



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

Oxy Low Carbon Ventures, LLC, Brown Pelican Class VI UIC Injection Wells

Ector County, Texas (Permit Nos. R6-TX-135-C6-0001, R6-TX-135-C6-0002, and R6-TX-135-C6-0003) August 2024

Options for Participating in the Permitting Process

EPA will hold a formal public hearing on the Oxy Low Carbon Ventures draft permits at:

MCM Elegante Hotel
5200 East University Boulevard
Odessa, Texas 79762

Thursday, October 3, 2024

11:00 a.m. to 2:00 p.m. CST and 6:00
p.m. to 9:00 p.m. CST

EPA will record and accept both oral and written comments. Please visit <https://www.epa.gov/tx/uic-class-vi-permit-intent-issue-oxy-low-carbon-ventures-llc> for further information.

The hearing will be livestreamed, but no virtual commenting will be allowed. You must either provide in-person, oral comments at the public hearing or submit written comments on the draft permit decision by the end of the comment period to preserve your right to appeal a final permitting decision.

Submit written comments at [regulations.gov](https://www.regulations.gov) under Docket #EPA-R06-OW-2024-0410. Please contact Brandon Maples at Maples.Brandon@epa.gov or by phone at (214) 665-7252 for additional assistance.

The U.S. Environmental Protection Agency (EPA) is accepting comments from the public on its intent to issue permits for Oxy Low Carbon Ventures, LLC, (OLCV) to construct three proposed carbon dioxide storage injection wells in Ector County, Texas. This process is called “geologic sequestration” or “carbon sequestration.” Carbon sequestration is a means of reducing carbon dioxide captured at an emission source or from the atmosphere.

Carbon dioxide will be captured at the Stratos direct air capture (DAC) facility that is located approximately four miles northeast of the proposed carbon sequestration site in Ector County, Texas. The DAC facility will extract carbon dioxide from the air, and the composition of the produced stream will be primarily carbon dioxide, oxygen, and water. A pipeline will be used to transport the carbon dioxide stream from the DAC facility to the proposed carbon sequestration site for injection into the subsurface via three injection wells.

OLCV selected the locations of the proposed wells after an extensive process of gathering information about the project site and planning well construction and project operations. These efforts ensure the wells are placed in a suitable geologic location, the carbon dioxide can be securely stored underground instead of being emitted to the atmosphere, and the wells will operate safely. The rock formation where the carbon dioxide will be stored is about 4,400 feet below ground, and studies of the site show that there are about 3,350 feet of evaporites and low permeability carbonates between the lowermost underground source of drinking water (USDW) in the area and the proposed carbon dioxide reservoir below.

Pursuant to the draft permits, OLCV would test and monitor the condition of the wells, the injection pressure, and the location and size of the plume of injected carbon dioxide during the 12-year timeframe of proposed carbon dioxide injection and for the 50-year post-injection site care (PISC) timeframe after injection is finished. This would be done

to make sure that the injection wells work properly during injection, to determine if any changes in operation are needed to protect USDWs, to observe how the movement of the carbon dioxide plume compares to predictions during and after injection, and to confirm that it is safe to close the project site at the end of the post-injection site care period.

OLCV plans to inject an average of 705,000 metric tons of carbon dioxide per year into these wells over the injection period of 12 years. OLCV must receive authorization from EPA prior to commencing injection.

How did EPA make its tentative decision?

In reviewing OLCV's permit applications, EPA evaluated technical information and project-specific data with the support from the Department of Energy and agency contractors. A list of project-specific data reviewed to make a tentative permitting decision is presented below. The description of the data also includes a reference to where interested members of the public can find this information in the permit administrative record. The administrative record includes other documents included in the supporting file for the draft permit.

- Advanced computational modeling to determine the maximum extent of the carbon dioxide plume and pressure front defining the proposed project area and corrective action procedures for all existing non-project wellbores near the project site found to be insufficiently plugged and abandoned. The computational modeling is based on thorough site characterization, monitoring, and operational data. See the Permit Application Narrative document (dated June 20, 2024) and Area of Review (AoR) and Corrective Action Plan document (Attachment 2 of the permit application, dated July 30, 2024); EPA's requests for additional information (RAIs), including RAI #1 (dated June 27, 2023), RAI #2 (August 30, 2023), RAI #3 (November 9, 2023), and RAI #4 (May 22, 2024); OLCV's responses to each RAI and updated application submittals in response documents dated November 28, 2023 (RAI #1, RAI #2, and RAI #3) and August 20, 2024 (RAI #4); and Federal Technical Assistance Program documents, FTAP Third-Party Review Oxy R06-TX-0005_final (February 2023) and Oxy Brown Pelican-R06-TX-0005-_Re-review#1-8-26-2024 (August 2024).
- A detailed study of the regional and site geology (rock layers and structures) to confirm that the carbon dioxide will remain in the formation into which it is injected. This includes the presence of a thick, dense, impermeable formation above the injection formation that will serve as a "confining zone," preventing upward movement of the carbon dioxide out of the injection formation. It also includes a characterization of site hydrogeology, including the location of the lowermost USDW in the project AoR. See the Permit Application Narrative document; the AoR and Corrective Action Plan document (Attachment 2 of the permit application, dated July 30, 2024); RAI #2, RAI #3, and RAI #4; and OLCV's responses to each RAI.
- The proposed well construction design. This includes construction materials, testing and monitoring procedures, and emergency shut-off procedures. See the Injection Well Construction Plan (Attachment 4 of the permit application, dated July 30, 2024); the Testing and Monitoring Plan (Attachment 6 of the permit application, dated July 30, 2024); the Emergency and Remedial Response Plan (Attachment 9 of the permit application, dated July 30, 2024); RAI #2 and RAI #4; and OLCV's responses to each RAI.
- The characteristics of the carbon dioxide to be injected. This includes the chemical composition of the carbon dioxide stream and potential geochemical reactions between the stream and the injection reservoir brines and mineralogy. See the Permit Application Narrative document and the AoR and Corrective Action Plan document (Attachment 2 of the permit application, dated July 30, 2024).
- The proposed approach and technologies OLCV would use to monitor the project during and after injection. This includes monitoring the physical condition of the well, the location and size of the carbon dioxide plume, the changing pressure in the subsurface, water quality in formations above the injection formation, and seismicity (including events too small to be felt at the surface). See the Testing and Monitoring Plan (dated July 30, 2024) (Attachment 6 of the permit application); OLCV's Quality Assurance Surveillance Plan for testing and monitoring activities (dated July 30, 2024); RAI #1, RAI #3, and RAI #4; and OLCV's responses to each RAI.

- The financial resources OLCV will have available to perform corrective action; responsibly operate, monitor, and close the project; and respond to emergency events. This includes a cost estimation for project activities and financial instruments sufficient to meet the financial responsibility requirements. See the Financial Assurance Demonstration Plan document (Attachment 3 of the permit application); RAI #2; and OLCV's responses to RAI #2.
- OLCV's approach to plug the injection wells to prevent endangerment of USDWs, perform monitoring following cessation of injection to track the carbon dioxide plume and pressure front, and close the site. See the Injection Well Plugging Plan document (Attachment 7 to the permit application, dated July 30, 2024); the Post-Injection Site Care (PISC) and Site Closure Plan (Attachment 8 to the permit application, dated July 7, 2024); OLCV's Quality Assurance Surveillance Plan; RAI #1, RAI #2, and RAI #4; and OLCV's responses to each RAI.

The more technical portion of this factsheet below provides an additional discussion about these data and EPA's review and analysis of this information that led to this tentative permitting decision. References to the administrative record are also included to allow the public to review the data and EPA's comprehensive analysis.

What happens next in the permit process?

After the close of the public comment period, EPA will review all public comments and complete consultations under Section 106 of the National Historical Preservation Act and Section 7 of the Endangered Species Act before making a final decision on whether to grant the permits. EPA will respond to all significant comments on the draft permits.

Additional Information and How to Appeal

The full administrative record, including all data submitted by OLCV in support of its permit applications, is available for public review at [regulations.gov](https://www.regulations.gov) under Docket #EPA-R06-OW-2024-0410. To review the administrative record in person or for additional information please contact Brandon Maples at 214-665-7252 or maples.brandon@epa.gov.

Additional Project Details

For more information about the OLCV Brown Pelican project: <https://www.epa.gov/tx/uic-class-vi-permit-intent-issue-oxy-low-carbon-ventures-llc>.

Legal Notice for Final Permit Decision Appeal

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 OLCV Brown Pelican Project

EPA conducted a thorough review of OLCV's permit application. The data and information provided by OLCV as part of the permit application (and subsequent responses for additional or clarifying information) and reviewed by EPA is publicly available as part of the permit administrative record, along with other information EPA considered in its decision-making. This portion of the draft permit fact sheet provides additional technical background

and details on the Brown Pelican project to help the public better understand how EPA reached the tentative permitting decision.

In addition, this portion of the draft permit fact sheet provides details about the draft permit requirements. Title 40 of the Code of Federal Regulations Parts 144 and 146 require EPA's permits for carbon dioxide storage, known as Class VI Underground Injection Control (UIC) permits, to

specify conditions for the construction, operation, monitoring, reporting, plugging, and post-injection site care and site closure of Class VI injection wells to prevent the movement of fluids into any underground sources of drinking water, or USDWs. See [40 CFR Parts 144](#) and [146](#) for the general provisions of underground injection permits.

EPA's review of OLCV's permit applications indicates no endangerment to USDWs should result from the proposed injection, so EPA proposes to issue permits for these wells. In accordance with [40 CFR 124.8](#), information and highlighted permit conditions for the proposed well(s) are presented below.

Area of Review and Corrective Action: In accordance with [40 CFR 146.84](#), the Area of Review, or AoR, is the region surrounding the geologic sequestration project where USDWs may be endangered by the injection activity. The combined AoR for these wells is an area of approximately 5.4 square miles. It was delineated pursuant to [40 CFR 146.84\(c\)\(1\)](#) using a computational model that predicts the movement of the carbon dioxide plume and critical pressure front based on available information about planned injection operations and the characteristics of the subsurface rock formations. See Figure 1.

Based on OLCV's search of well records, there are three wells within the AoR that require plugging because the wellbores penetrate the injection and confining zones and will not be used for injection or monitoring for the proposed injection project. OLCV must properly plug and abandon the wells before EPA will authorize injection. No other wells within the AoR were found to penetrate the confining zone. One fault was identified within the AoR at a depth of 1,800 feet below the lower confining zone. This east-west trending fault does not pose a risk to the containment of injectate.

As required at [40 CFR 146.84\(e\)](#), OLCV will re-evaluate the AoR at a minimum of every five years (at a higher frequency if warranted by monitoring and operational conditions) by evaluating monitoring and operational data, then update the initial computational modeling to re-define the AoR for the permit application, if needed. The re-evaluation will verify that the carbon dioxide plume and pressure front are moving as predicted. If there are any significant changes from modeled predictions, OLCV must revise the project-specific plans described below, and EPA will modify the permit per [40 CFR 144.39](#).

EPA reviewed OLCV's AoR and Corrective Action Plan (Attachment 2 to the permit applications) to ensure it complies with all requirements. Specifically, EPA reviewed OLCV's computational modeling approach to verify that it meets the needs for complex AoR delineations and that the model assumptions and inputs reflect site-specific geologic conditions as described in the permit application AoR and Corrective Action Plan. EPA asked OLCV questions about its modeling approach, which included questions about the modeling methodology and inputs. EPA reviewed OLCV's replies and updated information and determined that the modeling approach represents an accurate prediction of the extent of the plume and pressure front.

EPA also reviewed and approved OLCV's proposed plan to perform corrective actions to plug non-project wells within the AoR. EPA asked clarifying questions about how OLCV identified wells for corrective action and the proposed corrective action procedures in RAI #1 and RAI #4, and determined that OLCV's responses to EPA's questions and updated application submittals demonstrated that corrective action meets the requirements.

Based on the review of the information provided by OLCV, EPA determined the permit application meets the requirements for the AoR and the Corrective Action Plan.

Underground Sources of Drinking Water (USDWs): USDWs are defined by federal regulations as aquifers or portions thereof that 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 unit considered to be a USDW in the area of the project is the Santa Rosa Formation, which contains the Dockum minor aquifer at a depth of 600 to 1,150 feet true vertical depth (TVD). EPA reviewed information submitted in the AOR/Corrective Action Plan, AOR Appendix B, and all updated information submitted in response to EPA's questions in RAI #4 related to how OLCV determined the depth to the lowermost USDW, which is included as part of the administrative record for the Permits.

Injection and Confining Zone: Requirements under [40 CFR 146.83](#) define the minimum siting criteria for a Class VI injection well, including the injection zone that will receive the carbon dioxide stream and the confining zone that will contain the injected carbon dioxide. OLCV's permit application provides information on the geology that comprises the injection zone and the confining zone.

EPA has reviewed information provided by the permittee including geophysical logs, whole cores, sidewall cores, and fluid samples collected in two stratigraphic test wells drilled within the AoR, which OLCV used to determine averages for porosity, permeability, gross thickness, and other properties for injection and upper and lower confining zones at the injection site. Additional information includes a high-density 3D seismic survey covering 20.5 square miles across the project site, two 2D seismic lines, and information collected by literature review. This information is documented in the Permit Application Narrative that is part of the administrative record for the Permits.

Based on this review, EPA has determined that the regional and local geologic features at the site support a determination of site suitability per 40 CFR 146.83, specifically that the injection zone can receive the total volume of carbon dioxide that OLCV proposes to inject without fracturing, and that it is separated from USDWs by a competent confining zone, with no transmissive faults or fractures. This is based on information about the lithological, petrophysical, geomechanical, and geochemical properties of the injection zone.

Also, EPA determined that the confining zone would provide a suitable trap to prevent the carbon dioxide from moving upward, thereby protecting USDWs from endangerment, as required under [40 CFR 146.83](#). This is based on information about the lithological, petrophysical, geomechanical, and geochemical properties of the upper and lower confining zones; a review of seismic history and seismic risk; and an evaluation of faults and fractures.

EPA asked questions (in RAI #2, RAI #3, and RAI #4) about the injection and confining zone properties, geomechanical and petrophysical information, and seismic history described in the permit application Narrative. EPA determined that OLCV's responses to its questions and updated Narrative addressed all concerns to the EPA's satisfaction. OLCV will also perform pre-operational testing (per 40 CFR 146.87) to provide additional data on the injection and confining zones to verify the information on which the permit application narrative is based.

Injection for geologic sequestration is limited by the draft permits to the Lower San Andres Formation at a depth of approximately 4,479 feet to 4,976 feet total vertical depth (TVD)(CCS1), 5,116 feet to 5,117 feet TVD (CCS2) and 4,382 feet to 4,906 feet TVD (CCS3). The designated primary confining zone for the project is the combined Upper San

Andres and Grayburg Formations, occurring at a depth of approximately 3,900 to 4,500 ft MD, and the lower confining zone is the Glorieta Formation at a depth of approximately 5,200 ft MD. The primary confining zone is separated vertically from the lowermost USDW by approximately 3,350 feet.

Construction Requirements: The regulatory criteria for Class VI well construction are provided at [40 CFR 146.86](#). All Class VI wells must be constructed with casing and cement that are compatible with the fluids in which they will come into contact. Materials expected to be exposed to carbon dioxide and carbon dioxide/water mixture need to be resistant to the corrosive effects.

Class VI wells must 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. To confirm that the wells are operating within permitted limits and to demonstrate internal mechanical integrity, wells will be equipped with continuous recording devices to monitor: the injection pressure; the rate, volume and/or mass, and temperature of the carbon dioxide being injected; the pressure on the annulus (space) between the tubing and the long string casing; and the volume of fluid in the annulus.

EPA reviewed the permit application to determine if the proposed Class VI wells' construction meets these requirements. Specifically, EPA evaluated information on proposed construction procedures, casings and cements, well schematics, mechanical integrity testing procedures, continuous monitoring, and emergency shut-off procedures to determine that they are suitable for carbon dioxide injection at the planned operating conditions and that all casings are set and cemented at depths appropriate to relevant formations (e.g., the lowermost USDW and the injection and confining zones). Based on the review, EPA identified deficiencies in the application materials related to well construction and pre-operational testing, and sent questions and comments to OLCV in RAI #2 and RAI #4. EPA reviewed OLCV's responses and updated construction plans, and determined that the proposed construction of the injection wells meets the regulatory criteria at 40 CFR 146.86. The proposed construction information is part of the administrative record in Attachment 4: Injection Well Construction Plan.

Injection Fluid: The injected fluid would be greater than 96.5% pure carbon dioxide. The proposed source of carbon dioxide for the project is the Stratos DAC facility, where carbon dioxide will be captured from the air and sent via pipeline to the proposed carbon sequestration site. The expected volume to be injected is approximately 385,000 metric tons of carbon dioxide per year for two years, followed by 772,000 metric tons per year for ten years. OLCV anticipates injecting a total of approximately 8.5 million metric tons of carbon dioxide over a 12-year period. EPA also evaluated the carbon dioxide composition in the context of information about the injection zone formation and fluid geochemistry to determine that there would be no adverse reactions that could lead to USDW endangerment. Attachment 1: Summary of Operating Requirements and the Permit Application Narrative provide relevant information about the injection fluid as part of the administrative record.

Maximum Injection Pressure: The pressure during injection must not initiate fractures in the injection or confining zones, as required under [40 CFR 146.88\(a\)](#). Such fractures could become conduits for the movement of injection or formation fluids into a USDW, which is prohibited by [40 CFR 146.86\(a\)](#). OLCV's permit application included a proposed maximum bottomhole injection pressure of 2,625 pounds per square inch in the BRP CCS#1 and BRP CCS #3 wells and 3,392 pounds per square inch in the BRP CCS #2 well.

EPA reviewed the proposed maximum injection pressure and found it to be appropriate to site-specific geomechanical data and congruent with a required safety factor below that of the calculated site fracture pressure. To support this evaluation of operating procedures, EPA asked clarifying questions of OLCV about how the proposed operating parameters were determined in RAI #3 and RAI #4. EPA determined that the responses OLCV provided supported the proposed operating parameters. As a result, EPA has determined that the maximum injection pressure would be limited to 2,625 pounds per square inch in the BRP CCS#1 and BRP CCS# 3 wells and 3,392 pounds per square inch in the BRP CCS#2 well to ensure that the pressure during injection does not initiate fractures in the injection or confining zones, pursuant to [40 CFR 146.88\(a\)](#).

Information related to the maximum injection pressure is included in the administrative record in AOR/Corrective Action Narrative, AOR Appendix A, and Attachment 1: Summary of Operating Requirements.

Monitoring and Reporting Requirements: The requirements for Class VI well testing and monitoring are found at [40 CFR 146.90](#). OLCV submitted a Testing and Monitoring Plan and Quality Assurance Surveillance Plan as part of the permit application. EPA reviewed the Testing and Monitoring Plan and requested clarifying information about groundwater sampling and plume and pressure front tracking locations, mechanical integrity testing procedures, seismic monitoring and associated quality assurance procedures in RAI #1 and RAI #4. EPA reviewed OLCV's responses and an updated Testing and Monitoring Plan and found that the permit applicant's submitted Testing and Monitoring Plan meets the federal requirements. EPA also reviewed the Quality Assurance and Surveillance Plan and determined that it addresses all testing and monitoring activities.

Based on the review, EPA has determined that the Testing and Monitoring Plan meets all requirements. Attachment 6: Testing and Monitoring Plan and the Quality Assurance and Surveillance Plan contain information related to the Testing and Monitoring Plan and are part of the administrative record.

Under the approved Testing and Monitoring Plan attached to the permits, OLCV would analyze the carbon dioxide frequently enough to provide information about its chemical and physical characteristics. OLCV would also be required to demonstrate well integrity (i.e., good physical condition) in accordance with [40 CFR 146.8](#) and [146.89](#), before EPA would authorize OLCV to start injecting. Internal mechanical integrity is demonstrated by an initial pressure test that shows that there is no significant leak in the casing, tubing, or packer. After injection begins, OLCV would continuously observe and record injection pressure, flow rate and volume, and the pressure on the annulus to detect the development of any leaks in the casing, tubing, or packer. In addition, OLCV must initially demonstrate external mechanical integrity (i.e., no movement of fluid along the well behind the casing) using a tracer survey (oxygen activation log), temperature or noise log, and a casing inspection log. After injection begins, OLCV must perform a temperature or noise log or another approved test every year to detect any fluid movement behind the casing. OLCV will also test the well materials every quarter for signs of corrosion. This will provide early indication of any degradation of well materials due to contact with carbon dioxide in the presence of water.

OLCV will perform several other types of monitoring to verify that the project and the injected carbon dioxide are

behaving as predicted. OLCV will monitor groundwater quality quarterly during the first 3 years of injection, then annually starting in year 4 in a geologic formation above the confining zone. This will indicate any changes in water quality, such as changes in pH, major ions, or mobilization of metals or organic compounds, that could be caused by leakage of carbon dioxide or fluids out of the injection zone.

Pressure fall-off testing will be performed every 5 years to verify that the injection zone is responding to injection as predicted. OLCV will track the movement of the carbon dioxide plume and pressure front using direct methods, including geochemical monitoring in the injection zone (quarterly during years 1-3, then annually) and continuous pressure and temperature monitoring of the injection zone. OLCV will also use indirect methods, including annual pulse neutron logging; 2D vertical seismic profiling (in years 1, 2, 5 and 10); and quarterly Differential Interferometric Synthetic-Aperture Radar (DInSAR) surveys to verify that the carbon dioxide plume and pressure front are moving as predicted or to provide early indication if they are not.

OLCV will also monitor seismic activity to determine whether injection operations may be inducing seismic activity (as described in Section Q of the Permit). Should any seismic events occur, OLCV must cease operations and, if necessary, implement the Emergency and Remedial Response Plan. OLCV will also perform surface air or soil gas monitoring to identify carbon dioxide leakage.

In accordance with [40 CFR 144.54](#) and [40 CFR 146.91](#), OLCV 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: The requirements for an Emergency and Remedial Response plan are found at [40 CFR 146.94](#). OLCV developed and submitted a site-specific Emergency and Remedial Response Plan as part of its permit application.

EPA reviewed the Emergency and Remedial Response Plan that identifies key resources including: USDWs and infrastructure including a local solar power generation operation and the direct air capture (DAC) facility adjacent to the AoR.

Based on the review, EPA has determined that the Emergency and Remedial Response Plan meets all requirements. The Emergency and Remedial Response

Plan (Attachment 9 of the permit application) is part of the administrative record.

The plan, an enforceable part of the permit, describes the responses that would be taken to address adverse events, and it 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: The requirements for demonstrating and maintaining financial responsibility are found at [40 CFR 146.85](#). OLCV has provided information to demonstrate adequate financial responsibility, and how it intends to maintain this financial responsibility, to perform all needed corrective action on wells in the AoR, plug the injection wells, perform all required post-injection site care and close the site, and conduct any needed emergency and remedial response measures.

EPA reviewed this information, including evaluating whether OLCV's proposed cost estimates were adequate to cover the activities as described in the AoR and Corrective Action Plan, Testing and Monitoring Plan, Well Plugging Plan, PISC and Site Closure Plan, and Emergency and Remedial Response Plan.

EPA also evaluated language in the applicant's financial instruments to determine that they included required conditions (e.g., for continuation, renewal, and cancellation) and are financially secure. EPA asked clarifying questions in RAI #2 and RAI #4 and reviewed the applicant's responses and updated financial information. Based on the review, EPA has determined that OLCV meets all requirements for demonstrating and maintaining financial responsibility. See the Financial Assurance Demonstration (Attachment 3 of the permit application) for relevant information related to financial responsibility as part of the administrative record.

OLCV will use a letter of credit to cover costs and demonstrate financial responsibility for corrective action, well plugging, post-injection site care, site closure, and responding to emergencies. The cost estimates for the covered activities would be required to be updated for inflation within 60 days prior to the anniversary date of the establishment of the financial instruments. If there are other updates to the financial responsibility instruments, this information must be submitted on an annual basis. These provisions ensure that resources are available to

perform these USDW-protective activities without using public/taxpayer money.

Plugging and Abandonment: The requirements for an Injection Well Plugging Plan are found at [40 CFR 146.92](#). This plan is a required permit application component reviewed by EPA. EPA's review of the Injection Well Plugging Plan included an evaluation of OLCV's proposed pre-plugging testing procedures and the cements and plugs to be used (including their resistance to corrosion and their location relative to the lowermost USDW and the injection and confining zones) to demonstrate the permit applicant met the Class VI requirements. EPA asked clarifying questions about OLCV's proposed plugging procedures (including the placement of plugs) in RAI #2 and RAI #4 and determined that OLCV's responses to EPA's questions and updated application submittals demonstrated that the wells will be plugged in a USDW protective manner.

Based on the review, EPA has determined that OLCV's Injection Well Plugging Plan meets all requirements. Permit application information related to the Injection Well Plugging Plan is part of the administrative record in Attachment 7: Plugging Plan.

The draft permits include the Injection Well Plugging Plan for environmentally protective well plugging at the cessation of injection operations. The wells 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: The requirements for Class VI Post-Injection Site Care (PISC) and Site Closure Plans are found [40 CFR 146.93](#). This plan is a required permit application component reviewed by EPA. EPA's review of the PISC and Site Closure Plan included verifying that information about the pre- and post-injection pressure differential and the predicted position of the carbon dioxide plume and associated pressure front at site closure are consistent with the AoR delineation modeling results; that the planned post-injection monitoring is appropriate to provide early warning of USDW endangerment and is consistent with injection-phase monitoring; and that OLCV will plug all monitoring wells and restore the site to its pre-operational condition. EPA asked clarifying questions related to pre- and post-injection pressure differentials and the figures showing the extent of the carbon dioxide plume and pressure front at site closure in RAI #1 and RAI #4 and

determined that OLCV's responses and the updated PISC and Site Closure Plan addressed the Agency's concerns. Based on the review, EPA has determined that OLCV's PISC and Site Closure Plan meets all requirements. Relevant permit application information related to post-injection site care and site closure is part of the administrative record in Attachment 8: Post Injection Site Care Plan.

Under the permits, OLCV would be required to implement an approved Post-Injection Site Care (PISC) and Site Closure Plan. Following the cessation of injection, OLCV 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. OLCV would continue this post-injection monitoring for at least 50 years. At the end of the PISC period, EPA will authorize site closure if OLCV demonstrates USDW non-endangerment based on monitoring and other site data. Following authorization to proceed with site closure activities, OLCV 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).

Environmental Justice Considerations: EPA is committed to incorporating environmental justice considerations into the Agency's core mission, which is to protect human health and the environment. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs federal agencies, to the greatest extent practical and permitted by law, to identify and address, as appropriate, disproportionate, and adverse human health or environmental impacts on people of color and low-income populations. See Exec. Order No. 12898, 59 Fed. Reg. 7629 (Feb. 11, 1994). Recently, Executive Order 14096, Revitalizing Our Nation's Commitment to Environmental Justice for All, supplemented this direction and included, among other things, consideration of "effects (including risks) and hazards... related to climate change and cumulative impacts of environmental and other burdens on communities with environmental justice concerns." See Exec. Order No. 14096, 88 Fed. Reg. 25251 (Apr. 21, 2023). It is against this backdrop that EPA has integrated

Environmental Justice into the UIC Class VI permitting program.

As part of the decision-making process for these permits, EPA considered the above-referenced executive orders and EPA's Environmental Justice Guidance for UIC Class VI Permitting and Primacy (Aug. 17, 2023), which, among other things, directs EPA to:

- Identify communities potentially adversely and disproportionately affected by human health, environmental, climate-related, and/or other cumulative harms or risks, and
- Ensure fairness and transparency in the decision-making process.

OLCV used multiple environmental justice screening and mapping tools developed by the EPA, Department of Energy, and Department of Agriculture to understand, characterize, and shape outreach approaches towards communities near the project area. There are no residents in the AoR. The nearest communities, more than 7 miles from the project, have higher minority populations and elevated levels of ozone exposure compared to the national average. Both EPA and OLCV sought feedback from these communities. Because these communities have a significant limited English-speaking population, Spanish language services have been provided.

OLCV has identified and engaged with community stakeholders in Ector County throughout their project development process. They've reached out directly to adjacent property owners, created an ongoing Community Engagement Plan, and met with community stakeholders in one-on-one, small group, and large public meetings. The details of this work are in OLCV's application in the Community Engagement and Environmental Justice Assessment section. EPA and OLCV have each held public information meetings with Spanish language translators

present, and both entities have made media about the project available in English and Spanish.

For this proposed permit, EPA is providing an extended public comment period of 34 days, a public engagement workshop, and a public hearing. The permit has several safeguards in place to prevent adverse impacts to public health and the environment, including USDWs, from injection-related activities throughout the lifetime of the project. The permit's protective requirements include: specific, enforceable schedules for receiving facility data; running an EJScreen analysis when there is an update to the AoR and Corrective Action Plan; continuous monitoring of parts of the well; and conditions where injection must cease immediately.

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 permits. However, in the event that public comments are received, and EPA decides to issue final permits, then the permits would become effective 30 days after the date of issuance unless a different effective date is specified in the decision or 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 OLCV 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 (AoR)

