

BEFORE THE ENVIRONMENTAL QUALITY COUNCIL

COMMENTS OF POWDER RIVER BASIN RESOURCE COUNCIL
On WYOMING WATER QUALITY RULES, CHAPTER 1

Powder River Basin Resource Council, by and through its undersigned counsel, submits the following comments on the proposed Wyoming Water Quality Rules and Regulations Chapter 1, and specifically Appendix H, the Agricultural Use Protection Policy.

While PRBRC applauds DEQ's effort to improve its regulation of the impacts of CBM water discharge on agricultural use and its recognition that stream systems in Wyoming are being adversely affected by wastewater discharges from industrial activities, the proposed rule still falls short of the Environmental Quality Act (EQA) mandate to "prevent, reduce and eliminate pollution" and to "preserve and enhance the . . . water and reclaim the land of Wyoming." WYO. STAT. § 35-11-102.

This rule has it backwards. DEQ should be setting effluent limitations that are protective of existing and designated uses and requiring the polluter to conform discharge to those limitations. Instead, this rule contorts effluent limitations to allow unaltered CBM discharges. The result is an increase in pollution and long term damage to the irrigable lands of Wyoming.

I. The rule recognizes scientifically defensible Tier 1 default limits deemed to be protective of agriculture, and then defeats their purpose by allowing Tier 2 and Tier 3 mechanisms for avoiding the limits.

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Environmental Quality Council**

The Tier 2 and Tier 3 mechanisms are nothing more than a dressed-up method for continuing to allow CBM discharges that violate the EQA and authorize a measurable decrease in crop or livestock production. As stated in the current Chapter 1, Section 20:

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 waters for agricultural purposes.

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

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

The standard is to allow “no measurable decrease in crop or livestock production.” If, as WDEQ has determined, the default limits are protective and will prevent such a measurable decrease, then those limits should be the standard and not the exception.

In practice, the use of the default procedure will only apply where permitted discharges are of exceptionally high quality. ” Tiers 2 and 3 will allow DEQ to contort effluent limits to allow discharges, rather than requiring discharges to conform to reasonable effluent limits that are protective of existing uses. DEQ forgets that the objective is to reduce or eliminate pollution, not to facilitate CBM production at the lowest cost to industry.

A. The Tier 2 and 3 “Refinements” are fundamentally flawed.

If, for the sake of argument, one accepts that DEQ’s default limits are more stringent than necessary, and that less stringent effluent limits would be adequately protective, the Tier 2 & 3 “refinements” of EC and SAR limits, as proposed, are seriously

flawed. The first problems are found in the Tier 2 process which would establish effluent limits on the basis of background water quality.

1. Tier 2 – Background Water Quality by Back Calculation from Soil Surveys.

Tier 2 can be a method for creating background water quality data to meet the actual quality of discharged water, when the discharge water cannot meet Tier I limits. This is commonly done by the selection of sample sites, the timing of sampling, the depth of sampling, and combining sample results to arrive at a potentially incorrect high number for background EC and SAR. The nature of the ephemeral drainage system is to flush salts down, so typically ECs will be higher at depth than on the surface. The surface EC of native ecosystems tends to be representative of the natural water quality; while at depths the EC is concentrated. Using the numbers from samples taken at depth and averaging results in an inaccurately high calculated background.

21. Tier 2 – Background Water Quality by Measured Water Data

Both Tier 2 methods for determining background water quality are irreparably defective. The first method, using measured water quality data, has three fundamental flaws: 1) it irresponsibly assumes that the pre-discharge historic water, regardless of its quality, was put to an irrigation use; 2) it fails to account for the dynamic nature of natural water quality in ephemeral and intermittent streams; and 3) it fails to require that scientifically defensible, representative data are used to determine “background” water quality. Because DEQ is currently using the agricultural use policy in the basic form proposed to draft permits, the application for renewal and DEQ’s draft permit for

WPDES Permit WY0037613 on Rawhide Creek provides a good illustration of how these fundamental flaws result in inadequate protection of downstream irrigation.

a. **The Tier 2 measured water quality method improperly assumes all historic water was put to irrigation use.**

The assumption that that pre-discharge water was used for irrigation is a safe assumption only for sub-irrigated and passively irrigated lands located at the point of measurement, but it is a dangerous assumption for actively irrigated lands and lands distant from the point of measurement. If measured historic data is to be used to relax effluent limits set to protect irrigation, then DEQ must require a showing that the water represented by the pre-discharge data was actually applied to the irrigated lands. But, as demonstrated below, DEQ uses data collected on historic flows that likely never reached the irrigated lands.

WYPDES Permit WY0037613, Application for Renewal identified only one downstream irrigator on Rawhide Creek (the drainage in which the permitted CBM wastewaters would be discharged). As part of its 2006 application for a renewal of this permit, the permittee submitted an August 9, 2000 report entitled *Devon Irrigation/Soil Suitability Investigations for Rawhide Creek*. In that report the author noted that “the landowner does monitor the salinity level in the stream throughout the season and will not release water to fields if quality is poor.” In addition, the irrigated lands are located approximately 4.7 stream miles below the monitoring points that DEQ used to establish “background water quality” data.¹ Flows measured in association with the ten samples

¹ In its application, the permittee submitted water quality data taken from a variety of sources, principally samples collected in association with a coal mine located on Rawhide Creek. The “average” EC as calculated by the permittee (claiming to have used 101 data points) was 4610 μ mhos/cm. The application, however, listed only 94 data points

DEQ used to determine “background” EC ranged from 0.002 to 4.19 cfs. Using DEQ’s own rule of thumb for instream infiltration losses of 0.1 cfs/mile, none of the sampled historic flows used to determine background EC would have reached the irrigated lands.² Despite the absence of any evidence that the water represented by this data set was ever applied to the irrigated lands, DEQ proposed to set the EC limit in this permit equal to the average EC of these samples. If it is DEQ’s policy to relax EC and SAR effluent standards when CBM discharges will not reach irrigated lands, then if for nothing more than the sake of logical consistency, it should not use data measured on water that itself never reached the irrigated lands in question to set background.

b. The Tier 2 measured water quality method fails to consider the dynamic nature of water quality in ephemeral streams

Water quality in an ephemeral drainage in its natural state is hydrologically dependent. Natural streamflow in an ephemeral drainage is flashy and is characterized by sharply increasing and declining flowrates. Water quality varies greatly during this rapidly changing flow regime. Typically, the concentration of dissolved solids first increases during the rising limb of the runoff hydrograph, peaks before the hydrograph peak, and quickly decreases to a nearly constant and much lower level. DEQ’s narrow

Additionally, only 20 of these data points had measured flows associated with them. These flows ranged from 0.002 cfs to 6.7 cfs. DEQ, however, only considered samples taken from below the coal mine for which a flow was also measured “as it was determined that these samples would be most representative of water quality that would have been used historically by the downstream irrigator.”

² Table 8a in the permittee’s application entitled “Pre-CBM Conductivity and Sulfate, Rawhide Creek” lists only nine samples from locations below the mine with where flow was also measured and ranged from 0.002 to 1.31 cfs. DEQ apparently included an additional sample with an associated flowrate of 4.19 cfs in its calculation of average background EC. If this were a discharge from a CBM facility, even at this much higher flowrate, DEQ’s method would assume the water would not reach irrigated lands located more than 4.2 miles from the measuring point.

focus and self-imposed constraint on controlling and limiting concentration alone means this vital connection between water quality and runoff quantity, rate and duration, is ignored to the detriment of uses in the stream. DEQ itself acknowledged the dynamic nature of water quality in ephemeral drainages in the Statement of Basis for the April 2005 renewal of permit WY0037613 when it stated that “the natural water quality of Rawhide Creek may exhibit high temporal variability with respect to . . . specific conductance at any given flow. That high variability may not be accounted for in the current water quality data record for Rawhide Creek.” Despite this fact, DEQ in a later renewal used only ten samples to calculate an average background EC for WYPDES Permit WY0037613. Additionally, the data submitted with the renewal application distorted the temporal variability as they were composed of multiple samples collected on the same (or consecutive) days at different points in the vicinity of the surface coal mine on Rawhide Creek.³ While samples collected on the same day at different locations along a stream reach are valuable for determining the spatial variability of water quality, samples sets of this nature are inappropriate for determining averages where temporal variability is significant. A series of temporally dispersed single point samples cannot be representative of the overall water quality of natural, pre-discharge flows in an ephemeral drainage that exhibits high variability in quality at any given flow.

³ The samples DEQ used to determine the background EC value were collected between 1981 and 1988 and two of the samples were collected on the same day at different locations in the same stream reach. The 94 data points listed in the permittee’s application also distort any temporal variation in historic water quality having been collected on only 56 different dates between March, 1975 and September, 1988. Typically, water quality data collected at the mine were collected on the same or consecutive days at either two or three sample locations upstream and downstream of the mine.

c. There is no assurance that the data used in a Tier 2 measured water quality analysis is representative of actual historic water quality.

The third fundamental flaw in DEQ's method of using historic water quality data to determine pre-CBM natural water quality is that it does not guarantee that only scientifically defensible, representative data are used. The only requirement is that background water quality based on measured data be based upon "published pre-discharge historic data." Appendix H at H-4, lines 26-27. First, "published" is undefined. DEQ must require more than just that the data are available. There should be a requirement that the data were collected and analyzed in a scientifically defensible manner. Second, as demonstrated in the above discussion of the renewal of WYPDES Permit WY0037613 there is nothing in the rule that requires the data to be representative. Representative data are especially important where they are to be used to determine water quality in highly variable ephemeral and intermittent streams.

3. Tier 3 – No Harm Analysis.

The fundamental flaw with Tier 3 is that it is nothing more than an escape hatch to allow poor quality discharges without requiring that they be treated. The presence of Tier 3 in this rule throws a bright light on the real purpose of this policy – to find a way to allow surface discharges despite evidence that they pose a substantial risk to existing agricultural uses. The whole approach is so nebulous that it is difficult to provide substantive comments. See Appendix H at H-6, lines 8-9, 15-16 (stating that "the actual effects of EC and SAR on crop production are variable based upon soil type and

chemistry” and citing “the very site-specific nature of this approach and the number and complexity of variables that may need to be considered . . .”

Presumably, DEQ believes that the default limits in this proposed rule are reasonable and “scientifically defensible.” Presumably, DEQ believes that the detailed soil sampling method for calculating effluent limits described in Tier 2 is reasonable and “scientifically defensible.” But when faced with a potential discharge that cannot meet effluent limitations determined by either of these reasonable and scientifically defensible methods, DEQ gives the polluter another option – give us something, which we don’t really define for you, that gives us some basis to permit your discharge without requiring that you treat it. The Tier 3 approach shows DEQ’s topsy-turvy practice of permitting CBM discharges. Rather than asking “What discharge limits are necessary to protect downstream irrigation, given that ‘the actual effects of EC and SAR on crop production are variable based upon soil type and chemistry’?” DEQ asks, “What is the quality of the water to be discharged and what is the minimal information we will accept from an applicant to justify its surface discharge?”⁴

B. The end-of-pipe deception.

The proposed rule has inherited the same defective assumption that afflicts all of DEQ’s CBM discharge permits – that water quality does not change between the end of the pipe and the point of use. DEQ has been presented with ample evidence that the water chemistry of a CBM discharge in an ephemeral or intermittent stream may change, but it steadfastly refuses to account for this in any of its permitting policies and practices.

⁴ This is especially true given the warning of experts about the long term effects of sodium buildup resulting from high SAR discharges.

DEQ can account for dilution that occurs when a discharge is made to a flowing stream (and correspondingly relaxes effluent limits for the permittee) but is apparently unable (or unwilling) to account for the opposite effect (i.e. the concentration of constituents) that occurs in the stream channel downstream of the end of pipe. This dichotomy reveals how DEQ, by taking every opportunity to relax effluent limits for discharges instead of keeping in the forefront its mandate to prevent, reduce and eliminate pollution and to preserve and enhance the air, water and lands of Wyoming has subverted the EQA.

C. DEQ ignores impacts related to flow volume, turbidity, temperature and the hydrograph.

This rule, as proposed, again displays DEQ's myopic vision of what constitutes pollution and of its regulatory authority. DEQ has the authority to regulate pollution, and CBM discharge water is "pollution"

"Pollution" is defined for purposes of water quality as:

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

WYO. STAT. § 35-11-103(c)(i).

CBM water alters the physical properties of the waters of the state. CBM water is "industrial waste." Northern Plains Resource Council v. Fidelity Exploration and Development Co., 325 F.3d 1155, 1161 (9th Cir. 2003), *cert. denied*, 540 U.S. 967 (2003) ("Because Fidelity is engaged in production of methane gas for commercial sale and

because CBM water is an unwanted byproduct of the extraction process, CBM water falls squarely within the ordinary meaning of ‘industrial waste.’”); Sierra Club v. Cedar Point Oil Co., 73 F.3d 546, 568 (5th Cir. 1996)(concluding “produced water” is encompassed as “industrial waste”). In addition, CBM water falls under the catchall definition of “waste” by virtue of it being both an “industrial waste” and a “liquid” or “other substance which may pollute any waters of the state.”⁵

The EQA specifically recognizes that quantity of water has important environmental impacts that can and should be regulated. That is why, for example, the EQA contains the following language:

No person, except when authorized by a permit issued pursuant to the provisions of this act, shall:

... (iv) Increase the quantity or strength of any discharge. . .

WYO. STAT. § 35-11-301(a).

The Wyoming Attorney General has also recognized that authority. In answer to a question posed by the EQC, the Wyoming Attorney General has opined that the Council has “the authority to regulate the quantity of water produced” from CBM, if the Council determines that the produced water is a “nuisance” under the statutory definition of “pollution.”

When considering “nuisance” in context, it is clear that it must be a discharge of any ‘acid or toxic material, chemical or chemical compound, whether it be liquid, gaseous, solid, radioactive or other substance, including waste into any water of the state” that creates the nuisance. The Council is granted the authority to regulate the discharge of substances into the waters of the state that create a “nuisance” in that sense.

⁵ “Waste” is defined as “sewage, industrial waste and all other liquid, gaseous, solid, radioactive, or other substances which may pollute any waters of the state.” WYO. STAT. § 35-11-103(c)(ii). CBM water is a substance which may pollute waters of the state.

July 12, 2006 AG letter to EQC at 6 (emphasis added). The AG recognized that “nuisance” includes “waste.” “Waste” includes CBM water. When the waste causes harm or injury, it is the DEQ’s charge to control the environmental degradation through effective rules that are effectively implemented.

CBM water quality and quantity is creating a nuisance that renders the waters harmful to agricultural (and other) uses. WYO. STAT. § 35-11-103(c)(i). The EQC and the DEQ have the authority, as well as the obligation, to regulate “pollution” – including the quantity, as well as the quality, of water that creates that nuisance. The rule as proposed fails to consider in any manner the detrimental effects related to quantity of flow and timing of discharges to agricultural lands.

An approach that considers both quality and quantity is consistent with the EQA, and does not run afoul of the limitation on interference with the State Engineer jurisdiction, duties or authorities. WYO. STAT. § 35-11-1104. DEQ would not mandate water rights administration, but would leave it as usual to the SEO and Board of Control. DEQ would require permittees to reduce or eliminate pollution; the mechanism for doing so is up to the permittee, who would need to obtain necessary permits from the other agencies as applicable. This is no different than the current structure: many DEQ-issued permits are dependent upon reservoirs in order to meet WYPDES permit terms. Reservoir permits are then obtained from the SEO, and nobody contends that structure interferes with SEO jurisdiction.

The nature of CBM flows and ephemeral drainages gives a practical basis for the need to regulate all parameters of water quality. Damage to soils and crops occurs as a result of the “quantity and timing” of the flows as well as their water quality. These

serious and long-term injuries to crops and soils are the result of the surface discharge of produced waters. They clearly fall under the definition of harm to agricultural interests. There is no basis in the EQA for limiting protections from the damage caused by elevated EC and SAR to irrigated lands. Soils in the ephemeral channels may have similar characteristics and they may build shallow water tables if the streams are converted to perennial flow.

Damage to vegetation and soils is not purely a function of water quality. Quantity and timing are important factors. For example, the level of salinity that can be tolerated without yield reduction will vary depending upon the ability to adequately leach the soil to keep sodium from building up. Historically in the Powder River Basin, leaching occurred during big runoff events. With the leveling off of runoff hydrographs as a result of CBM development, such leaching events are curtailed. The destruction of vegetation in channel bottoms and floodplains is another example of injury to livestock and wildlife caused by pollution (waste water flooding). It is a situation that DEQ steadfastly refuses to regulate.

The Water Quality Rules and Regulations recognize this quality/quantity interdependence. Chapter 1, Water Quality Standards, Section 35(b) requires that DEQ collect credible data to determine if designated uses on a water body are being attained including “consideration of soil, geology, hydrology, geomorphology, climate, stream succession and the influences of man upon the system.” (emphasis added). Chapter 1, Section 11 allows for the altering of numeric quality standards “during periods of low flow,” a recognition that flow can alter the impacts of numeric standards. DEQ must expand that recognition to occasions when protection of agricultural use is called for, not

just for protection of discharges. Chapter 1, Section 2(b)(xi) defines effluent limitations to mean “any restriction . . . on quantities, rates and concentrations of chemical, physical, biological and other constituents which are discharged from point sources into waters of the state,” a recognition that more than just simple controls on constituent concentration are necessary to effectively regulate polluting discharges. DEQ needs to unbind itself and regulate all of the parameters affecting water quality that it has power to regulate.

D. The rule fails to consider long-term impacts of CBM water on agricultural lands

CBM water’s elevated SAR damages soil’s physical condition and particularly its infiltration rate. “Application of salty water to arid and semi-arid soils containing clay minerals with poor drainage may accumulate salts, decrease infiltration, and increase runoff and erosion.” The soil breakdown is likely irreversible.

In December, 2005, two University of Wyoming scientists felt compelled to write to DEQ Director John Corra to point out fundamental mistakes being made by DEQ staff (Dec. 5, 2005 Munn and Paige letter to Corra.) An important error pointed out had to do with the misapplication of the Hanson diagram, which “makes no claim to evaluation of long term effects of sodium build up in the soil as a result of long term additions of saline/sodic water. . . and provides absolutely no justification for discharging water to the surface or channels with SAR of greater than 10.”

The possibility of long-term damage to soils, cost and feasibility of reclamation, and allocation of those costs to the proper parties are not even contemplated in the proposed rule. The protection against pollution that is required by the Wyoming Environmental Quality Act is not met without that consideration.

III. Conclusion

Appendix H, as proposed, is the formalization of a policy gone dangerously awry. Its focus on permitting discharges by whatever means possible subverts the EQA and improperly emphasizes the use of Wyoming's waters for industrial purposes at the expense of the environment and other legitimate, preexisting uses. Industry is fond of saying that the EQA requires that environmental protection under the EQA must be balanced with industrial uses of the environment, but Appendix H, as proposed is an embodiment of how DEQ strikes that balance with its thumb resting heavily on industry's weighing pan. We therefore respectfully request that Appendix H in its present form not be approved.

Dated this 26th day of August, 2008.

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