



Public Comments Sought on Class VI UIC Injection Well Carbon Storage Draft Permits

Wabash Carbon Services, Class VI UIC Injection wells
Vermillion (IN-165-6A-0001) and
Vigo (IN-167-6A-0001) Counties, Indiana

July 2023

You are invited

EPA will hold a public meeting and a formal public hearing on the Wabash Carbon Services draft permits at:

Indiana State University
Federal Hall, Smith Magna Carta
Courtroom, Second Floor
30 North 7th Street
Terre Haute, Indiana
August 10, 2023

Public Meeting: 6 to 7:30 p.m.
Public Hearing: 7:30 to 9 p.m.

Oral and written comments will be recorded or accepted. EPA will provide a summary of its proposed decision and answer questions during the meeting but will not answer questions or respond to comments during the hearing.

How to comment

In addition to accepting comments at the public hearing, EPA will accept written comments until August 11, 2023. Please refer to Wabash Carbon Services, permits no. IN-165-6A-0001 and IN-167-6A-0001, when providing comments.

Email your comments to:

Marc Fisher: fisher.marc@epa.gov
Phone: (312) 886-4240. Please contact Mr. Fisher by telephone if you do not have access to email.

Web resources

<https://www.epa.gov/uic/underground-injection-control-epa-region-5-il-mi-mn-oh-and-wi#public-notice>

The U.S. Environmental Protection Agency (EPA) is accepting comments from the public (*see box, left*) on its intent to issue permits for Wabash Carbon Services to inject and store carbon dioxide underground at its two injection wells in Vermillion and Vigo County, Indiana. The process is called “geologic sequestration” or “carbon sequestration.” Carbon sequestration is a means of reducing emissions of carbon dioxide to the atmosphere.

Carbon dioxide will be created at the affiliated Wabash Valley Resources hydrogen production and power generation facility. In carbon capture and storage, the carbon dioxide will be captured at the generating facility, transported to the injection wells, and then put under high pressure and turned into a liquid so it can be injected deep into the ground through wells.

Wabash Carbon Services selected the locations of the proposed wells after a long period of scientific research and planning. This was done to make sure the wells would work as planned and that the carbon dioxide can be safely stored in the rock formations about 5,000 feet below the ground instead of being emitted to the atmosphere. Studies of the site show that there is about 2,100 feet of solid rock, including very low permeability shale, between the deepest source of drinking water in the area and the proposed carbon dioxide reservoir below.

Wabash would study and monitor the wells during the 12 years of proposed carbon dioxide injection and 10 years thereafter. This would be done to make sure that the injection wells work properly, and the carbon dioxide does not move from its injected location.

Wabash Carbon Services plans to inject 1.67 million metric tons of carbon dioxide per year into these wells over the injection period of 12 years.

How did EPA make its tentative decision?

In reviewing Wabash Carbon Services' permit applications, EPA evaluated technical information and project-specific data, such as:

- Advanced computational modeling to determine the maximum extent of the carbon dioxide plume and pressure front defining the proposed project area
- A detailed study of the geology and the rock layers through which the proposed injection well would be drilled to confirm that the carbon dioxide will stay where it is injected
- The location of drinking water resources near the project and how they will be protected
- The proposed well construction design
- The characteristics of the carbon dioxide to be injected
- The proposed approach and technologies Wabash Carbon Services would use to operate and monitor the project during and after injection
- The financial resources Wabash Carbon Services will have available to responsibly operate, monitor, and close the project
- Wabash Carbon Services' approach to ensure that the project will protect underground sources of drinking water, public health, and the environment

What happens next in the permit process?

EPA will review all public comments before making a final decision on whether or not to grant the permits. The Agency will respond to all significant comments on the draft permits.

If EPA decides to issue final permits, Wabash Carbon Services could proceed to drill the wells.

Administrative Record

The full administrative record, including all data submitted by Wabash Carbon Services in support of its permit applications, is available for public review at the EPA Region 5 office. To review the administrative record or for additional information please contact Marc Fisher at (312) 886-4240 or fisher.marc@epa.gov.

On the Web

For more information about the Wabash Carbon Services project:

<https://www.epa.gov/uic/underground-injection-control-epa-region-5-il-mi-mn-oh-and-wi#public-notice>

Legal Notice

To preserve your right to appeal any final permit decision, you must either participate in the public hearing or send in written comments on the draft permit decision by the end of the comment period.

The first appeal must be made to the Environmental Appeals Board; only after all agency review procedures have been exhausted may you file an action in the appropriate Circuit Court of Appeals.

Technical background and details of the Wabash Carbon Services, LLC carbon storage project

EPA's review of Wabash Carbon Services' permit applications indicate no significant environmental impact should result from the proposed injection, so EPA proposes to issue permits for these wells.

Title 40 of the Code of Federal Regulations Parts 144 and 146 require EPA permits for carbon dioxide storage, known as Class VI Underground Injection Control (UIC) permits, to specify conditions for the construction, operation, monitoring, reporting, plugging, post-injection site care and site closure of Class VI injection wells to prevent the movement of fluids into any underground source of drinking water, or USDW. See 40 CFR Parts 144 and 146 for the general provisions of underground injection permits.

In accordance with 40 CFR 124.8, below is information and highlighted permit conditions for the proposed wells.

Area of Review and Corrective Action: In accordance with 40 CFR 146.84, the Area of Review, or AoR, is the area surrounding each injection well where any improperly sealed, completed or abandoned wells that penetrate the confining zone could provide a conduit for fluid migration. The AoR for these wells have radii of approximately 2 miles and was delineated pursuant to 40 CFR 146.84(c)(1) using a model that predicts the movement of the carbon dioxide plume and pressure front based on available information about planned injection operations and the subsurface rock formations. See Figure 1.

Based on a search of well records, there are no wells within the AoRs that penetrate the confining zone.

As required at 40 CFR 146.84(e), Wabash Carbon Services would re-evaluate the AoR by evaluating monitoring and operational data every five years over the duration of the project to verify that the carbon dioxide plume and pressure front are moving as predicted. If there are any significant changes from modeled predictions, Wabash Carbon Services must revise the project-specific plans described here and EPA will modify the permit per 40 CFR 144.39.

Underground Sources of Drinking Water: USDWs are defined by federal regulations as aquifers or portions thereof which contain less than 10,000 milligrams per liter of total dissolved solids and are being used, or could be used, as a source of drinking water. The lowest geologic units considered to be a USDW is the Silurian System that includes the Bainbridge Group (Wabash, Louisville, and Salamon Formations) and the Sexton Creek Formation with depth ranging from 1,919 to 2,386 feet below the ground surface.

Injection and Confining Zone: Injection for geologic sequestration is limited by the draft permits to the Oneota and Potosi Formations between 3,970 and 5,162 feet below ground. This zone is separated from the lowest USDW by approximately 2,100 feet of rock, including an impermeable 616-foot thick confining zone of carbonates and shale that

will act as a barrier to fluid movement. EPA has reviewed information provided by the permittee, including maps, well logs, cores, and the results of seismic surveys and determined that the regional and local geologic features at the site would allow the Oneota and Potosi Formations to receive the amounts proposed to be injected without fracturing and that the confining zone would provide a suitable trap so that the carbon dioxide would remain in place and USDWs would not be endangered, as required under 40 CFR 146.83.

Construction Requirements: The proposed construction of the injection well meets the regulatory criteria at 40 CFR 146.86. All Class VI wells must be constructed with materials and cements that can withstand exposure to carbon dioxide and carbon dioxide/water mixtures over the life of the project. Class VI wells must also be cased and cemented to prevent the movement of fluids into or between USDWs. These wells would be equipped with an automatic surface shut-off system that would shut off the well if any permitted operating parameters—such as injection pressure—diverge from permit limitations. Wabash Carbon Services may not commence construction, including drilling, of any new well until a final permit has been issued and is effective.

Injection Fluid: The injected fluid would be 99.5% pure carbon dioxide. The source is the affiliated Wabash Valley Resources hydrogen production and power generation facility. The expected amount of fluid to be injected is 1.67 million tons per year. Wabash Carbon Services anticipates injecting a total of approximately 20 million tons of carbon dioxide over a 12-year period.

Maximum Injection Pressure: The maximum injection pressure would be limited to 2,537 pounds per square inch (psi) to ensure that the pressure during injection does not initiate fractures in the injection or confining zones, pursuant to 40 CFR 146.88(a). In turn, this ensures that the injection pressure would not cause the movement of injection or formation fluids into a USDW as prohibited by 40 CFR 146.86(a).

Monitoring and Reporting Requirements: In accordance with 40 CFR 146.90, Wabash Carbon Services would implement an approved Testing and Monitoring Plan. The permittee would analyze the carbon dioxide monthly to provide information about its chemical and physical characteristics. Wabash Carbon Services would also be required to demonstrate well integrity before injection begins and throughout injection operations. Wabash Carbon Services would be required to conduct and pass a two-part mechanical integrity test, in accordance with 40 CFR 146.8 and 146.89, before EPA would authorize Wabash Carbon Services to start injecting. After injection begins, Wabash Carbon Services would continuously observe and record injection pressure, flow rate and volume, and the pressure on the annulus to detect leaks in the casing, tubing, or packer. In addition, Wabash Carbon Services must demonstrate external

mechanical integrity using a temperature or noise log or another approved method, every year to detect fluid movement behind the casing. Wabash Carbon Services will test the well for signs of corrosion every quarter to provide early indication of any well material corrosion due to contact with carbon dioxide in the presence of water that could compromise the well.

Wabash Carbon Services will also monitor the environment near the wells to verify that the project and the injected carbon dioxide are behaving as predicted. Wabash Carbon Services must perform groundwater quality monitoring in shallow and deep wells quarterly to detect geochemical changes that may be a result from injection—such as leaching or mobilization of heavy metals and organic compounds or fluid displacement that could impact USDWs. Pressure fall-off testing will be performed every 5 years to verify that the injection zone is responding to injection as predicted. Wabash Carbon Services will also track the movement of the carbon dioxide plume and pressure front using direct methods such as fluid monitoring of the injection zone and USDWs and pressure monitoring of the injection zone, and indirect methods such as seismic surveys and pulse neutron logging of well bores to verify that the carbon dioxide plume and pressure front are moving as predicted or to provide early indication if they are not.

In accordance with 40 CFR 144.54 and 146.91, Wabash Carbon Services will submit results of this monitoring to EPA semiannually or within 30 days of the completion of a mechanical integrity test or other required testing.

Emergency and Remedial Response: In accordance with 40 CFR 146.94, Wabash Carbon Services developed a site-specific Emergency and Remedial Response Plan that identifies key resources including: Sequestration Well #1, (WVCCS1), Sequestration Well #2 (WVCCS2), Underground Sources of Drinking Water (USDWs), potable water wells (Brouillets Creek), International Union of Operating Engineers Training Facility; and Wabash Carbon Services' hydrogen generating facility. The plan, an enforceable part of the permit, describes the responses that would be taken to address adverse events, and identifies the staff and equipment available to support emergency and remedial response events. The emergency and remedial response provisions of the permit will facilitate expedient responses and prevent or mitigate harm to the environment, including USDWs.

Financial Responsibility: In accordance with 40 CFR 146.85, Wabash Carbon Services has demonstrated, and will maintain, adequate financial responsibility to perform all needed corrective action on wells in the AoR, to plug the injection well, to perform all required post-injection site care and close the site, and to conduct any needed emergency and remedial response measures.

Wabash Carbon Services will use a trust fund to cover costs and demonstrate financial responsibility for system operation, corrective action, emergency contingencies, well

abandonment, site closure and site restoration to pre-injection conditions. The cost estimates for the covered activities would be required to be updated within 60 days prior to the anniversary date of the establishment of the financial instruments. These provisions ensure that resources are available to perform these USDW-protective activities without using public/taxpayer money.

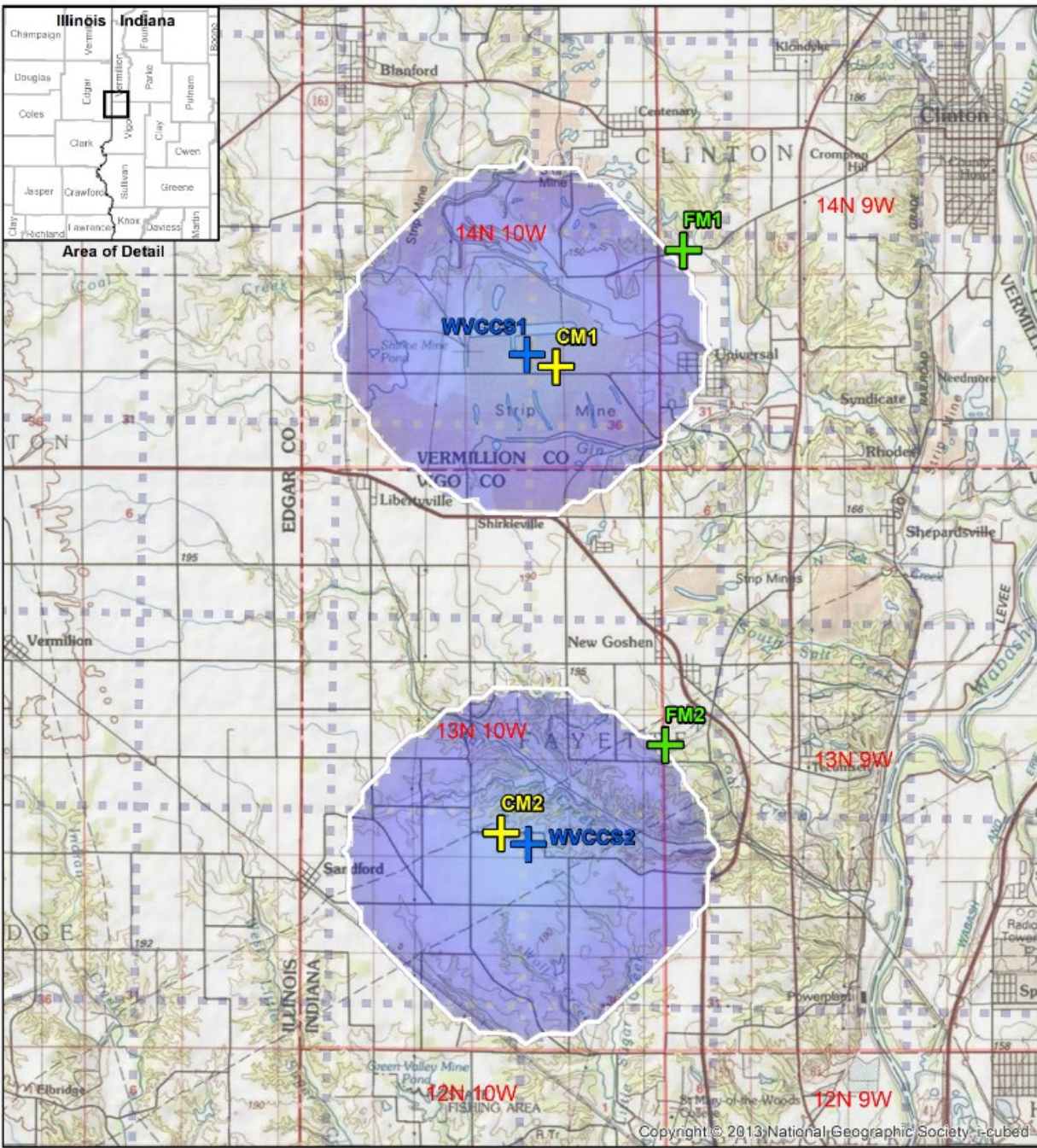
Plugging and Abandonment: In accordance with 40 CFR 146.92, the draft permits include an Injection Well Plugging Plan for environmentally protective well plugging at the cessation of injection operations. The well would be plugged using approved materials that are compatible with carbon dioxide/water mixtures to ensure the well will not serve as a conduit for fluid movement.

Post-Injection Site Care and Site Closure: In accordance with 40 CFR 146.93, Wabash Carbon Services would be required to implement an approved Post-Injection Site Care and Site Closure Plan. Following the cessation of injection, Wabash Carbon Services would be required to continue to monitor groundwater quality and track the position of the carbon dioxide plume and pressure front in a manner similar to that described under “Monitoring and Reporting Requirements” above. This monitoring will help confirm predictions about the behavior of the carbon dioxide plume and pressure front (i.e., that pressures should subside after injection ceases) and provide early indication of potential USDW endangerment. Wabash Carbon Services would continue this post-injection monitoring for at least 10-years, and until it demonstrates USDW non-endangerment, based on monitoring and other site data. At the end of the 10-year period, if site data support it, the EPA may authorize Wabash to close the site. Following authorization to proceed with site closure activities, Wabash Carbon Services would plug all monitoring wells with carbon dioxide-compatible materials to ensure they cannot serve as conduits for fluid movement and would restore the site to its original condition (by removing all surface equipment and planting vegetation).

Issuance and Effective Date of Permits: In accordance with 40 CFR 124.15, the permits would become effective immediately upon issuance if no public comments were received that requested a change in the draft permit. However, in the event that public comments are received, and EPA decides to issue final permits, then the permits would become effective 45 days after the date of issuance unless the permits are appealed.

In accordance with 40 CFR 144.36(a), the permits would be in effect for the duration of the project unless they are otherwise modified, revoked and reissued, or terminated as provided at 40 CFR 144.39, 144.40, and 144.41. The permits would expire in two years if Wabash Carbon Services does not commence construction unless a written request for an extension of this two-year period has been approved by EPA. Authorization to inject under the permits may be granted following well construction and compliance with additional requirements as outlined in the permit and regulations at 40 CFR 146.82, 146.86, 146.87, and 146.89.

Figure 1 - Area of Review.



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