



Denbury Resources Inc.

FILED

JUN 28 2010

Jim Ruby, Executive Secretary  
Environmental Quality Council

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June 24, 2010

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WATER QUALITY DIVISION  
CHEYENNE

Wyoming Department of Environmental Quality  
Water Quality Division  
122 West 25<sup>th</sup> Street, Herschler Building-4W  
Cheyenne, Wyoming 82002

Attn: Kevin Frederick

**Re: Comments on Water Quality Rules and Regulation set for hearing July 8,  
2010 Regarding Class VI Injection Wells and Facilities under the  
Underground Injection Control Program**

Denbury Resources, Inc., a publicly traded company, and recent acquirer of Encore Operating Company, L.P. in Wyoming, was not involved in Wyoming activities at the time comments were originally solicited for the above-referenced proposed rules in 2009. Denbury is a major developer of carbon dioxide enhanced oil recovery (CO<sub>2</sub> EOR) projects in the Southeast (Mississippi and Louisiana, and soon to be in Texas and Wyoming), and is a leading participant in several federal government and university sponsored research programs examining carbon capture and storage (CCS) technologies. As such, we offer our comments with regard to the proposed rules for geologic sequestration as they definitely could impact our future activities in Wyoming.

Denbury has participated in the comments of multiple trade groups in response to EPA's NOPR for Class VI well regulations. For your information and further review, we attach the comments and suggestions made by the Multi-Stakeholder Discussion (MSD) group to the EPA. This diverse group of energy companies (electric power and oil and gas), environmental interests (NRDC, EDF and CATF) and other participants has spent the better part of the past two years developing consensus proposals for the benefit of the EPA as they consider CO<sub>2</sub>-EOR/Geologic Sequestration policy and rule implementation. A primary concern of Denbury is that these Wyoming rules are being promulgated in anticipation of EPA regulations which do not yet exist. The Wyoming proposal appears to be based on comments solicited over a year ago, many of which have been compromised between the various environmental and energy groups since that time. The concern is that Wyoming may adopt a requirement that the EPA has since modified or now been convinced by the comments they have received as unnecessary.

PETROLEUM EXPLORATION

Subsidiaries

Denbury Operating Company  
Denbury Onshore, LLC  
Denbury Green Pipeline-Texas, LLC

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CO<sub>2</sub> is a greenhouse gas that EPA recognizes has potential for future underground storage, including through the utilization of depleted oil fields. CO<sub>2</sub> is a substance that is not toxic and is not explosive. To us, CO<sub>2</sub> is a commodity that we utilize safely and securely every day to produce new supplies of otherwise stranded oil. The U.S. Department of Energy estimates that 480 million to 1.38 billion barrels of oil are recoverable in Wyoming utilizing CO<sub>2</sub>-EOR.

As you know, CO<sub>2</sub> is used for a variety of industrial purposes and is also used for food production. To promulgate rules that require technologically unfeasible and overly expensive mechanisms to enhance the assurance of total containment in the underground reservoir will only serve to discourage such projects from becoming a reality. Operators of CO<sub>2</sub> floods have been managing the injection and handling of CO<sub>2</sub> for decades in Class II wells, and we believe these are an excellent source of information of what may be required for Class VI wells in the future.

Therefore, together with the MSD comments provided, Denbury has attached comments with regard to the above-referenced proposed rulemaking. We appreciate the Department's consideration of such comments and would be happy to meet with appropriate Department officials to provide additional information you may desire.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert L. Cornelius". The signature is fluid and cursive, with a long horizontal stroke at the end.

Robert L. Cornelius  
Sr. Vice President-Operations

## Comments Regarding Proposed Class VI Rulemaking

Offered by Denbury Resources Inc.

### Section 4. Permits required.

(a)(vii) the requirement that each permit be reviewed by the department at least once every five years for continued validity is not a requirement in the proposed EPA regulations. The requirements in the proposed rules for re-evaluation in Section 8 (Area of review delineation and corrective action), Section 11 (Injection well operating requirements) and Section 12 (Mechanical integrity) verify the integrity of the operation under the UIC permit. It appears that another review by the staff is not necessary.

(viii) the requirement that sections of the permit application which represent “engineering work” be sealed, signed and dated by a licensed professional engineer” is also beyond the requirement of the proposed EPA regulations for Class VI wells. CO<sub>2</sub> injection operations is a unique niche and many inhouse qualified professionals have the necessary experience and credentials (and daily hands-on involvement) to ascertain the appropriate well completion requirements, standards for equipment, reservoir modeling, etc. Denbury recommends that the Wyoming DEQ recognize that there are qualified inhouse professionals that may complete portions of the application and that this will be sufficient to the process. The verification of the corporate officer required under the Wyoming rule proposal as to the veracity of the information in the permit application should be sufficient to demonstrate that the applicant stands by the professionalism and integrity of his inhouse engineering staff. To require the use of a licensed professional engineer does not necessarily provide the availability of such engineers with the requisite knowledge of CO<sub>2</sub> operations and could add time delays and unnecessary costs to the process.

(b)(viii) the inclusion of the term “interested person” having authority to petition for a modification, revocation, reissuance or termination of a permit appears to be fairly liberal in breadth. The “interested persons” would appear to include only those affected by the permit that require notice of the permit application under the rule, or an “aggrieved party” who participated in the original public comment process for the application as provided in W. S. 35-11-208.

### Section 5. Permit application.

(b)(vii)(a) The statement that “A Class VI area of review shall never be less than the area of potentially affected groundwater” is an extremely vague criteria as this could be interpreted to include an entire aquifer. The area of review as defined in Section 2. (Definitions) is already definitive as to the three-dimensional extent of the presence of carbon dioxide. There could be areas where there is little or no presence of groundwater within the area of review.

(b)(xviii) (formation testing); (xxiv) (logging and testing on wells); and (xxv) (demonstration of mechanical integrity) represent permit application requirements that

may not be known before a well is actually drilled. The same comments were presented to the EPA with regard to its proposal. In an area where there are existing wells that may be converted or wells from which such information was extracted, some information may be available for the permit application but for a newly drilled Class VI well, this information will not be available.

**Section 11. Injection well operating requirements.**

(c) (i) It is unclear what this subsection is protecting. A rule requiring the owner or operator to maintain a positive pressure on the annulus might cause damage to the casing if the owner or operator is required to maintain a positive pressure on the annulus that is greater than the injection pressure. Maintaining such a pressure could exceed the burst pressure of the casing. If the operator is required to maintain pressure on the annulus that exceeds the injection pressure, monitoring the annulus pressure may not be an accurate indicator of mechanical integrity. This practice should only be required if the Director makes the determination that it will not cause a problem.

**Section 12. Mechanical integrity.**

(c) This provision should be modified to eliminate the unnecessary expense of providing on an annual basis confirmation of the absence of significant fluid movement. This requirement is not in the proposed EPA regulations. Furthermore, the other requirements in the proposed rule for re-evaluation in Section 8 (area of review delineation and corrective action), Section 11 (injection well operating requirements) and Section 12 (mechanical integrity) verify the integrity of the operation under the UIC permit. It appears that another review by the staff is not necessary.

**Section 13. Testing and monitoring requirements.**

(b) (iv) This subsection overstates the corrosivity of CO<sub>2</sub>. Dry CO<sub>2</sub> is not corrosive. CO<sub>2</sub> is only corrosive in the presence of free water. CO<sub>2</sub> transported by pipeline will be dehydrated prior to transportation and will be non-corrosive when injected. This subsection should be limited to well components that contact water saturated CO<sub>2</sub>.

**Suggested Language:**

(iv) Corrosion monitoring of the well materials for loss of mass, thickness, cracking, pitting, and other signs of corrosion must be performed and recorded at least quarterly (or less frequently as approved by the administrator, based on construction materials, operating conditions and monitoring history) to ensure that the well components that contact water saturated carbon dioxide streams meet the minimum standards for material strength and performance set forth in Section 9(b)(i) through (iii) by:

The requirements of this subpart are waived when the carbon dioxide stream is dehydrated to meet pipeline specifications.