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Stan Meiburg  
Designated  
Federal Official

March 31, 2010

Honorable Peter Silva  
Assistant Administrator  
Office of Water  
U.S. Environmental Protection Agency  
Washington, DC 20460

Dear Mr. Silva:

The Environmental Financial Advisory Board (EFAB) was asked by the Office of Water to evaluate alternatives for financial assurance for a new class of underground injection wells, designated in the Agency's proposed rule under the Safe Drinking Water Act (SDWA) as Class VI wells, for geologic sequestration of carbon dioxide gas streams. Specifically, we were asked to provide recommendations on guidance for use by State and Regional implementers of Class VI programs. In connection with that charge, the Board was asked to review existing State and federal underground injection control financial assurance regulations and guidance under SDWA, and to evaluate existing SDWA and Resource Conservation and Recovery Act (RCRA) financial assurance programs for potential application to this new class of wells. EFAB is pleased to transmit to you this *Report on Financial Assurance for Underground Carbon Sequestration Facilities*.

After an extensive review of the existing regulations for SDWA wells, in particular Class I and Class II wells, and RCRA facilities, the Board concluded that the RCRA and the SDWA financial assurance requirements for Class I wells rather than SDWA Class II wells provide the best model for establishing financial assurance requirements for new Class VI wells. The financial assurance requirements for Class I wells closely resemble the RCRA regulations.

A key consideration for the Board's recommendation is that the Class VI wells will be operated as part of a facility rather than as individual wells, which is more typical for the operation of Class II wells. The Board also recommends that because carbon sequestration technology remains developmental and pilot projects and other facility-level testing is ongoing, the periodic review of operational conditions in the proposed regulations include a review of the scope of obligations covered by financial assurance as well as the continued viability of the financial assurance instruments being used.

We hope that you will find Board’s report constructive and useful. The members of EFAB appreciate the opportunity to advise and assist the Agency on important environmental finance issues, and wish to particularly express our gratitude to Ann Codrington, Joseph Tiago and Bruce Kobelski of the Office of Water for their assistance and cooperation.

If you would like to discuss the report in more detail, we would be happy to meet with you and/or members of your staff at your convenience.

Sincerely,



A. James Barnes  
Chair



A. Stanley Meiburg  
Designated Federal Official

Enclosure

cc: Bob Perciasepe, Deputy Administrator  
Peter S. Silva, Assistant Administrator, Office of Water  
Barbara J. Bennett, Chief Financial Officer

# Environmental Financial Advisory Board

## EFAB

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## Financial Assurance for Underground Carbon Sequestration Facilities

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This report has not been reviewed for approval by the U.S. Environmental Protection Agency; and hence, the views and opinions expressed in the report do not necessarily represent those of the Agency or any other agencies in the Federal Government.

*March 2010*

*Printed on Recycled Paper*

# FINANCIAL ASSURANCE FOR UNDERGROUND CARBON SEQUESTRATION FACILITIES

## I. CHARGE

At the request of the U. S. Environmental Protection Agency (Agency), the Environmental Financial Advisory Board (Board) is examining questions concerning the financial assurance requirements and long-term financial stewardship related to the sequestration of carbon dioxide gas streams<sup>1</sup> through underground injection. In a subsequent directive, the Agency requested that the Board address only financial assurance requirements and defer consideration of long-term financial stewardship. In connection with this request, the Agency asked EFAB to review existing regulations and guidance governing the Underground Injection Control Program issued pursuant to the Safe Drinking Water Act (SDWA), which in large part use the financial assurance instruments and framework in the Resource Conservation and Recovery Act (RCRA) regulations.

EFAB has already spent a considerable amount of time and effort evaluating some of the financial assurance mechanisms under RCRA. The RCRA requirements address closure, post-closure, corrective action and other aspects of the Subtitle C (hazardous waste), Subtitle D (solid waste) and Subtitle I (underground storage tank) programs, with the goal of ensuring that an obligated party has the financial capacity to meet its obligations. Under RCRA, a range of mechanisms are available to regulated entities to meet these requirements including: (1) trust funds; (2) satisfying the corporate financial test; (3) corporate guarantees provided by a corporate parent, sibling corporation, or other firm with a substantial business relationships that does meet the financial test; (4) insurance; (5) letters of credit; and (6) third-party sureties (payment or performance bonds).

A workgroup of the Board classified these instruments into three categories. The first encompasses the financial test and corporate guarantee, both of which rely on the financial viability of the regulated entity or an affiliate. The second category contains three of the four remaining mechanisms, insurance, letters of credit and sureties, which are provided by third parties, resulting in an additional cost to the regulated entity. The final category is a trust fund, usually created by the responsible party.

## II. BACKGROUND & CONTEXT

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<sup>1</sup> In its proposed rule for geologic sequestration wells, the Agency defined a carbon dioxide stream as “carbon dioxide that has been captured from an emission source (e.g. a power plant), plus incidental associated substances derived from the source materials and the capture process, and any substances added to the stream to enable or improve the injection process. This subpart does not apply to any carbon dioxide stream that meets the definition of a hazardous waste under 40 CFR part 261.” *See* Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO<sub>2</sub>) Geologic Sequestration (GS) Wells, 73 Fed. Reg. 43,491 (2008), proposed 40 CFR § 146.81(d), 73 Fed. Reg. at 43,535.

In a letter dated January 11, 2006, EFAB provided its initial analysis and response concerning the use of the first category, the financial test and corporate guarantee. The Board found that many regulated parties rely on their credit ratings to use the financial test for meeting their financial assurance requirements. Its primary recommendation was that the use of independent credit analysis, i.e. credit ratings, is a cost-effective mechanism for demonstrating financial assurance and should continue to be an alternative for those companies that have investment-grade ratings on their debt. Many of the large public companies that are obligated to provide financial assurance are participants in the debt markets and carry ratings on their bonds.

In a second letter dated March 20, 2007, the Board addressed the question of whether captive insurance companies should be allowed to issue financial assurance policies. Captive insurers are often distinguished by the initial funding and restriction of their coverage to one company. Given that the Board's recommendation addressed both the financial strength of the parent company and the financial strength of the captive insurer, our recommendations are a hybrid between the first and second categories of financial assurance instruments. Consistent with the findings with regard to use of the financial test for financial assurance purposes, the Board found that the use of independent credit analysis (i.e., credit ratings) to be a cost-effective mechanism for demonstrating the financial strength of a captive insurer. It also recommended certain additional measures, such as transparent and rigorous oversight by the licensing agency.

On February 25, 2010, the Board transmitted a letter outlining its findings and recommendations with respect to the use of the first of the third-party instruments, commercial insurance for financial assurance. The Board concluded that in many cases insurance is a viable and valuable mechanism for providing financial assurance. It determined that there should be minimum requirements to evidence the financial strength of an insurer underwriting insurance for environmental financial assurance, but deferred recommending a specific minimum credit rating for third-party providers until it completes its review of other third-party instruments. The Board recognized that the use of insurance for financial assurance purposes is a highly complex area and that the regulators have divergent views on its use. The Board did not recommend the use of standardized policy language, but did suggest that the Agency adopt procedures under which the regulatory authority can specifically agree to limitations contained in the insurance policy or, in the alternative, specifically reject such limitations prior to the time the carrier becomes legally obligated to issue the policy.

In light of the significant change in the financial markets since the first two letters were issued, the question of whether the financial test and captive insurance remain viable alternatives has resurfaced. In addition, the market conditions have raised two additional questions: (1) should regulators evaluate the creditworthiness of the third-party issuers of financial assurance; and (2) should regulators rely on credit-rating agencies to assess financial viability of any entity offering financial assurance?

Despite current market conditions, the Board continues to recommend making the financial test and third-party financial assurance mechanisms available to responsible

parties. There are other governmental bodies charged with regulating these markets and it does not make sense for federal or state environmental entities to establish parallel alternative economic criteria for evaluating the financial viability of those entities. Nor does the Board believe that the regulations should be rewritten to presume that the economy is in a perpetual crisis, thus requiring the establishment of costly measures like trust funds. Since financial assurance is a hedge against financial distress of the owner/operator, duplicative or excessive upfront funding of financial responsibilities would not be an appropriate use of economic resources.

While the board continues its work on financial assurance with respect to RCRA, we have begun to examine financial assurance for a proposed new class of wells for the injection of carbon dioxide gas streams in proposed carbon capture and sequestration (CCS) facilities. Toward this end, we have examined the SDWA requirements associated with Class I waste injection wells and Class II oil and gas injections wells in connection with the Agency's proposed rule to regulate carbon dioxide gas stream injection with the creation of Class VI wells under SDWA.<sup>2</sup>

#### **A. DISCUSSION OF CHARGE**

We believe that the RCRA and the SDWA financial assurance requirements for Class I wells rather than Class II wells provide the best model for establishing the requirements for Class VI wells. The Class II requirements relate to individual wells, while the Class I requirements apply at a facility-level with multiple wells. The operating paradigm of a CCS facility is a multiple well injection facility, hence the Class I overall approach to financial assurance at a facility level is more appropriate as a working model. However, we do note that there are differences among the programs as outlined below.

The SDWA financial assurance regulations for Class I wells closely resemble the financial assurance requirements under RCRA. Owners/operators are required to establish financial assurance for plugging and abandonment of each existing and new Class I hazardous waste injection wells. The SDWA regulations allow owner/operators to use same six instruments prescribed under RCRA regulations at 40 C.F.R. §264.143(a)-(f) as well additional provisions stipulated at 40 C.F.R. § 144.63(g)-(i).

Notable exceptions between RCRA Subtitle C and the SDWA Class I regulations include:

- Section 144.63(f) of the SDWA regulations limits guarantors that can underwrite a corporate guarantee to parent corporations of the owner/operator. In contrast, under RCRA Subtitle C, corporate guarantees can also be underwritten by a firm with the same parent corporation as the owner/operator or a firm with a 'substantial business relationship' with the owner/operator. We recommend that the Agency extend the acceptance of a party with a "substantial business

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<sup>2</sup> *Id.*

relationship” to the guarantee provisions for SDWA.

- SDWA Class I regulations also require owner/operators to notify the EPA Regional Administrator by certified mail of the commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, within 10 business days after the commencement of the proceeding. We recommend that his provision be applied to the Class VI wells.
- SDWA Class I regulations also stipulate owner/operators using letter of credits, surety bonds, or insurance policies will be deemed without the required financial assurance in the event of bankruptcy, insolvency, or a suspension or revocation of the license or charter of the issuing institution. The owner/operator is required to obtain alternate financial assurance within 60 days after such an event. However, it is important to note that unlike the RCRA Subtitle C regulations, the SDWA Class I regulations do not extend this provision to include bankruptcy of the trustee or a loss of the issuing institution’s authority to act as a trustee. We recommend that the SDWA Class VI regulations extend the provision to include bankruptcy or loss of authority of the trustee.

The primary difference between the available financial assurance mechanisms under SDWA for purposes of plugging Class I and Class II wells is that commercial insurance is not an allowable instrument for Class II wells. There are also some structural differences between the instruments for Class II wells as compared to Class I wells. In particular, while language is prescribed for letters of credit and sureties for Class I wells, it is not for Class II wells.

Another material distinction between the Class I and Class II well requirements is the significant difference between the requirements of the financial test. The Class I wells requirements closely mirror those of the RCRA. For Class II wells, however, there is no requirement that the financial capacity of the owner/operator be linked to the estimated cost of the plugging and abandonment and the owner/operator only need demonstrate a net worth of \$1 million.

## **B. RECOMMENDATIONS**

We are of the opinion that these differences result in weaknesses in the Class II wells requirements if applied at a facility scale, as would be the case for a CCS facility. Therefore, we believe that the Class I instruments be used, which include the use of insurance as well as specific language for the other instruments.

Additionally, because the RCRA financial mechanisms that are largely used in the SDWA Class I program were developed based on hazardous waste facility owner and operator considerations, there may be differences in the owner/operator profiles for proposed carbon sequestration facilities that warrant additional financial assurance mechanisms. For example, it may be appropriate to consider the use of rate-based financing, such as sinking funds, to meet financial assurance requirements. The Board

does not have sufficient information about the profile of CCS facility owners and operators to make specific recommendations on this issue, but we encourage the Agency to consider adding a new category of financial assurance to the Class VI program that provides the Agency with the flexibility to approve the "functional equivalent" to the established RCRA financial assurance tests.

The Board notes that the timing and amount of financial assurance must be determined by the Agency based in its evaluation of the risks. During our discussions, a key component of geological sequestration identified to protect drinking water sources is a comprehensive system of monitoring wells during the operation of the facility. The Board was informed that, under current SWDA regulations, decisions on the scope of financial assurance requirements are in large part left to state regulators under delegated programs. Some states require financial assurance for monitoring during operations for certain classes of wells while other states do not. We also note that RCRA does not require financial assurance for monitoring during the operation of the facility. Because the Agency identified two objectives in its summary of the proposed rule for geological sequestration of carbon dioxide, consistency in permitting geological sequestration operations across the United States and prevention of the endangerment of underground sources of drinking water,<sup>3</sup> the Board recommends that the Agency consider the extent to which it has the authority to require financial assurance for monitoring wells before closure of the sequestration facility, in addition to the costs for plugging wells and closing the facility.

As a further consideration, because carbon sequestration technology remains developmental and pilot projects and other facility-level testing is ongoing, the performance levels of such technology and projects cannot be known with a high level of predictability. Additionally, field testing and ongoing operations by their very nature often result in deviations from predicted or modeled studies created during the permitting process. The Board believes that these issues are best addressed in the context of the permitting process, rather than establishing financial assurance requirements that are so costly as to create barriers to the development and deployment of effective carbon sequestration technologies. The proposed Class VI well regulations require periodic review of operational conditions, and the Board believes that these periodic reviews provide an opportunity to revisit, as necessary, the amount of financial assurance required for CCS facilities. This would include financial assurance for corrective action for a prospective remedial scenario (e.g., the cost of installing extraction well(s) at the point of drinking water incursion to extract and treat affected groundwater)<sup>4</sup> during the operational phase of the facility if adverse impacts to drinking water sources are threatened or occur.

A possible answer to the issue of updating financial assurance requirements for a facility is to link the amount of financial assurance required to cost estimates that are updated on a regular basis (e.g., every five years). In order to periodically update estimates for a

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<sup>3</sup> *Id.* at 43492.

<sup>4</sup> We recognize that pumping and treating groundwater can be expensive, including treatment for non-hazardous constituents.



large sequestration project, it would be desirable to collect various types of data on a rolling basis. EPA's proposed rule for Class VI wells would require operators to update as necessary various plans relating, among other things, to monitoring, corrective action, well plugging and site closure. If coupled with robust annual reporting requirements that document why updated plans have or have not been necessary, EPA's proposed rules would establish the basis for making adjustments to the required amount of financial assurance. The financial instruments being used could be reviewed at that same time.

### **III. CONCLUSION**

The Board's recommended use of Class I financial assurance mechanisms relates only to our familiarity with, and belief in, the effectiveness of these mechanisms. This recommendation is not intended, and should not be construed, as making any judgment that carbon sequestration facilities are or should be regulated as hazardous waste treatment, storage or disposal facilities under RCRA.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

JUN 04 2010

OFFICE OF  
WATER

Professor A. James Barnes  
Chair, Environmental Finance Advisory Board  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue N.W.  
Washington, D.C. 20460

Dear Professor Barnes:

Thank you for your letter of March 31, 2010, providing the Environmental Finance Advisory Board (EFAB) recommendations on Financial Assurance for Geologic Sequestration of carbon dioxide. I appreciate the significant time and effort that the Carbon Capture and Storage Workgroup and the EFAB full board spent in conducting their review and preparing their recommendations over the past two years.

We value your suggestions. Your recommendations are informing the Environmental Protection Agency's development of a guidance document entitled "Financial Responsibility for Underground Injection Control Program Class VI Geologic Sequestration Wells."

Again, thank you for your assistance with this important effort. If you have any questions, please contact Cynthia Dougherty, Director of the Office of Ground Water and Drinking Water at (202) 564-3750.

Sincerely,

A handwritten signature in black ink that reads "Pet Sil".

Peter S. Silva  
Assistant Administrator