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Mandatory Reporting of Greenhouse Gases: Injection and Geologic Sequestration of Carbon Dioxide; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 72, 78, and 98

[EPA–HQ–OAR–2009–0926; FRL–9232–6]

RIN 2060–AP88

Mandatory Reporting of Greenhouse Gases: Injection and Geologic Sequestration of Carbon Dioxide

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: EPA is promulgating a regulation to require greenhouse gas monitoring and reporting from facilities that conduct geologic sequestration of carbon dioxide and all other facilities that conduct injection of carbon dioxide. This rule does not require control of greenhouse gases, rather it requires only monitoring and reporting of greenhouse gases.

DATES: The final rule is effective on December 31, 2010.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA–HQ–OAR–2009–0926. All documents in the docket are listed on the *http://www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, *e.g.,* confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through *http://www.regulations.gov* or in hard copy at EPA's Docket Center, Public Reading Room, EPA West Building, Room 3334, 1301 Constitution Avenue, NW., Washington, DC 20004. This Docket Facility is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Air Docket is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT: For technical information and implementation materials, please go to the website *http://www.epa.gov/climatechange/emissions/ghgrulemaking.html.* To submit a question, select Rule Help Center, and then select Contact Us. You may also contact Mark de Figueiredo, Climate Change Division, Office of Atmospheric Programs (MC–6207J), Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460; telephone number: (202) 343–9928; fax number: (202) 343–2202.

SUPPLEMENTARY INFORMATION: *Regulated Entities.* The Administrator has determined that this action is subject to the provisions of Clean Air Act (CAA) section 307(d). *See* CAA section 307(d)(1)(V) (the provisions of CAA section 307(d) apply to "such other actions as the Administrator may determine"). These regulations will affect owners or operators of carbon dioxide (CO_2) injection wells. Regulated categories and entities include those listed in Table 1 of this preamble:

TABLE 1—EXAMPLES OF AFFECTED ENTITIES BY CATEGORY

Category	NAICS	Examples of affected facilities
CO_2 Enhanced Oil and Gas Recovery Projects.	211	Oil and gas extraction projects using CO_2 enhanced oil and gas recovery.
Acid Gas Injection Projects	211111 or 211112	Projects that inject acid gas containing CO_2 underground.
Geologic Sequestration Projects	N/A	CO_2 geologic sequestration projects.

Table 1 of this preamble is not intended to be exhaustive but rather provides a guide for readers regarding facilities likely to be affected by this action. Table 1 of this preamble lists the types of facilities that EPA is now aware could be potentially affected by the reporting requirements. Other types of facilities not listed in the table could also be subject to reporting requirements. To determine whether you are affected by this action, you should carefully examine the applicability criteria found in 40 CFR part 98, subpart A and the relevant criteria in the sections related to the injection and geologic sequestration (GS) of CO_2 (*i.e.,* subparts RR and UU). If you have questions regarding the applicability of this action to a particular facility, consult the website person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

Some facilities that are affected by this final rule are required to report under multiple source categories. Table 2 of this preamble has been developed as a guide to help potential CO_2 injection and GS reporters subject to the final rule identify the source categories (by subpart) that they may need to (1) consider in their facility applicability determination, and/or (2) include in their reporting. The table should only be seen as a guide. Additional subparts in 40 CFR part 98 may be relevant for a given reporter. Similarly, not all listed subparts are relevant for all reporters.

TABLE 2—SOURCE CATEGORIES AND RELEVANT SUBPARTS

Source category (and main applicable subpart)	Other subparts recommended for review to determine applicability
Geologic Sequestration of Carbon Dioxide (40 CFR part 98, subpart RR)	40 CFR part 98, subpart C. 40 CFR part 98, subpart W. 40 CFR part 98, subpart PP.
Injection of Carbon Dioxide (40 CFR part 98, subpart UU)	40 CFR part 98, subpart C. 40 CFR part 98, subpart W. 40 CFR part 98, subpart PP.

What is the effective date? The final rule is effective on December 31, 2010. Section 553(d) of the Administrative Procedure Act (APA), 5 U.S.C. chapter 5, generally provides that rules may not take effect earlier than 30 days after they are published in the **Federal Register.** EPA is issuing this final rule under section 307(d)(1) of the Clean Air Act,

which states: "The provisions of section 553 through 557 * * * of Title 5 shall not, except as expressly provided in this section, apply to actions to which this subsection applies." Thus, section 553(d) of the APA does not apply to this rule. EPA is nevertheless acting consistently with the purposes underlying APA section 553(d) in making this rule effective on December 31, 2010. Section 5 U.S.C. 553(d)(3) allows an effective date less than 30 days after publication "as otherwise provided by the agency for good cause found and published with the rule." As explained below, EPA finds that there is good cause for this rule to become effective on or before December 31, 2010, even if this results in an effective date fewer than 30 days from date of publication in the **Federal Register**.

While this action is being signed prior to December 1, 2010, there is likely to be a significant delay in the publication of this rule as it contains equations and charts, and is relatively long in length. As an example, EPA signed a shorter technical amendments package related to the same underlying reporting rule on October 7, 2010, and it was not published until October 28, 2010, 75 FR 66434, three weeks later.

The purpose of the 30-day waiting period prescribed in 5 U.S.C. 553(d) is to give affected parties a reasonable time to adjust their behavior and prepare before the final rule takes effect. Where, as here, the final rule will be signed and made available on the EPA Web site more than 30 days before the effective date, but where the publication is likely to be delayed due to the complexity and length of the rule, that purpose is still met. Moreover, EPA determined that facilities that are subject to this rule already collect data on CO_2 that is received. Facilities may use best available monitoring methods for calculating the mass of CO_2 received through the first quarter of 2011. Facilities subject to subpart RR that were issued a final Underground Injection Control (UIC) permit authorizing the injection of CO_2 into the subsurface on or before December 31, 2010 are required to submit a proposed monitoring, reporting, and verification (MRV) plan to EPA by June 30, 2011 and are allowed to request one extension of up to an additional 180 days in which to submit their proposed MRV plan. This will provide facilities a substantial additional period to adjust their behavior to the requirements of the final rule. Accordingly, we find good cause exists to make this rule effective on or before December 31, 2010, consistent with the purposes of 5 U.S.C. 553(d)(3).[1]

Judicial Review.

Under CAA section 307(b)(1), judicial review of this final rule is available only by filing a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit by January 31, 2011. Under CAA section 307(d)(7)(B), only an objection to this final rule that was raised with reasonable specificity during the period for public comment can be raised during judicial review. This section also provides a mechanism for EPA to convene a proceeding for reconsideration, "[i]f the person raising an objection can demonstrate to EPA that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of this rule." Any person seeking to make such a demonstration to EPA should submit a Petition for Reconsideration to the Office of the Administrator, Environmental Protection Agency, Room 3000, Ariel Rios Building, 1200 Pennsylvania Ave., NW., Washington, DC 20004, with a copy to the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section, and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20004. Note, under CAA section 307(b)(2), the requirements established by this final rule may not be challenged separately in any civil or criminal proceedings brought by EPA to enforce these requirements.

Acronyms and Abbreviations. The following acronyms and abbreviations are used in this document.

3–D three-dimensional
AGA American Gas Association
AMA active monitoring area
ANSI American National Standards Institute
API American Petroleum Institute
ASME American Society of Mechanical Engineers
CAA Clean Air Act
CBI confidential business information
CCS carbon dioxide capture and geologic sequestration
CFR Code of Federal Regulations
CO_2 carbon dioxide
DOE Department of Energy
EAB Environmental Appeals Board
EIA Economic Impact Analysis
EPA Environmental Protection Agency
EO Executive Order
ER enhanced oil and gas recovery
GHG greenhouse gas
GS geologic sequestration
ICR Information Collection Request
IRS Internal Revenue Service
MMA maximum monitoring area
MRV monitoring, reporting, and verification
NAESB North American Energy Standards Board
NAICS North American Industry Classification System
NTTAA National Technology Transfer and Advancement Act
OAR Office of Air and Radiation
OMB Office of Management and Budget
OW Office of Water
QA/QC quality assurance/quality control
R&D research and development
RFA Regulatory Flexibility Act
SBREFA Small Business Regulatory Enforcement Fairness Act
SDWA Safe Drinking Water Act
TSD technical support document
UIC Underground Injection Control
US United States
UMRA Unfunded Mandates Reform Act of 1995
USDW underground source of drinking water
VEF Vulnerability Evaluation Framework

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[1] We recognize that this rule could be published at least 30 days before December 31, 2010, which would negate the need for this good cause finding, and we plan to request expedited publication of this rule in order to decrease the likelihood of a printing delay. However, as we cannot know the date of publication in advance of signing this rule, we are proceeding with this good cause finding for an effective date on or before December 31, 2010.

I. Background

A. Organization of This Preamble

This preamble is divided into four sections, as detailed in the *Table of Contents.* This section describes the layout of the preamble and provides a brief summary of each section.

The first section of this preamble contains the basic background information about the origin of this rule, including a discussion of how it relates to the finalized requirements for suppliers of CO_2 under 40 CFR part 98, subpart PP. It also contains information on EPA's legal authority and how this rule relates to the UIC program, the Interagency Task Force on Carbon Capture and Storage and other Federal GS initiatives, as well as other GS information collection and reporting efforts.

The second section of this preamble provides an overview of the GHG Reporting Program and summarizes changes to the general provisions of the GHG Reporting Program. It also provides a summary of this final rule on key design elements such as: Source category definition, reporting threshold, GHGs to report, GHG calculations and monitoring, data reporting, and recordkeeping requirements. In addition, it describes the major changes made since the proposal and provides a brief summary of public comments and EPA's responses thereto.

The third section of this preamble provides the summary of the cost impacts, economic impacts, and benefits of this rule and discusses comments on the regulatory impacts analysis.

Finally, the last section of this preamble discusses the various statutory and executive order requirements applicable to this final rulemaking.

B. Background on the Final Rule

This action finalizes monitoring and reporting requirements for injection and geologic sequestration of carbon dioxide.

On April 12, 2010, EPA proposed this rule amending 40 CFR part 98. 40 CFR part 98 provides the regulatory framework for the GHG Reporting Program. The GHG Reporting Program requires reporting of GHG emissions and other relevant information from certain source categories in the United States. The GHG Reporting Program, which became effective on December 29, 2009, includes reporting requirements for facilities and suppliers in 34 subparts. For more detailed background information on the GHG Reporting Program, see the preamble to the final part 98 rule establishing that program (74 FR 56260, October 30, 2009) and the preamble to the Part 98 rule expanding that program from 30 to 34 subparts (75 FR 39736, July 12, 2010).

Subpart PP of the GHG Reporting Program requires the reporting of CO_2 supplied to the economy. During the public comment period on the part 98 rule establishing that requirement, EPA received comments that CO_2 geologically sequestered should be considered in the GHG Reporting Program. (For further information on relevant comments received in 40 CFR part 98, subpart PP, see "Mandatory Greenhouse Gas Reporting Rule: EPA's Response to Public Comments, Subpart PP: Suppliers of Carbon Dioxide" in Docket EPA–HQ–OAR–2008–0508.) In the final rule promulgating 40 CFR part 98, subpart PP, EPA committed to taking action to collect such data in the near future.

This final rule amends 40 CFR part 98 to add reporting requirements covering facilities that conduct geologic sequestration of CO_2 (40 CFR part 98, subpart RR) and all other facilities that conduct injection of CO_2 (40 CFR part 98, subpart UU).[2] GS is the long-term containment of a CO_2 stream in subsurface geologic formations. This data will, among other things, inform Agency decisions under the CAA related to the use of carbon dioxide capture and geologic sequestration (CCS) for mitigating GHG emissions.

Subpart RR information will enable EPA to monitor the growth and efficacy of GS (and therefore CCS) as a GHG mitigation technology over time and to evaluate relevant policy options. Furthermore, where enhanced oil and gas recovery (ER) projects are reporting under 40 CFR part 98, subpart RR, EPA will be able to evaluate ER as a non-emissive end use. Under 40 CFR part 98, subpart UU, EPA will be able to reconcile information obtained from this rule with data obtained from 40 CFR part 98, subpart PP on CO_2 supplied to the economy.

This rule was proposed by EPA on April 12, 2010. One public hearing was held on April 19, 2010, and the 60-day public comment period ended June 11, 2010. This final rule takes into consideration comments received during the comment period and finalizes the monitoring and reporting requirements for facilities conducting GS and all other facilities conducting CO_2 injection.

This final rule does not address whether data reported under 40 CFR part 98, subparts RR or UU will be released to the public or will be treated as CBI. EPA published a proposed rule on confidentiality determination on July 7, 2010 (75 FR 39094) that addressed this issue. In that action, EPA proposed which specific data elements may be released to the public and which would be treated as CBI. EPA received several comments on that proposal, and is in the process of considering these comments.

C. Legal Authority

EPA is promulgating this rule under its existing CAA authority; specifically, authorities provided in CAA section 114. As discussed in detail in Sections I.C and II.Q of the preamble to the final part 98 rule establishing the GHG Reporting Program (74 FR 56260, October 30, 2009), CAA section 114 provides EPA with the authority to require the information mandated by this rule because such data will inform and are relevant to EPA's implementation of a wide variety of CAA provisions. Under CAA section 114(a)(1), the Administrator may require emissions sources, persons subject to the CAA, manufacturers of emission control or process equipment, or persons whom the Administrator believes may have necessary information to monitor and report emissions and provide such other information as the Administrator requests for the purposes of carrying out any provision of the CAA (except for a

[2] EPA has moved all definitions, requirements, and procedures for facilities conducting CO_2 injection only (which both EPA and commenters have referred to as "Tier 1" facilities for simplicity) into a new subpart, 40 CFR part 98, subpart UU, and retained all definitions, requirements, and procedures related to facilities conducting GS (which both EPA and commenters have referred to as "Tier 2" facilities for simplicity) in 40 CFR part 98, subpart RR.

provision of title II with respect to motor vehicles). EPA may gather information for a variety of purposes, including for the purpose of assisting in the development of implementation plans or of emissions standards under CAA section 111, determining compliance with implementation plans or such standards, or more broadly for "carrying out any provision" of the CAA.

D. Relationship to Underground Injection Control Regulations Under the Safe Drinking Water Act

The Agency maintains a high-level of coordination across EPA offices and regions on GS activities and regulatory development. EPA's Office of Air and Radiation (OAR) and Office of Water (OW) work closely to promote safe and effective implementation of GS technologies while ensuring protection of human health and the environment. OAR and OW have closely coordinated this rulemaking under CAA authority and the rulemaking under Safe Drinking Water Act (SDWA) authority establishing Federal requirements under the UIC program for Class VI wells (hereafter referred to as the UIC Class VI rule).

EPA's UIC program was established in the 1970s to prevent endangerment of underground sources of drinking water (USDWs) from injection of various fluids, including CO_2 for ER, oil field fluids, water stored for drinking water supplies, and municipal and industrial waste. The UIC program, which is authorized by Part C of SDWA (42 U.S.C. 300h *et seq.*), is designed to prevent the movement of such fluid into USDWs by addressing the potential pathways through which injected fluids can migrate and potentially endanger USDWs. In 2008, EPA proposed to amend the UIC program to establish a new class of injection well—Class VI—to cover the underground injection of CO_2 for the purpose of GS, or long-term storage of CO_2 (73 FR 43492, July 25, 2008). For a summary of the UIC program and more details on the final UIC Class VI rule, please see the UIC Geologic Sequestration of Carbon Dioxide Web site.[3]

EPA designed the reporting requirements under 40 CFR part 98, subpart RR with careful consideration of UIC requirements, including Class VI, to minimize overlap between the two programs. There are two areas of potential overlap (see Table 3 of this preamble). The first overlap is the requirement that owners or operators report the quantity of CO_2 injected. The UIC Class VI rule requires owners or operators to continuously monitor the amount of CO_2 injected and submit semi-annual reports on the monthly amount injected. The UIC program requires information on the amount injected to ensure appropriate CO_2 injection operations. Subpart RR requires facilities to collect data on the amount injected over a quarter and submit annual reports on the annual amount of CO_2 injected. Data on the amount of CO_2 injected is a component of the 40 CFR part 98, subpart RR mass balance approach [4] used to quantify the amount of CO_2 sequestered. EPA determined that quarterly data collection and annual reporting under 40 CFR part 98, subpart RR was necessary in order to harmonize data with other subparts of the GHG Reporting Program. Facilities reporting under 40 CFR part 98, subpart RR may use flow meters used to comply with the flow monitoring and reporting provisions in their UIC permit.

The second overlap is a monitoring plan for detecting air emissions. While requirements under the UIC program are focused on demonstrating that USDWs are not endangered as a result of CO_2 injection into the subsurface, requirements under the GHG Reporting Program through 40 CFR part 98, subpart RR will enable EPA to verify the quantity of CO_2 that is geologically sequestered and to assess the efficacy of GS as a mitigation strategy. Subpart RR achieves this by requiring facilities conducting GS to develop and implement a MRV plan [5] to detect and quantify leakage of injected CO_2 to the surface in the event leakage occurs and to report the amount of CO_2 geologically sequestered using a mass balance approach, regardless of the class of UIC permit that a facility holds.

The monitoring required by 40 CFR part 98, subpart RR for quantification purposes is complementary to and builds on UIC permit requirements. In particular, the UIC Class VI permit requires a comprehensive site characterization that includes an assessment of the geologic, hydrogeologic, geochemical, and geomechanical properties of the proposed GS site to ensure that GS wells are located in suitable formations. The UIC Class VI permit also requires computational modeling of the Area of Review, and a periodic re-evaluation of this Area of Review based on robust modeling and monitoring of the CO_2 stream, injection pressures, integrity of the injection well, groundwater quality and geochemistry, and the position of the CO_2 plume and pressure front throughout injection. These requirements can provide the basis for the MRV plan submitted to EPA for 40 CFR part 98, subpart RR. Therefore, EPA will accept a UIC Class VI permit to satisfy certain MRV plan requirements; however, the reporter must include additional information to outline how monitoring will achieve detection and quantification of CO_2 in the event surface leakage occurs.

The UIC Class VI rule also allows for surface air and soil gas monitoring at the discretion of the UIC Director as a means of identifying CO_2 leaks that may pose a risk to USDWs and informing emergency notification of a Class VI owner or operator and UIC Director in the event of a USDW endangerment. If the UIC Director determines that it is appropriate to require surface air or soil gas monitoring for USDW protection, the UIC Director must approve the use of monitoring employed under 40 CFR part 98, subpart RR so long as the owner or operator is able to demonstrate USDW protection pursuant to requirements at 40 CFR 146.90(h)(3).

TABLE 3—COMPARISON OF REPORTING REQUIREMENTS UNDER SUBPART RR WITH UIC CLASS VI REGULATIONS

Reporting requirement	Subpart RR	UIC Class VI
Quantity of CO_2 received	Yes	N/A.
Quantity of CO_2 injected	Yes	Yes.
Equipment leaks and vented emissions from surface equipment between flow meters and the wellhead	Yes	N/A.

[3] *http://water.epa.gov/type/groundwater/uic/wells_sequestration.cfm.*

[4] The subpart RR mass balance equation for quantifying the amount of CO_2 that is geologically sequestered includes variables on injected CO_2; equipment leaks and vented CO_2 emissions from surface equipment between the flow meters and the wellhead; CO_2 produced and/or remaining with produced oil, gas or other fluids; and CO_2 leakage to the surface. For more information, see Section II.B of this preamble.

[5] The subpart RR MRV plan includes delineation of monitoring areas, identification and assessment of potential surface leakage pathways, a strategy for detecting and quantifying surface leakage of CO_2 if leakage occurs, an approach for establishing the expected baselines, and a summary of considerations for calculating site-specific variables for the mass balance equation, such as calculating CO_2 in produced fluids. For more information, see Section II.B of this preamble.

TABLE 3—COMPARISON OF REPORTING REQUIREMENTS UNDER SUBPART RR WITH UIC CLASS VI REGULATIONS—Continued

Reporting requirement	Subpart RR	UIC Class VI
Quantity of CO_2 produced with oil or natural gas (ER) or other fluids	Yes	N/A.
Percentage of CO_2 estimated to remain with oil (ER) or other fluids	Yes	N/A.
Quantity of CO_2 emitted from the subsurface	Yes	N/A.
Quantity of CO_2 sequestered in the subsurface	Yes	N/A.
Cumulative mass of CO_2 sequestered in the subsurface	Yes	N/A.
Monitoring plan for detecting air emissions	Yes	Yes.[1]
Monitoring plan for quantifying air emissions	Yes	N/A.

[1] UIC Class VI rule allows for surface air/soil gas monitoring for USDW protection at the discretion of the UIC Director.

EPA has determined that the requirements of these two rules complement one another by concurrently ensuring USDW protection, as required under SDWA, and requiring reporting of CO_2 surface emissions under 40 CFR part 98, subpart RR. EPA is committed to working closely within the agency to coordinate implementation of the UIC and GHG Reporting programs, reduce burden on reporters, provide timely access to verified emissions data, establish mechanisms to efficiently share data, and harmonize data systems to the extent possible.

E. Relationship to the Interagency Task Force on Carbon Capture and Storage and Other Federal Geologic Sequestration Initiatives

On February 3, 2010, President Obama established an Interagency Task Force on Carbon Capture and Storage (CCS Task Force). The CCS Task Force, co-chaired by EPA and the Department of Energy (DOE), developed a plan to overcome the barriers to the widespread, cost-effective deployment of CCS within ten years, with a goal of bringing five to ten commercial demonstration projects online by 2016. The CCS Task Force's plan was delivered to President Obama in August 2010.

The CCS Task Force explored incentives for commercial CCS adoption and addressed financial, economic, technological, legal, institutional, social, or other barriers to deployment. For example, the CCS Task Force examined Federal regulatory activities that address the safety, efficacy, and environmental soundness of GS. The CCS Task Force also considered how best to coordinate existing administrative authorities and programs, including those involving international collaboration, as well as identified areas where additional administrative authority may be necessary. The CCS Task Force recommended that EPA finalize this rule. For more information, please see EPA's CCS Task Force Web site.[6]

F. Relationship to Other Geologic Sequestration Information Collection and Reporting Efforts

EPA reviewed and took into account several existing domestic and international reporting and monitoring programs in designing this rule. For additional information, please see Section I.F of the notice of proposed rulemaking (75 FR 18581, April 12, 2010).

Also as discussed in the notice of proposed rulemaking, EPA notes that the Internal Revenue Service (IRS) published IRS Notice 2009–83 [7] to provide guidance regarding eligibility for the Internal Revenue Code section 45Q credit for CO_2 sequestration, computation of the section 45Q tax credit, reporting requirements for taxpayers claiming the section 45Q tax credit, and rules regarding adequate security measures for secure GS. As clarified in the IRS guidance, taxpayers claiming the section 45Q tax credit must follow the appropriate UIC requirements. The guidance also clarifies that taxpayers claiming section 45Q tax credit must follow the MRV procedures that are being finalized under 40 CFR part 98, subpart RR in this final rule.

II. Summary of Final Rule

A. Summary of Changes to the General Provisions of the Greenhouse Gas Reporting Program

This action amends certain requirements in 40 CFR part 98, subpart A (General Provisions).

Changes to Applicability. In this action, EPA is amending Table A–3 in 40 CFR 98.2(a)(1) to include the geologic sequestration of CO_2 and injection of CO_2 source categories.

B. Summary of the Reporting Requirements for Geologic Sequestration of Carbon Dioxide (Subpart RR)

Reporting requirements for facilities conducting GS are found in 40 CFR part 98, subpart RR. These facilities are required to report the amount of CO_2 received, develop and implement an EPA-approved MRV plan, and report the amount of CO_2 sequestered using a mass balance approach, by subtracting total CO_2 emissions from CO_2 injected in the reporting year. Other facilities injecting CO_2 underground report under 40 CFR part 98, subpart UU.

1. Subpart RR Source Category Definition

The 40 CFR part 98, subpart RR source category consists of any well or group of wells that inject a CO_2 stream for long-term containment into a subsurface geologic formation.[8] All wells permitted as Class VI by the UIC program meet the definition of this source category. Facilities conducting ER are not subject to 40 CFR part 98, subpart RR unless they choose to opt-in to the requirements of this subpart or hold a UIC Class VI permit.

Research and development (R&D) projects are exempt from reporting requirements under 40 CFR part 98, subpart RR provided they meet the eligibility requirements. A project is eligible for the exemption if it investigates or will investigate practices, monitoring techniques, or injection verification, or if it is engaged in other applied research that focuses on enabling safe and effective long-term containment of a CO_2 stream in subsurface geologic formations, including research and injection tests conducted as a precursor to a larger more permanent long-term storage operation. Small and large-scale projects meeting the criteria for an exemption, such as the current Regional Carbon

[6] *http://www.epa.gov/climatechange/policy/ccs_task_force.html.*

[7] Available at: *http://www.irs.gov/irb/2009–44_IRB/ar11.html#d0e1860.*

[8] Note that R&D projects that are exempted from subpart RR report under Subpart UU—see discussion below.

Sequestration Partnership projects supported by the Office of Fossil Energy at the DOE, would be considered R&D for the purposes of this exemption from reporting for the duration of the R&D activity. Other DOE supported GS R&D projects may also satisfy the eligibility requirements for the exemption. In addition, short duration CO_2 injection projects conducted to identify local amenability to long term storage will be exempted from 40 CFR part 98, subpart RR for the duration of such injection testing. This includes cases where an operator is using a short duration CO_2 injection test to assess local geologic conditions and validate the injectivity potential of a particular site prior to developing that site for commercial scale geologic storage of carbon dioxide. Demonstration projects can apply for the exemption, but will be measured against the same criteria established in 40 CFR 98.440(d). Projects that are not R&D projects, such as commercial GS operations, are not eligible for the exemption.

To receive an R&D exemption, the project representative must submit to the Administrator information on the planned duration of CO_2 injection for research, the planned annual CO_2 injection volumes during this time period, the purposes of the project, the source and type of funding for the project, and the class and duration of UIC permit, or, for an offshore facility not subject to SDWA, a description of the legal instrument authorizing GS.

The Administrator will determine if a project meets the definition of research and development project within 60 days of receipt of the submission of a request for exemption. In making this determination, the Administrator will take into account any information that the reporter submits demonstrating that the planned duration of CO_2 injection for the project and the planned annual CO_2 injection volumes during the duration of the project are consistent with the purpose of the research and development project. This rule allows for administrative appeals of the Administrator's R&D determination, as provided for in 40 CFR part 78.

Facilities that qualify for a GS R&D exemption from 40 CFR part 98, subpart RR are not exempted from any other source category of the GHG Reporting Program including 40 CFR part 98, subpart UU. For other source categories of the GHG Reporting Program, R&D is defined at 40 CFR 98.6.

2. Subpart RR Reporting Threshold

All facilities that meet the 40 CFR part 98, subpart RR source category definition must report (*i.e.,* there is no reporting threshold). However, reporters that receive a subpart RR R&D exemption are no longer subject to subpart RR, but rather report CO_2 received under subpart UU. The cease reporting provisions of § 98.2(i) do not apply to subpart RR. Rather, once a facility is subject to the requirements of this subpart, including facilities that opt-in to 40 CFR part 98, subpart RR, the owner or operator must continue for each year thereafter to comply with all requirements of this subpart, including the requirement to submit annual reports, until the Administrator has issued a final decision on an owner or operator's request to discontinue reporting. The request to discontinue reporting must include either a copy of the applicable UIC program Director's authorization of site closure, or a demonstration that the injected CO_2 stream is not expected to migrate in a manner likely to result in surface leakage. Before the reporter can discontinue reporting, but after injection has ceased, EPA expects that in most cases there will be minimal burden in monitoring and reporting unless a surface leak is detected.

3. Subpart RR GHGs to Report

Facilities covered by this source category must report the mass of CO_2 received; the mass of CO_2 injected; the mass of CO_2 produced (*i.e.,* mixed with produced oil, gas, or other fluids); the mass of CO_2 emitted from surface leakage; the mass of CO_2 equipment leaks and vented CO_2 emissions from sources between the injection flow meter and the injection wellhead or between the production flow meter and the production wellhead; and the mass of CO_2 sequestered in subsurface geologic formations (this is calculated from the other quantities).

4. Subpart RR GHG Calculations and Monitoring

Facilities covered by this source category must calculate the annual mass of CO_2 received. Starting from the date specified in the EPA-approved MRV plan, facilities must also use a mass balance approach to calculate the mass of CO_2 geologically sequestered. First, facilities must calculate the annual mass of CO_2 injected. From the annual mass of CO_2 injected, facilities must subtract the mass of CO_2 emitted from surface leakage, using the site-specific procedures in their MRV plan, and the mass of CO_2 emitted as equipment leaks or vented emissions from applicable surface equipment, using the procedures specified in 40 CFR part 98, subpart W of the GHG Reporting Program. All GS projects with equipment leak or vented emissions from surface equipment applicable to the GS mass balance equation should use the procedures specified in subpart W, regardless of whether such projects are associated with the oil and gas industry. Facilities that are producing, oil, gas, or other fluids must additionally subtract the mass of CO_2 produced. Calculation procedures are provided at 40 CFR 98.443.

5. Subpart RR Geologic Sequestration Monitoring, Reporting, and Verification (MRV) Plans

Facilities must develop an MRV plan, submit the MRV plan to EPA, receive an approved MRV plan from EPA, implement the EPA-approved plan, and submit annual reports.

The MRV plan must include five major components:

X Delineation of the maximum monitoring area (MMA) and the active monitoring area (AMA).

X Identification and evaluation of the potential surface leakage pathways and an assessment of the likelihood, magnitude, and timing, of surface leakage of CO_2 through these pathways in the MMA.

X A strategy for detecting and quantifying any surface leakage of CO_2 in the event leakage occurs.

X An approach for establishing the expected baselines for monitoring CO_2 surface leakage.

X A summary of considerations made to calculate site-specific variables for the mass balance equation.

First, the MRV plan must include a delineation of the MMA and the AMA. The MMA includes the extent of the free phase CO_2 plume over the lifetime of the project plus a buffer zone of one-half mile. Potential surface leakage pathways must be identified and assessed in the MMA. The AMA is the area that will be monitored over a specified time interval chosen by the reporter, which must be greater than one year. All of the area in the MMA will eventually be covered by one or more AMAs. The first time interval will begin from the date determined in your MRV plan through the date at which the MRV plan calls for the first expansion of the AMA. For each subsequent time interval, a new AMA must be determined. This allows operators to phase in monitoring so that during any given time interval, only that part of the MMA in which leakage might occur needs to be monitored. The boundary of the AMA in each time interval is established by superimposing two areas. The first is the area projected to contain the free phase CO_2 plume at the end of the specified time interval plus an all around buffer zone of at least

one-half mile, or greater if known leakage pathways extend laterally more than one-half mile. The second is the area projected to contain the free phase CO_2 plume five years beyond the specified time interval.[9]

Second, the MRV plan must include identification and evaluation of potential surface leakage pathways within the MMA and an assessment of the likelihood, magnitude, and timing, of surface leakage of CO_2 through these pathways. Possible conduits for CO_2 leakage include faults, fractures, and abandoned wells.[10]

Third, the MRV plan must describe the strategy for detecting and quantifying surface leakage of CO_2 in the event leakage occurs. It should include a description of the approach for determining whether surface leakage has occurred, an explanation of how CO_2 surface leaks will be distinguished from the baseline, and the approach for quantifying detected and verified surface leakage. The expected performance of the selected leakage detection monitoring system or technical specifications should also be described in the MRV plan. If a surface leak is detected, the reporter should have a strategy in place to verify that a surface leak has occurred, confirm the location and source of the surface leak, and then apply some combination of direct measurement and estimation to quantify the surface leak.

Fourth, the MRV plan should include an approach for establishing expected baselines. The primary goal of establishing expected baselines is so that the Reporter can discern whether the results of monitoring are attributable to leakage of injected CO_2 or from another cause (e.g. natural variability). The MRV plan leakage detection and quantification strategy may include monitoring a selection of indicator parameters to detect potential CO_2 leakages. These indicator parameters may be environmental such as subsurface pressure, soil CO_2 flux rates, etc., or operational, such as the injection pressure and the annular pressure in the well. To judge whether a set of measured parameter values obtained during GS operations may indicate CO_2 leakage, reporters should know what those parameter values would be expected to be in the absence of leaks. The MRV plan should describe how the baselines will be determined, how they will be measured or calculated, how they could be used to detect monitoring anomalies, and the operating conditions and their variability.

Fifth, the MRV plan should include a description of monitoring and calculation methodologies to calculate equipment leaks and vented emissions from surface equipment between the flow meters and either injection or production wellheads, and the quantity of CO_2 that is produced with oil or other fluids.

EPA will send a notice of receipt to the reporter within 15 days to acknowledge that EPA has received the MRV plan submission. EPA will determine if the MRV plan is complete within 45 days of the notice of receipt and will notify the reporter whether the plan is complete or incomplete. If incomplete, the reporter must submit an updated MRV plan within 45 days of EPA notification unless otherwise specified by EPA.

Once EPA determines that the MRV plan is complete, technical review will commence. After 60 days of technical review, EPA will send the reporter a request for additional information including clarifying technical questions, if necessary. The reporter will be encouraged to provide a response to this request within 15 days, however EPA recognizes that there may be circumstances where additional time is needed for the reporter to collect the information requested.

Following this iterative process, EPA will issue a final MRV plan as submitted, or with revisions. EPA will post the approved MRV plan on a public Web site, subject to any limitations or requirements in its CBI determination (see Section I.B of this preamble). Any reporter, or interested person, objecting to EPA's final decision, may appeal it to EPA's Environmental Appeals Board.

Facilities must re-submit the MRV plan for EPA approval if a material change was made to monitoring and/or operational parameters that was not anticipated in the original plan, if the facility's UIC permit class changes, or if an EPA review of the annual report determines that it is necessary. Examples of material changes include but are not limited to a large change in the volume of CO_2 injected; the construction of new injection wells not referred to in the MRV plan; failures of the monitoring system to perform as expected due to inadequate monitoring system sensitivity, performance, location, or baseline; changes to surface land use that affects baseline or operational conditions; observed plume location that differs significantly from the predicted plume area used for developing the monitoring plan; a change in the MMA or AMAs; or a change in monitoring technology that would result in coverage or detection capability different from what is specified in the MRV plan. As an example of a facility's UIC permit class changing, the UIC Class VI rule provides that UIC Class II ER projects must seek a UIC Class VI permit when there is an increased risk to USDWs compared to UIC Class II operations. Please see 40 CFR 144.19 of the UIC Class VI rule for a list of risk-based criteria that the UIC Director shall use to determine if the owner or operator of a UIC Class II ER project must apply for and obtain a UIC Class VI permit. This list of criteria may also be used by Class II ER project owners and operators to self-determine if they need to apply for and obtain a UIC Class VI permit. If a facility's UIC permit were to change from Class II to Class VI, it would be required to submit a revised MRV plan to EPA for approval.

6. Subpart RR Data Reporting

In addition to the information summarized at "Subpart RR GHGs to Report" in this section of the preamble, facilities must report the source of the CO_2 received and the cumulative amount of CO_2 geologically sequestered since the facility first reported under subpart RR. All facilities must also report concentration, facilities using mass flow meters must report mass flow information, facilities using volumetric flow meters must report volumetric flow information, and facilities using containers must measure the mass or volume of the containers. They are required to report a description of the monitoring program that was implemented, including descriptions of monitoring anomalies and surface leakage, if any. Finally, for EPA verification purposes, they are required to report for each injection well the class of UIC permit and well identification number used for the UIC permit.

Subpart RR requires reporting of CO_2 equipment leaks and vented CO_2 emissions to the extent they are a component of the GS mass balance. Subpart RR does not require reporting of CO_2 equipment leaks and vented CO_2 emissions from all surface equipment located within the facility (*e.g.,* operational emissions not related to the CO_2 being injected); however, GS projects that produce oil or natural gas may be required to report CO_2 equipment leaks and vented CO_2 emissions in the petroleum and natural

[9] In some cases, the actual footprint of the free phase CO_2 plume and the area that is projected to contain the free phase CO_2 plume after five years may be the same. The one-half mile or greater area provides a buffer zone in the case that upward migration of a CO_2 leak moves laterally as it approaches the surface.

[10] As discussed in Section I.D. of this preamble, UIC requirements can provide the basis for the MRV plan submitted to EPA for 40 CFR part 98, subpart RR.

gas system subpart, 40 CFR part 98, subpart W as part of either offshore or onshore petroleum and natural gas production.

7. Subpart RR Recordkeeping

Facilities must retain quarterly records of CO_2 received; injected CO_2; produced CO_2; CO_2 emitted by surface leakage; CO_2 emitted as equipment leaks and vented emissions from equipment located on the surface between the flow meter used to measure the injection quantity and the injection wellhead and between the flow meter used to measure the production quantity and the production wellhead; and any other records as outlined for retention in the facility MRV plan for 3 years per 40 CFR 98.3(g).

8. Subpart RR Administrative Appeals

Under this final rule, final decisions of the Administrator under part 98, subpart RR are appealable to EPA's Environmental Appeals Board under the regulations that are set forth in part 78 (40 CFR part 78). Part 78 is revised to accommodate such appeals. Specifically, the list in 40 CFR 78.1 of the types of final decisions that can be appealed under 40 CFR part 78 is expanded to cover final decisions of the Administrator under 40 CFR part 98, subpart RR. This list includes, but is not limited to, the following specific types of decisions under subpart RR, a determination of eligibility for an R&D exemption under 40 CFR 98.440(d)(4), the approval or disapproval of a request for discontinuation of reporting under 40 CFR 98.441(b)(2), and the approval or disapproval of a MRV plan under 40 CFR 98.448(c).

Further, 40 CFR 78.3 is revised to allow for petitions for administrative appeal of decisions of the Administrator under 40 CFR part 98, subpart RR. Under the general approach in the existing part 78, an "interested person" (in addition to the official representative of owners and operators involved in a matter) may petition for an administrative appeal of a final decision of the Administrator. The "interested person" definition, which is located in part 72 of the Acid Rain Program regulations, is expanded to take into account final decisions of the Administrator under part 98. In particular, EPA is revising the "interested person" definition by replacing specific references to the Acid Rain Program and draft permits with broader references to any decision by the Administrator and the Administrator's process of making that decision. As a result of this revision and the revisions of 40 CFR part 78, a person who does not own or operate a facility covered by a final decision under 40 CFR part 98, subpart RR will need to submit his or her name to be included by the Administrator on an "interested persons list" in order to be able to appeal—by filing a petition for an administrative appeal—that final decision.

In addition, 40 CFR 78.4 is expanded to state that filings on behalf of owners and operators of a facility subject to 40 CFR part 98, subpart RR must be signed by the designated representative of the owners and operators.

C. Summary of the Reporting Requirements for Injection of Carbon Dioxide (Subpart UU)

Reporting requirements for all other facilities conducting CO_2 injection are found in 40 CFR part 98, subpart UU. Facilities conducting GS and reporting under 40 CFR part 98, subpart RR are not required to report under 40 CFR part 98, subpart UU.

1. Subpart UU Source Category Definition

The 40 CFR part 98, subpart UU source category consists of any other well or group of wells that inject a CO_2 stream into the subsurface. This includes any wells used to enhance oil and gas recovery and GS R&D projects that are exempted from 40 CFR part 98, subpart RR monitoring and reporting requirements. If you report under 40 CFR part 98, subpart RR for a well or group of wells, you are not required to report under 40 CFR part 98, subpart UU for that well or group of wells.

2. Subpart UU Reporting Threshold

All facilities that inject CO_2 underground must report under this subpart (except those in subpart RR), regardless of the amount of emissions from the facility or the amount of CO_2 injected. Reporters can cease subpart UU reporting pursuant to the provisions at 40 CFR 98.2(i) that allow facilities to cease GHG reporting to EPA; with respect to subpart UU, any reference to CO_2 emissions in 40 CFR 98.2(i) means CO_2 received.

3. Subpart UU GHGs to Report

Facilities covered by this source category must report the annual mass of CO_2 received.

4. Subpart UU GHG Calculations and Monitoring

Facilities covered by this source category must calculate the annual mass of CO_2 received using the calculation procedures for either mass or volumetric flow meters. Where CO_2 is received in containers, facilities must use the calculation procedures for determining the mass or volume of contents in containers.

5. Subpart UU Data Reporting

In addition to reporting the mass of CO_2 received, facilities must report the source of the CO_2. All facilities must also report concentration, facilities using mass flow meters must report mass flow information, facilities using volumetric flow meters must report volumetric flow information, and facilities using containers must measure the mass or volume of the containers.

6. Subpart UU Recordkeeping

Facilities must retain quarterly records of CO_2 received for 3 years per 40 CFR 98.3(g).

D. Summary of the Major Changes Since Proposal

The major changes in this rule since the original proposal are identified in the following list. The rationale for these and any other changes to the rule can be found in this section or in "Mandatory Greenhouse Gas Reporting Rule: EPA's Response to Public Comments, Subparts RR and UU: Injection and Geologic Sequestration of Carbon Dioxide."

X EPA has moved all definitions, requirements, and procedures for facilities conducting CO_2 injection only (which both EPA and commenters have referred to as "Tier 1" facilities for simplicity) into a new subpart, 40 CFR part 98, subpart UU, and retained all definitions, requirements, and procedures related to facilities conducting GS (which both EPA and commenters have referred to as "Tier 2" facilities for simplicity) in 40 CFR part 98, subpart RR.

X EPA has removed the requirement that facilities report the amount of CO_2 injected in 40 CFR part 98, subpart UU (Tier 1) but retained requirements that facilities subject to this subpart report the amount of CO_2 received and the source of CO_2 if known.

X EPA has established procedures for calculating CO_2 received in containers.

X In 40 CFR part 98, subpart RR, EPA has established eligibility requirements for a GS R&D project to be exempt from 40 CFR part 98, subpart RR.

X In 40 CFR part 98, subpart RR, EPA has retained the requirement that facilities report the equipment leaks and vented emissions for surface equipment that could be included in the GS mass balance but removed the requirement for reporting equipment leaks and

vented emissions for all other surface equipment.

X In 40 CFR part 98, subpart RR, EPA has added an MRV plan requirement for the delineation of the areas that will be monitored.

X In 40 CFR part 98, subpart RR, EPA has clarified the requirements for an addendum to the annual report and renamed it the monitoring report.

X EPA has amended 40 CFR part 78 to include administrative appeals procedures for EPA decisions made under 40 CFR part 98, subpart RR, such as decisions relating to eligibility for the R&D exemption under 40 CFR 98.440(d)(4), decisions relating to a request for discontinuation of reporting under 40 CFR 98.441(b)(2), or MRV plan decisions under 40 CFR 98.448(c).

E. Summary of Comments and Responses

This section contains a brief summary of major comments and responses. A large number of comments on CO_2 injection and sequestration were received covering numerous topics. Responses to significant comments received can be found in "Mandatory Greenhouse Gas Reporting Rule: EPA's Response to Public Comments, Subparts RR and UU: Injection and Geologic Sequestration of Carbon Dioxide."

1. Legal Authority

Comment: EPA received a number of comments regarding its legal authority to require the proposed reporting from facilities conducting CO_2 injection or GS. Some commenters argued that EPA has over-reached its CAA statutory authority, stating that the CAA authorizes the regulation of air emissions, not CO_2 injection or GS. One commenter asserted that EPA is overstepping its authority under CAA section 114 by requiring indefinite and broad monitoring and reporting, and that none of EPA's stated purposes in the preamble to the proposal provide adequate justification for the proposed data collection requirements, imposition of new measurement protocols, or installation of new instrumentation. Some commenters also asserted that the fiscal year 2008 Appropriations Act constrains the scope of EPA's information gathering to GHG emissions, which does not include CO_2 injection or GS. Some commenters asserted that the proposal was within EPA's authority under the CAA.

Response: EPA is promulgating this rule under the authority provided in CAA section 114. We disagree that we do not have statutory authority to promulgate this rule. The Administrator may gather information under CAA section 114, as long as that information is for purposes of carrying out any provision of the CAA. The information submitted to EPA as a result of this rule will, among other things, inform policy decisions under the CAA related to the use of CCS for mitigating GHG emissions. This data will prove valuable to the Agency in several areas, including reconciling 40 CFR part 98, subpart UU data on CO_2 received with CO_2 supply data to better understand the amount of CO_2 supply that is used for CO_2 injection and GS, monitoring the growth and efficacy of GS over time, and evaluating ER as a potentially non-emissive end use.

EPA is not citing the fiscal year 2008 Consolidated Appropriations Act as the statutory basis for this action. Furthermore, we do not agree that the appropriations language constrains EPA's ability to collect the information under this action. Please also refer to Mandatory Greenhouse Gas Reporting Rule: EPA's Response to Public Comments, Volume No.: 9, Legal Issues (Docket ID No. EPA–HQ–OAR–2008–0508) for similar comments received in developing the rule establishing the GHG Reporting Program.

2. Definition of Source Category

Comment: EPA received many comments about the definition of source category and GS facility. At least one commenter recommended setting a clearer distinction between CO_2 injection without GS (Tier 1) and CO_2 injection with GS (Tier 2). This commenter and others recommended a further distinction within the GS group—GS with ER and GS without ER. In addition, several commenters either requested clarification of or demonstrated a misunderstanding of whether particular provisions of the proposed rule, such as the GS R&D exemption and proposed discontinuation of reporting provisions, would apply to all CO_2 injection, to CO_2 injection with GS only, or to CO_2 injection without GS only.

Furthermore, several commenters were confused by the definition of GS facility in the regulatory text and found it to be redundant, complicated, unclear, or vague. At least two commenters urged EPA not to change the definition of facility found in 40 CFR 98.6 of the GHG Reporting Program General Provisions, while other commenters appeared to support a subpart RR-specific facility definition but raised questions or provided comment about which structures or equipment would be within the GS facility. Some commenters requested edits or additions to the list of activities at 40 CFR 98.440(d) that are not included in the source category.

Response: EPA agrees with commenters that the structure of proposed 40 CFR 98.440 could be made clearer. It was never EPA's intention to override the definition of facility in 40 CFR 98.6; rather EPA intended to create a defined term "GS facility" to provide clarity about which facilities under the 40 CFR part 98, subpart RR source category would be subject to both "Tier 2" and "Tier 1" requirements. To harmonize 40 CFR part 98, subpart RR with the rest of the GHG Reporting Program as intended and to maximize clarity, the defined term "GS facility" is not included in the final rule. In this action, EPA has deleted the term "GS facility" from the regulatory text and has reframed any necessary information as part of the definition of "source category." The owner or operator of a group of CO_2 injection wells will determine the boundaries of the facility by following the definition in 40 CFR 98.6. EPA has provided several examples in the General Technical Support Document (TSD)[11] to illustrate how a facility would be delineated under various operational configurations.

In order to effectuate the original intent of the "GS facility" term, and in light of comments expressing confusion between the "Tier 1" and "Tier 2" requirements, EPA is retaining procedures and requirements for facilities conducting GS (Tier 2) in 40 CFR part 98, subpart RR and is moving all procedures and requirements for all other facilities conducting CO_2 injection (Tier 1) into a new 40 CFR part 98, subpart UU in this action. EPA has concluded that this organizational change allows for two source category definitions while clearly distinguishing the two sets of provisions and procedures. EPA notes that this new organizational structure is merely formalizing the structure that EPA and commenters have been using to date informally.

EPA considered but did not create a third source category as proposed in some comments for GS projects with ER. EPA has concluded that the provisions, procedures, and requirements in 40 CFR part 98, subpart RR apply equally to all GS projects—whether they conduct ER or not. It is most practical to cover both types of projects with one subpart.

In this final action, EPA removed from the regulatory text the list of

[11] General Technical Support Document for Injection and Geologic Sequestration of Carbon Dioxide: Subparts RR and UU (see docket ID No. EPA–HQ–OAR–2009–0926).

activities that are not included in the source category. Based on experience with implementation questions from reporters to the rest of the GHG Reporting Program, EPA has concluded that this list does not provide regulatory clarity and instead creates confusion. Without this list the regulatory text is clear that the operations covered under 40 CFR part 98, subparts RR and UU are wells that inject CO_2 underground. EPA does not need to explicitly provide a list of operations that do not meet this definition. EPA has found that operators may mistakenly conclude that they are exempt from 40 CFR part 98, subpart RR or UU reporting requirements if they conduct an activity on the list, even if they also operate wells that inject CO_2 underground. To avoid this confusion, EPA had deleted the list from the regulatory text and is clarifying here that operators conducting any of the following activities need not be concerned with these activities when determining applicability to or reporting under 40 CFR part 98, subpart RR or UU: above ground CO_2 storage, CO_2 transportation or distribution, CO_2 purification, compression, or processing, CO_2 capture, and CO_2 end-uses other than underground injection. EPA notes that these activities may meet the definition of another source category in the GHG Reporting Program.

3. Geologic Sequestration Research and Development (GS R&D)

Comment: EPA received a range of comments relating to exempting GS R&D projects. Some commenters supported the R&D exemption while others opposed it because they believe these projects can provide valuable information on the efficacy of GS as a climate mitigation approach. These commenters also noted that these projects are currently gathering data which would provide EPA an early opportunity to evaluate the appropriateness and application of monitoring methods. Some commenters suggested that GS R&D projects be provided an option to opt-in to GS reporting requirements. One group of commenters recommended that EPA exempt GS R&D projects on a case-by-case basis.

Response: EPA agrees with commenters that collecting data from all GS projects, including R&D, would provide useful information about the efficacy of GS and monitoring techniques and approaches to quantify leakage. However, the Agency recognizes that GS is an emerging climate mitigation approach and there are likely to be some projects that are investigating practices, monitoring techniques, injection verification, or are engaged in other applied research that will facilitate the development and adoption of GS, and that these projects would benefit from being exempted from this subpart. Therefore the Agency is retaining a GS R&D exemption, with some modifications from the proposed rule. See Section II.B of the preamble for a summary of the R&D exemption process.

Comment: Many commenters noted that restricting the proposed exemption to federally funded projects was too stringent, that R&D can also be supported by states, academia, or the private sector, and argued that GS R&D projects should not be defined based on the source of funding.

Response: EPA agrees with commenters that there are non-Federal funding sources that could fund GS R&D projects and that Federal funding should not be the basis for an R&D exemption. Other sources of funding for GS R&D include State and academic sources. Funding might also come from the R&D budget of a private sector entity. However, in order for EPA to have basic information about projects operating under an R&D exemption, projects must provide information on the source and type of funding as part of their submission in support of the exemption.

Comment: Many commenters suggested that EPA consider a threshold for exempting R&D projects. These commenters noted that a threshold would allow for reduced regulatory burden and that collecting data from projects below the threshold would yield little value for EPA.

Response: EPA found that it would be challenging to define a threshold for GS R&D projects because project size could vary depending on the R&D goals and other factors such as availability and source of CO_2. As stated above, EPA is establishing an exemption for R&D projects that are investigating practices, monitoring techniques, injection verification, or are engaged in other applied research, that will enable safe and effective long-term containment of a CO_2 stream in subsurface geologic formations, including research conducted as a precursor to long-term storage.

Comment: Some commenters recommended that GS R&D projects be required to comply with "Tier 1" requirements, while a few commenters suggested that EPA exempt both Tier 1 and Tier 2 requirements for GS R&D projects.

Response: EPA agrees with comments recommending that GS R&D projects report "Tier 1" data. Projects that qualify for a GS R&D exemption under 40 CFR part 98, subpart RR are not required to develop an MRV plan or report the GS mass balance information required of facilities conducting GS. However, these projects are required to report basic information on CO_2 received under subpart UU. EPA determined that GS R&D projects already collect such data and that the burden of reporting such data would be minimal.

4. Reporting Requirements

Comment: EPA received many comments about the proposed "Tier 1" reporting requirements. Many commenters from the ER industry in particular urged EPA to remove all "Tier 1" reporting requirements for CO_2 injection projects without GS. These commenters expressed concern that collecting any information from business-as-usual ER would lead to a misunderstanding of the CO_2 material balance at such operations. Many stated that data on total CO_2 injected in particular would have no bearing on future policy decisions about GHG emissions and should not be collected. Many commenters conceded that data on the quantity of "new" CO_2 received could be collected if EPA insisted on collecting some data from "Tier 1" sources, presumably because it could potentially inform future climate change policy decisions. At least one commenter offered that by collecting data on the quantity of "new" CO_2 received, EPA could reasonably estimate the amount of CO_2 retained underground.

On the other end of the spectrum, one set of comments echoed that the "Tier 1" reporting requirements as proposed would be insufficient for an accurate CO_2 material balance, and recommended expanding "Tier 1" reporting requirements rather than narrowing or removing them. This set of comments recommended that data on CO_2 recycled from each project be collected so that EPA could get a full understanding of the ER industry. These commenters advocated for collection of quantity data from "Tier 1" reporters, arguing that ER operations dominate CO_2 end-users and the data will be necessary to understand the disposition of CO_2 supply reported under 40 CFR part 98, subpart PP of the GHG Reporting Program. Meanwhile, at least three commenters offered that the proposed "Tier 1" reporting requirements would be adequate to meet EPA's stated needs and that no additional data reporting should be required in the final regulation.

Response: In this final rule, EPA is retaining some of the proposed "Tier 1"

reporting requirements for CO_2 injection facilities. EPA is requiring reporting under 40 CFR part 98, subpart UU (previously referred to as "Tier 1" facilities) of CO_2 received (a term that EPA is defining in this final action for what commenters described as "new" CO_2). EPA is not requiring reporting on total CO_2 injection under 40 CFR part 98, subpart UU. Reporting on total CO_2 injection will be required for facilities conducting GS under 40 CFR part 98, subpart RR (previously referred to as "Tier 2" facilities). EPA has concluded that data on CO_2 received is critical for EPA to better understand the disposition of CO_2 supply reported in 40 CFR part 98, subpart PP. Furthermore, EPA recognizes that the geology of an oil and gas reservoir can create a barrier to trap CO_2 underground and that many projects in the ER industry could successfully verify and report the geologic sequestration of CO_2 with an EPA-approved MRV plan. By collecting data on CO_2 received at these facilities, EPA will better understand the scope and size of a potentially non-emissive end-use.

Due to the comments received on this issue, EPA considered adding recycled CO_2 to the proposed Tier 1 data requirements. Ultimately, EPA concluded that a CO_2 material balance is most informative to the Agency from GS projects that verify the quantity of CO_2 geologically sequestered by implementing their EPA-approved MRV plans. Though the collection of either a partial or full set of data from 40 CFR part 98, subpart UU facilities would have given EPA additional data regarding ER operations, it could have also caused confusion amongst reporters and the public about which facilities are estimating and reporting geologic sequestration. By requiring mass balance inputs from GS projects only and by splitting the proposed rule into two subparts, EPA is making clear in this action that the quantity of CO_2 geologically sequestered can only be verified and reported to EPA by developing and implementing an EPA-approved MRV plan and reporting GS under 40 CFR part 98, subpart RR.

For clarification, EPA reworded the proposed term "CO_2 transferred onsite from offsite" to "CO_2 received" because EPA identified at least one configuration where CO_2 would be supplied to an injection well from an adjacent plant that is part of the same facility (per the definition of facility in 40 CFR 98.6). CO_2 received from a natural source within the same field or basin in which it is injected is also included as CO_2 received.

5. Reporting Threshold

Comment: EPA proposed "all in" requirements and sought comment on whether and how to establish a threshold. A few of the comments EPA received agreed with EPA's all-in reporting approach, noting that data from all facilities is significant at this early stage in the GS industry, that at this point there is not enough data to determine a sensible threshold level, that the amount of CO_2 injected in one year is not a good indicator of the amount of CO_2 injected in the following year, and that EPA needs a comprehensive picture of the industry. One comment characterized no threshold for "Tier 1" reporting as reasonable because of the associated low burden.

Other comments opposed the all-in reporting threshold stating that it would burden a higher number of facilities than was necessary. These comments provided a variety of possible approaches and thresholds for EPA to consider including a threshold of 100,000 metric tons per year of "new" CO_2 received, an injection threshold of 25,000 metric tons per year, an injection threshold of 100,000 metric tons of CO_2 per year, an injection threshold of 2–3 million metric tons per year, and an emission threshold of 25,000 metric tons of CO_2 per year.

Response: EPA agreed with commenters who supported an all-in threshold because it would result in the most comprehensive tracking and reporting. Collecting information on all projects is important, especially at this early stage in the GS industry. As demonstrated by the range of suggested thresholds provided by commenters, there is no one obvious sensible threshold. The amount of CO_2 injected in one year is not a good indicator of the amount of CO_2 injected in the following year and there are no monitoring standards or data available to determine the amount of CO_2 emitted. In this final rule, EPA is requiring reporting from all facilities that meet the 40 CFR part 98, subpart UU (previously referred to as "Tier 1" facilities) source category definition and from all facilities that meet the 40 CFR part 98, subpart RR (previously referred to as "Tier 2" facilities) source category definition. EPA is not establishing a reporting threshold for these facilities. Reporters can cease subpart UU reporting pursuant to the provisions at 40 CFR 98.2(i) that allow facilities to cease GHG reporting to EPA; with respect to subpart UU, any reference to CO_2 emissions in 40 CFR 98.2(i) means CO_2 received. The cease reporting requirements of § 98.2(i) do not apply to subpart RR; the owner or operator must continue to comply with all requirements until the Administrator has issued a final decision on the owner or operator's request to discontinue reporting.

As noted in the proposal, an all-in reporting threshold will allow the Agency to comprehensively track all CO_2 supply (as reported in Suppliers of CO_2, 40 CFR part 98, subpart PP) that is received for injection underground. This approach is consistent with the all-in requirements in the GHG Reporting Program for some suppliers of petroleum, natural gas, and coal-to-liquid products (40 CFR part 98, subparts LL, MM, and NN),[12] producers of industrial gases (40 CFR part 98, subpart OO), and suppliers of CO_2 (40 CFR part 98, subpart PP).

With respect to 40 CFR part 98, subpart UU, EPA has estimated the cost for facilities conducting CO_2 injection to comply with the minimum reporting requirements and has determined that the burden will be small, given the equipment and data collection efforts already in place at ER projects. With respect to 40 CFR part 98, subpart RR, the Agency notes that GS R&D projects are exempt from 40 CFR part 98, subpart RR once EPA confirms their eligibility for the exemption. EPA has concluded that these two features will ensure that projects receiving and injecting small amounts of CO_2 are not disproportionately burdened by the reporting requirements in this final rule.

6. Equipment Leaks and Vented Emissions

Comment: EPA proposed that all facilities subject to "Tier 2" requirements would be required to report fugitive and vented CO_2 emissions from the surface components located within the facility, unless already reported under 40 CFR part 98, subpart W (petroleum and natural gas systems). A few commenters were concerned about overlap in reporting requirements and recommended that EPA require the reporting of fugitive and vented CO_2 emissions from equipment associated with oil and gas production solely under 40 CFR part 98, subpart W and limit the reporting under 40 CFR part 98, subpart RR to fugitive and vented emissions from equipment associated with GS operations for which emissions were not already being reported under 40 CFR part 98, subpart

[12] In a recently proposed rulemaking (75 FR 48744, August 11, 2010), EPA proposed to establish a threshold for Local Distribution Companies in subpart NN.

W. A number of commenters disagreed with EPA's proposed reporting requirements for fugitive and vented CO_2 emissions and suggested that EPA scale back or eliminate such reporting, while one commenter supported such reporting requirements. Four commenters stated that fugitive and vented emissions would be trivial when compared to the amount of CO_2 injected, and three commenters stated that such reporting would unwarrantedly shift CO_2 into a hazardous air pollutant-like category. One commenter suggested that reporting of fugitive and vented emissions would be germane where applicable to the GS mass balance equation. One commenter supported EPA's proposed requirements for the reporting of fugitive and vented CO_2 emissions.

Response: EPA proposed to require the reporting of fugitive CO_2 emissions (referred to in this final action as CO_2 equipment leakage) and vented CO_2 emissions in order to better understand the volume of CO_2 equipment leakage and vented CO_2 emissions from such facilities as compared to the amount of CO_2 sequestered. However, EPA has concluded that the information that would be generated from such a reporting requirement is not necessary for computing the mass balance of the amount of CO_2 sequestered.

In the notice of proposed rulemaking, EPA proposed that CO_2 equipment leakage and vented CO_2 emissions be included in the GS mass balance calculation if the emissions occur downstream of the CO_2 injection flow meter or upstream of the production flow meter. EPA is retaining this reporting requirement in 40 CFR part 98, subpart RR because such data are important in order to provide a proper accounting of the amount of CO_2 that is geologically sequestered. In this action, EPA is requiring reporting of equipment leakage and vented emissions with respect to equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead and between the production wellhead and the flow meter used to measure production quantity.

Emissions not related to the mass balance calculation do not need to be reported under subpart RR. Such emissions may need to be reported under subpart W if the facility is required to report under this subpart.

7. MRV Plan Requirements

Comment: EPA received many comments supporting the Agency's proposal that reporters develop a site-specific MRV plan, but some commenters stated that more detail was needed about how MRV plans would be evaluated by EPA.

Response: EPA has set out the basic components for MRV plans in Section II.B of this preamble. EPA has clarified the definition of the area where potential leakage pathways should be identified and characterized, and how monitoring could be phased in over time as CO_2 is injected. This is reflected in the regulatory text at 40 CFR 98.448(a). EPA has also refined the requirements for what should be included in the annual report, and in what cases the reporter would need to resubmit an MRV plan for EPA approval.

EPA's approach allows for site-specific flexibility for MRV plans and does not prescribe particular monitoring technologies. The approach also allows the owner or operator to leverage the site characterization, risk assessment, and/or monitoring required by other authorities as the foundation for demonstrating compliance with the MRV plan requirements of 40 CFR part 98, subpart RR. EPA recognizes the merit in providing greater clarity on the evaluation criteria, but notes that the geology and other conditions among facilities conducting GS vary. EPA has provided information in the General TSD on the technical evaluation of MRV plans, including illustrative examples describing the types of information that may be included in the MRV plan to fulfill the regulatory requirements at 40 CFR 98.448. This includes delineating the monitoring area, both the maximum area that the CO_2 plume is predicted to cover and how monitoring can be phased in over this area; selecting leakage detection systems that are suitable for the site; determining and verifying that a leak has occurred; identifying baseline conditions; and quantifying a CO_2 leak once a leak has been verified.

Comment: EPA received many comments about the procedural aspects of MRV plan approval. Some commenters stated that CO_2 injection should not be allowed until MRV plans are approved. Many commenters urged the Agency to allow for public involvement.

Response: EPA has set out the general MRV plan approval process in Section II.B of this preamble. EPA has designed MRV plan requirements under 40 CFR part 98, subpart RR so that facilities will not need to disrupt or delay normal operations. However, EPA clarifies that facilities will report the amounts of CO_2 geologically sequestered under 40 CFR part 98, subpart RR after they implement an EPA-approved MRV plan.

EPA agrees with commenters that there should be a process for public involvement. Therefore, EPA plans to post approved MRV plans to a public Web site, to the extent consistent with any confidentiality determination. "Interested persons" can then appeal EPA decisions on MRV plans to the Environmental Appeals Board (EAB) through the appeals process described in 40 CFR part 78. An "interested person" may be any person who—in connection with the Administrator's process of making his or her decision—submitted comments, testified at a public hearing, submitted objections, or otherwise submitted his or her name to be included by the Administrator in an interested persons list. In the case of MRV plans, an interested person who wishes to appeal an EPA decision should submit his or her name to be included in the interested persons list. EPA will provide the public instruction on joining the interested persons list for 40 CFR part 98, subpart RR. More information on the administrative appeals process can be found in Section II.B of this preamble and in "Mandatory Greenhouse Gas Reporting Rule: EPA's Response to Public Comments, Subparts RR and UU: Injection and Geologic Sequestration of Carbon Dioxide." Though there is no formal public comment process prior to approval of individual MRV plans in today's rule, EPA believes the administrative appeals process provides an opportunity for involvement by any member of the public who is concerned about the provisions of an approved plan. Further, if future GS policies or programs are promulgated as a result of the data collected through today's rule for which a formal public notice and comment period would be appropriate, EPA will establish a public notice and comment period for such a policy or program at that time.

EPA has provided further information in the General TSD about the procedural aspects of MRV plan approval.

Comment: EPA received many comments about the role of a UIC permit with respect to MRV plan requirements. Most commenters emphasized the need for coordination between the UIC program and 40 CFR part 98, subpart RR. Some commenters stated that any class of UIC permit is enough for purposes of the MRV plan. Others noted that the MRV plan should build off of the UIC permit and that comprehensive monitoring for the purposes of verifying quantities of CO_2 sequestered cannot occur under SDWA alone.

Response: EPA maintains a high-level of coordination across EPA offices and regions on GS activities and regulatory

development. EPA's OAR and OW work closely to promote safe and effective implementation of GS technologies while ensuring protection of human health and the environment. EPA agrees with commenters that the UIC program provides the foundation for the safe sequestration of CO_2 by helping to ensure that injected fluids remain isolated in the subsurface and away from underground sources of drinking water, thereby serving to reduce the risk of CO_2 leakage to the atmosphere. A facility's UIC permit may be used to demonstrate that certain MRV plan requirements have been fulfilled. However, provisions are needed that go beyond what is required of UIC permits in order to quantify leakages, if any. See Section I.D of this preamble for a more detailed discussion of 40 CFR part 98, subpart RR and UIC Class VI requirements.

III. Economic Impacts of the Final Rule

This section of the preamble examines the costs and economic impacts of the final rule for CO_2 injection and GS, including the estimated costs and benefits of the rule, and the estimated economic impacts of the rule on affected entities, including estimated impacts on small entities. Complete detail of the economic impacts of the rule can be found in the text of the Economic Impact Analysis (EIA) (EPA–HQ–OAR–2009–0926). This section also contains a brief summary of major comments and responses.

A. How were compliance costs estimated?

1. Summary of Method Used To Estimate Compliance Costs

EPA estimated costs of complying with the rule and the total incremental annual cost of compliance. A base case is created assuming relevant monitoring costs required under UIC requirements (including the UIC Class VI rule). Then incremental reporting from geologic storage sites were evaluated in terms of required technologies, practices, and costs.

The estimated costs include capital and operating and maintenance (O&M), including labor costs. The cost of drilling and equipping wells represents a large component of sequestration costs. Examples of other costs include seismic data acquisition, periodic sampling and testing of the injected CO_2.

The estimated costs are based on hypothetical or pro-forma sites for various types of projects such as R&D GS projects, commercial saline formation projects, and ER GS projects. The geologic and engineering assumptions for these pro-forma projects are the same as those used by the EPA Office of Water in the UIC Class VI rule. The costs are presented in 2008 dollars.

The capital costs are annualized using an interest rate of 7 percent with projects lasting 4 years, 10 years or 40 years. Next, annual O&M costs are added to the annualized capital costs to determine total annual direct costs. Finally, a 20 percent overhead and general and administrative cost factor is added to obtain total annual costs. These are then divided by the amount assumed to be injected each year in the pro-forma project to arrive at total costs per metric ton of CO_2 injected. These per-ton costs are then used to estimate total annual costs for the level of injection expected in the activity baseline.

2. Summary of Comments and Responses

Comment: A majority of the comments received on the compliance costs of the reporting rule focused on facility level costs for monitoring and reporting. One commenter stated that EPA underestimated labor costs in the economic analysis of the rule.

Response: EPA discussed and presented information for the costs and economic impacts of the proposed rule, including the estimated costs and benefits of the proposed rule, and the estimated economic impacts of the proposed rule on affected entities, including estimated impacts on small entities. Complete detail of the economic impacts of the rule can be found in Section 4 of the EIA. EPA's cost estimation methods reflect accepted engineering practices and publicly available cost and price data. For example, EPA used wage rates and overhead factors from the Department of Labor's Bureau of Labor Statistics.[13]

B. What are the costs of the rule?

1. Summary of Costs

The total annualized costs incurred under the rule by these entities will be approximately $1.1 million (2008$), as illustrated in Table 4 of this preamble. This is based on projects that are currently injecting or will be injecting CO_2 by 2012, and includes costs for 1 saline GS facility reporting under subpart RR, and 92 CO_2 injection facilities reporting under subpart UU. There are 9 R&D projects that incur costs to apply for a waiver under subpart RR, these same facilities are assumed to receive a waiver for the reporting requirements under subpart RR and are included in the subpart UU baseline of 92 projects. The public sector burden estimate is $344,000 for program implementation and verification activities. This may underestimate the total public sector burden depending on the extent to which DOE R&D projects funded with public dollars transition to commercial GS and consequently incur costs associated with monitoring, reporting and verification. Given uncertainties related to project adoption and the costs of the reporting program, EPA considered two other cost scenarios (one higher and one lower than the reference cost scenario) in order to assess a range of potential economic impacts on affected entities, as illustrated in Table 5 of this preamble. The three cost scenarios vary in terms of assumptions about which monitoring devices would be used at a facility conducting GS and how often sampling and measurement would take place. Because each facility conducting GS will have unique characteristics that may result in the selection of different monitoring techniques, a range of assumptions was used about the percents of sites that would be expected to use each device or technique. Complete detail on the cost scenarios is provided in Section 4.5.1 of the final Economic Impact Analysis (EIA) (EPA–HQ–OAR–2009–0926).

[13] Bureau of Labor Statistics. *http://www.bls.gov/bls/wages.htm.*

TABLE 4—NATIONAL ANNUALIZED MANDATORY REPORTING COSTS ESTIMATES (2008$): SUBPARTS RR AND UU

Type	Number of projects	Metric tons CO_2 received per year	Reference	
			First year (thousand, 2008$)	Second year (thousand, 2008$)
R&D (RR)	9	5,320,000	$36	$36
Facilities Conducting GS (Saline) (RR)	1	1,842,885	318	240
Additional Facilities Conducting GS (ER opt in) (RR) [a]	0	0	0	0
Facilities Conducting CO_2 Injection (no GS) (UU) [b]	92	48,735,442	410	410
Private Sector, Total All Projects	93	50,578,327	764	686
Private Sector, Average ($/ton)	.....	.....	0.02	0.01
Public Sector, Total	.....	.....	344	344
National Total	.....	.....	1,107	1,030

a. Because reporting for ER facilities is optional, EPA has not included projections of ER reporters in the primary analysis. In the alternate costs scenarios EPA has analyzed costs assuming either a medium or high level of opt-in.
b. Includes UIC Class II ER Facilities.

TABLE 5—ANNUALIZED REPORTING COSTS PER PROJECT (2008$): SUBPARTS RR AND UU

Type	Reference		Alternative cost scenarios			
			Low		High	
	First year ($1,000)	Second year ($1,000)	First year ($1,000)	Second year ($1,000)	First year ($1,000)	Second year ($1,000)
R&D (RR)	$4	$4	$4	$4	$4	$4
Facilities Conducting GS (Saline) (RR)	318	240	96	18	490	413
Facilities Conducting GS (ER opt in) (RR)	2,124	2,005	1,893	1,773	2,271	2,151
Facilities Conducting CO_2 Injection (No GS) (UU)	4	4	4	4	4	4

2. Summary of Comments and Responses

Comment: EPA received comments on source specific cost data reflected in the engineering cost analysis presented in the EIA, Section 4 (EPA–HQ–OAR–2009–0926). Some commenters asked EPA to not overly burden entities that may be required to report, and questioned whether the proposed reporting program was duplicative with other EPA regulations on underground injection.

Response: EPA considered all relevant comments regarding source specific cost data developed in the engineering cost analysis and used in the EIA. In some cases, we revised our cost estimates, and in some cases we revised monitoring and reporting requirements in ways that reduced burden. Please see source specific comments and responses in Section II.E of this preamble and "Mandatory Greenhouse Gas Reporting Rule: EPA's Response to Public Comments, Subparts RR and UU: Injection and Geologic Sequestration of Carbon Dioxide."

EPA has determined the selected option for the mandatory GHG reporting rule strikes a balance between impacts on small entities, consistency with other programs, costs incurred by the reporting entities, and emissions coverage. Section 5 of the final EIA (EPA–HQ–OAR–2009–0926) provides cost comparisons for each alternative evaluated.

C. What are the economic impacts of the rule?

1. Summary of Economic Impacts

EPA assessed how the regulatory program may influence the profitability of companies by comparing the monitoring program costs to total sales (*i.e.,* a "sales" test). Given limited data on commercial GS operations, EPA restricted the analysis to ER operations (approximately 90 percent of the fields). To do this, EPA divided the average annualized mandatory reporting costs per field by the estimated revenue for a representative field. Sales test ratios are between 3.1 to 4.0 percent for facilities conducting GS (ER opt in). The number of ER operations that would choose to report as facilities conducting GS (ER opt in) is unknown and EPA could not identify any information or analysis to estimate this quantity. As a result, EPA considered two additional scenarios to represent medium and high levels of ER project opt ins. Section 5.2.1 of the final Economic Impact Analysis (EIA) (EPA–HQ–OAR–2009–0926) details the scenario analysis and projected national cost estimates. In contrast, facilities conducting ER CO_2 injection (no GS) sales test ratios are below 0.01 percent, as illustrated in Table 6 of this preamble.

TABLE 6—SALES TEST FOR A REPRESENTATIVE COMMERCIAL ER FIELD OPERATION

[2008$]

	Cost-to-sales ratios (CSRs)		
		Alternative cost scenarios	
	Reference	Low	High
Facilities Conducting GS (ER opt in) (RR)	3.7%	3.3%	4.0%
Facilities Conducting CO_2 Injection (No GS) (UU)	<0.1%	<0.1%	<0.1%

2. Summary of Comments and Responses

Comment: EPA received a number of comments on the overall economic impacts of the proposed rule. Some commenters stated that the economic impacts are understated as total national costs could be significantly higher if there is large scale deployment of CCS. Other commenters stated that large increases in operating costs resulting from mandatory reporting of GHGs could prevent projects from moving forward.

Response: As described previously, EPA conducted a thorough analysis of available information and reviewed comments submitted on this issue, and we have determined that this analysis provides a reasonable characterization of costs for facilities in each subpart, under current law, and that the documentation provides adequate explanation of how the costs were estimated. EPA has estimated the total national cost of the reporting program based on current laws and regulations. Accordingly, one would not expect large scale deployment of CCS in the absence of a comprehensive climate policy that required or otherwise incentivized GS. In response to comments that total national costs would be higher given large scale deployment of CCS, EPA has augmented the scenario analyzing costs assuming future climate policy in Section 5.2.2 of the final EIA. Given the potential for future deployment of CCS technologies, EPA considered two additional scenarios of the number of large scale saline aquifer GS (commercial saline) project deployment by 2050: low (5 projects), medium (9 projects), and high (54 projects). The low scenario is based on the low end of the range of deployment targeted by the CCS Task Force. The medium scenario is based on large scale saline project deployment projected in the cost analysis prepared for the UIC Class VI final rule. The high scenario is based on EPA modeling of the projected deployment of CCS under the American Power Act. The national first year annual cost estimates increase by $1.3 million under the low outcome; $2.5 million under the medium outcome, and $16.8 million under the high outcome. In addition to the scenarios above, EPA also considered scenarios of the number of ER operations that would choose to report as facilities conducting GS (ER opt in) in Section 5.2.1 of the final EIA. In the medium scenario, all anthropogenic CO_2 projects (16) choose to report as facilities conducting GS (ER opt in) (Subpart RR). In the high scenario, all anthropogenic CO_2 projects (16) and fifty percent of other CO_2 projects (32) choose to report as facilities conducting GS (ER opt in) (Subpart RR). The national cost estimate is $35 million under the medium ER opt in outcome (first year) and $33 million in subsequent years. The national cost estimate is $103 million under the high ER opt in outcome (first year) and $97 million in subsequent years.

To understand these numbers in context, EPA used the estimates of cost by facility type shown in Table 5. The large scale saline aquifer GS (commercial saline) projects in the American Power Act scenario are assumed to be facilities that conduct GS, with an estimated cost of $318,000 for the first year and $240,000 for subsequent years. The ER opt in scenario used the 'Facilities Conducting GS (ER opt in)' project cost, with an estimated cost of $2.1 million for the first year and $2.0 million for the subsequent year. The basis for these cost estimates is explained in detail in Section 4 of the EIA (EPA–HQ–OAR–2009–0926). The principal driver in the difference in national costs for these scenarios is the type of project assumed to be reporting.

EPA used the same first year, subsequent year methodology for these cost scenarios that was used in the core national cost analysis. This assumes that the number of projects in a given scenario all opt in or begin required reporting in year 1. This assumption overestimates the national cost under these scenarios, as it is more likely that projects will opt in or begin required reporting over a long period of time.

D. What are the impacts of the rule on small businesses?

1. Summary of Impacts on Small Businesses

As required by the RFA and the Small Business Regulatory Enforcement and Fairness ACT (SBREFA), EPA assessed the potential impacts of the rule on small entities (small businesses, governments, and non-profit organizations). (See Section IV.C of this preamble for definitions of small entities.)

After considering the economic impact of the rule on small entities, EPA has concluded that this action will not have a significant economic impact on a substantial number of small entities. Currently EPA has determined that small ER operations will most likely be UIC Class II ER projects that do not opt in to subpart RR. As shown in Table 6 of this preamble, the average ratio of annualized reporting program costs to revenues of a typical ER operation likely owned by a representative small enterprise and reporting under subpart UU was less than 0.1 percent.

Although this rule will not have a significant economic impact on a substantial number of small entities, EPA nonetheless took several steps to reduce the impact of this rule on small entities. For example, EPA's monitoring and reporting requirements are built off of the UIC program. In addition, EPA is requiring equipment and methods that may already be in use by a facility for compliance with its UIC permit. Also, EPA is requiring annual reporting instead of more frequent reporting.

E. What are the benefits of the rule for society?

EPA examined the potential benefits of this rule. EPA's previous analysis of the GHG Reporting Program discussed the benefits of a reporting system with respect to policy making relevance, transparency issues, and market efficiency. Instead of a quantitative analysis of the benefits, EPA conducted a systematic literature review of existing studies, including government, consulting, and scholarly reports.

The greatest benefit of mandatory reporting of industry GHG emissions to government will be realized in developing future GHG policies.

Benefits to industry of GHG emissions monitoring include the value of having independent, verifiable data to present to the public to demonstrate appropriate environmental stewardship, and a better understanding of their emission levels and sources to identify opportunities to reduce emissions. Such monitoring allows for inclusion of standardized GHG data into environmental management systems, providing the necessary information to achieve and disseminate their environmental achievements.

Standardization will also be a benefit to industry. Once facilities invest in the institutional knowledge and systems to report emissions, the cost of monitoring should fall and the accuracy of the accounting should improve. A standardized reporting program will also allow for facilities to benchmark themselves against similar facilities to understand better their relative standing within their industry.

IV. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

Under Executive Order (EO) 12866 (58 FR 51735, October 4, 1993), this action is a "significant regulatory action" because it may raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the EO. Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under EO 12866 and any changes made in response to OMB recommendations have been documented in the docket for this action.

EPA prepared an analysis of the potential costs and benefits associated with this action in the EIA (EPA–HQ–OAR–2009–0926). A copy of the analysis is available in the docket for this action and the analysis is briefly summarized here. In the EIA, EPA has identified the regulatory options considered, their costs, and the emissions that would likely be reported under each option, and explained the selection of the option chosen for the rule. The costs of the rule are reported in Section 4 of the EIA, and the economic impacts and qualitative benefits assessment are reported in Section 5 of the EIA. Overall, EPA has concluded that the costs of the Injection and Geologic Sequestration of Carbon Dioxide Reporting Rule are justified by the potential benefits of more comprehensive information about CO_2 injection. In the absence of new climate policy, the total annualized cost of the rule will be approximately $1.1 million (in 2008$) during the first year of the program and $1.0 million in subsequent years (including $344,000 of programmatic costs to the Agency). The baseline used to calculate these costs assume 1 facility conducting GS reporting under subpart RR and 92 facilities conducting CO_2 injection reporting under subpart UU. This national cost estimate is described in detail in Section 5.2 of the final EIA.

B. Paperwork Reduction Act

The information collection requirements in this final rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* The Information Collection Request (ICR) document prepared by EPA has been assigned EPA ICR number 2372.02.

EPA has identified the following goals of the GHG reporting system:

X Obtain data that is of sufficient quality that it can be used to analyze and inform the development of a range of future climate change policies and potential regulations.

X Create reporting requirements that are, to the extent possible and appropriate, consistent with existing GHG reporting programs in order to reduce reporting burden for all parties involved.

The information from CO_2 injection and geologic sequestration facilities will allow EPA to make well-informed decisions about whether and how to use the CAA to regulate these facilities and encourage voluntary reductions. Because EPA does not yet know the specific policies that will be adopted, the data reported through the mandatory reporting system should be of sufficient quality to inform policy and program development. Also, consistent with the Appropriations Act, the reporting rule covers a broad range of sectors of the economy including sites that inject and store CO_2.

This information collection is mandatory and will be carried out under CAA section 114. Information identified and marked as CBI will not be disclosed except in accordance with procedures set forth in 40 CFR part 2. However, emissions information collected under CAA section 114 generally cannot be claimed as CBI and will be made public.[14]

The projected cost and hour burden for non-Federal respondents is $7.0 million and 9,416 hours per year. The estimated average burden per response is 56.6 hours; the frequency of response is annual for all respondents that must comply with the rule's reporting requirements, except for electricity-generating units that are already required to report quarterly under 40 CFR part 75 (acid rain program); and the estimated average number of likely respondents per year is 93. The cost burden to respondents resulting from the collection of information includes the total capital and start-up cost annualized over the equipment's expected useful life (averaging $717,000 per year) a total operation and maintenance component (averaging $5.3 million per year), and a labor cost component (averaging $1.0 million per year). Burden is defined at 5 CFR part 1320.3(b). Although not included in the primary economic analysis, the costs and burdens to the ER opt ins were estimated using an alternate cost scenario and in this section EPA is giving its best estimates of likely costs and burdens, including to voluntary reporters, as required by the Paperwork Reduction Act. These cost numbers differ from those shown elsewhere in the EIA for this final rule because ICR costs represent the average cost over the first three years of the rule, but costs are reported elsewhere in the EIA for the first year of the rule and for subsequent years of the rule. Also, the ICR focuses on respondent burden only, while the EIA for this final rule includes EPA Agency costs as well. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9. When this ICR is approved by OMB, the Agency will publish a technical amendment to 40 CFR part 9 in the **Federal Register** to display the OMB control number for the approved information collection requirements contained in this final rule.

C. Regulatory Flexibility Act (RFA)

The RFA generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a

[14] Although CBI determinations are usually made on a case-by-case basis, on July 7, 2010, EPA published a proposed rule (75 FR 39094) relating to CBI determinations for the data collected under the GHG Reporting Program (40 CFR part 98).

substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's rule on small entities, small entity is defined as: (1) A small business as defined by the Small Business Administration's regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of this final rule on small entities, I certify that this rule will not have a significant economic impact on a substantial number of small entities. Currently EPA has determined that small ER operations will most likely be facilities conducting CO_2 injection only, including UIC Class II ER projects, which are only required to report under subpart UU. The average ratio of annualized reporting program costs to revenues of a typical ER operation likely owned by representative small enterprises is less than 1 percent.

Although this final rule will not have a significant economic impact on a substantial number of small entities, EPA nonetheless took several steps to reduce the impact of this rule on small entities. For example, monitoring and reporting requirements are built off of the UIC program. In addition, EPA is requiring equipment and methods that may already be in use by a facility for compliance with its UIC permit. Also, EPA is requiring annual reporting instead of more frequent reporting.

During rule implementation, EPA will maintain an "open door" policy for stakeholders to ask questions about the rule or provide suggestions to EPA about the types of compliance assistance that will be useful to small businesses. EPA intends to develop a range of compliance assistance tools and materials and conduct extensive outreach for this final rule.

D. Unfunded Mandates Reform Act (UMRA)

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and Tribal governments and the private sector. Under CAA section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for final rules with "Federal mandates" that may result in expenditures to State, local, and Tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year.

This final rule does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and Tribal governments, in the aggregate, or the private sector in any one year. Overall, EPA estimates that the total annualized costs of this final rule are approximately $1.1 million (in 2008$) during the first year of the program and $1.0 million in subsequent years (including $344,000 of programmatic costs to the Agency). Thus, this final rule is not subject to the requirements of CAA sections 202 or 205 of the UMRA.

This final rule is also not subject to the requirements of CAA section 203 of the UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. Facilities subject to this final rule include facilities that inject CO_2 for enhanced recovery, and those that sequester CO_2. None of the facilities currently known to undertake these activities are owned by small governments.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled "Federalism" (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have Federalism implications." "Policies that have Federalism implications" is defined in the EO to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

This final rule does not have Federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in EO 13132.

This regulation applies to public- or private-sector facilities that inject CO_2 underground. Few government facilities would be affected. This regulation applies directly to facilities that inject CO_2 underground. It does not apply to governmental entities unless the government entity owns a facility that injects and/or sequesters CO_2 underground. This regulation also does not limit the power of States or localities to collect GHG data and/or regulate GHG emissions. Thus, EO 13132 does not apply to this final rule. However, as it is EPA's policy to promote communication between the Agency and State and local governments, EPA specifically solicited comments on the proposed rule from State and local officials.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

Executive Order 13175, entitled "Consultation and Coordination with Indian Tribal Governments" (59 FR 22951, November 6, 2000), requires EPA to develop an accountable process to ensure "meaningful and timely input by Tribal officials in the development of regulatory policies that have Tribal implications."

This action does not have Tribal implications, as specified in EO 13175 (65 FR 67249, November 9, 2000). This regulation applies directly to facilities that inject and/or sequester CO_2 underground. EPA analyzed the facilities expected to be affected by this rule and did not find that any facilities expected to be affected by the rule are likely to be owned by tribal governments. In addition, EPA did not hear from any Tribal governments contradicting this analysis. Thus, EO 13175 does not apply to this final rule.

Although EO 13175 does not apply to this final rule, EPA sought opportunities to provide information to Tribal governments and representatives during development of the GHG reporting rule. In consultation with EPA's American Indian Environment Office, EPA's outreach plan included tribes. EPA conducted several conference calls with Tribal organizations during the proposal phase of the GHG reporting rule. For example, EPA staff provided information to tribes through conference calls with multiple Tribal working groups and organizations at EPA that interact with tribes and through individual calls with two Tribal board members of the Climate Registry (TCR). In addition, EPA prepared a short article on the GHG reporting rule that appeared on the front page of a Tribal newsletter—Tribal Air News—that was distributed to EPA/Office of Air Quality Planning & Standards' network of Tribal organizations. EPA gave a presentation on various climate efforts, including the GHG Reporting Program, at the National Tribal Conference on Environmental Management on June 24–26, 2008. In addition, EPA had copies of a short information sheet distributed at a meeting of the National Tribal Caucus.

See the "Summary of EPA Outreach Activities for Developing the GHG reporting rule," in Docket No. EPA–HQ–OAR–2008–0508–055 for a complete list of Tribal contacts. EPA participated in a conference call with Tribal air coordinators in April 2009 and prepared a guidance sheet for Tribal governments on the proposed GHG reporting rule. It was posted on the GHG Reporting Program website and published in the Tribal Air Newsletter.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

This action is not subject to EO 13045 because it does not establish an environmental standard intended to mitigate health or safety risks, and it is not an economically significant regulatory action under EO 12866.

H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use

This final rule is not a "significant energy action" as defined in EO 13211 (66 FR 28355, May 22, 2001) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Further, EPA has concluded that this rule is not likely to have any adverse energy effects. This final rule relates to monitoring, reporting and recordkeeping at facilities that inject and/or sequester CO_2 underground and does not impact energy supply, distribution or use. Oil and gas operations that use CO_2-ER are only required to report under subpart UU, unless they opt into subpart RR to establish that CO_2 is being geologically sequestered. Therefore, we conclude that this rule is not likely to have any adverse effects on energy supply, distribution, or use.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104–113 (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (*e.g.,* materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, with explanations when the Agency decides not to use available and applicable voluntary consensus standards. This rulemaking involves technical standards. EPA developed no new measuring device standard. Rather we allow the use of an appropriate standard method published by a consensus-based standards organization if such a method exists; or an industry standard practice.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629, February 16, 1994) establishes Federal executive policy on environmental justice. Its main provision directs Federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that the final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it does not affect the level of protection provided to human health or the environment. The final rule does not affect the level of protection provided to human health or the environment because it is a rule addressing information collection and reporting procedures only.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 *et seq.,* as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the U.S. prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a "major rule" as defined by 5 U.S.C. 804(2). This rule will be effective December 31, 2010.

List of Subjects

40 CFR Part 72

Acid rain, Administrative practice and procedure, Air pollution control, Electric utilities, Intergovernmental relations, Nitrogen oxides, Reporting and recordkeeping requirements, Sulfur dioxide.

40 CFR Part 78

Acid rain, Administrative practice and procedure, Air pollution control, Electric utilities, Intergovernmental relations, Nitrogen oxides, Reporting and recordkeeping requirements, Sulfur dioxide.

40 CFR Part 98

Environmental protection, Administrative practice and procedure, Greenhouse gases, Air pollution control, Reporting and recordkeeping requirements.

Dated: November 22, 2010.

Lisa P. Jackson,

Administrator.

■ For the reasons stated in the preamble, parts 72, 78, and 98 of title 40, chapter I, of the Code of Federal Regulations are amended as follows:

PART 72—[AMENDED]

■ 1. The authority citation for part 72 is revised to read as follows:

Authority: 42 U.S.C. 7401, 7403, 7410, 7411, 7426, 7601, *et seq.*

■ 2. Section 72.2 is amended by revising the definition for "interested person" to read as follows:

§ 72.2 Definitions.

* * * * *

Interested person means, with regard to a decision of the Administrator, any person who submitted comments or testified at a public hearing pursuant to an opportunity for comment provided by the Administrator as part of the process of making such decision, who submitted objections pursuant to an opportunity for objections provided by the Administrator as part of the process of making such decision, or who submitted (to the Administrator and in a format specified by the Administrator) his or her name to be placed on a list of persons interested in such decision. The Administrator may update the list of interested persons from time to time by requesting additional written indication of continued interest from the persons listed and may delete from the list the name of any person failing to respond as requested.

* * * * *

PART 78—[AMENDED]

■ 3. The authority citation for part 78 continues to read as follows:

Authority: 42 U.S.C. 7401, 7403, 7410, 7411, 7426, 7601, *et seq.*

■ 4. Section 78.1 is amended by:
■ a. Removing, in paragraph (a)(1), the words "or part 97 of this chapter" and adding, in their place, the words "part 97 of this chapter, or subpart RR of part 98."
■ b. Adding and reserving paragraphs (b)(13) through (b)(16).
■ c. Adding paragraph (b)(17) to read as follows.

§ 78.1 Purpose and scope.

* * * * *

(b) * * *

(13)–(16) [Reserved]

(17) Under subpart RR of part 98 of this chapter,

(i) A determination of eligibility for research and development exemption under § 98.440(d) of this chapter.

(ii) The approval or disapproval of a request for discontinuation of reporting under § 98.441(b) of this chapter.

(iii) The approval or disapproval of a geologic sequestration monitoring, reporting, and verification (MRV) plan under § 98.448(c) and § 98.448(d) of this chapter.

* * * * *

■ 5. Section 78.3 is amended by:
■ a. Adding and reserving paragraph (a)(10).
■ b. Adding paragraph (a)(11).
■ c. In paragraph (b)(3)(i), removing the words "paragraph (a)(1) and (2)" and adding, in their place, the words "paragraphs (a)(1), (a)(2), (a)(10), and (a)(11)".
■ d. Adding and reserving paragraph (d)(11).
■ e. Adding paragraph (d)(12).

§ 78.3 Petition for administrative review and request or evidentiary hearing.

(a) * * *

(10) [Reserved]

(11) The following persons may petition for administrative review of a decision of the Administrator that is made under subpart RR of part 98 of this chapter:

(i) The owner or operator of a facility covered by the decision.

(ii) Any interested person with regard to the decision.

* * * * *

(d) * * *

(11) [Reserved]

(12) Any provision or requirement of subpart RR of part 98 of this chapter.

■ 6. Section 78.4 is amended by:
■ a. Adding and reserving paragraphs (a)(1) introductory text, (a)(1)(i), (a)(1)(ii), and (a)(1)(iii).
■ b. Adding paragraph (a)(1)(iv).
■ c. Adding and reserving paragraph (a)(2).

§ 78.4 Filings.

(a) * * *

(1) [Reserved]

(i) [Reserved]

(ii) [Reserved]

(iii) [Reserved]

(iv) Any filings on behalf of owners and operators of a facility covered by subpart RR of part 98 of this chapter shall be signed by the designated representative.

(2) [Reserved]

* * * * *

PART 98—[AMENDED]

■ 7. The authority citation for part 98 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart A—[Amended]

■ 8. Table A–3 to subpart A is amended by adding entries to the end of the table for "Geologic sequestration of carbon dioxide" and "Injection of carbon dioxide" to read as follows:

TABLE A–3 OF SUBPART A—SOURCE CATEGORY LIST FOR § 98.2(a)(1)

Source Categories [a] Applicable in 2010 and Future Years
* * * * *
Additional Source Categories [a] Applicable in 2011 and Future Years
* * * * *
Geologic sequestration of carbon dioxide (subpart RR).
Injection of carbon dioxide (subpart UU).

[a] Source categories are defined in each applicable subpart.

■ 9. Part 98 is amended by adding subpart RR to read as follows:

Subpart RR—Geologic Sequestration of Carbon Dioxide

Sec.

Subpart RR—Geologic Sequestration of Carbon Dioxide

§ 98.440 Definition of the source category.

(a) The geologic sequestration of carbon dioxide (CO_2) source category comprises any well or group of wells that inject a CO_2 stream for long-term containment in subsurface geologic formations.

(b) This source category includes all wells permitted as Class VI under the Underground Injection Control program.

(c) This source category does not include a well or group of wells where a CO_2 stream is being injected in subsurface geologic formations to enhance the recovery of oil or natural gas unless one of the following applies:

(1) The owner or operator injects the CO_2 stream for long-term containment in subsurface geologic formations and has chosen to submit a proposed monitoring, reporting, and verification (MRV) plan to EPA and received an approved plan from EPA.

(2) The well is permitted as Class VI under the Underground Injection Control program.

(d) *Exemption for research and development projects.* Research and development projects shall receive an exemption from reporting under this subpart for the duration of the research and development activity.

(1) *Process for obtaining an exemption.* If you are a research and development project, you must submit the information in paragraph (d)(2) of this section to EPA by the time you would be otherwise required to submit an MRV plan under § 98.448. EPA will use this information to verify that the project is a research and development project.

(2) *Content of submission.* A submission in support of an exemption as a research and development project must contain the following information:

(i) The planned duration of CO_2 injection for the project.

(ii) The planned annual CO_2 injection volumes during this time period.

(iii) The research purposes of the project.

(iv) The source and type of funding for the project.

(v) The class and duration of Underground Injection Control permit or, for an offshore facility not subject to the Safe Drinking Water Act, a description of the legal instrument authorizing geologic sequestration.

(3) *Determination by the Administrator.*

(i) The Administrator shall determine if a project meets the definition of research and development project within 60 days of receipt of the submission of a request for exemption. In making this determination, the Administrator shall take into account any information you submit demonstrating that the planned duration of CO_2 injection for the project and the planned annual CO_2 injection volumes during the duration of the project are

consistent with the purpose of the research and development project.

(ii) Any appeal of the Administrator's determination is subject to the provisions of part 78 of this chapter.

(iii) A project that the Administrator determines is not eligible for an exemption as a research and development project must submit a proposed MRV plan to EPA within 180 days of the Administrator's determination. You may request one extension of up to an additional 180 days in which to submit the proposed MRV plan.

§ 98.441 Reporting threshold.

(a) You must report under this subpart if any well or group of wells within your facility injects any amount of CO_2 for long-term containment in subsurface geologic formations. There is no threshold.

(b) *Request for discontinuation of reporting.* The requirements of § 98.2(i) do not apply to this subpart. Once a well or group of wells is subject to the requirements of this subpart, the owner or operator must continue for each year thereafter to comply with all requirements of this subpart, including the requirement to submit annual reports, until the Administrator has issued a final decision on an owner or operator's request to discontinue reporting.

(1) *Timing of request.* The owner or operator of a facility may submit a request to discontinue reporting any time after the well or group of wells is plugged and abandoned in accordance with applicable requirements.

(2) *Content of request.* A request for discontinuation of reporting must contain either paragraph (b)(2)(i) or (b)(2)(ii) of this section.

(i) For wells permitted as Class VI under the Underground Injection Control program, a copy of the applicable Underground Injection Control program Director's authorization of site closure.

(ii) For all other wells, and as an alternative for wells permitted as Class VI under the Underground Injection Control program, a demonstration that current monitoring and model(s) show that the injected CO_2 stream is not expected to migrate in the future in a manner likely to result in surface leakage.

(3) *Notification.* The Administrator will issue a final decision on the request to discontinue reporting within a reasonable time. Any appeal of the Administrator's final decision is subject to the provisions of part 78 of this chapter.

§ 98.442 GHGs to report.

You must report:

(a) Mass of CO_2 received.

(b) Mass of CO_2 injected into the subsurface.

(c) Mass of CO_2 produced.

(d) Mass of CO_2 emitted by surface leakage.

(e) Mass of CO_2 equipment leakage and vented CO_2 emissions from surface equipment located between the injection flow meter and the injection wellhead.

(f) Mass of CO_2 equipment leakage and vented CO_2 emissions from surface equipment located between the production flow meter and the production wellhead.

(g) Mass of CO_2 sequestered in subsurface geologic formations.

(h) Cumulative mass of CO_2 reported as sequestered in subsurface geologic formations in all years since the facility became subject to reporting requirements under this subpart.

§ 98.443 Calculating CO_2 geologic sequestration.

You must calculate the mass of CO_2 received using CO_2 received equations (Equations RR–1 to RR–3 of this section), unless you follow the procedures in § 98.444(a)(4). You must calculate CO_2 sequestered using injection equations (Equations RR–4 to RR–6 of this section), production/recycling equations (Equations RR–7 to RR–9 of this section), surface leakage equations (Equation RR–10 of this section), and sequestration equations (Equations RR–11 and RR–12 of this section). For your first year of reporting, you must calculate CO_2 sequestered starting from the date set forth in your approved MRV plan.

(a) You must calculate and report the annual mass of CO_2 received by pipeline using the procedures in paragraphs (a)(1) or (a)(2) of this section and the procedures in paragraph (a)(3) of this section, if applicable.

(1) For a mass flow meter, you must calculate the total annual mass of CO_2 in a CO_2 stream received in metric tons by multiplying the mass flow by the CO_2 concentration in the flow, according to Equation RR–1 of this section. You must collect these data quarterly. Mass flow and concentration data measurements must be made in accordance with § 98.444.

$$CO_{2T,r} = \sum_{p=1}^{4} (Q_{r,p} - S_{r,p}) * C_{CO_{2,p,r}} \qquad \text{(Eq. RR-1)}$$

Where:

$CO_{2T,r}$ = Net annual mass of CO_2 received through flow meter r (metric tons).

$Q_{r,p}$ = Quarterly mass flow through a receiving flow meter r in quarter p (metric tons).

$S_{r,p}$ = Quarterly mass flow through a receiving flow meter r that is redelivered to another facility without being injected into your well in quarter p (metric tons).

$C_{CO2,p,r}$ = Quarterly CO_2 concentration measurement in flow for flow meter r in quarter p (wt. percent CO_2, expressed as a decimal fraction).

p = Quarter of the year.

r = Receiving flow meter.

(2) For a volumetric flow meter, you must calculate the total annual mass of CO_2 in a CO_2 stream received in metric tons by multiplying the volumetric flow at standard conditions by the CO_2 concentration in the flow and the density of CO_2 at standard conditions, according to Equation RR–2 of this section. You must collect these data quarterly. Volumetric flow and concentration data measurements must be made in accordance with § 98.444.

$$CO_{2T,r} = \sum_{p=1}^{4} (Q_{r,p} - S_{r,p}) * D * C_{CO_{2,p,r}} \qquad \text{(Eq. RR-2)}$$

Where:

$CO_{2T,r}$ = Net annual mass of CO_2 received through flow meter r (metric tons).

$Q_{r,p}$ = Quarterly volumetric flow through a receiving flow meter r in quarter p at standard conditions (standard cubic meters).

$S_{r,p}$ = Quarterly volumetric flow through a receiving flow meter r that is redelivered to another facility without being injected into your well in quarter p (standard cubic meters).
D = Density of CO_2 at standard conditions (metric tons per standard cubic meter): 0.0018682.
$C_{CO2,p,r}$ = Quarterly CO_2 concentration measurement in flow for flow meter r in quarter p (vol. percent CO_2, expressed as a decimal fraction).
p = Quarter of the year.
r = Receiving flow meter.

(3) If you receive CO_2 through more than one flow meter, you must sum the mass of all CO_2 received in accordance with the procedure specified in Equation RR–3 of this section.

$$CO_2 = \sum_{r=1}^{R} CO_{2T,r} \quad \text{(Eq. RR-3)}$$

Where:

CO_2 = Total net annual mass of CO_2 received (metric tons).
$CO_{2T,r}$ = Net annual mass of CO_2 received (metric tons) as calculated in Equation RR–1 or RR–2 for flow meter r.
r = Receiving flow meter.

(b) You must calculate and report the annual mass of CO_2 received in containers using the procedures in paragraphs (b)(1) or (b)(2) of this section.

(1) If you are measuring the mass of contents in a container under the provisions of § 98.444(a)(2)(i), you must calculate the CO_2 received for injection in containers using Equation RR–1 of this section.

Where:

$CO_{2T,r}$ = Net annual mass of CO_2 received in containers r (metric tons).
$C_{CO2,p,r}$ = Quarterly CO_2 concentration measurement of contents in containers r in quarter p (wt. percent CO_2, expressed as a decimal fraction).
$Q_{r,p}$ = Quarterly mass of contents in containers r in quarter p (metric tons).
$S_{r,p}$ = Quarterly mass of contents in containers r redelivered to another facility without being injected into your well in quarter p (metric tons).
p = Quarter of the year.
r = Containers.

(2) If you are measuring the volume of contents in a container under the provisions of § 98.444(a)(2)(ii), you must calculate the CO_2 received for injection in containers using Equation RR–2 of this section.

Where:

$CO_{2T,r}$ = Net annual mass of CO_2 received in containers r (metric tons).
$C_{CO2,p,r}$ = Quarterly CO_2 concentration measurement of contents in containers r in quarter p (vol. percent CO_2, expressed as a decimal fraction).
$Q_{r,p}$ = Quarterly volume of contents in containers r in quarter p (standard cubic meters).
$S_{r,p}$ = Quarterly mass of contents in containers r redelivered to another facility without being injected into your well in quarter p (metric tons).
D = Density of the CO_2 received in containers at standard conditions (metric tons per standard cubic meter):0.0018682.
p = Quarter of the year.
r = Containers.

(c) You must report the annual mass of CO_2 injected in accordance with the procedures specified in paragraphs (c)(1) through (c)(3) of this section.

(1) If you use a mass flow meter to measure the flow of an injected CO_2 stream, you must calculate annually the total mass of CO_2 (in metric tons) in the CO_2 stream injected each year in metric tons by multiplying the mass flow by the CO_2 concentration in the flow, according to Equation RR–4 of this section. Mass flow and concentration data measurements must be made in accordance with § 98.444.

$$CO_{2,u} = \sum_{p=1}^{4} Q_{p,u} * C_{CO_{2,p,u}} \quad \text{(Eq. RR-4)}$$

Where:

$CO_{2,u}$ = Annual CO_2 mass injected (metric tons) as measured by flow meter u.
$Q_{p,u}$ = Quarterly mass flow rate measurement for flow meter u in quarter p (metric tons per quarter).
$C_{CO2,p,u}$ = Quarterly CO_2 concentration measurement in flow for flow meter u in quarter p (wt. percent CO_2, expressed as a decimal fraction).
p = Quarter of the year.
u = Flow meter.

(2) If you use a volumetric flow meter to measure the flow of an injected CO_2 stream, you must calculate annually the total mass of CO_2 (in metric tons) in the CO_2 stream injected each year in metric tons by multiplying the volumetric flow at standard conditions by the CO_2 concentration in the flow and the density of CO_2 at standard conditions, according to Equation RR–5 of this section. Volumetric flow and concentration data measurements must be made in accordance with § 98.444.

$$CO_{2,u} = \sum_{p=1}^{4} Q_{p,u} * D * C_{CO_{2,p,u}} \quad \text{(Eq. RR-5)}$$

Where:

$CO_{2,u}$ = Annual CO_2 mass injected (metric tons) as measured by flow meter u.
$Q_{p,u}$ = Quarterly volumetric flow rate measurement for flow meter u in quarter p at standard conditions (standard cubic meters per quarter).
D = Density of CO_2 at standard conditions (metric tons per standard cubic meter): 0.0018682.
$C_{CO2,p,u}$ = CO_2 concentration measurement in flow for flow meter u in quarter p (vol. percent CO_2, expressed as a decimal fraction).
p = Quarter of the year.
u = Flow meter.

(3) To aggregate injection data for all wells covered under this subpart, you must sum the mass of all CO_2 injected through all injection wells in accordance with the procedure specified in Equation RR–6 of this section.

$$CO_{2I} = \sum_{u=1}^{U} CO_{2,u} \quad \text{(Eq. RR-6)}$$

Where:

CO_{2I} = Total annual CO_2 mass injected (metric tons) through all injection wells.
$CO_{2,u}$ = Annual CO_2 mass injected (metric tons) as measured by flow meter u.
u = Flow meter.

(d) You must calculate the annual mass of CO_2 produced from oil or gas production wells or from other fluid wells for each separator that sends a stream of gas into a recycle or end use system in accordance with the procedures specified in paragraphs (d)(1) through (d)(3) of this section. You must account only for wells that produce the CO_2 that was injected into the well or wells covered by this source category.

(1) For each gas-liquid separator for which flow is measured using a mass flow meter, you must calculate annually the total mass of CO_2 produced from an oil or other fluid stream in metric tons that is separated from the fluid by multiplying the mass gas flow by the CO_2 concentration in the gas flow, according to Equation RR–7 of this section. You must collect these data quarterly. Mass flow and concentration data measurements must be made in accordance with § 98.444.

$$CO_{2,w} = \sum_{p=1}^{4} Q_{p,w} * C_{CO_{2,p,w}} \quad \text{(Eq. RR-7)}$$

Where:

$CO_{2,w}$ = Annual CO_2 mass produced (metric tons) through separator w.

$Q_{p,w}$ = Quarterly gas mass flow rate measurement for separator w in quarter p (metric tons).

$C_{CO2,p,w}$ = Quarterly CO_2 concentration measurement in flow for separator w in quarter p (wt. percent CO_2, expressed as a decimal fraction).

p = Quarter of the year.

w = Separator.

(2) For each gas-liquid separator for which flow is measured using a volumetric flow meter, you must calculate annually the total mass of CO_2 produced from an oil or other fluid stream in metric tons that is separated from the fluid by multiplying the volumetric gas flow at standard conditions by the CO_2 concentration in the gas flow and the density of CO_2 at standard conditions, according to Equation RR–8 of this section. You must collect these data quarterly. Volumetric flow and concentration data measurements must be made in accordance with § 98.444.

$$CO_{2,w} = \sum_{p=1}^{4} Q_{p,w} * D * C_{CO_{2,p,w}} \quad \text{(Eq. RR-8)}$$

Where:

$CO_{2,w}$ = Annual CO_2 mass produced (metric tons) through separator w.

$Q_{p,w}$ = Volumetric gas flow rate measurement for separator w in quarter p at standard conditions (standard cubic meters).

D = Density of CO_2 at standard conditions (metric tons per standard cubic meter): 0.0018682.

$C_{CO2,p,w}$ = CO_2 concentration measurement in flow for separator w in quarter p (vol. percent CO_2, expressed as a decimal fraction).

p = Quarter of the year.

w = Separator.

(3) To aggregate production data, you must sum the mass of all of the CO_2 separated at each gas-liquid separator in accordance with the procedure specified in Equation RR–9 of this section. You must assume that the total CO_2 measured at the separator(s) represents a percentage of the total CO_2 produced. In order to account for the percentage of CO_2 produced that is estimated to remain with the produced oil or other fluid, you must multiply the quarterly mass of CO_2 measured at the separator(s) by a percentage estimated using a methodology in your approved MRV plan.

$$CO_{2P} = (1+X) * \sum_{w=1}^{W} CO_{2,w} \quad \text{(Eq. RR-9)}$$

Where:

CO_{2P} = Total annual CO_2 mass produced (metric tons) through all separators in the reporting year.

$CO_{2,w}$ = Annual CO_2 mass produced (metric tons) through separator w in the reporting year.

X = Entrained CO_2 in produced oil or other fluid divided by the CO_2 separated through all separators in the reporting year (weight percent CO_2, expressed as a decimal fraction).

w = Separator.

(e) You must report the annual mass of CO_2 that is emitted by surface leakage in accordance with your approved MRV plan. You must calculate the total annual mass of CO_2 emitted from all leakage pathways in accordance with the procedure specified in Equation RR–10 of this section.

$$CO_{2E} = \sum_{x=1}^{X} CO_{2,x} \quad \text{(Eq. RR-10)}$$

Where:

CO_{2E} = Total annual CO_2 mass emitted by surface leakage (metric tons) in the reporting year.

$CO_{2,x}$ = Annual CO_2 mass emitted (metric tons) at leakage pathway x in the reporting year.

x = Leakage pathway.

(f) You must report the annual mass of CO_2 that is sequestered in subsurface geologic formations in the reporting year in accordance with the procedures specified in paragraphs (f)(1) and (f)(2) of this section.

(1) If you are actively producing oil or natural gas or if you are producing any other fluids, you must calculate the annual mass of CO_2 that is sequestered in the underground subsurface formation in the reporting year in accordance with the procedure specified in Equation RR–11 of this section.

$$CO_2 = CO_{2I} - CO_{2P} - CO_{2E} - CO_{2FI} - CO_{2FP} \quad \text{(Eq. RR-11)}$$

Where:

CO_2 = Total annual CO_2 mass sequestered in subsurface geologic formations (metric tons) at the facility in the reporting year.

CO_{2I} = Total annual CO_2 mass injected (metric tons) in the well or group of wells covered by this source category in the reporting year.

CO_{2P} = Total annual CO_2 mass produced (metric tons) in the reporting year.

CO_{2E} = Total annual CO_2 mass emitted (metric tons) by surface leakage in the reporting year.

CO_{2FI} = Total annual CO_2 mass emitted (metric tons) as equipment leakage or vented emissions from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead, for which a calculation procedure is provided in subpart W of this part.

CO_{2FP} = Total annual CO_2 mass emitted (metric tons) as equipment leakage or vented emissions from equipment located on the surface between the production wellhead and the flow meter used to measure production quantity, for which a calculation procedure is provided in subpart W of this part.

(2) If you are not actively producing oil or natural gas or any other fluids, you must calculate the annual mass of

CO_2 that is sequestered in subsurface geologic formations in the reporting year in accordance with the procedures specified in Equation RR–12 of this section.

$$CO_2 = CO_{2I} - CO_{2E} - CO_{2FI} \qquad \text{(Eq. RR-12)}$$

Where:

CO_2 = Total annual CO_2 mass sequestered in subsurface geologic formations (metric tons) at the facility in the reporting year.

CO_{2I} = Total annual CO_2 mass injected (metric tons) in the well or group of wells covered by this source category in the reporting year.

CO_{2E} = Total annual CO_2 mass emitted (metric tons) by surface leakage in the reporting year.

CO_{2FI} = Total annual CO_2 mass emitted (metric tons) as equipment leakage or vented emissions from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead.

§ 98.444 Monitoring and QA/QC requirements.

(a) *CO_2 received.*

(1) Except as provided in paragraph (a)(4) of this section, you must determine the quarterly flow rate of CO_2 received by pipeline by following the most appropriate of the following procedures:

(i) You may measure flow rate at the receiving custody transfer meter prior to any subsequent processing operations at the facility and collect the flow rate quarterly.

(ii) If you took ownership of the CO_2 in a commercial transaction, you may use the quarterly flow rate data from the sales contract if it is a one-time transaction or from invoices or manifests if it is an ongoing commercial transaction with discrete shipments.

(iii) If you inject CO_2 received from a production process unit that is part of your facility, you may use the quarterly CO_2 flow rate that was measured at the equivalent of a custody transfer meter following procedures provided in subpart PP of this part. To be the equivalent of a custody transfer meter, a meter must measure the flow of CO_2 being transported to an injection well to the same degree of accuracy as a meter used for commercial transactions.

(2) Except as provided in paragraph (a)(4) of this section, you must determine the quarterly mass or volume of contents in all containers if you receive CO_2 in containers by following the most appropriate of the following procedures:

(i) You may measure the mass of contents of containers summed quarterly using weigh bills, scales, or load cells.

(ii) You may determine the volume of the contents of containers summed quarterly.

(iii) If you took ownership of the CO_2 in a commercial transaction, you may use the quarterly mass or volume of contents from the sales contract if it is a one-time transaction or from invoices or manifests if it is an ongoing commercial transaction with discrete shipments.

(3) Except as provided in paragraph (a)(4) of this section, you must determine a quarterly concentration of the CO_2 received that is representative of all CO_2 received in that quarter by following the most appropriate of the following procedures:

(i) You may sample the CO_2 stream at least once per quarter at the point of receipt and measure its CO_2 concentration.

(ii) If you took ownership of the CO_2 in a commercial transaction for which the sales contract was contingent on CO_2 concentration, and if the supplier of the CO_2 sampled the CO_2 stream in a quarter and measured its concentration per the sales contract terms, you may use the CO_2 concentration data from the sales contract for that quarter.

(iii) If you inject CO_2 from a production process unit that is part of your facility, you may report the quarterly CO_2 concentration of the CO_2 stream supplied that was measured following the procedures provided in subpart PP of this part.

(4) If the CO_2 you receive is wholly injected and is not mixed with any other supply of CO_2, you may report the annual mass of CO_2 injected that you determined following the requirements under paragraph (b) of this section as the total annual mass of CO_2 received instead of using Equation RR–1 or RR–2 of this subpart to calculate CO_2 received.

(5) You must assume that the CO_2 you receive meets the definition of a CO_2 stream unless you can trace it through written records to a source other than a CO_2 stream.

(b) *CO_2 injected.*

(1) You must select a point or points of measurement at which the CO_2 stream(s) is representative of the CO_2 stream(s) being injected. You may use as the point or points of measurement the location(s) of the flow meter(s) used to comply with the flow monitoring and reporting provisions in your Underground Injection Control permit.

(2) You must measure flow rate of CO_2 injected with a flow meter and collect the flow rate quarterly.

(3) You must sample the injected CO_2 stream at least once per quarter immediately upstream or downstream of the flow meter used to measure flow rate of that CO_2 stream and measure the CO_2 concentration of the sample.

(c) *CO_2 produced.*

(1) The point of measurement for the quantity of CO_2 produced from oil or other fluid production wells is a flow meter directly downstream of each separator that sends a stream of gas into a recycle or end use system.

(2) You must sample the produced gas stream at least once per quarter immediately upstream or downstream of the flow meter used to measure flow rate of that gas stream and measure the CO_2 concentration of the sample.

(3) You must measure flow rate of gas produced with a flow meter and collect the flow rate quarterly.

(d) *CO_2 equipment leakage and vented CO_2.* If you have equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead or between the flow meter used to measure production quantity and the production wellhead, you must follow the monitoring and QA/QC requirements specified in subpart W of this part for the equipment.

(e) *Measurement devices.*

(1) All flow meters must be operated continuously except as necessary for maintenance and calibration.

(2) You must calibrate all flow meters used to measure quantities reported in § 98.446 according to the calibration and accuracy requirements in § 98.3(i).

(3) You must operate all measurement devices according to one of the following. You may use an appropriate standard method published by a consensus-based standards organization if such a method exists or an industry standard practice. Consensus-based standards organizations include, but are not limited to, the following: ASTM International, the American National Standards Institute (ANSI), the American Gas Association (AGA), the American Society of Mechanical Engineers (ASME), the American Petroleum Institute (API), and the North

American Energy Standards Board (NAESB).

(4) You must ensure that any flow meter calibrations performed are National Institute of Standards and Technology (NIST) traceable.

(f) *General.*

(1) If you measure the concentration of any CO_2 quantity for reporting, you must measure according to one of the following. You may use an appropriate standard method published by a consensus-based standards organization if such a method exists or an industry standard practice.

(2) You must convert all measured volumes of CO_2 to the following standard industry temperature and pressure conditions for use in Equations RR–2, RR–5 and RR–8 of this subpart: Standard cubic meters at a temperature of 60 degrees Fahrenheit and at an absolute pressure of 1 atmosphere.

(3) For 2011, you may follow the provisions of § 98.3(d)(1) through (2) for best available monitoring methods only for parameters required by paragraphs (a) and (b) of § 98.443 rather than follow the monitoring requirements of paragraph (a) of this section. For purposes of this subpart, any reference to the year 2010 in § 98.3(d)(1) through (2) shall mean 2011.

§ 98.445 Procedures for estimating missing data.

A complete record of all measured parameters used in the GHG quantities calculations is required. Whenever the monitoring procedures cannot be followed, you must use the following missing data procedures:

(a) A quarterly flow rate of CO_2 received that is missing must be estimated as follows:

(1) Another calculation methodology listed in § 98.444(a)(1) must be used if possible.

(2) If another method listed in § 98.444(a)(1) cannot be used, a quarterly flow rate value that is missing must be estimated using a representative flow rate value from the nearest previous time period.

(b) A quarterly mass or volume of contents in containers received that is missing must be estimated as follows:

(1) Another calculation methodology listed in § 98.444(a)(2) must be used if possible.

(2) If another method listed in § 98.444(a)(2) cannot be used, a quarterly mass or volume value that is missing must be estimated using a representative mass or volume value from the nearest previous time period.

(c) A quarterly CO_2 concentration of a CO_2 stream received that is missing must be estimated as follows:

(1) Another calculation methodology listed in § 98.444(a)(3) must be used if possible.

(2) If another method listed in § 98.444(a)(3) cannot be used, a quarterly concentration value that is missing must be estimated using a representative concentration value from the nearest previous time period.

(d) A quarterly quantity of CO_2 injected that is missing must be estimated using a representative quantity of CO_2 injected from the nearest previous period of time at a similar injection pressure.

(e) For any values associated with CO_2 equipment leakage or vented CO_2 emissions from surface equipment at the facility that are reported in this subpart, missing data estimation procedures should be followed in accordance with those specified in subpart W of this part.

(f) The quarterly quantity of CO_2 produced from subsurface geologic formations that is missing must be estimated using a representative quantity of CO_2 produced from the nearest previous period of time.

(g) You must estimate the mass of CO_2 emitted by surface leakage that is missing as required by your approved MRV plan.

(h) You must estimate other missing data as required by your approved MRV plan.

§ 98.446 Data reporting requirements.

In addition to the information required by § 98.3(c), report the information listed in this section.

(a) If you receive CO_2 by pipeline, report the following for each receiving flow meter:

(1) The total net mass of CO_2 received (metric tons) annually.

(2) If a volumetric flow meter is used to receive CO_2 report the following unless you reported yes to paragraph (a)(5) of this section:

(i) The volumetric flow through a receiving flow meter at standard conditions (in standard cubic meters) in each quarter.

(ii) The volumetric flow through a receiving flow meter that is redelivered to another facility without being injected into your well (in standard cubic meters) in each quarter.

(iii) The CO_2 concentration in the flow (volume percent CO_2 expressed as a decimal fraction) in each quarter.

(3) If a mass flow meter is used to receive CO_2 report the following unless you reported yes to paragraph (a)(5) of this section:

(i) The mass flow through a receiving flow meter (in metric tons) in each quarter.

(ii) The mass flow through a receiving flow meter that is redelivered to another facility without being injected into your well (in metric tons) in each quarter.

(iii) The CO_2 concentration in the flow (weight percent CO_2 expressed as a decimal fraction) in each quarter.

(4) If the CO_2 received is wholly injected and not mixed with any other supply of CO_2, report whether you followed the procedures in § 98.444(a)(4).

(5) The standard or method used to calculate each value in paragraphs (a)(2) through (a)(3) of this section.

(6) The number of times in the reporting year for which substitute data procedures were used to calculate values reported in paragraphs (a)(2) through (a)(3) of this section.

(7) Whether the flow meter is mass or volumetric.

(8) A numerical identifier for the flow meter.

(b) If you receive CO_2 in containers, report:

(1) The mass (in metric tons) or volume at standard conditions (in standard cubic meters) of contents in containers received in each quarter.

(2) The concentration of CO_2 of contents in containers (volume or wt. percent CO_2 expressed as a decimal fraction) in each quarter.

(3) The mass (in metric tons) or volume (in standard cubic meters) of contents in containers that is redelivered to another facility without being injected into your well in each quarter.

(4) The net mass of CO_2 received (in metric tons) annually.

(5) The standard or method used to calculate each value in paragraphs (b)(1) and (b)(2) of this section.

(6) The number of times in the reporting year for which substitute data procedures were used to calculate values reported in paragraphs (b)(1) and (b)(2) of this section.

(c) If you use more than one receiving flow meter, report the total net mass of CO_2 received (metric tons) through all flow meters annually.

(d) The source of the CO_2 received according to the following categories:

(1) CO_2 production wells.

(2) Electric generating unit.

(3) Ethanol plant.

(4) Pulp and paper mill.

(5) Natural gas processing.

(6) Gasification operations.

(7) Other anthropogenic source.

(8) Discontinued enhanced oil and gas recovery project.

(9) Unknown.

(e) Whether you began data collection according to your approved MRV plan in a reporting year prior to this annual report submission.

(f) If you report yes in paragraph (e) of this section, report the following. If

this is your first year of reporting, report the following starting on the date you began data collection according to your approved MRV plan.

(1) For each injection flow meter (mass or volumetric), report:

(i) The mass of CO_2 injected (metric tons) annually.

(ii) The CO_2 concentration in flow (volume or weight percent CO_2 expressed as a decimal fraction) in each quarter.

(iii) If a volumetric flow meter is used, the volumetric flow rate at standard conditions (in standard cubic meters) in each quarter.

(iv) If a mass flow meter is used, the mass flow rate (in metric tons) in each quarter.

(v) A numerical identifier for the flow meter.

(vi) Whether the flow meter is mass or volumetric.

(vii) The standard used to calculate each value in paragraphs (f)(1)(i) through (f)(1)(iv) of this section.

(viii) The number of times in the reporting year for which substitute data procedures were used to calculate values reported in paragraphs (f)(1)(ii) through (f)(1)(iv) of this section.

(ix) The location of the flow meter.

(2) The total CO_2 injected (metric tons) in the reporting year as calculated in Equation RR–6 of this subpart.

(3) For CO_2 equipment leakage and vented CO_2 emissions, report the following:

(i) The mass of CO_2 emitted (in metric tons) annually as equipment leakage or vented emissions from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead.

(ii) The mass of CO_2 emitted (in metric tons) annually as equipment leakage or vented emissions from equipment located on the surface between the production wellhead and the flow meter used to measure production quantity.

(4) For each separator flow meter (mass or volumetric), report:

(i) CO_2 mass produced (metric tons) annually.

(ii) CO_2 concentration in flow (volume or weight percent CO_2 expressed as a decimal fraction) in each quarter.

(iii) If a volumetric flow meter is used, volumetric flow rate at standard conditions (standard cubic meters) in each quarter.

(iv) If a mass flow meter, mass flow rate (metric tons) in each quarter.

(v) A numerical identifier for the flow meter.

(vi) Whether the flow meter is mass or volumetric.

(vii) The standard used to calculate each value in paragraphs (f)(4)(ii) through (f)(4)(iv) of this section.

(viii) The number of times in the reporting year for which substitute data procedures were used to calculate values reported in paragraphs (f)(4)(ii) through (f)(4)(iv) of this section.

(5) The entrained CO_2 in produced oil or other fluid divided by the CO_2 separated through all separators in the reporting year (weight percent CO_2 expressed as a decimal fraction) used as the value for X in Equation RR–9 of this subpart and as determined according to your EPA-approved MRV plan.

(6) Annual CO_2 produced in the reporting year as calculated in Equation RR–9 of this subpart.

(7) For each leakage pathway through which CO_2 emissions occurred, report:

(i) A numerical identifier for the leakage pathway.

(ii) The CO_2 (metric tons) emitted through that pathway in the reporting year.

(8) Annual CO_2 mass emitted (metric tons) by surface leakage in the reporting year as calculated by Equation RR–10 of this subpart.

(9) Annual CO_2 (metric tons) sequestered in subsurface geologic formations in the reporting year as calculated by Equation RR–11 or RR–12 of this subpart.

(10) Cumulative mass of CO_2 (metric tons) reported as sequestered in subsurface geologic formations in all years since the well or group of wells became subject to reporting requirements under this subpart.

(11) Date that the most recent MRV plan was approved by EPA and the MRV plan approval number that was issued by EPA.

(12) An annual monitoring report that contains the following components:

(i) A narrative history of the monitoring efforts conducted over the previous calendar year, including a listing of all monitoring equipment that was operated, its period of operation, and any relevant tests or surveys that were conducted.

(ii) A description of any changes to the monitoring program that you concluded were not material changes warranting submission of a revised MRV plan under § 98.448(d).

(iii) A narrative history of any monitoring anomalies that were detected in the previous calendar year and how they were investigated and resolved.

(iv) A description of any surface leakages of CO_2, including a discussion of all methodologies and technologies involved in detecting and quantifying the surface leakages and any assumptions and uncertainties involved in calculating the amount of CO_2 emitted.

(13) If a well is permitted under the Underground Injection Control program, for each injection well, report:

(i) The well identification number used for the Underground Injection Control permit.

(ii) The Underground Injection Control permit class.

(14) If an offshore well is not subject to the Safe Drinking Water Act, for each injection well, report any well identification number and any identification number used for the legal instrument authorizing geologic sequestration.

§ 98.447 Records that must be retained.

(a) You must follow the record retention requirements specified by § 98.3(g). In addition to the records required by § 98.3(g), you must retain the records specified in paragraphs (a)(1) through (7) of this section, as applicable. You must retain all required records for at least 3 years.

(1) Quarterly records of CO_2 received, including mass flow rate of contents of containers (mass or volumetric) at standard conditions and operating conditions, operating temperature and pressure, and concentration of these streams.

(2) Quarterly records of produced CO_2, including mass flow or volumetric flow at standard conditions and operating conditions, operating temperature and pressure, and concentration of these streams.

(3) Quarterly records of injected CO_2 including mass flow or volumetric flow at standard conditions and operating conditions, operating temperature and pressure, and concentration of these streams.

(4) Annual records of information used to calculate the CO_2 emitted by surface leakage from leakage pathways.

(5) Annual records of information used to calculate the CO_2 emitted as equipment leakage or vented emissions from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead.

(6) Annual records of information used to calculate the CO_2 emitted as equipment leakage or vented emissions from equipment located on the surface between the production wellhead and the flow meter used to measure production quantity.

(7) Any other records as specified for retention in your EPA-approved MRV plan.

(b) You must complete your monitoring plans, as described in

§ 98.3(g)(5), by April 1 of the year you begin collecting data.

§ 98.448 Geologic sequestration monitoring, reporting, and verification (MRV) plan.

(a) *Contents of MRV plan.* You must develop and submit to the Administrator a proposed MRV plan for monitoring, reporting, and verification of geologic sequestration at your facility. Your proposed MRV plan must contain the following components:

(1) Delineation of the maximum monitoring area and the active monitoring areas. The first period for your active monitoring area will begin from the date determined in your MRV plan through the date at which the plan calls for the first expansion of the monitoring area. The length of each monitoring period can be any time interval chosen by you that is greater than 1 year.

(2) Identification of potential surface leakage pathways for CO_2 in the maximum monitoring area and the likelihood, magnitude, and timing, of surface leakage of CO_2 through these pathways.

(3) A strategy for detecting and quantifying any surface leakage of CO_2.

(4) A strategy for establishing the expected baselines for monitoring CO_2 surface leakage.

(5) A summary of the considerations you intend to use to calculate site-specific variables for the mass balance equation. This includes, but is not limited to, considerations for calculating equipment leakage and vented emissions between the injection flow meter and injection well and/or the production flow meter and production well, and considerations for calculating CO_2 in produced fluids.

(6) If a well is permitted under the Underground Injection Control program, for each injection well, report the well identification number used for the Underground Injection Control permit and the Underground Injection Control permit class. If the well is not yet permitted, and you have applied for an Underground Injection Control permit, report the well identification numbers in the permit application. If an offshore well is not subject to the Safe Drinking Water Act, for each injection well, report any well identification number and any identification number used for the legal instrument authorizing geologic sequestration. If you are submitting your Underground Injection Control permit application as part of your proposed MRV plan, you must notify EPA when the permit has been approved. If you are an offshore facility not subject to the Safe Drinking Water Act, and are submitting your application for the legal instrument authorizing geologic sequestration as part of your proposed MRV plan, you must notify EPA when the legal instrument authorizing geologic sequestration has been approved.

(7) Proposed date to begin collecting data for calculating total amount sequestered according to equation RR–11 or RR–12 of this subpart. This date must be after expected baselines as required by paragraph (a)(4) of this section are established and the leakage detection and quantification strategy as required by paragraph (a)(3) of this section is implemented in the initial AMA.

(b) *Timing.* You must submit a proposed MRV plan to EPA according to the following schedule:

(1) You must submit a proposed MRV plan to EPA by June 30, 2011 if you were issued a final Underground Injection Control permit authorizing the injection of CO_2 into the subsurface on or before December 31, 2010. You will be allowed to request one extension of up to an additional 180 days in which to submit your proposed MRV plan.

(2) You must submit a proposed MRV plan to EPA within 180 days of receiving a final Underground Injection Control permit authorizing the injection of CO_2 into the subsurface. If your facility is an offshore facility not subject to the Safe Drinking Water Act, you must submit a proposed MRV plan to EPA within 180 days of receiving authorization to begin geologic sequestration of CO_2. You will be allowed to request one extension of the submittal date of up to an additional 180 days.

(3) If you are injecting a CO_2 stream in subsurface geologic formations to enhance the recovery of oil or natural gas and you are not permitted as Class VI under the Underground Injection Control program, you may opt to submit an MRV plan at any time.

(4) If EPA determines that your proposed MRV plan is incomplete, you must submit an updated MRV plan within 45 days of EPA notification, unless otherwise specified by EPA.

(c) *Final MRV plan.* The Administrator will issue a final MRV plan within a reasonable period of time. The Administrator's final MRV plan is subject to the provisions of part 78 of this chapter. Once the MRV plan is final and no longer subject to administrative appeal under part 78 of this chapter, you must implement the plan starting on the day after the day on which the plan becomes final and is no longer subject to such appeal.

(d) *MRV plan revisions.* You must revise and submit the MRV plan within 180 days to the Administrator for approval if any of the following in paragraphs (d)(1) through (d)(4) of this section applies. You must include the reason(s) for the revisions in your submittal.

(1) A material change was made to monitoring and/or operational parameters that was not anticipated in the original MRV plan. Examples of material changes include but are not limited to: Large changes in the volume of CO_2 injected; the construction of new injection wells not identified in the MRV plan; failures of the monitoring system including monitoring system sensitivity, performance, location, or baseline; changes to surface land use that affects baseline or operational conditions; observed plume location that differs significantly from the predicted plume area used for developing the MRV plan; a change in the maximum monitoring area or active monitoring area; or a change in monitoring technology that would result in coverage or detection capability different from the MRV plan.

(2) A change in the permit class of your Underground Injection Control permit.

(3) If you are notified by EPA of substantive errors in your MRV plan or monitoring report.

(4) You choose to revise your MRV plan for any other reason in any reporting year.

(e) *Final MRV plan.* The requirements of paragraph (c) of this section apply to any submission of a revised MRV plan. You must continue reporting under your currently approved plan while awaiting approval of a revised MRV plan.

(f) *Format.* Each proposed MRV plan or revision and each annual report must be submitted electronically in a format specified by the Administrator.

(g) *Certificate of representation.* You must submit a certificate of representation according to the provisions in § 98.4 at least 60 days before submission of your MRV plan, your research and development exemption request, your MRV plan submission extension request, or your initial annual report under this part, whichever is earlier.

§ 98.449 Definitions.

Except as provided below, all terms used in this subpart have the same meaning given in the Clean Air Act and subpart A of this part.

Active monitoring area is the area that will be monitored over a specific time interval from the first year of the period (n) to the last year in the period (t). The

boundary of the active monitoring area is established by superimposing two areas:

(1) The area projected to contain the free phase CO_2 plume at the end of year t, plus an all around buffer zone of one-half mile or greater if known leakage pathways extend laterally more than one-half mile.

(2) The area projected to contain the free phase CO_2 plume at the end of year t+5.

CO_2 received the CO_2 stream that you receive to be injected for the first time into a well on your facility that is covered by this subpart. CO_2 received includes, but is not limited to, a CO_2 stream from a production process unit inside your facility and a CO_2 stream that was injected into a well on another facility, removed from a discontinued enhanced oil or natural gas or other production well, and transferred to your facility.

Equipment leak means those emissions that could not reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening.

Expected baseline is the anticipated value of a monitored parameter that is compared to the measured monitored parameter.

Maximum monitoring area means the area that must be monitored under this regulation and is defined as equal to or greater than the area expected to contain the free phase CO_2 plume until the CO_2 plume has stabilized plus an all-around buffer zone of at least one-half mile.

Research and development project means a project for the purpose of investigating practices, monitoring techniques, or injection verification, or engaging in other applied research, that will enable safe and effective long-term containment of a CO_2 stream in subsurface geologic formations, including research and short duration CO_2 injection tests conducted as a precursor to long-term storage.

Separator means a vessel in which streams of multiple phases are gravity separated into individual streams of single phase.

Surface leakage means the movement of the injected CO_2 stream from the injection zone to the surface, and into the atmosphere, indoor air, oceans, or surface water.

Underground Injection Control permit means a permit issued under the authority of Part C of the Safe Drinking Water Act at 42 U.S.C. 300h *et seq.*

Underground Injection Control program means the program responsible for regulating the construction, operation, permitting, and closure of injection wells that place fluids underground for storage or disposal for purposes of protecting underground sources of drinking water from endangerment pursuant to Part C of the Safe Drinking Water Act at 42 U.S.C. 300h *et seq.*

Vented emissions means intentional or designed releases of CH_4 or CO_2 containing natural gas or hydrocarbon gas (not including stationary combustion flue gas), including process designed flow to the atmosphere through seals or vent pipes, equipment blowdown for maintenance, and direct venting of gas used to power equipment (such as pneumatic devices).

■ 10. Part 98 is amended by adding subpart UU to read as follows:

Subpart UU—Injection of Carbon Dioxide

Sec.

Subpart UU—Injection of Carbon Dioxide

§ 98.470 Definition of the source category.

(a) The injection of carbon dioxide (CO_2) source category comprises any well or group of wells that inject a CO_2 stream into the subsurface.

(b) If you report under subpart RR of this part for a well or group of wells, you are not required to report under this subpart for that well or group of wells.

(c) A facility that is subject to this part only because it is subject to subpart UU of this part is not required to report emissions under subpart C of this part or any other subpart listed in § 98.2(a)(1) or (a)(2).

§ 98.471 Reporting threshold.

(a) You must report under this subpart if your facility injects any amount of CO_2 into the subsurface.

(b) For purposes of this subpart, any reference to CO_2 emissions in § 98.2(i) shall mean CO_2 received.

§ 98.472 GHGs to report.

You must report the mass of CO_2 received.

§ 98.473 Calculating CO_2 received.

(a) You must calculate and report the annual mass of CO_2 received by pipeline using the procedures in paragraphs (a)(1) or (a)(2) of this section and the procedures in paragraph (a)(3) of this section, if applicable.

(1) For a mass flow meter, you must calculate the total annual mass of CO_2 in a CO_2 stream received in metric tons by multiplying the mass flow by the CO_2 concentration in the flow, according to Equation UU–1 of this section. You must collect these data quarterly. Mass flow and concentration data measurements must be made in accordance with § 98.474.

$$CO_{2T,r} = \sum_{p=1}^{4} (Q_{r,p} - S_{r,p}) * C_{CO_{2,p,r}} \qquad \text{(Eq. UU-1)}$$

Where:

$CO_{2T,r}$ = Net annual mass of CO_2 received through flow meter r (metric tons).

$Q_{r,p}$ = Quarterly mass flow through a receiving flow meter r in quarter p (metric tons).

$S_{r,p}$ = Quarterly mass flow through a receiving flow meter r that is redelivered to another facility without being injected into your well in quarter p (metric tons).

$C_{CO2,p,r}$ = Quarterly CO_2 concentration measurement in flow for flow meter r in quarter p (wt. percent CO_2, expressed as a decimal fraction).

p = Quarter of the year.

r = Receiving flow meter.

(2) For a volumetric flow meter, you must calculate the total annual mass of CO_2 in a CO_2 stream received in metric tons by multiplying the volumetric flow at standard conditions by the CO_2 concentration in the flow and the density of CO_2 at standard conditions, according to Equation UU–2 of this section. You must collect these data quarterly. Volumetric flow and concentration data measurements must be made in accordance with § 98.474.

$$CO_{2T,r} = \sum_{p=1}^{4}(Q_{r,p} - S_{r,p}) * D * C_{CO_{2,p,r}} \quad \text{(Eq. UU-2)}$$

Where:

$CO_{2T,r}$ = Net annual mass of CO_2 received through flow meter r (metric tons).
$Q_{r,p}$ = Quarterly volumetric flow through a receiving flow meter r in quarter p at standard conditions (standard cubic meters).
$S_{r,p}$ = Quarterly volumetric flow through a receiving flow meter r that is redelivered to another facility without being injected into your well in quarter p (standard cubic meters).
D = Density of CO_2 at standard conditions (metric tons per standard cubic meter): 0.0018704.
$C_{CO2,p,r}$ = Quarterly CO_2 concentration measurement in flow for flow meter r in quarter p (vol. percent CO_2, expressed as a decimal fraction).
p = Quarter of the year.
r = Receiving flow meter.

(3) If you receive CO_2 through more than one flow meter, you must sum the mass of all CO_2 received in accordance with the procedure specified in Equation UU–3 of this section.

$$CO_2 = \sum_{r=1}^{R} CO_{2T,r} \quad \text{(Eq. UU-3)}$$

Where:

CO_2 = Total net annual mass of CO_2 received (metric tons).
$CO_{2T,r}$ = Net annual mass of CO_2 received (metric tons) as calculated in Equation UU–1 or UU–2 for flow meter r.
r = Receiving flow meter.

(b) You must calculate and report the annual mass of CO_2 received in containers using the procedures specified in either paragraph (b)(1) or (b)(2) of this section.

(1) If you are measuring the mass of contents in a container under the provisions of § 98.474(a)(2)(i), you must calculate the CO_2 received in containers using Equation UU–1 of this section.

Where:

$CO_{2T,r}$ = Annual mass of CO_2 received in containers r (metric tons).
$C_{CO2,p,r}$ = Quarterly CO_2 concentration measurement of contents in containers r in quarter p (wt. percent CO_2, expressed as a decimal fraction).
$Q_{r,p}$ = Quarterly mass of contents in containers r in quarter p (metric tons).
$S_{r,p}$ = Quarterly mass of contents in containers r that is redelivered to another facility without being injected into your well in quarter p (standard cubic meters).
p = Quarter of the year.
r = Containers.

(2) If you are measuring the volume of contents in a container under the provisions of § 98.474(a)(2)(ii), you must calculate the CO_2 received in containers using Equation UU–2 of this section.

Where:

$CO_{2T,r}$ = Annual mass of CO_2 received in containers r (metric tons).
$C_{CO2,p,r}$ = Quarterly CO_2 concentration measurement of contents in containers r in quarter p (vol. percent CO_2, expressed as a decimal fraction).
$S_{r,p}$ = Quarterly mass of contents in containers r that is redelivered to another facility without being injected into your well in quarter p (standard cubic meters).
$Q_{r,p}$ = Quarterly volume of contents in containers r in quarter p (standard cubic meters).
D = Density of the CO_2 received in containers at standard conditions (metric tons per standard cubic meter): 0.0018682.
p = Quarter of the year.
r = Containers.

§ 98.474 Monitoring and QA/QC requirements.

(a) *CO_2 received.*

(1) You must determine the quarterly flow rate of CO_2 received by pipeline by following the most appropriate of the following procedures:

(i) You may measure flow rate at the receiving custody transfer meter prior to any subsequent processing operations at the facility and collect the flow rate quarterly.

(ii) If you took ownership of the CO_2 in a commercial transaction, you may use the quarterly flow rate data from the sales contract if it is a one-time transaction or from invoices or manifests if it is an ongoing commercial transaction with discrete shipments.

(iii) If you inject CO_2 from a production process unit that is part of your facility, you may use the quarterly CO_2 flow rate that was measured at the equivalent of a custody transfer meter following procedures provided in subpart PP of this part. To be the equivalent of a custody transfer meter, a meter must measure the flow of CO_2 being transported to an injection well to the same degree of accuracy as a meter used for commercial transactions.

(2) You must determine the quarterly mass or volume of contents in all containers if you receive CO_2 in containers by the most appropriate of the following procedures:

(i) You may measure the mass of contents of containers summed quarterly using weigh bills, scales, or load cells.

(ii) You may determine the volume of the contents of containers summed quarterly.

(iii) If you took ownership of the CO_2 in a commercial transaction, you may use the quarterly mass or volume of contents from the sales contract if it is a one-time transaction or from invoices or manifests if it is an ongoing commercial transaction with discrete shipments.

(3) You must determine a quarterly concentration of the CO_2 received that is representative of all CO_2 received in that quarter by following the most appropriate of the following procedures:

(i) You may sample the CO_2 stream at least once per quarter at the point of receipt and measure its CO_2 concentration.

(ii) If you took ownership of the CO_2 in a commercial transaction for which the sales contract was contingent on CO_2 concentration, and if the supplier of the CO_2 sampled the CO_2 stream in a quarter and measured its concentration per the sales contract terms, you may use the CO_2 concentration data from the sales contract for that quarter.

(iii) If you inject CO_2 from a production process unit that is part of your facility, you may report the quarterly CO_2 concentration of the CO_2 stream supplied that was measured following procedures provided in subpart PP of this part as the quarterly CO_2 concentration of the CO_2 stream received.

(4) You must assume that the CO_2 you receive meets the definition of a CO_2 stream unless you can trace it through written records to a source other than a CO_2 stream.

(b) *Measurement devices.*

(1) All flow meters must be operated continuously except as necessary for maintenance and calibration.

(2) You must calibrate all flow meters used to measure quantities reported in § 98.476 according to the calibration and accuracy requirements in § 98.3(i).

(3) You must operate all measurement devices according to one of the following. You may use an appropriate standard method published by a consensus-based standards organization if such a method exists or an industry standard practice. Consensus-based standards organizations include, but are not limited to, the following: ASTM International, the American National Standards Institute (ANSI), the American Gas Association (AGA), the American Society of Mechanical Engineers (ASME), the American Petroleum Institute (API), and the North

American Energy Standards Board (NAESB).

(4) You must ensure that any flow meter calibrations performed are National Institute of Standards and Technology (NIST) traceable.

(c) *General.*

(1) If you measure the concentration of any CO_2 quantity for reporting, you must measure according to one of the following. You may use an appropriate standard method published by a consensus-based standards organization if such a method exists or an industry standard practice.

(2) You must convert all measured volumes of CO_2 to the following standard industry temperature and pressure conditions for use in Equations UU–2 of this subpart: standard cubic meters at a temperature of 60 degrees Fahrenheit and at an absolute pressure of 1 atmosphere.

(3) For 2011, you may follow the provisions of § 98.3(d)(1) through (2) for best available monitoring methods rather than follow the monitoring requirements of this section. For purposes of this subpart, any reference to the year 2010 in § 98.3(d)(1) through (2) shall mean 2011.

§ 98.475 Procedures for estimating missing data.

A complete record of all measured parameters used in the GHG quantities calculations is required.

(a) Whenever the monitoring procedures for all facilities that used flow meters covered under this subpart cannot be followed to measure flow, the following missing data procedures must be followed:

(1) Another calculation methodology listed in § 98.474(a)(1) must be used if possible.

(2) If another method listed in § 98.474(a)(1) cannot be used, a quarterly flow rate value that is missing must be estimated using a representative flow rate value from the nearest previous time period.

(b) Whenever the monitoring procedures of this subpart cannot be followed to measure quarterly quantity of CO_2 received in containers, the most appropriate of the following missing data procedures must be followed:

(1) Another calculation methodology listed in § 98.474(a)(2) must be used if possible.

(2) If another method listed in § 98.474(a)(2) cannot be used, a quarterly mass or volume that is missing must be estimated using a representative mass or volume from the nearest previous time period.

(c) Whenever the monitoring procedures cannot be followed to measure CO_2 concentration, the following missing data procedures must be followed:

(1) Another calculation methodology listed in § 98.474(a)(3) must be used if possible.

(2) If another method listed in § 98.474(a)(3) cannot be used, a quarterly concentration value that is missing must be estimated using a representative concentration value from the nearest previous time period.

§ 98.476 Data reporting requirements.

If you are subject to this part and report under this subpart, you are not required to report the information in § 98.3(c)(4) for this subpart. In addition to the information required by § 98.3(c)(1) through § 98.3(c)(3) and by § 98.3(c)(5) through § 98.3(c)(9), you must report the information listed in this section.

(a) If you receive CO_2 by pipeline, report the following for each receiving flow meter:

(1) The total net mass of CO_2 received (metric tons) annually.

(2) If a volumetric flow meter is used to receive CO_2:

(i) The volumetric flow through a receiving flow meter at standard conditions (in standard cubic meters) in each quarter.

(ii) The volumetric flow through a receiving flow meter that is redelivered to another facility without being injected into your well (in standard cubic meters) in each quarter.

(iii) The CO_2 concentration in the flow (volume percent CO_2 expressed as a decimal fraction) in each quarter.

(3) If a mass flow meter is used to receive CO_2:

(i) The mass flow through a receiving flow meter (in metric tons) in each quarter.

(ii) The mass flow through a receiving flow meter that is redelivered to another facility without being injected into your well (in metric tons) in each quarter.

(iii) The CO_2 concentration in the flow (weight percent CO_2 expressed as a decimal fraction) in each quarter.

(4) The standard or method used to calculate each value in paragraphs (a)(2) through (a)(3) of this section.

(5) The number of times in the reporting year for which substitute data procedures were used to calculate values reported in paragraphs (a)(2) through (a)(3) of this section.

(6) Whether the flow meter is mass or volumetric.

(b) If you receive CO_2 in containers, report:

(1) The mass (in metric tons) or volume at standard conditions (in standard cubic meters) of contents in containers in each quarter.

(2) The concentration of CO_2 of contents in containers (volume or weight percent CO_2 expressed as a decimal fraction) in each quarter.

(3) The mass (in metric tons) or volume (in standard cubic meters) of contents in containers that is redelivered to another facility without being injected into your well in each quarter.

(4) The net total mass of CO_2 received (in metric tons) annually.

(5) The standard or method used to calculate each value in paragraphs (b)(1) and (b)(2) of this section.

(6) The number of times in the reporting year for which substitute data procedures were used to calculate values reported in paragraphs (b)(1) and (b)(2) of this section.

(c) If you use more than one receiving flow meter, report the net total mass of CO_2 received (metric tons) through all flow meters annually.

(d) The source of the CO_2 received according to the following categories:

(1) CO_2 production wells.

(2) Electric generating unit.

(3) Ethanol plant.

(4) Pulp and paper mill.

(5) Natural gas processing.

(6) Gasification operations.

(7) Other anthropogenic source.

(8) Discontinued enhanced oil and gas recovery project.

(9) Unknown.

§ 98.477 Records that must be retained.

(a) You must follow the record retention requirements specified by § 98.3(g). In addition to the records required by § 98.3(g), you must retain quarterly records of CO_2 received, including mass flow rate or contents of containers (mass or volumetric) at standard conditions and operating conditions, operating temperature and pressure, and concentration of these streams. You must retain all required records for at least 3 years.

(b) You must complete your monitoring plans, as described in § 98.3(g)(5), by April 1 of the year you begin collecting data.

§ 98.478 Definitions.

Except as provided below, all terms used in this subpart have the same meaning given in the Clean Air Act and subpart A of this part.

CO_2 received means the CO_2 stream that you receive to be injected for the first time into a well on your facility that is covered by this subpart. CO_2 received includes, but is not limited to, a CO_2 stream from a production process unit inside your facility and a CO_2 stream that was injected into a well on another facility, removed from a

discontinued enhanced oil or natural gas or other production well, and transferred to your facility.

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