wyoming Department of Environmental Quality (DEQ).

We assert that the two agencies can bridge the regulatory chasm between them using their existing authority. Further, we argue it is their obligation to do so. While additional statutory authority for dealing with specific CBM issues may also be necessary, that should be the subject of another article, and of legislative action. The first step towards effective regulation of CBM water in Wyoming, allowing CBM production to proceed profitably while protecting the state’s other natural resources, is water regulatory agencies that step up to the plate and use their existing authority.

11. IENR 2005 REPORT at 10, Tbl.2.

12. *Id.*

13. The capacity of Pathfinder Reservoir is approximately 1.02 million acre-feet: U.S. BUREAU OF RECLAMATION, NORTH PLATTE PROJECT, (June 1982) (pamphlet reprinted from Project Data Book). For statewide surface water irrigation demand, estimated at 2.3 million acre-feet a year, see WYOMING WATER DEVELOPMENT COMMISSION, WATER PLANNING TEAM, POCKET WATER FACTS.

14. UW/IENR has also identified the need for such an approach, noting some possibilities for improved well completion technologies to reduce water production, under the heading “Minimize Water Production,” IENR 2005 REPORT at 43-45. Earlier drafts of this article were made available to IENR and were made use of on pp. 35-36, 43-45, 50-51. In the IENR 2005 REPORT an earlier draft of this article is cited as Fox, K.M., and A. MacKinnon, “‘Beyond Beneficial Use: Opportunities and Obligations for Wyoming Regulators in Coalbed Methane,’ Unpublished draft report in preparation for submission for publication.”

Existing statutes enable the agencies to act quickly to take steps in order to address problems caused by CBM water production. To do so, however, the agencies will have to focus their attention on the unique aspect of the CBM water problem: the significant *volume* of water that is being produced and is expected to be produced by the CBM industry.

The volume of water discharged in connection with CBM production creates issues never before contemplated, and therefore not addressed, in the water rights and environmental quality regulatory framework of the past. In Wyoming, an arid state, regulators and citizens alike tend to believe that more water could only be better. Neither SEO nor DEQ regulation of CBM drilling and water discharges has adapted to the fact that with CBM production, there is *too much water*. Wyoming's water rights permitting process keeps an eye out to be sure CBM wells don't produce water by interfering with neighbors' wells, but accepts a producer's choice simply to dispose of the water once it reaches the surface.¹⁵ Wyoming's environmental water regulations are directed toward control of water pollution in its strictest sense and fail to contemplate the breadth of environmental impacts that large volumes of water discharges can have.

Nonetheless, both SEO and DEQ have authority to address the problem of too much water. For both agencies, the authority turns on the term "beneficial use." Beneficial use is a term of art for SEO and for DEQ and means something quite different in the context of each agency's statutory framework. But for each agency, demanding proof of genuine beneficial use—or, put another way, adopting a far more demanding interpretation of the term beneficial use than either agency has done so far for CBM—will lead to a much better balance between the needs of energy production and the need for protection of the state's water, land, and wildlife resources. For DEQ, additional authority to address the problems of CBM exists in its enabling legislation, and specifically the definition of "pollution,"¹⁶ which

15. See *infra* section CBM Groundwater Permitting.

16. This was pointed out in an April 12, 2006 Opinion of the Wyoming Attorney General. 2006-001 Op. Att'y Gen. 3 (2006). The opinion cites the Environmental Quality Act's definition of "pollution:"

contamination or alteration of the physical, chemical, or biological properties of any waters of the state, including change in temperature, taste, color, turbidity or odor of the waters or any discharge of any acid, or toxic material, chemical or chemical compound, whether it be liquid, gaseous, solid, radioactive or other substance, including wastes, into any waters of the state which creates a nuisance or renders any waters harmful, detrimental or injurious to public health, safety or welfare, to domestic commercial, industrial, agricultural, recreational or other legitimate beneficial uses,

grants that agency far broader regulatory latitude than it has to date been willing to exercise. The agencies should act now to use their existing authority to give their own, separate beneficial use standards real meaning in order to protect Wyoming's water resources. The Legislature should follow up by giving both agencies the increased staff positions and funding necessary to implement those standards.¹⁷

II. WATER QUANTITY REGULATION—THE WYOMING STATE ENGINEER'S OFFICE

Wyoming water law evolved in a time when irrigation use was new to the state, still developing, and expected to become the major water use.¹⁸ The primary objective of the water law was to allow orderly distribution of a scarce resource - constructively channeling the energy of would-be water-users, and providing both the certainty and flexibility needed for economic growth and for change over time with a changing economy.¹⁹ That objective

or to livestock, wildlife or aquatic life, or which degrades the water for its intended use, or adversely affects the environment.

Id. (citing WYO. STAT. ANN. § 35-11-103(c) (emphasis added)).

17. The 2006 Legislature did fund thirty new positions for the DEQ. House Enrolled Act No. 11, §20, 58th Leg. (Wyo. 2006).

18. Territorial Engineer reports make it clear that one of the goals of creation of an engineer's office was to encourage and stabilize new development in Wyoming agriculture after the crash of the open range stock industry in the hard winter-drought years of 1886 and 1887. The constitutional and statutory language of 1890-91, which still governs much of Wyoming's water law, was motivated, as the reports show, by the same concern. The goal was stock-farms—irrigated bottomlands raising winter feed to serve the cattle using surrounding grazing lands. See 1888 REPORT OF THE TERRITORIAL ENGINEER, at 2, 11-12 and App. A, 1-2, and 1889 SECOND ANNUAL REPORT OF THE TERRITORIAL ENGINEER TO THE GOVERNOR OF WYOMING, at 2, 4, 10-11. See also T.A. LARSON, HISTORY OF WYOMING 190-94 (Univ. of Neb. Press, 1978); CRAIG COOPER, A HISTORY OF WATER LAW, WATER RIGHTS AND WATER DEVELOPMENT IN WYOMING, 1868-2002, 15 (Wyo. Water Dev/Comm'n 2004), available at <http://wwdc.state.wy.us/>.

19. See the early comments of Territorial and State Engineer Elwood Mead, author of the basic constitutional and statutory language, in his 1889 SECOND ANNUAL REPORT OF THE TERRITORIAL ENGINEER at 2-3.

[T]he construction of ditches and the utilization of their waters has been in advance of legislation for the regulation and protection of the various interests connected therewith. This has resulted in unavoidable injustice and hardship in some cases...The most unfortunate feature, however, is the fact that the location and manner of construction of ditches has been left entirely to the inclination or financial resources of the settler. There has been no preliminary control of the streams and the waters have been diverted in a haphazard fashion, rather than in pursuance of a definite policy, hav-

is manifested in the language of the Wyoming Constitution, which states: "Water being essential to industrial prosperity, of limited amount, and easy of diversion from its natural channels, its control must be in the state, which, in providing for its use, shall equally guard all the various interests involved."²⁰

The Origins of "Beneficial Use"

The concept that a water right must be rooted in beneficial use was central to the system of state ownership of water and the mandatory requirement of state permitting of water rights that Wyoming adopted. As the Wyoming Supreme Court has pointed out, even without the statutory statement on beneficial use as basis-measure-and-limit, there is a limitation on quantity implicit in the nature of a water right in Wyoming: "Because of the nature of a water right, this limitation [on quantity] would exist in the absence of statute. The waters belong to the public or the state, and an appropriator cannot acquire a right that permits him to use more than is reasonably necessary for beneficial purposes."²¹

ing for its end their full utilization and economical distribution. As a result, while we have many works of an excellent character, leaving in their admirable design and substantial construction nothing to be desired, considered as a whole the result is far from satisfactory. In many instances defective works make the utilization of the waters wasteful and expensive. In others, wrong locations and excessive appropriations make the proper supervision and control by the public extremely difficult and expensive. These evils will in time undoubtedly disappear but they could almost wholly have been obviated by the exercise on the part of the territory of an intelligent and preliminary supervision of the location and construction of all irrigation works.

Id. Mead proposed, of course, to remedy that situation with the language he drafted for the constitution of the new state, adopted just before he wrote these words, *id.* at 4, and the statutes he helped craft the next year. Arguably, if "coal bed methane facilities" and "well driller" were substituted in this passage for "irrigation works" and "settler," Mead's views on the need for new water regulatory policy via the engineer's office would apply equally well today. The Wyoming Supreme Court took the same view of the goal of the Wyoming's constitutional and statutory provisions on water in the landmark case upholding the state's then-new water law system crafted by Mead, *Farm Investment Co. v. Carpenter*, 61 P. 258 (Wyo. 1900).

20. WYO. CONST. art. I, § 31.

21. *Quinn v. John Whitaker Ranch Co.*, 92 P.2d 568, 571 (1939) (citing *Farm Investment Co. v. Carpenter*, 61 P. 258 (1900)). Note that the statutory language of WYO. STAT. ANN. § 41-3-101 on beneficial use as "the basis, the measure and limit of the right to use water" was not actually enacted until 1909, when the Legislature at the behest of water users and the State Engineer's office chose to include in the statutes language explicitly stating what both groups considered had been implied in

The term "beneficial use" has never been defined further by statute, case law, or regulation.²² Rather, beneficial use has been viewed as the amount of water "reasonably required for the proper and successful cultivation of the land or other use to which the water is applied."²³ In the case of irrigation with surface water, a "duty of water" was developed by the Territorial Engineer's Office working with actual field testing,²⁴ and adopted in the first state water code in 1890,²⁵ setting the familiar standard of "1 cubic foot per second for each 70 acres of land" which is applied in the absence of reliable evidence that a different duty of water is appropriate to particular lands.²⁶ Early Board of Control application of the beneficial use standard in stream-wide adjudications, upheld in the Wyoming Supreme Court, made it clear that the board and the court viewed the beneficial use standard as a weapon against waste. *Nichols v. Hufford* and *Quinn v. Whitaker Ranch* both involved territorial rights, and the question of whether territorial rights should be held to the state statutory rule of 1 cfs per 70 acres was reduced to a question of whether a beneficial use standard inherent since the beginning of the territory had been met—i.e., whether the use of water involved no waste. In *Nichols* the court, and the board in the adjudication that the court upheld, reviewed and accepted testimony on waste from the plaintiff Hufford, himself an engineer. Hufford testified that though Nichols had diverted and used all the water called for under his territorial claim (amounting to all the water in the stream), the water was seen standing in pools on Nichols' land, demonstrating waste.²⁷ The contestants in *Nichols* were implicitly arguing over concepts of the public interest. What prevailed with the board

earlier law. The goal was to correct what they considered an earlier erroneous court ruling. See 1905-06 EIGHTH BIENNIAL REPORT OF THE STATE ENGINEER 81-99; and 1909-1910 TENTH BIENNIAL REPORT OF THE STATE ENGINEER 17-29.

22. Typically, in Wyoming the decision of what use qualifies as a beneficial use has been left to the judgment of the State Engineer and the Board of Control headed by the engineer. The water uses that qualify as beneficial uses in Wyoming have multiplied and changed over time as the engineer rules on specific permit applications or the Board of Control rules on changes of use of adjudicated rights. In the exception that proves the rule, the Wyoming Legislature in 1986 did act to identify one particular, non-consumptive use, in-stream flows for fisheries, as a beneficial use. For a contemporary description of the history of the Wyoming in-stream flow statute, see Matthew Reynolds, *Wyoming's New Instream Flow Act: An Administrative Quagmire*, 21 LAND & WATER L. REV. 455, 458-61 (1986).

23. *Nichols v. Hufford*, 133 P. 1084, 1087-88. (1913).

24. See 1889 SECOND ANNUAL REPORT OF THE TERRITORIAL ENGINEER TO THE GOVERNOR OF WYOMING 27-31.

25. 1890-91 Wyo. Sess. Laws Ch. 8, § 25.

26. *Nichols*, 133 P. at 1087-89. In that case, the Board of Control, in a stream-wide adjudication of the Bear River and its tributaries, had adjudicated Nichols' territorial right and determined that 1 cfs per 70 acres was a reasonable standard to apply, based as it was in practical testing, and in the absence of any credible evidence that Nichols' land required more.

27. *Id.* at 1088.

and the high court was the plaintiff's argument that use of water in excess of the amount needed by crops was waste and was a violation of the public interest. That public interest was conceived of by the plaintiff, the board, and the court, as an interest demanding orderly distribution of limited water resources for the sake of all present and future users and their development of an economy requiring water put to many uses. In *Quinn*, the court upheld a territorial court adjudication of more than 1 cfs per 70 acres to certain lands, as unaffected by the 1890 statutory standard and within the beneficial use limitation on quantity that is inherent in the nature of a water right, noting that there had been no evidence of "actual waste of water" in the exercise of the territorial right using more than 1 cfs per 70 acres.²⁸ Evidence of such "actual waste of water"—water use in excess of the amount necessary for the purpose—clearly would have led to a different result.

Discussion of the issue in early engineer annual reports also makes it clear that the expectation of the engineer and the board was that the "duty of water" would actually change and most likely narrow over time, as demand for water increased and water-use technology improved.²⁹

The intense discussion of the concepts of beneficial use, avoidance of waste, and the duty of water for irrigation between 1888 and 1920 took place in an age that did not include CBM. The history demonstrates that the primary intent of the beneficial use requirement has been to discourage waste, no matter what may be the use to which water is put. Today the major challenge for managing water discharged in the course of CBM production is not how to use it, but how to get rid of it.³⁰ That highlights the need for another intense discussion of beneficial use, in the context of CBM production. It is important now to examine how much water CBM production

28. *Quinn*, 92 P.2d. at 570-72.

29. 1889 SECOND ANNUAL REPORT OF THE TERRITORIAL ENGINEER TO THE GOVERNOR OF WYOMING FOR THE YEAR 28. After discussing the tests done to reach a standard for Wyoming, Elwood Mead comments, "as (the soil) had only been cultivated the two years previous it probably absorbed more water than will be required hereafter, and it is an established fact that wild land requires more water than land cultivated several years. Tests made on the same land hereafter may, therefore, be expected to show a higher duty." In the 1913-1914 TWELFTH ANNUAL REPORT OF THE STATE ENGINEER 16, one of Mead's successors commented that increasing demand for water will lead farmers to "appreciate its real value," drop the "prevailing practice" of using two to three times more water than the 1cfs/70 specified by law, and demand that water users with higher priority rights do the same. A well-known commentator on water law, Clesson S. Kinney, noted in 1912 that with increased settlement, increasing demand for water, and increased technical knowledge on irrigation in the agricultural colleges, irrigators would need less water than originally considered necessary to irrigate their lands. KINNEY ON IRRIGATION, § 885 (2d. ed., 1912).

30. See *supra* note 4 and accompanying text.

really requires, and, in turn, to what uses the water can be put once produced, in order to come as close as possible to ensuring that CBM water once brought to the surface is not water wasted. Avoiding waste can be addressed in both the initial groundwater well permitting and subsequent SEO permitting once the water reaches the surface.

CBM Groundwater Permitting

The State Engineer's Office, early in the development of the CBM industry, declared that production of coal bed methane gas is a beneficial use of water. That declaration is a reasonable one and recognizes the office's authority to regulate CBM water production via the issuance of a permit, as required for all beneficial uses of water.³¹ Significantly, it ensures the SEO a role in CBM decision-making. Filling that role properly is the challenge the SEO now faces. In the past year, with projections of increased CBM industry growth and increased concern that water issues left unattended could hamper the industry,³² the SEO appears to have seen the need to become a more active player in CBM regulation. The office has begun to treat permit issuance as a pivotal point, and in fact has denied permits and threatened action against operators who fail to follow SEO requirements for permitting.³³

There is a further step the SEO must take, however, to follow up properly on its original decision that CBM production is a beneficial use and requires a permit. That further step is ensuring that in the production of the CBM water and in its disposal, no water is wasted. That is what the office has so far failed to do.

To avoid waste in the CBM situation, the SEO should take a two-pronged approach: examining and properly limiting the quantity of water produced in association with the methane gas production process and ensur-

31. Similarly, the SEO has for decades issued permits for mine de-watering as a beneficial use of water. See Barbara G. Stephenson and Albert E. Utton, *The Challenge of Mine Dewatering to Western Water Law and the New Mexico Response*, 15 LAND AND WATER L. REV. 445, 458-60 (1980). By contrast, the SEO does not require or issue water well permits for oil and gas wells producing water as a by-product. WYO. STAT. ANN. §§ 41-3-903, 904 (2005).

32. See *supra* notes 4-13 and accompanying text.

33. State Engineer Pat Tyrrell in March 2006, for instance, announced he had denied permit applications for eighty-three wells to Pinnacle Gas Resources Inc. Pinnacle had failed to get a reservoir permit for planned CBM water storage, which the office now requires before issuing CBM well permits, and Pinnacle had put CBM wells into production before receiving and in some cases before even applying for CBM well permits. Dustin Bleizeffer, *State Seeks Action in Methane Violations*, CASPER STAR-TRIBUNE, Mar. 22, 2006, at A1; Interview with State Engineer Patrick Tyrrell, Mar. 27, 2006.

ing that the water so produced is, as far as possible, put to further beneficial use or made available for future use.

First, the limitation on CBM water production itself. CBM water permits typically contain a volume amount, but the stated volume typically represents only an applicant's estimate,³⁴ not an amount determined by the SEO as appropriate for the intended use. To remedy that, we propose that the concept of beneficial use should be rigorously applied to CBM water to avoid waste of water. The SEO should take the requisite step, as was taken with surface water irrigation, and establish in effect a "duty of water" for CBM.

Though all Wyoming water rights carry an implicit quantity limitation, as noted by the Wyoming Supreme Court, only one surface water use—irrigation—and no groundwater uses thus far have a "duty of water" standard attached to them (though groundwater wells may be limited in the volume of water produced, if drilled within groundwater control areas).³⁵

Yet it is clear that the SEO can take such a step, and establish such a standard, for uses that demand it. And indeed the constitutional language requires the SEO to take such a step.³⁶ Wyoming's water law administrators in 1890 recognized that requirement in the case of surface water irrigation. They saw an increasing demand for water for that purpose and increasing efficiency in water use techniques, affecting a resource likely to be needed for years to come.³⁷ Accordingly they moved to create a "duty of water" standard for surface water irrigation.³⁸ Wyoming's water law administrators

34. Interview with Lisa Lindemann, SEO Groundwater Division Chief (Mar. 22, 2005).

35. WYO. STAT. ANN. § 41-3-915 (2005).

36. See discussion *infra* note 37.

37. As the Wyoming Supreme Court noted in 1913 in *Nichols v. Hufford*,

It is no doubt true that when the appropriators were few, and there was ample water for all, the law was not construed very strictly with reference to the amount of water appropriated But with the increase of the acreage under irrigation and the number of appropriators, requiring economy in the distribution and use of water to make it serve as much land as possible, there has been a gradual and persistent tendency to restrict the appropriation and use to an amount reasonably necessary when properly applied.

Nichols v. Hufford, 133 P. 1084, 1087 (Wyo. 1913).

38. In the same vein, the State Engineer at the turn of the last century reported, under the heading "Impounding Stock Water" that "when application has been made for stock purposes, inquiry as to the number of stock to be watered has been made of the applicant before his application has been passed on. The volume to be impounded under his permit is then limited to the needs of the number of stock for

now should recognize that a similar step is required for CBM-produced water. They should do so for similar reasons. A dramatically increasing demand for water for that use, joined with increasingly efficient technology, is tapping a water resource that future users may need.

Wyoming's constitution requires that the state engineer consider affected public interests in approving water rights permits: "No appropriation shall be denied except when such denial is demanded by the public interests."³⁹ For further emphasis, the constitution states that control of water "must be in the state, which, in providing for its use, shall equally guard all the various interests involved."⁴⁰ These interests, construed even to the most narrow water-rights meaning,⁴¹ must include the public interest in the orderly distribution of a scarce resource that the supreme court has noted since *Farm Investment Co. v. Carpenter*.⁴² Production of amounts of groundwater which prompt companies and regulators alike to see the primary problem as how to get rid of the water surely make it clear that the primary public interest in orderly distribution of a scarce resource is not being met.

Common concerns over CBM water at the SEO itself bolster that conclusion. It is generally acknowledged in the agency that the less water produced with CBM gas, the better. Attempts to supervise disposal of that water in reservoirs has strained the resources of the office;⁴³ complaints have been lodged by downstream irrigators that the natural flow on which they depend has been affected by CBM waters or reservoirs. Production of unnecessary water from CBM wells in fact creates a myriad of public interest problems on the surface, as the discussion below will illustrate further. Unnecessary CBM water production can: degrade surface and groundwater water quality, with long-term damage to local economies; interfere with oth-

which application is made." 1899-1900 REPORT OF THE STATE ENGINEER, at 36.

39. WYO. CONST. art. VIII, § 3. For the statutory provision on groundwater that follows the constitutional requirement, see WYO. STAT. ANN. § 41-3-931 which states, "An application for a permit for a well in any areas not designated as a critical area shall be granted as a matter of course, if the proposed use is beneficial and, if the state engineer finds that the proposed means of diversion and construction are adequate. If the state engineer finds that to grant the application as a matter of course, would not be in public's water interest, then he may deny the application subject to review at the next meeting of the state board of control." WYO. STAT. ANN. § 41-3-931 (2005).

40. WYO. CONST. art. I, § 31.

41. The Wyoming Constitution requires consideration of a far broader range of interests than just the water rights. WYO. CONST. art I, § 31, art. 8, § 3.

42. *Farm Investment Co. v. Carpenter*, 61 P. 258 (Wyo. 1900).

43. By spring 2005, CBM represented two-thirds of the workload of both the surface and groundwater divisions. Interview with Deputy State Engineer Harry LaBonde (Apr. 1, 2005).

ers' use of the surface; create regulatory problems which may deny prior rights holders their water; and encourage construction of reservoirs that by their sheer numbers may evade permitting requirements and which in future may act, as State Engineer Pat Tyrrell has pointed out, as a "sponge"—soaking up natural-flow water that ordinarily would flow to prior rights holders.⁴⁴

Production of unnecessary water from CBM wells also creates public interest problems underground, since it unnecessarily uses a water resource that may well be more limited than surface water resources. There is considerable controversy, and a yawning lack of data, on the actual capacity of aquifers tapped by CBM and the effect of CBM production on those aquifers. That lack of data has prevented the SEO from being able to analyze in detail the extent of the draw-down created by CBM production.⁴⁵ But in principle any significant use of groundwater should properly be considered

44. Interview with Pat Tyrrell, Wyoming State Engineer (Mar. 22, 2005). Tyrrell has required provision for bypass structures to eliminate CBM reservoir capture of natural flows, and that CBM reservoir permits be issued for a limited time period followed by mandatory breach of the reservoir. Ensuring that all CBM reservoirs meet those requirements may be difficult. *See infra* notes 72-75 and accompanying text.

45. The 2006 Legislature appropriated \$200,000 to coalbed methane aquifer impact analysis, for the Wyoming Geological Survey to correlate data produced from existing monitoring wells and other sources. The 2006 Legislature also funded a new position in the SEO groundwater division to monitor permit conditions (although the position is statewide, in the case of CBM water the permit condition would most often be aquifer impact monitoring). Interview with Deputy State Engineer Harry LaBonde (Mar. 23, 2006). Further monitoring wells are likely to be needed (and were included in a larger original appropriation proposal to the Legislature) in order to provide full data on aquifer drawdown by CBM wells. Interview with Ron Surdam, Wyoming State Geologist (Mar. 24, 2006).

How much is too much groundwater to be used for industrial purposes in Wyoming has been a political question, whose answer varies with the eye of the beholder. There was considerable controversy in the 1970s over coal slurry and its proposed export of "Wyoming's gold" (the water, not the coal), a proposal which fueled debate in contemporary races for governor. As a result, the Legislature limited the proposed export in coal slurry pipelines of Powder River Basin groundwater (from a key aquifer tapped for drinking water by area towns) by Energy Transportation Systems Inc. and surface water by Texas Eastern Wyoming Inc. to (a still controversial) 20,000 acre-feet per year, per company (WYO. STAT. ANN. § 41-3-115 (d); enacted 1974, repealed 1985; and WYO. STAT. ANN. § 41-2-301, enacted 1979) (The lines were never built). The 2003 estimated annual production of water from CBM-produced groundwater from the Powder River Basin of approximately 73,000 acre-feet a year is more than three times that amount, but is not officially exported. *See supra* note 5. Meanwhile, based on state figures on Wyoming Powder River Basin coal production, and its average water content, some 79,000 acre-feet a year of Wyoming Powder River Basin groundwater is currently invisibly shipped out of state each year in unit coal trains without raising public ire.

“mining” of that water resource, since its capacity for renewal is typically best measured in geologic rather than in human time. In the absence of adequate data, the presumption should be that groundwater mining is occurring. And meanwhile the state and the industry should take aggressive steps to obtain necessary data on groundwater impacts. Accordingly, it is clearly incumbent on the SEO, even in the absence of any data on aquifer conditions, to keep production of water associated with CBM, a recognized beneficial use, to the amount “reasonably necessary” to accomplish that use.

To meet constitutional obligations, the SEO should establish an efficient procedure to allow public interest concerns over waste of water, including both unnecessary water production and discharge without use of produced water, to be reviewed in the case of each proposed CBM permit in order to decide whether to issue the permit and on what terms.

To accomplish that, the State Engineer in permitting CBM wells should require a permit applicant to establish that the method and quantity of discharge or the management of the discharged water is not wasteful. The best technology available⁴⁶ is the proper standard to apply to determine what amount of water is reasonably necessary to produce in a given well to access the coal-bed gas. That standard is appropriate given that this is a profitable industry, no longer new, for which studies of new technology are being steadily generated.⁴⁷ Adoption of such a standard by the SEO, and its application to CBM permitting decisions, will provide the kind of incentive the industry needs to further pursue and prove technology to limit the amount of water produced from CBM wells.

Specifically, the SEO should examine permit applications case-by-case and require applicants to establish that:

46. The “best technology available” standard suggested here is deliberately phrased so as not to invoke the technical standard used by the Environmental Protection Agency (such as BACTEA–Best Available Control Technology Economically Achievable). The proposal here is that the State Engineer’s Office establish its own standard, with which to determine whether the proposed water discharge from a given well, for which a permit is sought, is wasteful. The standard, however, undoubtedly would include the idea of determining if limited water production and discharge is both technically and economically feasible, as does the EPA standard. Accordingly in this discussion, the echo of the concept behind the EPA standard is intentional.

47. See for instance the proceedings of the First Annual Coalbed Natural Gas Research, Monitoring and Applications Conference, University of Wyoming, Aug. 2004. See also RUCKELHAUS INST. OF ENVTL. AND NATURAL RESOURCES. WATER PRODUCTION FROM COALBED METHANE DEVELOPMENT IN WYOMING: A SUMMARY OF QUANTITY, QUALITY AND MANAGEMENT OPTIONS 29-30, 43-44 (2005), for discussions of new and emerging technologies.

- Volume of produced water: no more water will be produced than is necessary to extract the gas;
- Water re-injection: re-injection of water will be utilized where feasible;
- Water use and treatment: water will be put to new beneficial use where feasible, including treatment and transportation if necessary, rather than storing it with the intent of disposing of it by evaporation and infiltration (a process that can lead to waste or to change of watershed regime affecting other water and land users.)⁴⁸;
- and, generally, all avenues have been explored, and will be utilized where feasible, to either minimize the production of water, or put it to an additional beneficial use once it has been produced.⁴⁹

There may be cases where it can be desirable to produce more water than the amount reasonably necessary for CBM production, because of the independent beneficial uses to which that water would be put. In such cases, the SEO can and should require that a plan of managing that water be submitted, and that the proposed user of that water apply for a water right for it, following the standards set for users filing for water rights in by-product water.⁵⁰ This is already done now with CBM produced water that is put to a new use after it reaches the surface. Proposals to dispose of excess CBM water by storing it and allowing it to seep or evaporate, however, require additional consideration and are discussed below.

48. The new studies authorized by the 2006 Legislature, *supra* notes 9 & 10, and an upcoming open file report by the Wyoming Geological Survey (due out in late spring 2006) focusing on how CBM water can be treated and transported for use, will provide support for this SEO requirement. Interview with Ron Surdam, Wyoming State Geologist (Mar. 24, 2006).

49. One option is, in addition, for the SEO to require a "water management plan" from the applicant and made with the agreement of the affected landowner or downstream users. The Bureau of Land Management requires water management plans for development of federal minerals. E-mail from Kathy Brus, Natural Resource Specialist, Bureau of Land Management, Buffalo Field Office (Mar. 15, 2006), (on file with author). Such plans cannot however take the place of informed state review of whether the best technology available has been pursued to limit the amount of water produced to that reasonably necessary for the purpose. Whatever the views of water management held by individual landowners or water users, they cannot sign away the state's obligation to protect the water resource.

50. WYO. STAT. ANN. §§ 41-3-903 et seq.

As the above discussion demonstrates, the authority, and in fact the mandate, for this approach lies in the Wyoming Constitution, and in the beneficial use statute and the nature of a water right in Wyoming as recognized by the Wyoming Supreme Court.

The Wyoming system makes it clear that it is at the point of water rights permitting, followed by inspection and adjudication, that the State Engineer should exercise his or her discretion and judgment in deciding whether to approve an appropriation following consideration of any public interests involved. With CBM wells, the SEO has reasonably established a practice of not taking CBM permits to adjudication, because of the short time-frame of the water production involved. Permitting is therefore the only point at which the SEO can fulfill the duties in water right issuance imposed by constitution and statute.⁵¹

In connection with the significance of the permitting point in CBM regulation by the SEO, it is also important to consider appropriate notice to potential interested parties and members of the public. These parties need to be alerted to the fact of application for CBM permits from the SEO. They may provide useful input on the question of the best technology available for application at a specific well, and they can bring up other matters that require attention from the State Engineer as part of the engineer's statutory duty to consider the "public's water interest" in granting groundwater permits.⁵² Regulations of the State Engineer's Office deserve an update (the groundwater regulations now in force date from 1974), and are in need of modernized notice provisions generally. Provision for notice via internet website postings of CBM well applications pending before the State Engineer's Office would be an important element to include in that update.

CBM Reservoirs

Reservoirs that receive CBM-produced water demand special policy considerations in SEO permitting. Storage of water has been historically viewed as a good thing, since it provided a more reliable supply of water on demand, so reservoir construction has been smiled upon and permitting requirements (particularly for small impoundments) have not been generally enforced. However, the assumptions underlying that historic approach are not valid when, as in the case of CBM water, the challenge is disposal of water instead of conservation for use.

The advent of CBM and the operators' desire to use storage facilities to dispose of the water they produce requires a whole new look at the pre-

51. The SEO has recognized this principle by using permit denial as a means of enforcing SEO requirements for CBM wells. *See supra* note 31.

52. *See* WYO. STAT. ANN. § 41-3-931; *see also supra* note 37.

sumptions behind storage permits, the permitting process, and permit enforcement.⁵³

The State Engineer's Revised Interim Policy Memo of April 26, 2004 states: "The storage of CBNG produced water is recognized as a beneficial use." The SEO has found this policy useful since the resulting reservoir permit can be a vehicle for imposing special conditions such as time limits on reservoirs storing CBM produced water.⁵⁴ Nonetheless, the SEO should re-examine the policy of blanket recognition of storage of CBM produced water as a beneficial use. It is one thing to say that the production of the water can be beneficial use if it is necessary to produce the gas, but quite another to say that storing the produced CBM water serves any useful purpose. The SEO issues permits for storage of mine-dewatering water and oil and gas by-product water, where no other purpose is served,⁵⁵ but CBM requires a new approach. The prospective volume of CBM water production, and potential proliferation of proposals for CBM reservoirs, requires the SEO to apply more scrutiny to CBM reservoir applications.

The purpose of CBM reservoirs generally is to store unwanted water so that it can be disposed of through infiltration, evaporation, or eventual release.⁵⁶ None of these genuinely constitute beneficial use in themselves. As the volume of CBM produced water and of storage proposals for these purposes grows, the familiar public policy questions are implicated: waste of a scarce resource, groundwater and surface water quality degradation

53. The initial decision letter in a CBM water declaratory judgment action recently decided in the Wyoming District Court, holding that "CBM water is water belonging to the state once that water is legally placed in a watercourse," only reinforces the duty of the SEO to carefully craft its policies on storage of this water. *Williams Production RMT Co. v. Maycock*, Campbell County No. 26099, Decision Letter, Oct. 11, 2005. The District Court's follow-up decision letter, finding that under the facts of that case the CBM producer had not presented evidence sufficient to find that the drainages at issue there constituted a "watercourse," presents interesting questions about when produced water can flow freely through a watercourse as a right, through the State easement, and when the water constitutes a trespass. *Williams Production RMT Co. v. Maycock*, Campbell County No. 26099, Decision Letter, Mar. 16, 2006.

54. See *infra* text accompanying note 66.

55. Interview with Pat Tyrrell, State Engineer (Mar. 27, 2006).

56. The benefits of providing stock-watering in arid regions have been much-touted, and the authors recognize those benefits do exist. However, as only a small fraction of CBM water could be consumed by the number of livestock and wildlife actually present in the Powder River Basin, suggestions that livestock and wildlife consumption could satisfy a beneficial use requirement for unlimited quantities of water should be met with skepticism. See also *supra* note 38 above, for the SEO's view early in the last century of the need to identify the number of stock being watered in order to determine the appropriate size of stockwater reservoir to be permitted.

through infiltration of shallow aquifers and return flows to streams rendering the scarce resource unusable, creation of salt flats when the reservoirs dry up, the “sponge” problem of multiple scattered reservoirs soaking up natural flow that otherwise would flow to holders of prior rights, etc.

Beneficial use for storage should be a threshold question for the SEO with CBM produced water. Storage for its own sake is not a beneficial use. Storage for another purpose, such as livestock watering, should be accompanied by some quantity limitation. Plans for these or other subsequent uses should be examined and linked to the issuance of the groundwater permit for production of the CBM water, as part of the “best technology available” test proposed above.⁵⁷ After careful determination whether beneficial use exists, then the question of properly permitting the storage reservoir arises.

Permitting of CBM reservoirs in key parts of the Powder River Basin has been dogged by the history of water regulation in the area. Historically, irrigation has been scarce in the eastern Johnson County/western Campbell County portions of the Powder River Basin, and stock reservoirs and minor water-spreading devices have accordingly often been built and operated without permits.⁵⁸ That has meant little water rights regulation in parts of the basin that are now the focus of CBM activity. As CBM production swept the area, CBM reservoirs have typically been constructed (or old un-permitted ranch reservoirs are converted to CBM use) prior to permit issuance, and often even prior to application for a permit. Inertia from the tradition of little regulation in these parts of the basin seems to have carried into the CBM era. The SEO did not until 2005 pro-actively enforce statutory requirements that would-be reservoir owners get SEO permits before constructing a reservoir. Rather, for some time the office held to the practice of not looking for un-permitted reservoirs in the area, or imposing requirements on them, until a situation developed indicating potential injury to a senior water-rights user.⁵⁹ As a result, early in 2005 a consultant study for the SEO showed 217 on-channel reservoirs in Rawhide Creek drainage alone—and over half of them were not permitted.⁶⁰ Since then the SEO has

57. See *supra* notes 41-43 and accompanying text. The SEO has already linked reservoir permits to groundwater permits, denying groundwater permits if operators have not received SEO permits for planned associated reservoirs. See *supra* note 31.

58. See, e.g., facts described in *Scott v. Swartz*, 522 P.2d 151 (Wyo. 1974).

59. Interview with Patrick Tyrrell, State Engineer (Mar. 27, 2006).

60. See Dustin Bleizeffer, *Governor Seeks More CBM Oversight*, CASPER STAR-TRIBUNE, Jan. 14, 2005 (reporting State Engineer Patrick Tyrrell was “stunned” to learn that 153 of 217—or seventy percent—of the on-channel reservoirs on Rawhide Creek alone were not permitted with his office.). Tyrrell later said that an SEO check on the consultant’s figures brought the un-permitted number of reservoirs down to around fifty percent of the total—and, knowing the regulatory history of the

begun to reverse its dismal record on CBM storage reservoir permitting. In 2005-2006, the SEO has added new positions to deal with CBM reservoirs, sought and won new legislative penalty provisions for reservoirs lacking permits,⁶¹ and has started issuing “cease use” orders for some reservoirs found operating without proper permits, whether or not there appears to be potential for “injury” to other water rights holders.⁶²

The inertia that plagued SEO regulation of CBM reservoirs for years before 2005 was unnecessary and damaging to effective supervision of the industry. Wyoming law clearly supports the SEO’s current more pro-active approach. The SEO has always had the authority to require issuance of a reservoir permit prior to reservoir construction. The reservoir statute requires that application be made before beginning construction.⁶³ There is clearly a common sense argument against sanctioning the build-first, permit-later-if-we-find-you approach. Review of the proposed reservoir and its impacts prior to construction allows for the careful consideration that is required of the State Engineer by the Wyoming Constitution, which gives the State Engineer the authority and the duty to exercise “general supervision of the waters of the state.”⁶⁴

Pre-construction evaluation (including determination of beneficial use) has also always been envisioned by the reservoir statutes. In addition to requiring a permit application before construction, the reservoir statutes say that it shall be unlawful to construct a dam until plans have been approved by the SEO.⁶⁵ Further clear support is found in the SEO rules, which state that “A permit from the State Engineer is required before commencing construction of any dam or reservoir”⁶⁶ Recently the Wyoming Supreme Court clearly stated the correct procedure:

Under administrative procedures adopted by Wyoming, water rights are perfected in three steps. First, a prospective

Powder River Basin, that figure did not surprise him. Interview with State Engineer Patrick Tyrrell (Mar. 27, 2006).

61. Enacted by the 2005 Legislature, in amendments to WYO. STAT. ANN. § 41-3-616 (2005). See *infra* note 68 and accompanying text.

62. See Bleizeffer, *supra*, note 31; Interview with State Engineer Patrick Tyrrell, Mar. 27, 2006.

63. WYO. STAT. ANN. § 41-3-301 (2005).

64. WYO. CONST. art. VIII, § 5.

65. See WYO. STAT. ANN. §§ 41-3-302, 41-3-305 and 41-3-615 (2005) (stating, respectively, that “[a]ll applications under this article [Reservoirs] shall be subject to the provisions of . . . § 41-3-615” and “plans for any diversion dam across the channel of a running stream, . . . shall be submitted to the state engineer for his approval, and it shall be unlawful to construct such diversion dam until the said plans have been approved.”).

66. SEO Rules, Part I, Chapter V, §1(a).

user must apply for a permit to divert or impound state waters. See Wyo. Stat. Ann. § 41-4-501 (LexisNexis 2003) (direct-flow permits) and § 41-3-301 (reservoir permits). Second, if the permit application is approved (upon a finding that water is available and other requirements are met), the applicant is authorized to construct diversion and/or storage structures, and to appropriate water through such structures, in accord with the permit's terms.⁶⁷

The provision of Article VIII, Section 5 of the Wyoming Constitution giving the SEO "general supervision of the waters of the state and the officers connected with its distribution" has been the source of enforcement authority for the SEO. The statutes give the Superintendents the duty to, "under the general supervision of the state engineer, execute the laws relative to the distribution of water . . ." ⁶⁸ The water commissioners, in turn, have the power to arrest "persons offending."⁶⁹ The commissioners perform their duties under the general direction and supervision of the superintendent.⁷⁰ Essentially the superintendent and the commissioner take the actual law enforcement steps, but they do so under the direction of the SEO, and his duty to supervise the waters of the state, in accordance with the statutes, is clear.

Revisions adopted by the 2005 Legislature were advertised as providing the SEO with stronger penalty provisions to aid enforcement, which they do. New language in section 41-3-616 of the Wyoming Statutes allows for a daily fine for violations of the water rights statutes of up to \$1,250 per day. However, new language in the reservoir statute gives a grace period to owners of small (less than twenty acre feet and less than twenty foot dam height) un-permitted reservoirs. Many CBM reservoirs qualify as small reservoirs. Owners of such reservoirs now have forty-five days after receipt of a notice of violation in which to submit an application for a reservoir permit. The SEO does nonetheless properly reserve the right to breach or issue orders to cease storage in such reservoirs, whether or not they have permits.⁷¹ The provision for forty-five days to submit a proper application, however, only perpetuates the current practice of ignoring the reservoir permit requirement. While the loophole was justified as protection for landowners who have historically used un-permitted reservoirs, that concern would have been easily addressed by giving owners of existing reservoirs a period in

67. The General Adjudication of all Rights to Use Water in the Big Horn River System and all other Sources, State of Wyoming Phase III, 85 P.3d 981, 989 (Wyo. 2004) (emphasis added).

68. WYO. STAT. ANN. § 41-3-503.

69. WYO. STAT. ANN. § 41-3-605 .

70. WYO. STAT. ANN. § 41-3-606 .

71. Interview with Patrick Tyrrell, State Engineer (Mar. 27, 2006).

which to apply for permits—instead of encouraging non-compliance into the future.

It is not acceptable for the SEO to wait until there is a call for regulation, and then go out and see what reservoirs may exist. The approach required by the law, as discussed above, is to consider the impacts prior to a call. Although a call for regulation has historically served as an effective method of policing water use, in these circumstances of major CBM water production and widespread reservoir construction it is merely an abdication of the SEO's duties. Many of the affected drainages are ephemeral streams, the senior right holders often do not have knowledge of the dams upstream of them, are unable to verify what waters might have been available to them, and cannot get the SEO to respond to a call for regulation in a timely way – that is, before the ephemeral flow has ended. Nor is it sufficient to rely upon the SEO's eventual ability to review and possibly reject a reservoir permit applied for after a reservoir already constructed is discovered; it is far more effective to require that a reservoir be initially constructed in observance of existing senior water rights and watershed conditions. With or without the latest statutory changes, the SEO must take a more proactive role in carrying out his duty to supervise the waters of the state by supervising reservoirs, particularly on-channel reservoirs, because they directly impact the availability of water under the prior appropriation system. The SEO has adopted policies intended to address the impacts of on-channel CBM reservoirs. A January 9, 2003 "Draft Guidance Memorandum" suggests three options to deal with the possibility of a call for regulation by a senior water right holder. The applicant "can commit to construction" of a by-pass structure; can submit a water administration plan with landowner approval; or the applicant can demonstrate that the drainage area above the reservoir is minimal.⁷² This is a good start, and would be effective if reservoirs were constructed after permits were issued with the appropriate terms; if SEO inspection staff were sufficient in number to ensure that all CBM reservoirs do have to meet SEO requirements; and if the "policies" were properly enacted rules and therefore enforceable with the force and effect of a law.

Proper regulation of CBM reservoirs and their impact on downstream water users further requires the SEO to expand its considerations to include water quality. While the SEO has historically considered injury to a downstream appropriator in the issuance of permits and regulation of water rights,⁷³ the office to date has declined to consider injury that results from

72. Draft Guidance Memorandum from John Barnes, Surface Water Administrator, Wyoming State Engineer's Office to CBM Operators (Jan. 9, 2003).

73. See, e.g., WYO. STAT. ANN. § 41-3-305 (2005), providing for the issuance of permits to store water "so long as no other Wyoming appropriator or user is injured or affected thereby."

impacts to water quality. This is an issue that can arise with CBM water, and one the SEO can address.

For example, in the case where a downstream irrigator with senior rights historically relied on natural flows to irrigate hay, after CBM the quantity of water may be greater than before. But if the water's salinity makes it unusable for irrigation, then the CBM water causes injury to the downstream water right holder. In that case the SEO has the authority to,⁷⁴ and should, regulate to prevent the injury. The quantity of water is meaningless when it cannot be put to the beneficial use for which it was permitted, and the SEO cannot ignore that fact. It will require more than allowing construction of reservoirs with simple by-pass structures to ensure that low-quality water does not reach the senior water-right holder downstream due to mixing in storage of natural runoff water and CBM water.

A new policy the SEO has developed to address unique CBM issues is the one that issues reservoir permits for a finite period (fifteen years or until the facility ceases to receive CBM water discharges,⁷⁵) with a mandatory breach to occur at the end of that period. This policy recognizes that the dams will merely obstruct natural flows when they no longer store CBM discharge water. The preferred solution to that problem is to minimize water production, as discussed above. It remains to be seen how the SEO will enforce the breach requirement, and who will pay to breach the dams. Often the dams are permitted in the name of the landowner, not the CBM operator, so will the obligation to breach be enforced against the landowner? Will that landowner be able to undertake the expense or want the dam to be breached? Of course, the only truly effective way of enforcing the breach requirement is to require the permittee or operator to post a bond.

In all these areas of water quantity regulation of CBM water by the SEO, a process targeted to CBM water and designed for efficient but effective case-by-case review of permit applications can and should be developed by the office. Rulemaking will be sufficient to address all but one issue. Rulemaking can address the following: electronic notice of CBM well permit applications; permit application requirement for proof of minimum water production or a permitted beneficial use of excess production; beneficial use review for CBM water reservoir applications; reiteration of a requirement for a permit pre-construction, and the penalties for failure to obtain a permit; reservoir requirements for protection of senior water-right holders from wa-

74. *Arizona Copper Co. v. Gillespie*, 230 U.S. 46, 56-57 (1912) ("The only subordination of one water user to another is the right of the first appropriator to a sufficiency of water for his necessary uses. That includes the quality as well as the quantity."); WYO. STAT. ANN. § 41-3-305 (2005).

75. Revised Interim Policy Memo from Pat Tyrrell, Wyoming State Engineer to State Engineer's Office (Apr. 26, 2004).

ter quality contamination; and adoption as rules of the new policies on bypass and breaching of CBM reservoirs. The only statutory change recommended here would create a one-time grace period for owners of existing small reservoirs to apply for permits, and ensure that after that period owners of small reservoirs are subject to standard penalties if their facilities have no permit.

The SEO must also promptly promulgate rules that create the procedure for consideration of the public interest, and for equal weighing of the various interests involved, in order to meet its constitutional obligations.

With slight statutory changes—plus the major additional staffing that will undoubtedly be necessary—the SEO should require no additional authority in order to make the crucial changes in its CBM permitting policy and properly protect Wyoming’s water resources.

III. WATER QUALITY REGULATION—THE WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

The DEQ, like the SEO, has unsuccessfully attempted to apply historic concepts of beneficial use to CBM water. As a result, it too has failed to fulfill its statutory obligations. The Environmental Quality Act’s (EQA) policy and purpose is, among other things, to preserve and enhance the water of Wyoming.⁷⁶ To date, DEQ’s regulation of CBM water has resulted in waste and degradation of the water of Wyoming. This is in large part due to a regulatory framework that was developed on the assumption that because water was a scarce and valuable resource, in arid regions such as Wyoming there would exist some useful purpose for water discharged as by-product of oil and gas production. Although it protests that it cannot regulate water

76. Wyoming Statute explains:

Whereas pollution of the air, water and land of this state will imperil public health and welfare, create public or private nuisances, be harmful to wildlife, fish and aquatic life, and impair domestic, agricultural, industrial, recreational and other beneficial uses; it is hereby declared to be the policy and purpose of this act to enable the state to prevent, reduce and eliminate pollution; to preserve, and enhance the air, water and reclaim the land of Wyoming; to plan the development, use, reclamation, preservation and enhancement of the air, land and water resources of the state; to preserve and exercise the primary responsibilities and rights of the state of Wyoming; to retain for the state the control over its air, land and water and to secure cooperation between agencies of the state, agencies of other states, interstate agencies, and the federal government in carrying out these objectives.

quantity, in essence that is exactly what it has been doing, by allowing unlimited CBM water to be discharged based on DEQ's "beneficial use" presumption. Because that presumption is not generally valid in the case of CBM water, the historic "beneficial use" exceptions now being applied to CBM water regulation in practice violate the letter and the spirit of both the EQA and the Clean Water Act.⁷⁷

Regulation of CBM water discharges has occurred in the framework of the National Pollution Discharge Elimination System. As authorized by the Clean Water Act, the NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States directly to surface waters. Congress adopted the Clean Water Act (CWA), (also known as the Federal Water Pollution Control Act Amendments of 1972), with the intent to "[r]estor[e] and maint[ain] the chemical, physical, and biological integrity of [the] Nation's waters."⁷⁸ The CWA prohibits the discharge of pollutants into the waters of the United States unless such discharge is in compliance with a permit. NPDES permits may be issued by either the EPA or a state agency authorized to administer the program. The Wyoming DEQ is authorized to issue WYPDES permits, under the standards set forth in the CWA and the rules promulgated thereunder.

Wyoming DEQ rules set forth the criteria for issuance of a WYPDES permit. The "beneficial use" exclusion in those rules allows discharge of produced water into the surface waters of the state when "[t]he produced water shall be of good enough quality to be used for wildlife or livestock watering or other agricultural uses and [is] actually put to such use during periods of discharge."⁷⁹ In practice this has meant that DEQ has imposed no limit to the quantity of water discharged, so long as it was of sufficient quality that wildlife or livestock might drink it. The "beneficial use" exclusion to the general rules of no water discharge has its origins in the Environmental Protection Agency's (EPA) Effluent Limitation Guidelines (ELGs) for the Oil and Gas Point Source Category.⁸⁰ As the EPA and DEQ recognize, "EPA did not consider CBM facilities when developing [the ELGs]."⁸¹ EPA has stated that it does not believe the Oil and Gas ELGs are

77. 33 U.S.C. § 1251 (2005) et seq.

78. 33 U.S.C. § 1251(a).

79. Wyoming Department of Environmental Quality Water Quality Rules Chapter 2, Permit Regulations for Discharges to Wyoming Surface Waters, Appendix H, available at http://deq.state.wy.us/wqd/WQDRules/Chapter_02.pdf (last visited Apr. 9, 2006).

80. 40 C.F.R. § 435 (2006).

81. Letter from Mike Reed, EPA, to Leah Krafft, WDEQ, which states:

The EPA Effluent Guidelines and Standards for Oil and Gas Extraction Point Source Category (Part 435, Subpart E) predate the development of coal bed methane extraction technology; however

the best method for regulating CBM water, because CBM “has very different economics and technical considerations, generates different volumes of produced waters, and has different water-quality constituent characteristics.”⁸² The general rule set forth in 40 CFR part 435 is that there be *no discharge* of water in conjunction with gas and oil production. Subpart E of that rule “allows the discharge of produced water from facilities west of the 98th meridian for use in agriculture and wildlife propagation.” The logic behind this exclusion is apparent—if water is being produced in the arid American west that could be put to use for agriculture or wildlife production, then its discharge should not be prohibited. DEQ recognizes this rationale in its April 25, 2005 memo attempting to justify its use of the 40 CFR part 435 ELG: “For oil and gas discharges, including CBNG permits issued from 1974 through 2000 by Wyoming, it was assumed that in the arid west region, the produced water would be used for agricultural or wildlife propagation so long as water quality standards and effluent limitations were met.”⁸³ That is no longer a valid assumption, and the DEQ, like the SEO, must manage CBM discharge water by recognizing that it is not generally being used; it is being disposed of. The problem is two-fold. DEQ not only continues to make the beneficial use assumption in the face of the undeniable fact that the majority of CBM water is being disposed of; it also has consistently refused to regulate quantity of water, as distinct from its quality. That distinction is an artificial one, without support in either law or fact.

CBM water’s impact typically arises from a combination of its quality, its quantity, and the geography and topography of the drainage where it is discharged. For example, on many drainages with CBM development in Wyoming, the soils are high in salinity. Successful irrigation practices have evolved over the years, based on ephemeral flooding which has not only irrigated the crops (often native hay meadows), but has also served to leach the soil and clear the root zones of salinity. A *steady* delivery of smaller

the technology is similar enough to conventional gas extraction that, in the professional judgment of the DEQ, this effluent limit guideline is appropriately applied to coal bed methane gas production.

Letter from Mike Reed, EPA, to Leah Krafft, WDEQ, “Sample NPDES permit” (Jan. 5, 2001) (on file with the authors).

82. U.S. EPA, GUIDANCE FOR DEVELOPING TECHNOLOGY-BASED LIMITS FOR COALBED METHANE OPERATIONS: ECONOMIC ANALYSIS OF THE POWDER RIVER BASIN 1-4 (Feb., 2003).

83. Wyoming Pollutant Discharge Elimination System (WYPDES) Program Basis for Technology-Based Effluent Limits in Coal Bed Methane (Natural Gas) WYPDES Permits, attached to letter from John Corra, DEQ, to Mr. Stephen Tuber, EPA, at 4 (Apr. 25, 2005) (on file with the authors).

flows of water (no matter what the water quality is) which may be provided by CBM discharge would adversely impact the soil or crop in this scenario.⁸⁴

The EQA provides DEQ with ample authority, independent of the CWA, to address these types of impacts. As pointed out in the April 12, 2006 Wyoming Attorney General's opinion,⁸⁵ the definition of "pollution" is a broad one. That definition, in turn, defines the scope of the DEQ's regulatory authority over water quality issues. It encompasses, for example, discharges that would alter water such that it was injurious to agricultural uses or injurious to livestock, wildlife, or aquatic life.⁸⁶ The Attorney General also opined that the DEQ has authority to regulate water quantity "[i]f the quantity of water is causing unacceptable water quality or has the potential to cause unacceptable water quality. . ."⁸⁷ The authors agree that DEQ has such authority and contend that such authority has heretofore not been exercised. For example, DEQ can and should regulate CBM water discharges that have the ultimate effect of damaging livestock forage in bottomlands, whether that damage is by flooding, salt mobilization from the stream channel, or poor quality of water discharged at the wellhead.

Water quality rules provide some measure of protection where crop (for example, irrigated hay lands) production would be measurably decreased. Quality Standards for Wyoming Surface Water, Chapter 1, section 20, states:

All Wyoming surface waters which have the natural water quality potential for use as an agricultural water supply shall be maintained at a quality which allows continued use of such water for agricultural purposes.

Degradation of such waters shall not be of such an extent to cause a measurable decrease in crop or livestock production.⁸⁸

84. The Maycock case Decision Letter of March 16, 2006, *supra* note 53, suggesting that discharge of quantities of CBM water into an ephemeral stream may require an easement from landowners crossed by the ephemeral stream, would seem to support the argument that ephemeral drainages deserve special consideration in state permitting of CBM water production and disposal.

85. *Supra* note 16.

86. WYO.STAT. ANN. § 35-11-103(c)(i) (2005).

87. Formal Opinion 2006-01 at 8.

88. The interpretation of the "crop or livestock production" language was still in a state of flux as this article went to press, and the Agricultural Use Implementation Policy was subject to final revisions. It seems clear, in light of the Attorney General's opinion, that the language should be given its broadest meaning.

Unless otherwise demonstrated, all Wyoming surface waters have the natural water quality potential for use as an agricultural water supply.

The challenges presented by the “measurable decrease” standard are obvious in a land where the crop or forage is rarely measured and varies with the rainfall. The DEQ has begun to do a better job of placing the burden of demonstrating no measurable decrease on the permit applicant, rather than on the landowner after issuance of the permit and the commencement of CBM discharges. The correct approach is to require the applicant to establish, first, what is the crop or livestock production that could be impacted, so that there is a baseline from which to measure any decrease, and, second, that the water discharged will be managed in such a way that no decrease will result.

The real shortcoming of this rule, and of DEQ’s entire approach to CBM water, is that it fails to address the broad spectrum of possible environmental impacts of CBM discharge water. Often the quality of CBM discharge water is so poor (high sodium adsorption ration SAR; or salinity, measured by Electrical Conductivity—EC) that the degradation of water quality is clear.⁸⁹ Frequently the quality of the CBM discharge water is arguably no worse than the natural flow, but the increase in flow that results from CBM discharge water is harmful because of the poor quality of existing soils. This is the type of impact the DEQ has to date failed to address, in spite of authority to do so.

Only recently has the DEQ begun to consider the cumulative flows of all discharges in a particular drainage. DEQ recognized two significant issues raised by CBM discharge water which have previously been unaddressed: cumulative impacts in any watershed and possible impacts to groundwater.⁹⁰ But the memos fall short of dealing with those two issues. Rather, they appear to be a recognition that the issues need to be dealt with. While DEQ formulates its policies, CBM water continues to be discharged at an unprecedented rate. In the Powder River Basin alone, in January 2005, 135 acre-feet of water were discharged, compared to about 250 gallons of water—essentially an immeasurable fraction of an acre-foot—in January 1989, according to the Wyoming Oil & Gas Conservation Commission. The current policy regarding groundwater monitoring requirements specifically

89. Girisha K. Ganjegunte, George F. Vance, & Lyle A. King, *Soil Chemical Changes Resulting from Irrigation with Water Co-Produced with Coalbed Natural Gas*, 34 J. ENVTL QUALITY 2217 (2005).

90. Memorandum from John Wagner, Water Quality Division Administrator, “Approaches to CBM Watershed Based Permitting and Groundwater Monitoring Requirements for CBM Ponds” (June 14, 2004); Memorandum from John Wagner, Water Quality Division Administrator, “Updated Approach to CBM Watershed Based Permitting,” (Jan. 4, 2005) (revising the June 14 memorandum).

states, "The WYPDES program will no longer delay the issuance of individual WYPDES permits while waiting for confirmation with the compliance monitoring" but permits "will contain an enforceable condition that specifies outfalls are not authorized to discharge until a written groundwater compliance approval has been issued."⁹¹

DEQ has severely limited its own ability to regulate CBM water and its impacts by taking the incorrect position that it is not authorized to regulate water quantity. Consider the scenario in which CBM wells produce water over a 100-square-mile area where previously there had been no reliable water source. It could be a good thing for a small herd of antelope and a few head of cows to have water available. That's all that's required by the current rules and DEQ practice. But, will a few tire tanks satisfy the wildlife and cattle needs? What about several fifteen-acre-foot reservoirs? Just how many antelope and cattle are we talking about? And what about the water that is being flushed down the drainage and into the main-stem? Many downstream ranchers and irrigators (including the State of Montana) do not welcome the water, and there is a great deal of evidence that it is degrading water quality, in contravention of the EQA and CWA. Neither law provides justification in the fact there may be an antelope or cow that may be thirsty. A quantity parameter should be included in the quality/beneficial use standard in order to have it serve any useful purpose. Such a parameter can properly be introduced by DEQ under current EQA and CWA authority.⁹² Implementation of quantity parameters that force transportation and use, as well as treatment to upgrade quality, may well prove to be reasonable under new and pending state studies of treatment, gathering and transportation options for CBM water.⁹³ DEQ water quantity parameters can then provide a much-needed incentive for the industry to take on treatment, gathering and transportation of CBM water for use.

Consideration of water quantity parameters by the DEQ is not foreclosed by SEO jurisdiction. The EQA clearly provides that the law does not authorize DEQ to limit or interfere with the jurisdiction of the SEO.⁹⁴

91. Memorandum from Todd Parfitt, WYPDES Program Manager, Integration of Groundwater Monitoring Requirements for CBM Ponds into the WYPDES Permitting Process (Apr. 14, 2004).

92. The Wyoming Environmental Quality Council voted unanimously in February 2006, to set a hearing on a Petition for Rulemaking filed by a landowner group and individual landowners. The proposed rule would require DEQ to consider the quantity parameter of water quality when it permits discharge of CBM water. The outcome of the hearing was not known at the date of this publication.

93. See *supra* note 9; Wyoming Geological Survey Report, *supra* note 45.

94. WYO. STAT. ANN. § 35-11-1104 (2005).

Wherever the SEO has made the statutory determination of beneficial use and issued a valid water right, DEQ regulation would have to defer to that SEO determination. Until DEQ regulation encountered SEO regulation, it should actively consider the quantity parameter in order to effectively fulfill its function to regulate quality.

Water quantity is not excluded from the arena of the CWA. The United States Supreme Court addressed an attempt to draw a line between water quantity and water quality under the CWA,⁹⁵ and held:

Petitioners also assert more generally that the Clean Water Act is only concerned with water “quality,” and does not allow the regulation of water “quantity.” This is an artificial distinction. In many cases, water quantity is closely related to water quality; a sufficient lowering of the water quantity in a body of water could destroy all of its designated uses, be it for drinking water, recreation, navigation or, as here, as a fishery. In any event, there is recognition in the Clean Water Act itself that reduced stream flow, i.e., diminishment of water quantity, can constitute water pollution. First, the Act’s definition of pollution as “the man-made or man induced alteration of the chemical, physical, biological, and radiological integrity of water” encompasses the effects of reduced water quantity. This broad conception of pollution—one which expressly evinces Congress’ concern with the physical and biological integrity of water—refutes petitioners’ assertion that the Act draws a sharp distinction between the regulation of water “quantity” and water “quality.” Moreover . . . the Act expressly recognizes that water

(a) Nothing in this act:

- (iii) Limits or interferes with the jurisdiction, duties or authority of the state engineer, the state board of control, the director of the Wyoming game and fish department, the state mine inspector, the oil and gas supervisor or the oil and gas conservation commission, or the occupational health and safety commission.

Id.

95. PUD No. 1 of Jefferson County v. Washington Dept. of Ecology, 511 U.S. 700 (1994).

“pollution” may result from “changes in the movement, flow, or circulation of any navigable waters”⁹⁶

Cases applying the Clean Water Act in the Tenth Circuit have reached the same result.⁹⁷

The Wyoming DEQ must reexamine its NPDES permitting in order to properly address the environmental issues raised by CBM water discharges. It too should begin by scrutinizing the volume of water discharged and require applicants to minimize volume of discharges wherever feasible. It should aggressively pursue watershed permitting that not only considers but also regulates all impacts that have the potential to cause unacceptable water quality and incorporate groundwater protection into the permitting process.

Additional statutory language may be needed to help DEQ address specific technical problems in CBM permitting. The crucial base of authority, however, is already in the EQA and CWA and should be acted upon. Any new provisions can then be added to that solid foundation for CBM water regulation.

IV. CONCLUSION

Both the DEQ and the SEO must recognize that the old practices, built on the understanding that there was not enough water, must be reexamined in today's world of CBM water—there is too much of it. In order to effectively address this reality, both agencies need to abandon their rigid adherence to the regulatory division between water quantity and water quality, which has resulted in leaving the intersection of quantity and quality unregulated. It is that intersection that is the unique province of CBM water, and with the massive CBM development yet to come in the state, that province must be clearly regulated by Wyoming's water regulators. The SEO must acknowledge that the historic tenets of beneficial use require the office

96. *Id.* at 719-20.

97. *Quivira Mining Co. v. United States EPA*, 765 F.2d 126, 129 (10th Cir. 1985)(quoting *United States v. Earth Sciences, Inc.*, 599 F.2d 368, 373 (10th Cir. 1979)(“The touchstone of the regulatory scheme is that those needing to use the waters for waste distribution must seek and obtain a permit to discharge that waste, with the *quantity* and *quality* of the discharge regulated.”)(emphasis added); *Riverside Irrigation Dist. v. Andrews*, 758 F.2d 508, 512 (10th Cir. 1985)(stating that “both the statute and the regulations authorize the Corps to consider downstream effects of changes in water *quantity* as well as on-site changes in water *quality*”)(emphasis added); *Alameda Water & Sanitation v. Reilly*, 930 F.Supp. 486, 491 (D.Colo. 1996)(citing *PUD No. 1* in rejecting plaintiff's contention “that in enacting the CWA Congress was concerned only with water *quality* impacts, such as pollution, and not effects relating to water *quantity*”)(emphasis added).

to scrutinize the quantity of water that is produced for the “beneficial use” of producing CBM, the purposes for which it may be stored, and the water quality problems that release of such storage may entail. Likewise, the DEQ must acknowledge that water quantity is intertwined with water quality. DEQ sacrifices its charge to preserve and enhance the water resource⁹⁸ so long as it continues to ignore the impacts of water quantity. The agencies’ legal advisors in the Attorney General’s office must take a much more vigorous stance in interpretation of the constitution and statutes, in order to support the agencies in undertaking their duties to protect state resources. Taking the proper approach to both quantity and quality issues in CBM regulation can be done under current authority by both agencies. Implementation of new procedures will require more staff for both the SEO and DEQ. Staffing needs must be met, and of course they can be, with the revenues coming in to the state from CBM. The SEO and the Governor should impress upon the Legislature the need to hire knowledgeable staff who can properly handle the information that CBM companies should submit in order to obtain permits in a properly-administered system. Both agencies should also consider requesting further state investment in creation of water quantity and quality data-bases that will improve their regulatory ability in the case of these crucial resources and this crucial industry. The 2006 Legislature created a task force “to review and evaluate alternative uses of water produced,” which will include a review of current statutes and regulations.⁹⁹ This may provide an opportunity for consideration of needed revisions to laws and regulations, with an initial report due in December 2006. Montana’s new water quality restrictions and the Wyoming studies of options for CBM water transportation and use should further fuel the SEO and DEQ efforts to use the full extent of their authority to regulate CBM water.¹⁰⁰ Both the SEO and DEQ are finding their way toward effective regulation of CBM produced water; they are adopting policies and starting to undertake implementation of those policies that begin to recognize the unique issues they now face. Both agencies can more immediately get control of those issues if they recognize the unique nature of the CBM water discharges requires a fresh approach, and they must undertake the new approach quickly in order to meet their statutory and constitutional obligations.

98. WYO. STAT. ANN. § 35-11-102 (2005).

99. S. Enrolled Act 55, § 21 58th Leg., (Wyo. 2006).

100. See *supra* notes 6, 9, and 76.

