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Mr. Mark Gordon, Chairman  
Wyoming Environmental Quality Council  
122 W 25<sup>th</sup> St.  
Herschler Bldg., Room 1714  
Cheyenne, WY 82002

Terri A. Lorenzon, Director  
Environmental Quality Council

Dear Mr. Gordon,

I am a hydrologist consultant with SWCA Environmental Consultants (SWCA) out of Sheridan, WY. Prior to my employment with SWCA, I was a hydrologist with the Buffalo, WY Field Office (BFO) of the Bureau of Land Management (BLM). While with the BLM my primary responsibility was to review water management plans for federal coal-bed methane (CBM) projects in the Powder River Basin (PRB) to ensure compliance with the National Environmental Policy Act. In that capacity, I reviewed many water management plans, from many different CBM operators. I have watched, and helped the water handling methodology evolve in response to ever changing environmental concerns and regulations. I began working with SWCA two years ago, and now write water management plans and applications for permits with the BLM, Department of Environmental Quality (DEQ), and State Engineers Office. Over the last two years, SWCA has hired a complete staff to permit CBM projects out of Sheridan, and we look forward to continued growth.

In the petition, the Powder River Basin Resource Council (PRBRC) has done a good job of identifying many of the issues and concerns associated with the development of CBM in the PRB of Wyoming. However, the petition neglects to consider the many advances that have been made in the handling CBM produced water since the inception of CBM development in the PRB. Nobody with experience in PRB CBM will contest that adverse environmental impacts have occurred as a result. Those same people will confirm that responsible CBM operators have modified their water management procedures to minimize those impacts. In most cases, operators who have not adapted their procedures are no longer in business. The PRBRC states in their petition that since 95% of the Wyoming CBM resource remains to be developed, there is still time to get it right. These statements, combined with subsequent statements in the petition, insinuate that Wyoming CBM operators have not gotten it right. Although there will always be room for improvement, PRB CBM operators, in conjunction with federal and state regulators, and in cooperation with landowners, have made great strides toward getting it right.

Nearly every statement made in the petition can be discussed from multiple viewpoints to get multiple results. The PRBRC has carefully worded the petition in such a way to illicit a perspective favorable to their goals. A few specific alternative views are as follows.

On page 8 of the petition, PRBRC states "The DEQ has recently instituted "policies" for requiring groundwater monitoring, which is a recognition of the potential for adverse groundwater impacts. However, these "policies" are of questionable efficacy, as they lack the force and effect of law of rules promulgated under the WAPA". This is a common tactic of the PRBRC. They argue the efficacy of a "policy" relative to its position in law. However, they disregard its effectiveness on the ground. In the case of DEQ's groundwater monitoring program, every CBM operator in the PRB regards this directive as absolute, and complies with it as if it were law. Therefore, the policy would have no greater effect as law than it currently has, which renders the PRBRC comment as irrelevant.

On page 10 of the petition, the PRBRC discusses the U.S. Supreme Court decision in regards to *PUD No. 1 of Jefferson County and City of Tacoma, Petitioners v. Washington Department of Ecology, et al.* 511 U.S. 700; 114 S. Ct. 1900; 128 L. Ed. 2d 716 (1994), where water quality concerns were related to water quantity concerns. However, one must question whether this decision would apply in the case of CBM in the PRB. The Washington case was relevant to a reduction in water quantity, which would cause a concentration of pollutants, and poorer water quality. In the PRBRC petition, we are discussing an increase of water quantity, which would most likely cause a dilution of pollutants, and quite often an improvement in water quality. In the same paragraph, the PRBRC references three additional court cases that discuss water quality vs. quantity, however, they do not provide enough detail to ascertain their relevance to the PRB.

The petition goes on to discuss CBM produced water and irrigation, quoting several respected scientists. However, the petition makes several significant generalities and omissions that will have the effect of misleading an uninformed public. The PRBRC states "CBM water quality has been of particular concern because it is salty, measured by total dissolved solids and specific conductance". This statement may be true in some places, but most definitely is not true in others. The PRB is not homogenous in terms of soils or water quality, and should not be treated as such. Descriptions of the effect of salt laden water with a high Sodium Adsorption Ratio (SAR) on soils are well presented. However, the authors of the petition have chosen to omit information on the relative nature of the processes. In the early days of the PRB CBM play, several operators experimented with using CBM produced water for irrigation, sometimes with less than satisfactory outcomes. However, as a result of these experiments, a great deal was learned about how to, or how not to irrigate with CBM produced water. Today, CBM operators know where managed irrigation will work, and won't work, in terms of soil, water, topography, and politics. The petition invests a great deal of space to the discussion of irrigation and land application, however an argument can be made that this is an unjustifiable investment. To date, and contrary to a statement later in the petition, relatively little irrigation, or land application is taking place using CBM produced water. However, some operators are having good success with it. In every instance where

irrigation is being used, the landowner has given informed consent on its use. There is no irrigation with CBM produced water in the PRB that has not been approved by the landowner. In most cases, the irrigation is being guided by well qualified soil scientists and agronomists. To ensure no adverse impacts occur to the soils, a variety of water and soil treatments are regularly being used. Often, the landowners who supervise the irrigation have seen large increases in their forage production on the irrigated lands. On page 17 of the petition, the PRBRC continues to argue that land application is a favored water disposal method and "has adverse impacts on the environment". As stated above, land application is a fairly uncommon water handling method, and CBM operators have learned how to avoid adverse impacts.

On page 14 of the petition, a quote from a letter from the EPA states: "large quantities of produced water discharged to small tributaries with erosive soils and geology can have unanticipated adverse impacts on wildlife habitat and/or agriculture" and, "the many potential environmental impacts from CBM operations are diverse. Possible impacts include: reduced flow or loss of domestic water wells, mortality and reduced growth and vigor of vegetation, erosion, soil compaction, and loss of topsoil. One of the major concerns associated with CBM production in the Powder River Basin is disposal of the produced water. The surface disposal of CBM-produced water may result in erosion or damage to drainages and associated vegetation within the area. Even though CBM discharge is essentially sediment-free, discharge to streams and creeks can increase sediment loading due to increased erosion." As the letter states, and all operators and regulators are aware, these are possible impacts. A more relevant discussion would be; what is being done to minimize these impacts from being realized.

Impacts to domestic water wells can, and have occurred. Operators regularly work with water well owners to replace or enhance water wells. Occasionally, CBM production is blamed for impacts to wells that are in fact, not due to CBM development. Most CBM wells are drilled into aquifers that are separated from aquifers used for domestic wells by a confining layer. In these cases, domestic well water production loss can often be traced back to drought or well deterioration. Sometimes, in cases such as these, CBM operators will assist the owners of the domestic wells in correcting the problem in the interest of good landowner relations.

Vegetation loss, or more accurately, vegetation change, does often occur in stream channels that are subjected to CBM produced water. However, this loss can be offset by placement of stock tanks filled with CBM water in areas that have never had water before. These stock tanks will draw cattle to more remote locations, allowing the use of pastures that may have historically been under used.

Erosion is of great concern in the PRB, and because of this, many operators work diligently to minimize it. When planning a CBM project, careful surveys of the project area are usually undertaken. Areas that are susceptible to erosion are normally mitigated, monitored or avoided. Although some instances of accelerated erosion have occurred due to CBM development, they are uncommon, and are usually mitigated once discovered. Additionally, grass growth in stream channels tend to increase once they

regularly have water available. These grasses usually improve the stability of the stream channels and hold the soils in place. The grasses will also serve to capture much of the entrained sediment, and prevent it from being moved very far. Therefore, as a result of the CBM operator's erosion control efforts, and improved vegetation, sediment loading of streams is not often seen.

Soil compaction and loss of topsoil is of great concern, and most operators work to minimize their occurrence, however, these issues are not within the purview of water quality rules and regulations, and don't belong in this discussion.

On page 15 of the petition, PRBRC begins to discuss on and off-channel impoundments. The petition discusses seepage from reservoirs into surface water, which does occasionally occur. However, these seeps are usually low in volume and rarely travel very far. Several violations issued by DEQ are referenced that include impoundment failures. Undoubtedly, if DEQ had more enforcement personnel, the number of violation notices would increase. However, if we keep the scale of the CBM development in mind, the number of serious problems is remarkably small. There have only been a few impoundment failures, which have actually caused very little damage. The petition goes on to state: "The primary purpose of constructing on-channel reservoirs for storage of CBM water is to take advantage of the dilution provided by natural flows...". This is not a true statement. Produced water is impounded to allow it to infiltrate, evaporate, and be used by livestock and wildlife. Dilution is rarely a consideration.

On page 16, the PRBRC discusses impoundment bonding, and states: The "guidance" is of doubtful utility, since it lacks the force and effect of law that rules promulgated under the Administrative Procedures Act have; and further, the bonding guidance addresses only potential damage to surface soils, and does not address degradation of the shallow aquifers or return flows into water sources. This statement is speculative and has no basis in fact. There have been no instances of an operator walking away from a bond in the PRB, leaving an impoundment unreclaimed. Granted, there have been very few impoundments that have been reclaimed as yet, but most of the operators in the basin hope to get future bonds. The likelihood that any operator would risk their future ability to get bonds is minimal. The accusation that the bonding "guidance is of doubtful utility because it lacks the force and effect of law" is unsubstantiated. Furthermore, the fact that the guidance addresses only "potential damage to surface soils, and does not address degradation of the shallow aquifers or return flows into water sources", is irrelevant. Those concerns are addressed elsewhere, and were not the intent of the bonding program.

The petition recommends the adoption of water quality standards that are unprecedented. Nowhere in the country are barium limits anywhere near the PRBRC's proposed limits for stock water. In fact, very few references to barium limits for stock water can be found. Wyoming's Total Dissolved Solids limits appear to be on par with most other western states, as are sulfates limits. If it is the PRBRC's intention to protect cattle, their proposed changes will in actuality have the opposite effect. Cattle will be forced to drink from fewer water sources that will have increased pollutant concentrations. Everyone has seen cattle wading in muddy bogs with very little water in them. These bogs will end up

being one of the primary sources of stock water once CBM water production is stopped. Overall cattle health will diminish, and ranchers will most likely be forced to reduce their herds.

Therefore, I respectfully request that you do not approve the Citizen Petition for Rulemaking as proposed by the Powder River Basin Resource Council, et al, for WQD Chapter 2. The petition as written, addresses the concerns of a small minority of people in the PRB, and although their concerns are of great value, the larger concern of what is good for the State of Wyoming as a whole must be considered. The CBM industry is contributing to an economy in Wyoming that is the envy of most of the other states in the country. It is also helping the U.S. meet its growing energy needs in a time that continued energy support is necessary for the national security. Approval of the petition will in all likelihood cause an economic depression to north eastern Wyoming that will be difficult to overcome. Hundreds of people will be forced to move from Wyoming, leaving homes that were bought when prices were high, and sold when prices will be low. This will cause an economic hardship that many will never recover from. Energy prices throughout the nation will increase as the market attempts to recover from the loss of a major natural gas supply.

These are only a few of the major concerns that I see with the petition, but these alone, should be enough to illustrate the need to disapprove the petition. If I can help in any way, or you have any questions, please feel free to contact me at:

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Sincerely,

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