United States
Environmental Protection
Agency

Geologic Sequestration of Carbon Dioxide – UIC Quick Reference Guide

Additional Considerations for UIC Program Directors on the Public Participation Requirements for Class VI Injection Wells

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I. INTRODUCTION

The purpose of the *Federal Requirements under the Underground Injection Control (UIC) Program for Carbon Dioxide Geologic Sequestration (GS) Wells* (75 FR 77230, December 10, 2010), referred to in this UIC Quick Reference Guide as the GS Rule, is to protect underground sources of drinking water (USDWs) through permitting, siting, construction, operation, injection, post-injection site care, and site closure requirements for the underground injection of carbon dioxide. The GS Rule requirements are in place to minimize any potential health risks from injection activities, especially risks to populations in or near the delineated area of review (AoR) for the injection well or in the anticipated direction of the carbon dioxide plume and pressure front. The GS Rule requires public notice and participation (see Box 1) on a proposed Class VI injection well, thus ensuring that the UIC Program Director considers the comments and positions of a broad range of stakeholders when reviewing and evaluating Class VI permit applications.

Box 1: UIC Class VI GS Rule Public Participation Requirements

The GS Rule (40 CFR 146.81 *et seq*.) adopts the existing public participation requirements under the Safe Drinking Water Act (SDWA) at 40 CFR Part 25 and UIC Program permitting procedures at 40 CFR Part 124 for Class VI injection wells. These requirements discuss: 1) providing public notice to interested parties of pending actions via newspaper advertisements, radio, mailings, or e-mails; 2) holding public hearings, soliciting and responding to public comment; and 3) involving a broad range of stakeholders.

The GS Rule also requires, at 40 CFR 124.10(c)(1)(xi), that the UIC Program Director provide public notice of Class VI permitting activities to state and local oil and gas regulatory agencies, state agencies regulating mineral exploration and recovery, the Director of the Public Water System Supervision (PWSS) program in the state, and all other agencies that may have jurisdiction over injection activities within the state.

The GS Rule also states that UIC Program Directors must apply the public notice and participation requirements to all supplemental applications for Class VI injection depth waivers (40 CFR 146.95(c)). The UIC Program Director must give public notice that a waiver application has been submitted, and the notice must state: 1) the depth of proposed injection zone; 2) location of the proposed injection well; 3) the name and depth of all USDWs within the delineated area of review (AoR); 4) a map of the AoR; 5) names of any public water supplies affected, reasonably likely to be affected, or served by USDWs in AoR; and 6) the results of UIC-PWSS Directors consultation pursuant to 40 CFR 146.95(b)(2).

Additional information on the public participation requirements for permitting Class VI injection wells is provided in the *Draft Underground Injection Control Program Class VI Primacy Application and Implementation Manual* available at http://water.epa.gov/type/groundwater/uic/class6/gsguidedoc.cfm.

Public participation in permitting decisions is a critical component of complying with the GS Rule requirements. These requirements were adopted and tailored from the existing UIC Program because GS is a relatively new technology. Providing all potentially affected communities with the means to understand the potential risks and benefits of a proposed Class VI injection well early in project development ensures that communities are informed. This enables communities to participate in the application review, and enables UIC Program Directors and permit

applicant or potential Class VI injection well owners or operators understand community concerns, preferences and perceptions on GS and the proposed Class VI injection well. Additionally, communities may have information about site-specific features not necessarily available to the UIC Program Director or owner or operator that will help fully inform the decision-making process.

EPA expects that there will be a high level of public interest in GS. Therefore, EPA encourages Directors to develop a clear plan to inform and involve the public during the Class VI permit application review process. In addition to the public participation requirements discussed above, EPA has a public involvement policy and public involvement website (www.epa.gov/publicinvolvement) that addresses community involvement.

EPA defines public involvement as the full range of activities that can be used to engage the American people in environmental decision-making processes. Resources available on that website include case studies which highlight public involvement experiences during EPA and state application review and approval.

Box 2: Seven Steps for Effective Public Involvement

1. Plan and budget for public involvement activities.
2. Identify interested and affected communities.
3. Consider providing technical or financial assistance to facilitate public involvement.
4. Provide information and outreach to the public.
5. Conduct public consultation and involvement activities.
6. Use public input as appropriate and provide feedback to the public.
7. Evaluate public involvement activities to help inform future activities.

Source: EPA Public Involvement Policy, available at: www.epa.gov/publicinvolvement/public/index.htm.

EPA promotes seven steps for effective public involvement that provide a comprehensive plan for engaging communities and to help set the stage for early, effective, and inclusive community involvement (see Box 2). Other public involvement resources can also be found outside of EPA, such as the International Association for Public Participation materials at www.IAP2.org.

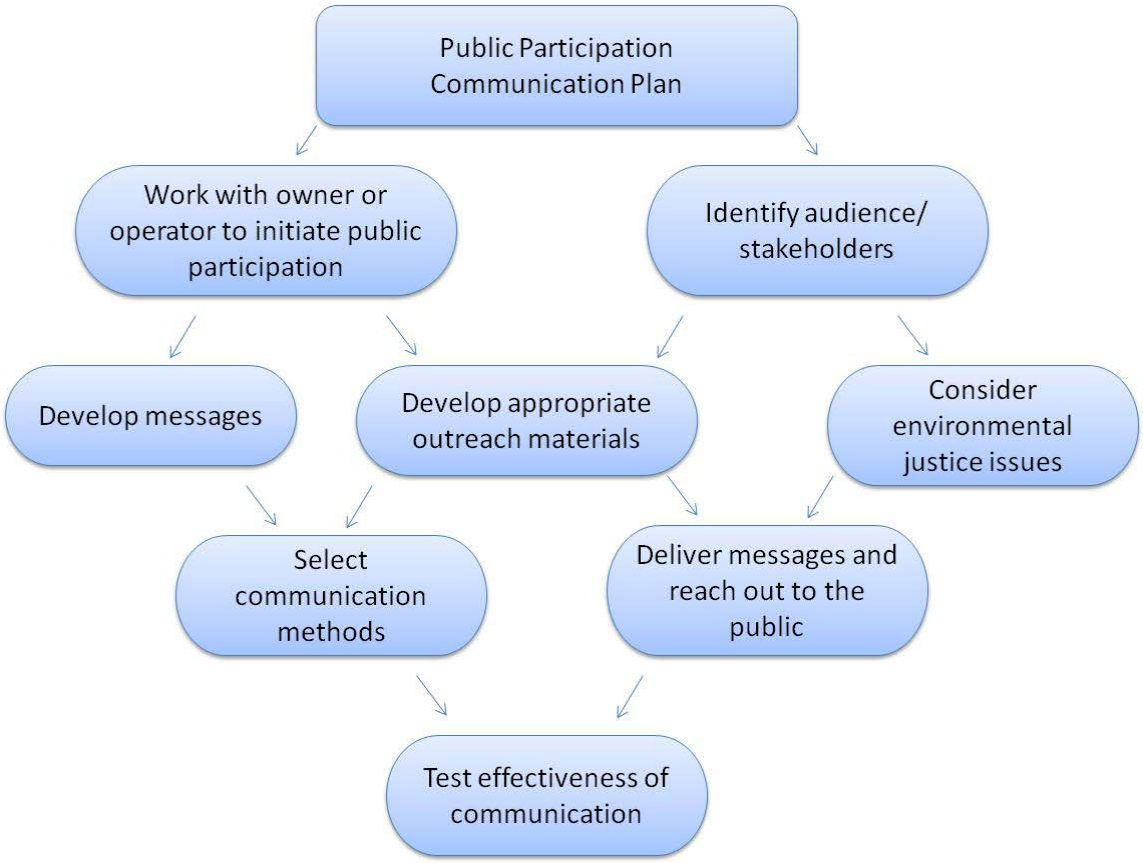
While owners or operators submitting a Class VI permit application do not have specific requirements for public involvement, they may choose to work with the UIC Program Director during the development and execution of a public participation plan for their Class VI permit application (especially in providing background information on the proposed Class VI injection well(s)). The owner or operator may choose to inform the public about the

proposed Class VI injection well(s) to solicit community input and to help facilitate increased community acceptance of the proposed Class VI injection well(s).

The steps outlined in Figure 1 and discussed below are considerations for the owner or operator in designing and implementing a communication plan for Class VI injection well(s). The steps also provide UIC Program Directors with some guidance on developing an effective public participation process during the Class VI permit review, as required by the GS Rule.

Generating an effective public participation or communication plan, including identifying the audience, is covered in Section II; developing the message is highlighted in Section III; selecting public participation and communication methods and delivering the message are discussed in Section IV; and testing the effectiveness of the plan is covered in Section V of this paper. Section VI provides an example approach for Class VI injection well(s), and a communication plan template is provided in Attachment 1.

Figure 1: Public Participation Communication Plan



II. IDENTIFYING THE AUDIENCE

In developing a public participation plan, the UIC Program Director (and owner or operator) may wish to gauge public interest in the Class VI injection well and identify key stakeholders. One approach is to conduct a social characterization of the community. A social characterization includes gathering and evaluating information to obtain an accurate portrait of stakeholder groups, their perceptions, and their concerns about a potential Class VI injection well. This type of assessment's aim is to understand community leadership dynamics, decision-making processes, and local context.

Stakeholders are broadly defined as parties who believe they are affected by the decisions regarding a proposed Class VI injection well. In addition to the owner or operator of proposed Class VI injection wells and the UIC Program Director, key stakeholders during the permitting process might include:

- Local elected and safety officials;
- Public water system operators;
- Land and business owners;
- Civic groups (e.g., business, environmental, religious);
- Owners or operators of other industrial facilities;
- Population within the AoR;
- Indian tribes;
- Educators;
- Media; and
- GS researchers (e.g., local universities).

To help UIC Program Directors understand the key stakeholders interested in participating in the review of a proposed Class VI injection well, it could be helpful to understand the demographic of the area. Identifying distinct groups within the community, including diversity in race and ethnicity, spoken languages, literacy, and income levels may result in a more effective public involvement plan. One approach that can help identify the composition of the local community is to conduct a demographic analysis, which is outside the scope of this Quick Reference Guide but is described in an accompanying *UIC Quick Reference Guide: Additional Tools for UIC Program Directors Incorporating Environmental Justice Considerations into the Class VI Injection Well Permitting Process.*

III. DEVELOPING THE MESSAGE

Once the key audience and stakeholders have been identified, owners or operators might develop messages for the public about the proposed Class VI injection well(s). Developing clear messages will help inform and involve the public. Effective messages succinctly present what the public should know about the proposed Class VI injection well(s).

UIC Program Directors are required to: 1) provide notice to interested parties of pending actions; 2) hold public hearings; 3) solicit and respond to public comment; and 4) involve a broad range of stakeholders in the permit review and approval process. Identifying the interested audience and developing a message on the permit application under review can help the Director meet the requirements for permitting at 40 CFR 124.

However, while the UIC Program Director's focus during the permit review is on protecting USDWs, other issues may be raised by the community during the implementation of the public participation plan. Carbon dioxide storage is technically complex. GS involves advanced science related to climate change, geology, and other fields of study. GS includes public policy related to energy, environment, and the economy, and issues related to risk, safety, and financial assurance. Questions or concerns related to any of these issues may be voiced during scheduled public participation events.

It is recommended that owners or operators identify key messages for proposed Class VI injection well(s) and submit these key messages with the Class VI permit application. The messages can be delivered to interested community stakeholders during public participation events (e.g., how USDWs are protected during GS or potential benefits of the Class VI injection well(s) to the community). The corresponding communication materials may help stakeholders gain a clearer understanding of the proposed Class VI injection well(s). UIC Program Directors may choose to identify key messages for stakeholders on how their concerns may be addressed in an approved Class VI permit's operating conditions.

Some example topics, key messages, and materials developed by the UIC Program Director or the owner or operator that could be used in public participation events include (adapted from WRI, 2010):

Potential Topic Areas:

- Role of the permitting authority in overseeing/regulating Class VI injection wells and USDW protection;
- Standard underground injection practices used to ensure safety when injecting into a Class VI injection well;

- Identification of all potentially impacted environmental resources (e.g., ground water or surface water) or infrastructure (e.g., the Class VI injection well(s) or nearby structures) near the Class VI injection well(s);[1]
- Benefits to the community (i.e., role of GS in mitigating carbon dioxide buildup in the atmosphere); and
- Potential costs and benefits to the community from the Class VI injection well(s).

Potential Messages:

- Protecting USDWs and public safety is a priority for permitting officials;
- Injection of carbon dioxide has been practiced for 30 years and natural geologic processes have trapped carbon dioxide for millions of years; and
- Underground injection and reservoir monitoring are both mature technologies.

The amount of information and level of technical detail provided on these topics must be tailored to the audience's degree of interest, education, and time constraints. Any concerns that have been identified, including perceived risks, should be addressed in language and format suited to the intended audiences.

When developing communication messages, UIC Program Directors and owners or operators may choose to draw information from the required Emergency and Remedial Response Plan (E&RR) for Class VI injection wells. The E&RR Plan, required by the GS Rule at 40 CFR 146.94(a), must be submitted with a Class VI permit application as specified at 40 CFR 146.82 (a)(18). The E&RR plan is required to ensure that the owner or operator of a Class VI injection well is prepared for unexpected events and have a working plan for any necessary emergency or remedial response to situations that arises. For more information on developing and implementing the required E&RR Plan, see the *Draft Underground Injection Control Program Class VI Primacy Application and Implementation Manual*.

[1] This list may be based on site-specific data collected in the site characterization and AoR processes. Potentially impacted resources or infrastructure near Class VI injection wells may include: the injection well, any public water systems, private drinking water wells, other deep wells within the AoR, aquifers and USDWs, surface water bodies, the soil column, buildings or other structures, biosphere/ecosystems, the atmosphere, and the geosphere.

IV. SELECTING COMMUNICATION METHODS AND DELIVERING THE MESSAGE

UIC Program Directors are required to solicit public participation in the Class VI permit application review and approval process pursuant to 40 CFR 124. One option is to combine face-to-face communications, direct mailings, and media outreach. Face-to-face communication includes public meetings, speakers' forums, roundtable discussions, site visits, etc. These types of public participation events offer an opportunity for local stakeholders to meet the permitting authority reviewing the permit application, to ask questions, and to voice their concerns. Properly run face-to-face communications can also inform citizens and help allay any concerns, gauge public opinion, and foster trust. Direct mailings generally involve the dissemination of fliers and fact sheets to the local community.

Media, including traditional and newer media, can be used to communicate information about the regulatory process to the community. Traditional media outlets include local television, radio, daily newspapers, and alternative/specialty newspapers. Owners or operators can provide information to the media through direct communication, print advertisements, fact sheets, and press releases. Messages about the proposed Class VI permit application could also be posted on newer media outlets, such as the UIC Program Director websites, the owner or operator website, and through web tools (e.g., Internet pages, blogs, listservs, podcasts, webcasts, and social media). Grassroots communications can target those audience segments that do not have access to or do not look to the mainstream media for information.

In some instances, stakeholders may need to receive information more than once and in several formats to gain a complete understanding of the subject matter. Having multiple types of materials available provides flexibility to use different options, depending on the audience's makeup and interests.

When communicating messages, the Director and owners or operators should identify distinct groups within the overall audience that require different communication styles (e.g., technical or low-literacy styles; text or graphical communications; English or Spanish text) and communication tactics (e.g., media or grassroots outreach). For instance, literacy levels are important because messaging for low literacy audiences is most effective when presented graphically (i.e., simple illustrations work better than textual explanations) and/or at a third-grade reading level. It is important, however, to ensure that the messages delivered to all audiences be consistent.

V. TESTING THE EFFECTIVENESS OF COMMUNICATIONS

Once the core public participation activities on a proposed Class VI injection well are complete or well underway, follow-up testing of the efforts can be conducted to assess whether the messages were received as intended and that target audiences understand the issues. The results of such an analysis can inform future public involvement efforts on other Class VI permit applications. Testing methods include surveillance of media coverage, polls, tracking requests for information or inquiries about the project, and surveys of target audiences.

Evaluating and monitoring the performance of the public participation program allows the UIC Program Director and owners or operators to stay abreast of how the community perceived the permitting process and to gauge the effectiveness of the public participation plan activities. Monitoring public opinion can also help identify any misconceptions about the project or the permitting authority's role in its oversight and develop plans to correct them. Public participation program monitoring also takes into account changes in local conditions, such as economic fluctuation or other significant impacts, which may influence the perception of a Class VI injection well.

VI. EXAMPLE PUBLIC OUTREACH APPROACH FOR A GEOLOGIC SEQUESTRATION PROJECT

[Example adapted from WRI November 2010 document.]

The following example is an adapted summary of the public involvement activities conducted for the proposed FutureGen carbon capture and storage (CCS) Project in Illinois.

For the proposed project, an array of governmental and non-governmental parties (referred to as the "Alliance") conducted community engagement efforts over several years. One aspect of the public outreach involved working with community stakeholders to determine issues, concerns, and overall perceptions of a potential "host community" for the FutureGen project, and to educate and answer any questions about the technology and project in general.

In scoping potential host sites, the Alliance, which included representatives from state government, met with over 200 stakeholders, including residents who live within a 10-mile radius of the proposed site, community leaders, farming association members, educators, nearby industrial business representatives, state regulators, environmental interest groups, and the media. The Alliance shared a fact sheet describing the FutureGen project and explained a technology flow diagram, illustrating how the integrated system would work.

The major topics of interest identified by the stakeholders were:

- Job opportunities;
- Using local coal;
- Potential disturbances (e.g., light, noise);
- Water quantity considerations;
- Ground water contamination risks;
- Site monitoring;
- Maintaining land use rights;
- Impacts on electric power bills;
- Decommissioning plans; and
- Potential research opportunities at the facility.

The Alliance began community engagement during the site proposal stage with a series of four public meetings at proposed project sites. Briefing materials (e.g., project fact sheets) and frequently asked questions (FAQs) were used during discussions with stakeholders. A series of meetings were held with stakeholders to inform the community about FutureGen and CCS using hands-on, physical demonstrations, such as rock samples and a three-dimensional sequestration model that shows how carbon dioxide behaves in the subsurface. Questions at the public meetings included:

- How does carbon dioxide stay in the rock formation?
- What happens to stored carbon dioxide in the event of an earthquake?
- Where does formation water go when carbon dioxide is injected?

A formal component to community engagement at FutureGen occurred when the U.S. Department of Energy (DOE) held its public hearings as required under the National Environmental Policy Act. At the meetings, technical experts with DOE and the Alliance were stationed at public displays related to aspects of the project, including a demonstration of a sequestration model. As of November 2010, a host site for the FutureGen project had not been selected. If and when a permit application is submitted, UIC Program Directors responsible for permitting this project should consider coordinating with the owner or operator and key stakeholders when implementing the required and additional public involvement activities during a Class VI injection well permit application review and approval process.

VII. RESOURCES

U.S. DOE National Energy Technology Laboratory. *Public Outreach and Education for Carbon Storage Projects.* DOE/NETL-2009/1391. December 2009. Available on the Internet at: http://www.netl.doe.gov/technologies/carbon_seq/refshelf/BPM_PublicOutreach.pdf.

U.S. EPA. *Geologic Sequestration of Carbon Dioxide – UIC Quick Reference Guide: Additional Tools for UIC Program Directors Incorporating Environmental Justice Considerations into the Class VI Injection Well Permitting Process.* June 2011. Available on the Internet at: http://water.epa.gov/type/groundwater/uic/class6/gsinformation.cfm.

U.S. EPA. *Geologic Sequestration of Carbon Dioxide: Draft Underground Injection Control Program Class VI Primacy Application and Implementation Manual*. June 2011. Available on the Internet at: http://water.epa.gov/type/groundwater/uic/class6/gsguidedoc.cfm.

U.S. EPA. *Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO2) Geologic Sequestration (GS) Wells Final Rule.* December 2010. Available on the Internet at: http://water.epa.gov/type/groundwater/uic/class6/gsregulations.cfm.

U.S. EPA. Public Involvement website, including tools and case studies. Available on the Internet at: http://www.epa.gov/publicinvolvement/index.htm.

U.S. EPA. *Public Participation Considerations for Geologic Sequestration Projects Fact Sheet.* December 2010. Available on the Internet at: http://water.epa.gov/type/groundwater/uic/class6/gsguidedoc.cfm.

U.S. Government Printing Office. *Code of Federal Regulation* (CFR) website for CFR citations referenced in this document. Available on the Internet at: http://www.gpoaccess.gov/cfr/index.html.

World Resources Institute (WRI). *CCS and Community Engagement: Guidelines for Community Engagement in Carbon Dioxide Capture, Transport, and Storage Projects.* November 2010. Available on the Internet at: http://www.wri.org/publication/ccs-and-community-engagement.

Attachment 1: Example Template of a Public Involvement Plan

Facility Information

Facility name:

Facility contacts (names, titles, phone numbers, e-mail addresses):

Location (town/county/etc.):

Project Description

Summarize the project, e.g., what will happen at the facility, the area affected, etc.

Key Stakeholders

List potentially interested and affected parties, including businesses, civic and environmental groups, Indian tribes, sensitive sub-populations, local water systems, local government, land owners, educators, other states, etc.

Messages

Describe key message(s) that you plan to deliver on the GS project, i.e., to describe GS technologies and how USDWs will be protected. This should be informed by any data available about local concerns/objections to the project.

Communication Methods

Describe communication activities to explain the planned GS project and keep the public informed on the latest developments related to the project, including schedules for hearings, briefings and other opportunities for involvement.

Public notice of pending Class VI permitting actions (via newspaper advertisements, postings, mailings, or e-mails to interested parties):

Public meetings (including speakers' forums, roundtable discussions, open houses, etc.):

Direct outreach to stakeholders:

Media conference calls:

Traditional media—TV, radio, newspapers (including editorial boards):

Internet-based media—Internet news, blogs, listservs, podcasts, webcasts, social media:

Arranged site visits:

Communication Materials

Describe materials and communication routes (i.e., how they will be distributed):

Fact sheets:

Press releases:

Fliers:

Public service materials:

Charts and illustrations:

Other Public Participation Activities

Note any other planned public participation or communication activities.

Testing Communication Effectiveness

Follow-up testing of the outreach campaign (this can help anticipate public concerns and help form the basis for future outreach/updates):

Media surveys:

Polling citizens:

Tracking requests for information: