

Comments by the Coal Utilization Research Council to the Environmental Protection Agency's Proposed Rulemaking under the Safe Drinking Water Act's Underground Injection Control Program for Carbon Dioxide Geologic Sequestration Wells
Docket ID No. EPA-HQ-OW-2008-0390

The Coal Utilization Research Council (CURC)¹ submits these comments to Docket ID No. EPA-HQ-OW-2008-0390, 73 Fed. Reg. 43492, the Environmental Protection Agency (EPA or Agency)'s proposed regulations for the injection and geologic sequestration (GS) of carbon dioxide (CO₂) issued pursuant to the underground injection control (UIC) program as authorized by the Safe Drinking Water Act (SDWA), 42 U.S.C. § 300f *et seq.* CURC and its members have been at the forefront of promoting the demonstration and commercial deployment of carbon capture and storage (CCS) technologies.² The widespread implementation of CCS will allow the nation to continue to enjoy the economic and energy security benefits of using our vast domestic and essential U.S. coal resources while promoting reduction of greenhouse gas emissions.

CURC has concerns about EPA's proposed rule. CURC believes that the final rule should be modified to provide: (a) greater regulatory certainty for CO₂ storage in geologic formations, (b) balance between reducing the risk of potential impacts of injected CO₂ on underground sources of drinking water (or USDW), and increasing the likelihood that overly stringent UIC rules could lead to delays in the commercial adoption of CCS technology and ultimately less CO₂ mitigation, (c) a regulatory design that accommodates greater flexibility in permitting CO₂ injection, (d) interim guidance for GS

¹ CURC is an association of coal stakeholders which has the primary purpose of fostering programs of technology, research, development, demonstration, and deployment of technologies to enable the continued economic and energy security benefits that derive from coal use, in a manner that is consistent with the nation's environmental policies and goals. CURC members include U.S. coal companies, coal-using electric utilities, manufacturers of power plants and power plant environmental control systems, major universities, and major coal-related associations and institutes.

² See *Carbon Sequestration: Risks, Opportunities, and Protection of Drinking Water*, Subcomm. on Environment and Hazardous Materials, H. Comm. on Energy and Commerce, 110th Cong. (2008) (statement of Ben Yamagata, Executive Director, Coal Utilization Research Council).

projects for the period that precedes promulgation of the final UIC rule, and (e) no interference with ongoing regulatory programs that govern the commercial injection of CO₂ for enhanced oil or methane recovery.

A. Regulatory Uncertainty

GS projects need regulatory certainty in order to move forward as a meaningful approach to reduce CO₂ emissions. While it is an important first step, the EPA proposed rule addresses only one piece of the needed regulatory framework: that is the protection of USDW. CURC understands that the authority delegated to EPA in the SDWA does not permit the EPA to develop a comprehensive regulatory framework that covers all of the components needed to provide regulatory certainty, which are needed to facilitate the widespread use of GS. This regulatory certainty is essential; a number of additional issues must be addressed by the federal or state governments in order for carbon capture and the enabling GS to move forward. Chief among these issues are:

1. the surface property rights associated with GS wells;
2. subsurface and pore space rights associated with GS wells;
3. flexibility in the ruling that allows transfer of geologic storage (GS) sites and CO₂ ownership, monitoring and mitigation responsibility from one entity to another; and
4. long-term liability.

EPA's proposed rule includes a number of requirements that could create significant uncertainty as CCS project developers initiate projects. These requirements will serve as barriers to CCS project developers who will need a clear idea of their environmental obligations and financial exposures before such projects are initiated. In

general, we believe that the “adaptive” regulatory approach, as set forth in Section III.B. of the Preamble, will lead to regulatory uncertainty. Specifically, the NOPR states that “EPA will track implementation of the final GS rule to determine whether these requirements continue to meet SDWA objectives and, if not, revise them as needed.” Formulating regulations on the best available scientific information available is appropriate but these NOPR statements signal an intent that the regulations could be modified before, during or after the initial regulations are promulgated. This ability to exercise such broad discretion will discourage entities considering CCS projects from moving forward. It is important for EPA to retain discretion to amend its rules, but to limit such discretion to be exercised within stated criteria; to provide notice and opportunity for comment; and to apply any modifications prospectively, allowing projects already operating under valid permits to continue to operate pursuant to regulations in place at the time such permits were issued.

Other areas of uncertainty in the proposed rule include:

- The unresolved issue of how much non-CO₂ material may be present before exceeding the limit for a “Carbon dioxide stream” (§146.81(d)).
- The potential requirement for “buffer zones” in addition to a confining zone (§146.83(b)).
- The open-ended requirement for post-injection site care (§146.93(b)).
- Prevention of “endangerment” of drinking water is a legislative requirement. Moreover, as noted in Section II.B. of the Preamble, Congress has defined endangerment to activities which “may result” in a system not meeting drinking water regulatory requirements, or otherwise

affecting health. However, EPA appears to have defined the word “may” to include an additional level of possibility in stating, for example, that the post-injection site care period ends when there is “no potential threat of endangerment.” Because “endangerment” is such a central theme throughout this regulation, we recommend that the rule clearly state that EPA interprets endangerment to mean “a reasonable likelihood” of damage based upon an objective assessment of genuine risk and not derived through any mathematically hypothesized possibility of damage.

B. The Need for Balanced Regulation

We agree that a regulatory structure for GS wells is urgently required for CO₂ injection outside of applications for enhanced recovery of stranded oil and methane. Most important, the final rules must insure the primacy of protecting our nation’s drinking water as we begin a program to sequester CO₂. However, the UIC regulations must not inadvertently create uncertainty or establish a regulatory program that actually discourages the geologically and geographically diverse commercial deployment of CCS. We appreciate the level of certainty that the proposed rule seeks to achieve for CCS project developers in light of the need to protect drinking water, yet there are several areas of the proposed rule that we believe require the EPA to document the need for the level of proposed stringency, or to consider reducing that stringency. This need for explanation or modification applies to the following elements of the proposed rule:

Area of Review (AoR)

The proposed regulation does not actually define the AoR, it merely states that the area will be determined by mathematical models. One of the concerns with the use of

such complex models is that the site may not be fully characterized with respect to hydro-geologic properties. There may be significant uncertainty in one or more hydraulic process/parameters. Therefore, it is possible to obtain a wide-range of model outcomes from different model parameters. The treatment of uncertainty in model parameters and sensitivity of model results to parameter selection should be addressed. Given that the AoR will be periodically revisited, we recommend that the final rule make a pragmatic determination of what will be necessary to protect groundwater, given the requirement for reevaluation over time, and that the Agency focus the requirements to rely upon the mathematical models with the inherent differences noted above.

Well Construction

The requirement that injection be allowed only beneath the lowermost formation containing a USDW may exclude numerous formations that would otherwise make excellent GS well candidates. It may be that protection of USDWs is not a function of whether the GS injection zone is above or below groundwater, especially since buoyant CO₂ is more likely to rise upward than to seep downward. We recommend that the regulation simply require that the permit applicant demonstrate that the CO₂ plume will not result in contamination of an USDW.

Also, initial GS projects may utilize CO₂ for enhanced oil recovery (EOR) or enhanced coal-bed methane recovery (ECGM) operations and then later convert to purely CO₂ storage operations. Many of those operations may be above the lowermost USDW.

Plume and Pressure Front Monitoring

EPA would require each Class VI well permit application to contain a monitoring plan to verify that a GS well is operating as intended and not endangering USDW. EPA

should be aware that certain monitoring technology is currently under development and not available as a tool in the near term to meet the proposed EPA requirements. Further, the usefulness of available technology is a function of site-specific characterizations. The EPA should not impose a one-size-fits-all approach. CURC recommends that the EPA permit well owners and operators to propose the use of available technology to meet the proposed requirements and then to amend their tailored monitoring plans as technology evolves.

Post-Injection Site Care

EPA's proposed 50-years default timeframe for Class VI wells post-injection site care (PISC) is not justifiable, and likely will raise long-term uncertainty about liability associated with a CO₂ injection project. Furthermore, the hybrid default/performance-based standard permits the agency to lengthen this period, making it impossible for a CCS project developer to understand the timeframe of its regulatory obligation at project inception. This long-term regulatory uncertainty presents an insurmountable risk. There is documented data that the risk drops off considerably after ten years.³ CURC endorses the Interstate Oil and Gas Compact Commission (IOGCC)'s recommendation for a 10-year post closure site care period.⁴ The IOGCC proposed rules draw from two decades of state regulatory and industry experience with compression transport, and injection of CO₂ from enhanced oil recovery.

³ Sally M. Benson, "Monitoring Carbon Dioxide Sequestration in Deep Geological Formations for Inventory Verification and Carbon Credits" (2006).

⁴ The Interstate Oil and Gas Compact Commission Task Force on Carbon Capture and Geologic Storage, "Storage of Carbon Dioxide in Geologic Structures: A Legal and Regulatory Guide for States and Provinces" (2007) [hereinafter IOGCC Model Rules].

Financial Responsibility and Long-term Care Requirements

The proposed rule's financial responsibility and long-term care requirements lead to significant economic burdens without demonstrating the environmental benefit of the requirement. Alone and in combination, these requirements go well beyond the financial assurance requirements currently in place for existing UIC well classes. Further, the rule provides no guidance to accommodate transfer of owner or operator financial responsibility to other entities, and there is no discussion of the creation of a third-party financial mechanism whereby a government entity, for example, could act as trustee to execute or cause to be executed any long-term responsibilities or requirements. It is recommended that such mechanisms be established in order for GS projects to move forward.

C. The Regulatory Design

Section III.A. of the Preamble presents several approaches for how the UIC rules for CO₂ injection might be structured. EPA selected an approach described as "Tailored Requirements," based on the perceived ability of that approach to be "tailored" to the volume, buoyancy, and corrosiveness of CO₂ from specific CCS operations. It rejected a more flexible alternative, described as "General Requirements," because it was not "tailored." A performance-based program with requirements that prescribe the required outcomes of properly designing and operating a CCS project, rather than a program that prescribes how to achieve those outcomes, is preferable. A performance-based approach better accommodates changes in knowledge and technology over time, and would allow implementing state permitting authorities the flexibility to use their expertise to address varying geologic and geographic situations. In many instances, retaining the primacy of

state regulatory authority may better address such an approach, and in all instances a performance-based approach would provide federal or state authorities and the CCS operators the flexibility to achieve required outcomes.

D. Interim Program Recommendations

CURC proposes that EPA consider issuing guidance to create an interim program that would provide a regulatory framework for CCS projects prior to the promulgation of a final rule. Our concern rests with the possibility that the final rules may not be issued for some time in the future. For example, a section in the preamble to the NOPR states:

During the Deployment Phase (1008-1017), the [RCSP] partnerships will conduct large volume carbon storage tests to demonstrate that large-scale CO₂ injection and storage can be achieved safely and economically. EPA will use the data collected from these projects to support decisions in the final GS rule.

This statement suggests that a final GS rule may not be issued until 2017 or that rules issued earlier than that date could be modified and changed later. While we ascribe to a belief that any final rule should be informed by the findings and data collected through RCSP partnerships, we are concerned that regulatory uncertainty will delay CCS project development; hence the need for an interim program.

Projects issued permits under this guidance would collect data and technological experience that could contribute information necessary to establish a viable working framework for a long term permitting and liability regime for geologic CO₂ storage activities. The program might be limited to a maximum number of projects, or cumulative amount of CO₂ injection, and it should be designed to be compatible with anticipated financial incentives for “early adopters” of CCS technology. Projects permitted under this interim guidance should be grandfathered from the final UIC rule.

Specific limiting provisions could be required in order to ease any concerns regarding the endangerment of USDW under such an interim program. Since proper site characterization is the most effective risk management tool for GS wells, EPA could require applicants under this program to use geologically superior sites, or provide alternative requirements for sites with significantly superior characteristics. The World Resource Institute (WRI) CCS Guidelines⁵ and IOGCC model rules include provisions for selecting storage sites that have a high probability of retaining injected CO₂.⁶ An interim program would recognize the same goals sought by EPA when it issued its guidance for DOE Regional Partnership pilot projects designed to evaluate the technical issues associated with CO₂ injection as Class V experimental technology wells.⁷

E. Conclusion

CURC understands EPA's position that the SDWA does not provide EPA with the authority to develop regulations for all questions and issues related to GS. While a full regulatory framework is necessary for CCS projects to move forward, CURC recommends that EPA work within the UIC program to create necessary regulatory certainty for early CCS projects. EPA should acknowledge that overly prescriptive

⁵ World Resource Institute, "CCS Guidelines: Guidelines for Carbon Capture, Transport and Storage" (2008). The WRI Guidelines also offer a comprehensive regulatory approach to CCS that goes beyond the regulation of GS wells. However, in the guideline's discussion of site closure, the WRI acknowledges a need for proper incentives so as not to impede the deployment of CCS technology as private companies may be reluctant to engage in storage operations if required to carry a financial commitment and liability out into the indefinite future. *Id.* at 104.

⁶ The IOGCC model rules premise approval of a GS storage site on four findings: (1) the facility and reservoir are suitable and feasible for injection and storage; (2) that a good faith effort has been made to obtain the consent of a majority of the owners having property interests affected by the storage facility, and that the operator intends to acquire any remaining interest by eminent domain or otherwise allowed by statute; (3) that the use of the storage facility will not contaminate other formations containing fresh water, oil, gas, coal or other mineral deposits; and (4) that the proposed storage will not unduly endanger human health and the environment and is in the public interest. *See* IOGCC Model Rules, *supra* note 5 at Appendix I.

⁷ Env'tl. Protection Agency, Office of Ground Water and Drinking Water, UIC Program Guidance #83, Using Class V Experimental Technology Well Classification for Pilot Geologic Sequestration Projects (2007).

regulations can discourage technological development and commercial deployment. Such an outcome can adversely impact the environment by impairing the design or implementation of a CO₂ mitigation program and can also lead to costly and unnecessary requirements. We also encourage EPA to reconsider the basic design of the UIC Class VI program and create a more flexible performance-based program given the fact that CO₂ injections has been conducted safely in the U.S. for more than a decade, rather than the more prescriptive program proposed. Lastly, CURC recommends that EPA issue guidance for an interim Class VI program for CCS projects that predate the final UIC rule.