



**TxCCSA EPA Draft Policy Comments
to the Texas Railroad Commission
(third draft 10/4/08)**

The Texas Carbon Capture and Storage (TxCCSA) is pleased to offer these ideas and positions to the Texas Railroad Commission (RRC) for its use in filing comments with the United States Environmental Protection Agency's (EPA) on the proposed Federal Requirements under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO₂) Geologic Sequestration. We strongly believe that the RRC is the most experienced and qualified regulator for CO₂ injection around the world. With this base, the RRC can provide EPA with a perspective how sequestration can evolve base. You have the most extensive knowledge and expertise in regulating underground injection of CO₂ for any purpose, including sequestration outside the context of hydrocarbon production or for, what is a more general term, commercial product extraction. With the exception of commercial feasibility, we believe that the principles of CO₂ enhanced oil recovery (EOR) and sequestration are substantially the same and that the EOR experience should be fully considered in compiling rules for sequestration. TxCCSA would like to encourage the RRC to reference this vast experience in its comments to EPA on the proposed rules.

While the EPA's draft rules represent a significant step in the development of Carbon Capture and Storage, the rules assume that sequestration is defined as injection without simultaneous fluid removal as in the case of EOR or enhanced gas recovery (e.g., enhanced coal bed methane or ECBM). The proposed rules focus on sequestration outside the context of commercial product extraction (non-commercial sequestration) and effectively separate CO₂ injection into two classes we shall call non-commercial sequestration and commercial sequestration (e.g., EOR or EGR).

We recognize and salute EPA's attempt to avoid labeling CO₂ injection as waste injection. However, it is completely obvious to us that their rules treat it as though it were waste. We do not see sequestration moving forward on those grounds. Perhaps what they chose not to do, forces them into this approach. They do not state a composition specification minimum to avoid the waste approach. We feel that is a serious weakness and requires a regulatory approach

and rules for worst-case injectate composition streams. This omission has prompted an overly protective approach by the EPA to the geologic sequestration of CO₂.

Fundamentally, the TxCCSA believes that commercial sequestration is one of the important avenues by which the next generation of energy will move forward. CO₂ occurs naturally in the subsurface and it is no stranger to explorationists who attempt to understand fluid migration and subsurface accumulations. The fact that CO₂ can be trapped in subsurface formations for geologic times is a fact; and mankind can find more of these locations without a doubt. This brings us to another deficiency in the draft rules having to do with the absence of a system that would qualify sites for CO₂ injection, a site permitting framework. Admittedly, this is a tough thing for a regulator to do, i.e., disqualify a site for injection. But, we feel this is a necessity or at least a necessity to rate the site for injection security. *Point #1: Work needs to occur to form a framework (ref Bryant's work at UT as an example) which could form the basis for qualifying or rating sites. We believe that such a framework is necessary for the insurance industry that will oversee injection in non-trapping (oil/gas) applications (i.e., CCS).*

As currently written, EPA creates a separate Class VI category of UIC regulation for CO₂ sequestration in their attempt to avoid the Class I waste moniker. *Point #2: As long as CO₂ sequestration sites can pass muster for permitting, we believe at TxCCSA that sequestration is substantially similar to EOR and any regulations for Class VI wells should reflect more closely UIC Class II standards than the more stringent Class I hazardous waste well standards. If the sequestration site doesn't pass muster or if the injectate composition is such that it is truly a waste stream, then the well requirements should more directly reflect the requirements of Class I of UIC, as is the case in this proposed Class VI category.* But if we use very pure CO₂, we can open our minds to more applications of commercial sequestration beyond the one we currently reference, hydrocarbon extraction.

Much is being made of subsurface groundwater protection and, very recently, redefining an underground source of drinking water (USDW) to a broader definition than the current 10,000 parts per million standard. What is not being considered is the value proposition that CO₂ injection can bring to commercializing brackish water extraction. If we dictate reasonably pure CO₂ injection, we can begin to extract brackish water and begin to desalinate vast underground resources that are currently non-commercial. What we must have is a set of rules that would not preclude this commercial activity. This speaks to a separate set of rules from the current

EPA draft rules for Class VI which would be a set of rules for relatively pure CO₂ similar to the Class II rules. In fact, *(Point #3) this is exactly the current approach we have today wherein CO₂ is treated as a commodity for commercial product extraction and we would suggest that commercial water extraction be added to the list of commercial products already extracted with CO₂.*

Point #4: The record of the existing CO₂ injection industry has been exemplary. This point should be made and remade. We estimate that over 8 trillion cubic feet of CO₂ have been stored in the Permian Basin alone and these volumes represent an already huge industry that is beginning to expand nationwide to cover the new injection for sequestration and expanded commercial applications.

Point #5a: A noticeable bias in the draft rules has been placed on minimizing the number of wellbore penetrations to accomplish sequestration. This bias is reflected in two very damaging ways. The first is that the best sedimentary basins, where sequestration projects will be of dramatically lower risk, have numerous wellbore penetrations from previous exploration activity. Most of those basins have proven trapping conditions for substances lighter than brine and therefore very much like CO₂. In addition, those investigations provide the understanding of the subsurface to guide sequestration projects. To eliminate those areas based upon a postulated concern of leakage from preexisting wellbores is misplaced. *Point #5b: It is much easier to fix a leaky wellbore than a leaky fault.* The effect of the bias has a second problem: namely, a lack of understanding of the compartmentalization of natural reservoir systems. It will be inconceivable to expect a single well or even a single digit set of wells to accomplish sequestration on a project of important size. An array of wells will be an imperative. Providing guidance to the director for requiring three monitoring wells per injection well displays a theoretical approach and a lack of practical understanding in how these projects will be implemented.

Point #6: The use of the term "CO₂ buoyancy," enumerated countless times in the draft rules, should be addressed as well. Many natural substances in the earth are buoyant relative to water. Natural gas, helium, hydrogen, nitrogen, and hydrogen sulfide are some examples to name just a few. To suggest that CO₂ is somehow in a class by itself is misleading. All of these substances can be shown to be geologically trapped in the subsurface in many stratigraphic and/or structural situations. Further, CO₂ will likely be emplaced in deeper situations where its density will be closer to that of liquid hydrocarbons than to that of the gases mentioned above.

So, actually, CO₂ will be emplaced in conditions where it is less buoyant than most naturally occurring gases in the subsurface. And, should depleted natural gas fields be candidates for sequestration in the future, it would be postulated that the CO₂ would seek the bottom of those reservoirs.

Another weakness of the draft EPA rules has to do with the lack of consideration for simultaneous commercial storage of CO₂ during oil and gas production. Again, we strongly believe that the early captured CO₂ will be injected in substantial volumes and stored during existing and new commercial (primarily EOR in the short term) operations. The only reference to the use of these EOR sites for sequestration is contained in proposed rule § 146.83(c) which discusses how existing wells, particularly Class II wells, can be carried over to or re-permitted as Class VI wells. We believe precluding storage during Class II operations reflects the undefined injectate composition issue and the waste approach used in the rules. This leads us to one of our most important points (#7): *to be complete and useful, a comprehensive national plan needs to specifically address **simultaneous** commercial injection and sequestration.*

The RRC's perspective and experience in implementing Class II UIC regulations, as well as its programs under our own statewide rules, should be reflected in the RRC's comments to the EPA. Because of the regulatory experience, it would seem most efficient to the Texas taxpayer that the RRC be the implementing agency for EPA's final Class VI regulations. We feel confident that the RRC, in this expanded mission, will consider the application of the coming protective national regulations that have been proven effective in local practice and that are supported by the regulated community. We salute the RRC and especially Commissioner Williams in addressing many of the important aspects of CO₂ CCS on his RRC website and encourage the RRC to provide comments on administering sequestration permitting regulations.

Point #8: Finally, other factors involving long-term fate (security/liability) of the CO₂ are effectively unaddressed by EPA. Since the concerns over CO₂ accumulations in the atmosphere are not just regional ones, it seems that a national system to facilitate injection and storage would be most appropriate. We are currently being asked to evaluate a set of Federal rules without much of a contribution from the Federal system¹. Perhaps this is the area where Federal involvement could be made more balanced.

¹ The U.S. Department of Energy's CO₂ Sequestration Partnership Program is a notable exception

Please let us know if we can provide any supporting materials or additional information.