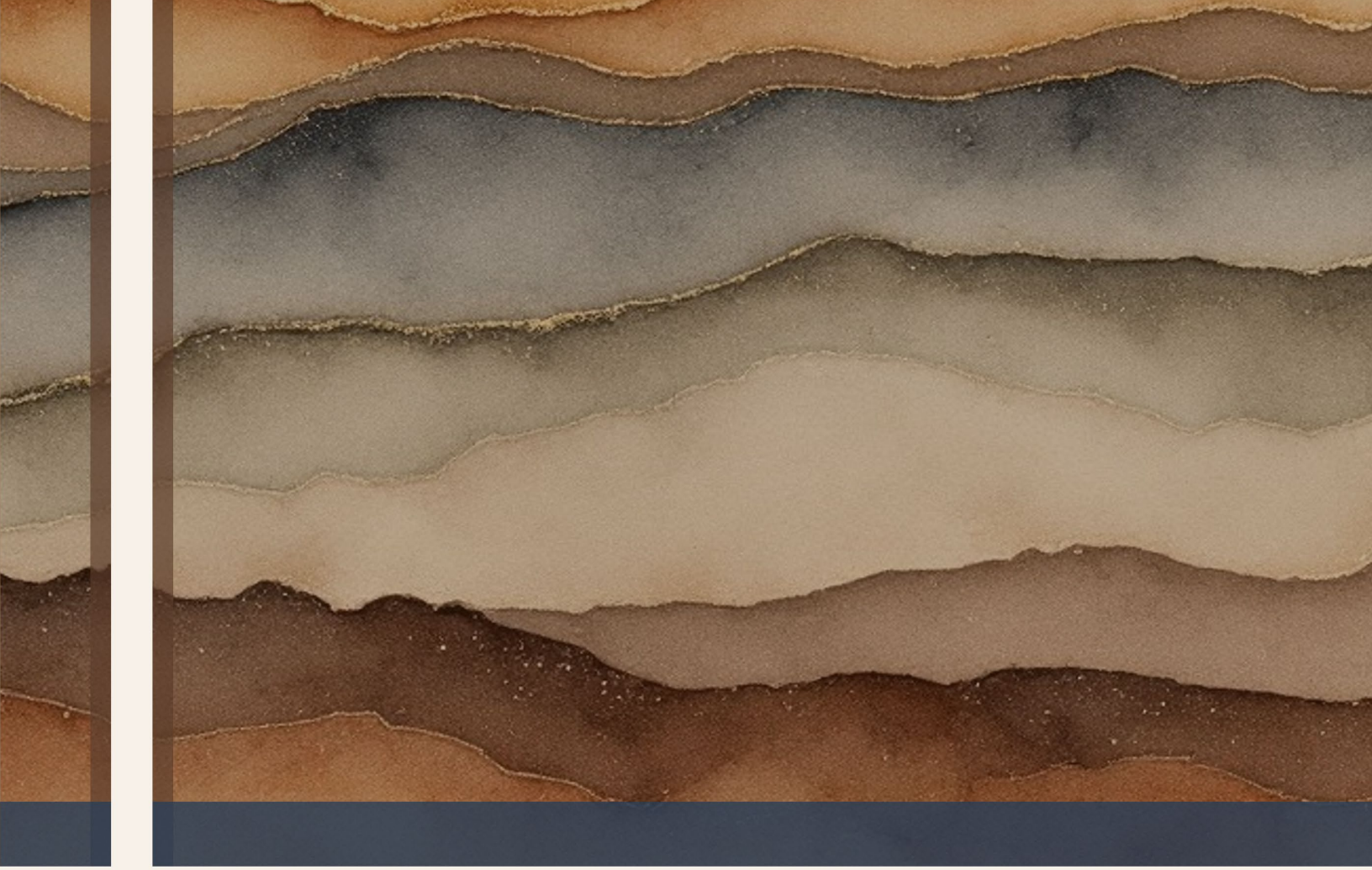
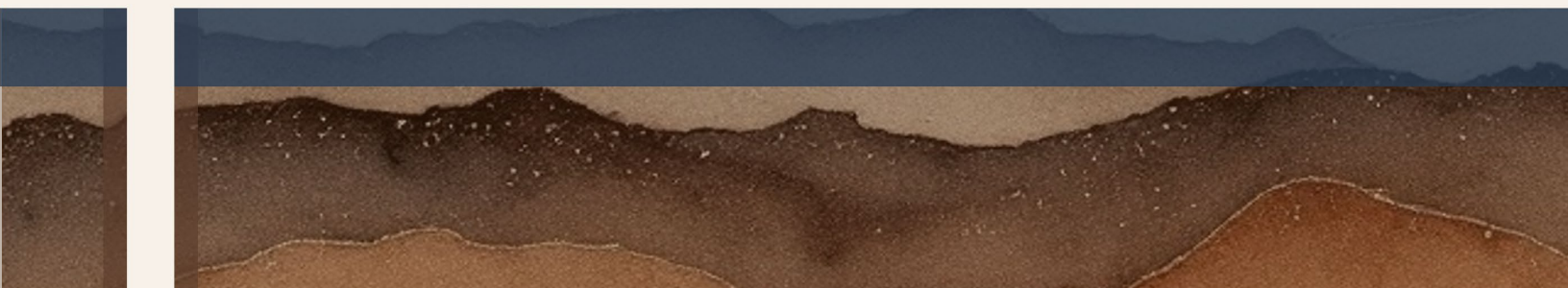


United States Environmental Protection Agency

Underground Injection Control **Class VI Permit Application Completeness Checklist**

January 2026



Contents

Introduction

The U.S. Environmental Protection Agency (EPA) is committed to streamlining permitting processes—making permitting faster and more transparent. This is a key part of EPA Administrator Zeldin's Great American Comeback. Streamlining permitting will incentivize investment into our economy and create American jobs. To support this, EPA is improving the permitting process for underground injection control (UIC) Class VI wells. The checklists in this document below help EPA evaluate permit applications and determine transparent and realistic timeframes for technical review. While this checklist is primarily for use by EPA staff, applicants can use it to inform their permit applications. The checklist includes tips to support applicants in developing project plans that are primed for an efficient technical review process and in preparing complete application materials.

EPA will use this checklist to perform the completeness review of Class VI permit applications to ensure all required components listed in the regulations or otherwise needed to inform a permit decision that protects Underground Sources of Drinking Water (USDWs) are included. When EPA deems an application to be "complete," it is not a decision on the substantive merits of the application. Instead, it is a recognition that the applicant has submitted sufficient information necessary to allow EPA to conduct technical review. EPA may need to request additional information from an applicant to clarify, modify, or supplement previously submitted materials.

Applicants may consider including, along with their application, a completed version of this checklist indicating the location of each item in the application.

The statutory provisions and EPA regulations described in this document contain legally binding requirements. This document does not substitute for those provisions or regulations, nor is it a regulation itself. Thus, it does not impose legally binding requirements on EPA, States, or the regulated community, and may not apply to a particular situation based upon the circumstances. EPA and State decisionmakers retain the discretion to adopt approaches on a case-by-case basis that differ from this checklist where appropriate. Any decisions regarding a particular permit will be made based on the statute and regulations. Therefore, interested parties are free to raise questions and objections about the substance of this checklist and the appropriateness of the application of this checklist to a particular situation.

Checklists

Checklist A. General Information

Appendix A has more information about regulatory citations and helpful tips to expedite the review of the application items in this checklist.

Required Items	Complete	Notes
A.1 Signatories to and certification of permit applications Required under [40 CFR 144.32(a)]. Learn more.	☐	
A.2 Information required in 40 CFR 144.31 (e)(1)-(6) — A listing of the activities conducted by the applicant which require RCRA, UIC, NPDES, or PSD permits. [40 CFR 144.31(e)(1)] Required under [40 CFR 146.82(a)(1)]. Learn more.	☐	
A.3 Name, mailing address, and location of the facility. Required under [40 CFR 144.31(e)(2)]. Learn more.	☐	
A.4 Up to four SIC codes. Required under [40 CFR 144.31(e)(3)]. Learn more.	☐	
A.5 The operator's name, address, telephone number, ownership status, and status as federal, state, private, public, or other entity. Required under [40 CFR 144.31(e)(4)]. Learn more.	☐	
A.6 Whether the facility is located on Indian lands. Required under [40 CFR 144.31(e)(5)]. Learn more.	☐	
A.7 A listing of all permits or construction approvals received or applied for under the following programs: i. Hazardous Waste Management program under RCRA. ii. UIC Program. iii. NPDES. iv. PSD Program. v. CAA Nonattainment Program. vi. NESHAPS Preconstruction Approval under the CAA. vii. Ocean Dumping Permits under MPRSA. viii. Section 404 Dredge and Fill Permits. ix. Other Relevant Environmental Permits, including State permits. Required under [40 CFR 144.31(e)(6)]. Learn more.	☐	

Required Items	Complete	Notes
A.8 Map of the Area A map showing the injection well and the AoR; it must also show the number or name and location of all: — Injection wells, — Producing wells, — Abandoned wells, — Plugged wells or dry holes, — Deep stratigraphic boreholes, — State- or EPA-approved subsurface cleanup sites, — Surface bodies of water, — Springs, — Mines (surface and subsurface), — Quarries, — Water wells, — Other pertinent surface features, — State, Tribal, and Territory boundaries, and — Roads. — Faults, if known or suspected. Required under [40 CFR 146.82(a)(2)]. Learn more.	☐	
A.9 A list of contacts for those States, Tribes, and Territories within the AoR. Required under [40 CFR 146.82(a)(20)]. Learn more.	☐	

Permit application materials that are submitted to the GSDT by applicants with a signed electronic signature agreement have met the signatory requirements for Class VI applications.

Related Application Files

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Checklist B. Geological Narrative/Site Characterization Information

Appendix B has more information about regulatory citations and helpful tips to expedite the review of the application items in this checklist.

Required Items	Complete	Notes
B.1 Geological Narrative Required under [40 CFR 146.82(a)(3, 5, and 6) and 146.83]. Learn more.	☐	
B.2 Regional Geologic Structure and Hydrogeologic Properties Required under [40 CFR 146.82(a)(3)]. Learn more.	☐	
B.3 Maps and Cross Sections of the AoR — The maps and cross sections may be accompanied by a brief narrative description interpreting the figures and providing an overview of key features important to the project. Required under [40 CFR 146.82(a)(3)(i)]. Learn more.	☐	
B.4 Information on Faults and Fractures Required under [40 CFR 146.82(a)(3)(ii)]. Learn more.	☐	
B.5 Data on the Injection Zone(s) — Depth — Areal extent — Thickness — Mineralogy — Porosity — Permeability — Capillary pressure Required under [40 CFR 146.82(a)(3)(iii)]. Learn more.	☐	
B.6 Data on the Confining Zone(s) — Depth — Areal extent — Thickness — Mineralogy — Porosity — Permeability — Capillary pressure Required under [40 CFR 146.82(a)(3)(iii)]. Learn more.	☐	

Required Items	Complete	Notes
B.7 Geomechanical and Petrophysical Information about the Confining Zone(s) — Fractures — Stress — Ductility — Rock strength — In situ fluid pressures Required under [40 CFR 146.82(a)(3)(iv)]. Learn more.	☐	
B.8 Information on Seismic History Required under [40 CFR 146.82(a)(3)(v)]. Learn more.	☐	
B.9 Geologic and Topographic Maps and Cross Sections Required under [40 CFR 146.82(a)(3)(vi)]. Learn more.	☐	
B.10 Hydrologic Information/Maps and Cross Sections of USDWs — Water wells and springs within the AoR. — Their positions relative to the injection zone(s). — The direction of water movement, where known. Required under [40 CFR 146.82(a)(5)]. Learn more.	☐	
B.11 Baseline Geochemical Data Required under Required under [40 CFR 146.82(a)(6)]. Learn more.	☐	
B.12 Demonstration of Site Suitability Required under [40 CFR 146.83]. Learn more.	☐	
B.13 *The suitability of the injection zone. Required under [40 CFR 146.83(a)(1)].	☐	
B.14 *The suitability of the confining zone. Required under [40 CFR 146.83(a)(2)].	☐	
B.15 Additional confining zone(s) Required under [40 CFR 146.83(b)]. Learn more.	☐	

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Checklist C. Planned Well Operations

Appendix C has more information about regulatory citations and helpful tips to expedite the review of the application items in this checklist.

Required Items	Complete	Notes
C.1 Proposed average and maximum daily rate and volume and/or mass and total anticipated volume and/or mass of the CO_2 stream Required under [40 CFR 146.82(a)(7)(i)]. Learn more.	☐	
C.2 Proposed average and maximum injection pressure. Required under [40 CFR 146.82(a)(7)(ii)]. Learn more.	☐	
C.3 The source(s) of the CO_2 Required under [40 CFR 146.82(a)(7)(iii)]. Learn more.	☐	
C.4 An analysis of the chemical and physical characteristics of the CO_2 stream Required under [40 CFR 146.82(a)(7)(iv)]. Learn more.	☐	

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Checklist D. Area of Review (AoR) and Corrective Action Plan

Appendix D has more information about regulatory citations and helpful tips to expedite the review of the application items in this checklist.

Required Items	Complete	Notes
D.1 The Method for Delineating the AoR Required under [40 CFR 146.82(a)(13), 146.84(b)(1)]. Learn more.	☐	
D.2 AoR Reevaluation Schedule and Criteria, including: A description of the minimum fixed frequency, not to exceed 5 years, for AoR reevaluations. Required under [40 CFR 146.84(b)(2)(i)].	☐	
D.3 The monitoring and operational conditions that would warrant a reevaluation of the AoR prior to the next scheduled reevaluation. Required under [40 CFR 146.84(b)(2)(ii)].	☐	
D.4 How monitoring and operational data will be used to inform an AoR reevaluation. Required under [40 CFR 146.84(b)(2)(iii)].	☐	
D.5 Corrective Action Information — How the phasing will be determined — How corrective action will be adjusted if there are changes in the AoR — How site access for future corrective action will be guaranteed Required under [146.84(b)(2)(iv)]. Learn more.	☐	
D.6 Identification and Tabulation of Wells in the AoR — Well type — Description of the well's construction — Date drilled — Location — Depth Required under [40 CFR 146.82(a)(4); 40 CFR 146.84(c)(2); 146.84(c)(3)]. Learn more.	☐	

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Checklist E: Testing and Monitoring Plan

Appendix E has more information about regulatory citations and helpful tips to expedite the review of the application items in this checklist.

Required Items	Complete	Notes
E.1 Testing and Monitoring Plan Required under 40 CFR 146.82(a)(15); 146.90]. Learn more.	☐	
E.2 CO_2 Stream Analysis Required under [40 CFR 146.90(a)]. Learn more.	☐	
E.3 Continuous Recording of Operational Parameters Required under [40 CFR 146.90(b)]. Learn more.	☐	
E.4 Corrosion Monitoring Required under [40 CFR 146.90(c)]. Learn more.	☐	
E.5 Above Confining Zone Monitoring Required under [40 CFR 146.90(d)]. Learn more.	☐	
E.6 External Mechanical Integrity Testing Required under 40 CFR 146.90(e)]. Learn more.	☐	
E.7 Pressure Fall-Off Testing Required under [40 CFR 146.90(f)]. Learn more.	☐	
E.8 Direct CO_2 Plume and Pressure Front Tracking Required under [40 CFR 146.90(g)(1)]. Learn more.	☐	
E.9 Indirect CO_2 Plume and Pressure Front Tracking Required under [40 CFR 146.90(g)(2)]. Learn more.	☐	
E.10 Surface Air Monitoring and/or Soil Gas Monitoring Required under [40 CFR 146.90(h)]. Learn more.	☐	
E.11 Other Monitoring Required under [40 CFR 146.90(i)]. Learn more.	☐	
E.12 Quality Assurance and Surveillance Plan Required under [40 CFR 146.90(k)]. Learn more.	☐	

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Checklist F. Injection Well Plugging Plan

Appendix F has more information about regulatory citations and helpful tips to expedite the review of the application items in this checklist.

Required Items	Complete	Notes
F.1 Well Plugging Plan — Tests or measures for determining bottomhole reservoir pressure. [40 CFR 146.92(b)(1)] — External mechanical integrity testing methods. [40 CFR 146.92(b)(2)] — The type and number of plugs to be used. [40 CFR 146.92(b)(3)] — The placement of each plug, including the elevation of the top and bottom of each plug. [40 CFR 146.92(b)(4)] — The type, grade, and quantity of material to be used in plugging. [40 CFR 146.92(b)(5)] — The method of placement of the plugs. [40 CFR 146.92(b)(6)] Required by [40 CFR 146.82(a)(16); 146.92(b)]. Learn more.	☐	

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Checklist G. Post-Injection Site Care (PISC) and Site Closure Plan

Appendix G has more information about regulatory citations and helpful tips to expedite the review of the application items in this checklist.

Required Items	Complete	Notes
G.1 PISC and Site Closure Plan Required by [40 CFR 146.82(a)(17); 146.93(a)(1)]. Learn more.	☐	
G.2 *The differential between pre-injection and predicted post-injection pressures in the injection zone(s) Required by [40 CFR 146.93(a)(2)(i)].	☐	
G.3 *The predicted position of the CO_2 plume and associated pressure front at site closure Required by [40 CFR 146.93(a)(2)(ii)].	☐	
G.4 *A description of post-injection monitoring locations, methods, and proposed frequencies. Required by [40 CFR 146.93(a)(2)(iii)]. Learn more.	☐	
G.5 *A proposed schedule for submitting post-injection site care monitoring results Required by [40 CFR 146.93(a)(2)(iv)].	☐	
G.6 *The duration of the post-injection site care timeframe Required by [40 CFR 146.93(a)(2)(v)].	☐	
G.7 Alternative Post-Injection Site Care (PISC) Timeframe Required by [40 CFR 146.82(a)(18); 146.93(c)]. Learn more.	☐	
G.8 *The results of computational modeling of the AoR Required by [40 CFR 146.93(c)(1)(i)].	☐	
G.9 *The predicted timeframe for pressure decline within the injection zone and any other zones to pre-injection pressures Required by [40 CFR 146.93(c)(1)(ii)].	☐	
G.10 *The predicted rate of CO2 plume migration within the injection zone and the predicted timeframe for the cessation of migration Required by [40 CFR 146.93(c)(1)(iii)].	☐	
G.11 *A description of the site-specific processes that will result in CO_2 trapping Required by [40 CFR 146.93(c)(1)(iv)].	☐	

Required Items	Complete	Notes
G.12 *The predicted rate of CO_2 trapping. Required by [40 CFR 146.93(c)(1)(v)].	☐	
G.13 *The results of laboratory analyses, research studies, and/or field or site-specific studies to verify the above information Required by [40 CFR 146.93(c)(1)(vi)].	☐	
G.14 *A characterization of the confining zone(s), including a demonstration that it is free of faults and fractures and is sufficiently thick, and will impede fluid movement Required by [40 CFR 146.93(c)(1)(vii)].	☐	
G.15 *The presence of potential conduits for fluid movement Required by [40 CFR 146.93(c)(1)(viii)].	☐	
G.16 *A description of the well's construction and an assessment of the quality of plugs of all abandoned wells in the AoR Required by [40 CFR 146.93(c)(1)(ix)].	☐	
G.17 *The distance between the injection zone and the nearest USDWs Required by [40 CFR 146.93(c)(1)(x)].	☐	

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Checklist H. Emergency and Remedial Response Plan

Appendix H has more information about regulatory citations and helpful tips to expedite the review of the application items in this checklist.

Required Items	Complete	Notes
H.1 Emergency and Remedial Response Plan Required by [40 CFR 146.82(a)(19); 146.94(a)]. Learn more.	☐	

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Checklist I. Injection Well Construction Plan

Appendix I has more information about regulatory citations and helpful tips to expedite the review of the application items in this checklist.

Required Items		Complete	Notes
I.1	**Description of the Casing and Cement** Required by [40 CFR 146.82(a)(11, 12); 146.86(b)]. Learn more.	☐	
I.2	***Depth to the injection zone(s)** Required by [40 CFR 146.86(b)(1)(i)].	☐	
I.3	***Injection pressure, external pressure, internal pressure, and axial loading** Required by [40 CFR 146.86(b)(1)(ii)].	☐	
I.4	***Hole size** Required by [40 CFR 146.86(b)(1)(iii)].	☐	
I.5	***Size and grade of all casing strings** Required by [40 CFR 146.86(b)(1)(iv)].	☐	
I.6	***Corrosiveness of the CO_2 stream and formation fluids** Required by [40 CFR 146.86(b)(1)(v)].	☐	
I.7	***Down-hole temperatures** Required by [40 CFR 146.86(b)(1)(vi)].	☐	
I.8	***Lithology of the injection and confining zone(s)** Required by [40 CFR 146.86(b)(1)(vii)].	☐	
I.9	***Type or grade of cement and cement additives** Required by [40 CFR 146.86(b)(1)(viii)].	☐	
I.10	***Quantity, chemical composition, and temperature of the CO_2 stream** Required by [40 CFR 146.86(b)(1)(ix)].	☐	
I.11	**Description of the Tubing and Packer** Required by [40 CFR 146.86(c)]. Learn more.	☐	
I.12	***Depth of setting** Required by [40 CFR 146.86(c)(3)(i)].	☐	
I.13	***Characteristics of the CO_2 stream and formation fluids** Required by [40 CFR 146.86(c)(3)(ii)].	☐	
I.14	***Maximum proposed injection pressure** Required by [40 CFR 146.86(c)(3)(iii)].	☐	
I.15	***Maximum proposed annular pressure** Required by [40 CFR 146.86(c)(3)(iv)].	☐	

Required Items	Complete	Notes
I.16 ***Proposed injection rate and volume and/or mass of the CO_2 stream** Required by [40 CFR 146.86(c)(3)(v)].	☐	
I.17 ***Size of tubing and casing** Required by [40 CFR 146.86(c)(3)(vi)].	☐	
I.18 ***Tubing tensile, burst, and collapse strengths** Required by [40 CFR 146.86(c)(3)(vii)].	☐	
I.19 **Continuous Recording Devices and Automatic Shutoff Devices** Required by [40 CFR 146.88(e)]. Learn more.	☐	

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Checklist J. Pre-Operational Testing

Appendix J has more information about regulatory citations and helpful tips to expedite the review of the application items in this checklist.

Required Items	Complete	Notes
J.1 Pre-Operational Testing Plan Required by [40 CFR 146.82(a)(8); 146.87]. Learn more.	☐	

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Checklist K. Financial Responsibility Demonstration

Appendix K has more information about regulatory citations and helpful tips to expedite the review of the application items in this checklist.

Required Items	Complete	Notes
K.1 Proposed Financial Responsibility Demonstration — Corrective action. [40 CFR 146.85(a)(2)(i)] — Injection well plugging. [40 CFR 146.85(a)(2)(ii)] — PISC and site closure. [40 CFR 146.85(a)(2)(iii)] — Emergency and remedial response. [40 CFR 146.85(a)(2)(iv)] Required by [40 CFR 146.82(a)(14); 146.85(a)&(c)]. Learn more.	☐	
K.2 Proposed Financial Instrument(s) Required by [40 CFR 146.85(a)(1)]. Learn more.	☐	

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Checklist L. Proposed Stimulation Plan

Appendix L has more information about regulatory citations and helpful tips to expedite the review of the application items in this checklist.

Required Items	Complete	Notes
L.1 Proposed Stimulation Program Required by [40 CFR 146.82(a)(9)]. Learn more.	☐	

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Checklist M. Injection Depth Waiver Request

Appendix M has more information about regulatory citations and helpful tips to expedite the review of the application items in this checklist.

Required Items	Complete	Notes
M.1 Injection Depth Waiver Request — *Information about the suitability of the injection zones. [40 CFR 146.95(a)(1)] — *Information about confinement. [40 CFR 146.95(a)(2)] — *Demonstration, using computational modeling, that USDWs will not be endangered. [40 CFR 146.95(a)(3)] — *Information on well design and construction. [40 CFR 146.95(a)(4)] — *Planned testing and monitoring. [40 CFR 146.95(a)(5)] — *The location of all public water supplies affected, reasonably likely to be affected, or served by USDWs in the AoR. [40 CFR 146.95(a)(6)] Required by [40 CFR 146.95]. Learn more.	☐	

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Checklist N. Aquifer Exemption Expansion Request

Appendix N has more information about regulatory citations and helpful tips to expedite the review of the application items in this checklist.

Required Items	Complete	Notes
N.1 Aquifer Exemption Expansion Request Required by [40 CFR 146.4(d)]. Learn more.	☐	

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Appendices

Appendix A: Reference Materials for Checklist A. General Information

This appendix has regulatory citations and helpful tips to expedite the review of application items required in Checklist A. General Information.

A.1 to A.9. Application Tips for all Items in the General Information Checklist

- Consider minimizing CBI claims, especially for project location details, for a smoother technical review and meaningful public engagement.
- Consider including necessary information for EPA compliance with 40 CFR 144.4 and applicable federal laws (e.g. NHPA, ESA) to help facilitate a more efficient technical review. If feasible, consider a different location if you identify complicating factors (e.g., presence of endangered species) to help reduce the complexity of the project.

A.8. Map of the Area [40 CFR 146.82(a)(2)]

- **Completeness Tip:** Submit a single high-resolution map to ensure a complete application. Consider making the map at least 300 DPI or PPI to ensure readability.
- **Additional Application Tip:** Consider positioning your project away from active or planned injection wells to minimize potential pressure front interactions. If your project is near active or planned injection wells (i.e., pressure fronts overlapping or in close proximity), a more robust technical review of your application may be necessary due to potential plume or pressure front interactions.
- **Additional Application Tip:** Consider selecting a lower confining zone free of penetrations from other active wells in the AoR to help facilitate a more efficient technical review. If active wells in the AoR penetrate the lower confining zone (e.g., O&G production below the Class VI injection zone), a more robust technical review of your application may be necessary due to potential impacts on pressure response in the injection zone. More information is available in Geologic Sequestration of Carbon Dioxide - Underground Injection Control (UIC) Program Class VI Well Area of Review Evaluation and Corrective Action Guidance.
- **Additional Application Tip:** Consider selecting a location or adjusting operational parameters to keep the AoR within a single state or jurisdiction to help facilitate a more efficient technical review. If your project AoR crosses state or jurisdictional tribal lines, a more robust technical review of your application may be necessary due to required communication with and coordination among government agencies in various States, Tribes, or Territories, as applicable.

Go back to Checklist A. General Information.

Appendix B: Reference Materials for Checklist B. Geological Narrative/Site Characterization Information

This appendix has regulatory citations and helpful tips to expedite the review of application items required in Checklist B. Geological Narrative/Site Characterization Information.

B.1. Geological Narrative [40 CFR 146.82(a)(3, 5, and 6) and 146.83]
The permit application should include a narrative description of the geologic structures, injection and confining zones, and fluid and solid geochemistry to meet the requirements of 40 CFR 146.82(a)(3, 5, and 6) and 146.83.

The geologic narrative will likely be supported by maps, cross sections, and tabular data. The narrative must describe the source of any data used (e.g., the type of data, the well location/survey extent where it was sourced).

- **Completeness Tip:** When available, provide data from stratigraphic test wells as a part of the initial application. Also, be sure to provide details on specific pre-operational testing plans to address any geologic characterization data gaps. More information is available in Geologic Sequestration of Carbon Dioxide - Underground Injection Control (UIC) Program Class VI Well Site Characterization Guidance.
- **Reminder:** Additional stratigraphic test well data cannot be added once an application is submitted unless requested by EPA through a request for additional information.

B.2. Regional Geologic Structure and Hydrogeologic Properties [40 CFR 146.82(a)(3)]
The description of the geologic structure and hydrogeologic properties of the proposed storage site and overlying formations must include the listed items.

B.3. Maps and Cross Sections of the AoR [40 CFR 146.82(a)(3)(i)]
The maps and cross sections may be accompanied by a brief narrative description interpreting the figures and providing an overview of key features important to the project.

- **Completeness Tip:** Submit high-resolution figures and maps to ensure a complete application. Consider making figures at least 300 DPI or PPI to ensure readability.

B.4. Information on Faults and Fractures [40 CFR 146.82(a)(3)(ii)]
This may be a narrative description of the location, orientation, and properties of known or suspected faults and fractures and a discussion supporting a determination that they would not interfere with containment. It may be accompanied by maps and cross sections and be supported by analyses of core samples, the results of geophysical surveys, pore pressure data, etc.

- **Additional Application Tip:** Consider selecting a project location free of active faults and known induced seismicity issues to limit the need for fault stability or sealing analysis. More information is available in Geologic Sequestration of Carbon Dioxide - Underground Injection Control (UIC) Program Class VI Well Site Characterization Guidance.

B.5. Data on the Injection Zone(s) [40 CFR 146.82(a)(3)(iii)]

This narrative may describe plans to collect or the results of geologic cores, outcrop data, seismic surveys, well logs, lithologic descriptions, and other field data used to characterize the injection zone(s), including geology/facies changes. The application must address the data on the injection zone(s) in the bulleted list.

- **Additional Application Tip:** Consider limiting the number of planned injection zones for a project to help facilitate a more efficient technical review. If the project includes multiple planned injection zones, a more robust technical review of your application may be necessary due to increased project complexity. More information is available in Geologic Sequestration of Carbon Dioxide - Underground Injection Control (UIC) Program Class VI Well Site Characterization Guidance.

B.6. Data on the Confining Zone(s) [40 CFR 146.82(a)(3)(iii)]

This narrative may describe plans to collect or the results of geologic cores, outcrop data, seismic surveys, well logs, lithologic descriptions, and other field data used to characterize the confining zone(s), including geology/facies changes. The application must address the data on the confining zone(s) in the bulleted list.

B.7. Geomechanical and Petrophysical Information about the Confining Zone(s) [40 CFR 146.82(a)(3)(iv)]

A narrative description of the confining zone(s) should describe the testing performed (or planned) and available results in a tabular and/or graphical form; it may include maps and present seismic or other geophysical data, core data, or well logs. The application must address the information about the confining zone(s) in the bulleted list.

B.8. Information on Seismic History [40 CFR 146.82(a)(3)(v)]

A narrative description of the presence and depth of seismic sources and a determination that seismicity would not interfere with containment that may be accompanied by tables and/or maps of seismic events, sources, and depths.

- **Completeness Tip:** Include a discussion of the potential for induced seismicity (e.g., how the operations will prevent or mitigate the effects of induced or nearby seismicity) to ensure a complete application. More information is available in Geologic Sequestration of Carbon Dioxide - Underground Injection Control (UIC) Program Class VI Well Site Characterization Guidance.

B.9. Geologic and Topographic Maps and Cross Sections [40 CFR 146.82(a)(3)(vi)]

These maps and cross sections of regional geology, hydrogeology, and local geologic structure may be accompanied by a narrative description or interpretations of logs or core data.

B.10. Hydrologic Information/Maps and Cross Sections of USDWs [40 CFR 146.82(a)(5)]

The maps and stratigraphic cross sections of the vertical and lateral limits of all USDWs may be accompanied by a narrative interpretation of the figures. The maps/cross sections must show the information in the bulleted list.

B.11. Baseline Geochemical Data [40 CFR 146.82(a)(6)]

The narrative description of available geochemical data on fluid- and solid-phase geochemistry of all subsurface formations (including USDWs) in the AoR may describe:

results or planned sampling/testing, the parameters analyzed, and any geochemical modeling that was performed, along with data sources, data quality or gaps, and sampling/testing methods and interpretation of the results/data.

- **Completeness Tip:** Include tabular or graphical data, statistics, and maps showing where samples were taken with baseline geochemical data to ensure a complete application. More information is available in Geologic Sequestration of Carbon Dioxide - Underground Injection Control (UIC) Program Class VI Well Site Characterization Guidance.

B.12 to B.14. Demonstration of Site Suitability [40 CFR 146.83]

This narrative demonstration may be accompanied by maps, cross sections, tables of relevant geological data, or descriptions of model inputs/results. It must describe each item denoted with an (*).

B.15. Additional confining zone(s) [40 CFR 146.83(b)]

A description of additional confining zones is not required of all projects.

Go back to Checklist B. Geological Narrative/Site Characterization Information.

Appendix C: Reference Materials for Checklist C. Planned Well Operations

This appendix has regulatory citations and helpful tips to expedite the review of application items required in Checklist C. Planned Well Operations.

C.1. Proposed average and maximum daily rate and volume and/or mass and total anticipated volume and/or mass of the CO_2 stream. [40 CFR 146.82(a)(7)(i)]

A narrative or tabular description that may be accompanied by calculations.

- Additional Application Tip: Consider designing a project with 1-5 injection wells to help facilitate a more efficient technical review. If a project includes more than 5 injection wells, a more robust technical review of your application may be necessary due to increased project complexity.

C.2. Proposed average and maximum injection pressure. [40 CFR 146.82(a)(7)(ii)]

A narrative or tabular description that may be accompanied by calculations.

- Completeness Tip: Describe how the fracture gradient or fracture pressure informed the operating parameters to ensure a complete application.

C.3. The source(s) of the CO_2. [40 CFR 146.82(a)(7)(iii)]

A narrative description of the CO_2 source.

C.4. An analysis of the chemical and physical characteristics of the CO_2 stream. [40 CFR 146.82(a)(7)(iv)]

A narrative description that may be accompanied by tables of parameters or analytical reports.

- **Completeness Tip**: Include a range of anticipated constituents and their percent composition in the CO_2 stream (e.g., based on direct testing results, literature studies, or design studies) to ensure a complete application.

Go back to Checklist C. Planned Well Operations.

Appendix D: Reference Materials for the Checklist D. Area of Review (AoR) and Corrective Action Plan

This appendix has regulatory citations and helpful tips to expedite the review of application items required in Checklist D. Area of Review (AoR) and Corrective Action Plan.

D.1. The Method for Delineating the AoR [40 CFR 146.82(a)(13), 146.84(b)(1)]
A narrative description of the AoR delineation model used, which may include assumptions made, any available outputs/results, and the inputs on which the model is based. It may be accompanied by tables, figures and graphics, or raw data in a tabular format. Some input data files may be uploaded directly to the GSDT.

- **Completeness Tip:** Explain the assumptions and boundary conditions associated with the modeling approach to ensure a complete application.
- **Additional Application Tips:**
  - Consider selecting an injection zone that is underpressurized or hydrostatic to help facilitate a more efficient technical review. If the injection zone is overpressurized, a more robust technical review of your application may be necessary due to need for more sophisticated methods to delineate the AoR.
  - Consider using EPA guidance recommended methods for the site condition to help facilitate a more efficient technical review. For example, avoid using methods for over-pressurized cases for a project that is not in an over-pressurized formation (non-standard/guidance recommended modeling approach).
  - Consider performing a sensitivity analysis as part of the AoR delineation modeling to help facilitate a more efficient technical review. This can also help verify that the model boundary conditions are not excessively impacting the AoR size and set a project up for successful operation and monitoring.

D.5. Corrective Action Information [146.84(b)(2)(iv)]
A narrative discussion of how corrective action was/will be conducted. If phased corrective action is planned, the application must describe the list of bulleted information.

- **Additional Application Tip:** Consider including the results of a physical survey associated with the search for wells in the AoR as part of the application to help facilitate a more efficient technical review. More information is available in Geologic Sequestration of Carbon Dioxide - Underground Injection Control (UIC) Program Class VI Well Project Plan Development Guidance.

D.6. Identification and Tabulation of Wells in the AoR [40 CFR 146.82(a)(4); 40 CFR 146.84(c)(2); 146.84(c)(3)]

The AoR and Corrective Action Plan must include a table listing wells within the AoR that penetrate the injection or confining zones or a statement there are no wells that penetrate the confining zone within the AoR. Other penetrations of the confining zone(s), such as underground mines, also must be identified. Determine which abandoned wells in the AoR have been plugged in a manner that prevents the movement of carbon dioxide or other fluids that may endanger USDWs, including use of materials compatible with the carbon dioxide stream. The table must include the information in the bulleted list.

- **Completeness Tip:** Include detailed data on artificial penetrations in the AoR (e.g., schematics or plugging reports) to ensure a complete application.
- **Additional Application Tip:** Consider selecting a project location with minimal artificial penetrations (<6) in the AoR to help facilitate a more efficient technical review. If there are many artificial penetrations in the AoR, a more robust technical review of your application may be necessary due to the need to evaluate the artificial penetrations for corrective action.

Go back to Checklist D. Area of Review (AoR) and Corrective Action Plan.

Appendix E: Reference Materials for the Checklist E. Testing and Monitoring Plan

This appendix has regulatory citations and helpful tips to expedite the review of application items required in Checklist E. Testing and Monitoring Plan.

E.1. Testing and Monitoring Plan [40 CFR 146.82(a)(15); 146.90]

The Testing and Monitoring Plan will be a narrative description of planned injection-phase testing activities that is accompanied by maps, tables, illustrations, or step-by-step procedures that describe the items marked with an (*).

- **Completeness Tip:** Provide a detailed Testing and Monitoring Plan with finalized elements, including monitoring well placement and plume and pressure front tracking strategies, as well as defined tests, methods, and procedures to ensure a complete application.
- **Additional Application Tip:** Consider proposing monitoring techniques that are consistent with the recommendations in EPA's Class VI Testing and Monitoring Guidance to help facilitate a more efficient technical review.

E.2. CO_2 Stream Analysis [40 CFR 146.90(a)]

Narrative description that may describe analytical parameters, sampling methods, sampling locations, and frequencies.

E.3. Continuous Recording of Operational Parameters [40 CFR 146.90(b)]

Narrative description of devices to continuously monitor and record injection pressure, rate, and volume; tubing-casing annulus pressure; and annulus fluid volume added. May be depicted on well schematics.

E.4. Corrosion Monitoring [40 CFR 146.90(c)]
Narrative description of corrosion monitoring methods that may describe sampling methods/locations or testing frequency.

E.5. Above Confining Zone Monitoring [40 CFR 146.90(d)]
Narrative description of planned water quality monitoring that may describe well locations; analytical methods and parameters; sampling locations and methods, formations/depths, and frequencies. The description may be accompanied by maps, monitoring well schematics, or tables of analytical parameters and methods.

E.6. External Mechanical Integrity Testing [40 CFR 146.90(e)]
Narrative (sometimes step-by-step) description of mechanical integrity tests (MITs) procedures and their planned frequency.

E.7. Pressure Fall-Off Testing [40 CFR 146.90(f)]
Narrative (sometimes step-by-step) description of pressure fall-off test procedures and their planned frequency.

E.8. Direct CO_2 Plume and Pressure Front Tracking [40 CFR 146.90(g)(1)]
Narrative description of planned direct methods to track the CO_2 plume and pressure front that may include well locations; analytical methods and parameters; sampling locations and formations/depths; and frequencies. The description may be accompanied by maps, monitoring well schematics, or tables of analytical parameters and methods.

E.9. Indirect CO_2 Plume and Pressure Front Tracking [40 CFR 146.90(g)(2)]
Narrative description of planned indirect methods to track the CO_2 plume and pressure front; it may describe: well locations; monitoring equipment; or geophysical survey extent/resolution. The description may be accompanied by maps, monitoring well or equipment schematics, or tables.

E.10. Surface Air Monitoring and/or Soil Gas Monitoring [40 CFR 146.90(h)]
This type of monitoring is not required for all projects; if it is included, it would be a narrative description of planned methods to detect CO_2 in the soil or atmosphere (including monitoring locations, equipment, and frequencies) that may be accompanied by maps or illustrations.

E.11. Other Monitoring [40 CFR 146.90(i)]
Additional monitoring is not required for all projects; if it is included, it would be a narrative description of the types of monitoring (e.g., seismic), including: methods, equipment, locations, and frequencies that may be accompanied by maps, illustrations, or tables.

E.12. Quality Assurance and Surveillance Plan [40 CFR 146.90(k)]
Narrative description of planned quality assurance procedures for all testing and monitoring activities.

Go back to Checklist E: Testing and Monitoring Plan.

Appendix F: Reference Materials for Checklist F. Injection Well Plugging Plan

This appendix has regulatory citations and helpful tips to expedite the review of application items required in Checklist F. Injection Well Plugging Plan.

F.1. Well Plugging Plan [40 CFR 146.82(a)(16); 146.92(b)]
The Well Plugging Plan may be a narrative (sometimes step-by-step) description of plugging procedures for the injection well. It may be accompanied by schematics and tables. The plan must include the bulleted information. More information is available in Geologic Sequestration of Carbon Dioxide - Underground Injection Control (UIC) Program Class VI Well Project Plan Development Guidance.

Go back to Checklist F. Injection Well Plugging Plan.

Appendix G: Reference Materials for Checklist G. PISC and Site Closure Plan

This appendix has regulatory citations and helpful tips to expedite the review of application items required in Checklist G. PISC and Site Closure Plan.

G.1. PISC and Site Closure Plan [40 CFR 146.82(a)(17); 146.93(a)(1)]
The plan will be a narrative discussion, accompanied by maps, cross sections, tables, or model outputs that must include the information denoted with an (*).

- **Completeness Tip:** Include details (e.g., plugging plans, mechanical integrity testing) for monitoring wells to ensure a complete application. More information is available in Geologic Sequestration of Carbon Dioxide - Underground Injection Control (UIC) Program Class VI Well Project Plan Development Guidance.

G.4. *A description of post-injection monitoring locations, methods, and proposed frequencies [40 CFR 146.93(a)(2)(iii)]
This may include well locations; analytical methods and parameters; and sampling locations, formations/depths, and frequencies.

G.7. Alternative Post-Injection Site Care (PISC) Timeframe [40 CFR 146.82(a)(18); 146.93(c)]
An Alternative PISC plan is not required for applications that propose to use the 50-year default PISC timeframe. However, if the applicant proposes an Alternative PISC plan, the following items (denoted by *) must be included:

- **Additional Application Tip:** Consider using the 50-year default PISC timeframe to help facilitate a more efficient technical review and avoid the need for an alternative PISC demonstration. More information is available in Geologic Sequestration of Carbon Dioxide

- Underground Injection Control (UIC) Program Class VI Well Project Plan Development Guidance.

Go back to Checklist G. PISC and Site Closure Plan.

Appendix H: Reference Materials for Checklist H. Emergency and Remedial Response Plan

This appendix has regulatory citations and helpful tips to expedite the review of application items required in Checklist H. Emergency and Remedial Response Plan.

H.1. Emergency and Remedial Response Plan [40 CFR 146.82(a)(19); 146.94(a)]
The Emergency and Remedial Response Plan is a narrative description of local resources and infrastructure, potential emergency events and response actions, personnel, and equipment to address USDW endangerment. It may be accompanied by maps, illustrations, and tables. More information is available in Geologic Sequestration of Carbon Dioxide - Underground Injection Control (UIC) Program Class VI Well Project Plan Development Guidance. An Emergency and Remedial Response Plan template is also available.

Go back to Checklist H. Emergency and Remedial Response Plan.

Appendix I: Reference Materials for Checklist I. Injection Well Construction Plan

This appendix has regulatory citations and helpful tips to expedite the review of application items required in Checklist I. Injection Well Construction Plan.

I.1. Description of the Casing and Cement [40 CFR 146.82(a)(11, 12); 146.86(b)]
Well schematics (either planned or as-built) that show the surface casing and at least one long string casing. The schematics should be accompanied by a narrative step-by-step process for installing casing strings, description of centralizers, cementing procedures, cement and cement additives. The application should also include a narrative description of how the casing and cement will be compatible with fluids with which they may come into contact and meet or exceed API/ASTM standards or comparable standards acceptable to the UIC Program Director (also, consider relevant AMPP standards including AMPP SP 21632). The application must address the information denoted with an (*) which may be presented in tables:

- **Additional Application Tip:** If converting an existing well (i.e., a well previously used as another well class or a stratigraphic test well) to Class VI, keep in mind that the existing well must be built to Class VI standards. More information is available in Geologic Sequestration of Carbon Dioxide - Underground Injection Control (UIC) Program Class VI Well Construction Guidance.

I.11. Description of the Tubing and Packer [40 CFR 146.86(c)
The tubing and packer may be depicted on the well schematics described above, and the information below may be summarized in tables. The application may also include a narrative description of how the tubing and packer materials will be compatible with fluids with which

they may come into contact and meet or exceed API/ASTM standards. The application must include the information denoted with an (*).

- **Completeness Tip:** Explain the appropriateness of well design, considering corrosion risks based on site-specific conditions to ensure a complete application. Include an explanation showing that long string casing is adequately corrosion resistant for the site-specific conditions and extends above the confining zone, supported by modeling and/or materials demonstration. More information is available in Geologic Sequestration of Carbon Dioxide - Underground Injection Control (UIC) Program Class VI Well Construction Guidance.
- **Additional Application Tip:** Consider selecting highly corrosion resistant well materials and standard construction approaches to help facilitate a more efficient technical review.

I.19. Continuous Recording Devices and Automatic Shutoff Devices [40 CFR 146.88(e)]
The well schematics should show continuous recording devices and automatic shutoff devices to monitor: injection pressure; the rate, volume and/or mass, and temperature of the CO_2 stream; and the pressure on the annulus between the tubing and the long string casing and annulus fluid volume.

- **Completeness Tip:** Include schematics and a description of the location and construction of monitoring wells used for groundwater monitoring and plume and pressure front tracking to ensure a complete application. More information is available in Geologic Sequestration of Carbon Dioxide - Underground Injection Control (UIC) Program Class VI Well Construction Guidance.

Go back to Checklist I. Injection Well Construction Plan.

Appendix J: Reference Materials for Checklist J. Pre-Operational Testing

This appendix has regulatory citations and helpful tips to expedite the review of application items required in Checklist J. Pre-Operational Testing.

J.1. Pre-Operational Testing Plan [40 CFR 146.82(a)(8); 146.87]
A narrative plan that describes the testing that the applicant has performed or plans to perform to characterize the well and all relevant geologic formations. The plan may include step-by-step procedures and be accompanied by tables or graphics. At a minimum, the logs and tests must address the information and testing required at 146.87 (a) through (e), including: logs, surveys and tests to determine or verify information about relevant geologic formations; tests to verify internal and external mechanical integrity; reports/analysis of injection zone and confining zone cores and formation fluid samples; and characterization of the injection zone(s).

Go back to Checklist J. Pre-Operational Testing.

Appendix K: Reference Materials for Checklist K. Financial Responsibility Demonstration

This appendix has regulatory citations and helpful tips to expedite the review of application items required in Checklist K. Financial Responsibility Demonstration.

K.1. Proposed Financial Responsibility Demonstration [40 CFR 146.82(a)(14); 146.85(a)&(c)]
The application must include a detailed cost estimate for performing covered activities. 40 CFR 146.85(c). The cost estimate must be performed for each phase separately and must be based on the costs to EPA of hiring a third party to perform the required activities. 40 CFR 146.85(c)(1). The cost estimate should be developed by a third party. Itemized cost estimates must be included for the bulleted items. More information is available in Geologic Sequestration of Carbon Dioxide: Underground Injection Control (UIC) Program Class VI Financial Responsibility Guidance.

K.2. Proposed Financial Instrument(s) [40 CFR 146.85(a)(1)]
The application will include a narrative description (or draft language) of one or more financial instruments.

Go back to Checklist K. Financial Responsibility Demonstration.

Appendix L: Reference Materials for Checklist L. Proposed Stimulation Plan

This appendix has regulatory citations and helpful tips to expedite the review of application items required in Checklist L. Proposed Stimulation Plan.

L.1. Proposed Stimulation Program [40 CFR 146.82(a)(9)]
The stimulation plan must include a narrative description of stimulation fluids to be used and a determination that stimulation will not interfere with containment.

- **Completeness Tip:** To ensure a complete application, include one of the following:

  1) a detailed simulation plan;

  2) a more generalized stimulation plan (if no immediate stimulation, e.g., acidization, is planned) that still describes the fluids to be used and a determination that stimulation will not interfere with containment;

  3) a statement that a detailed stimulation plan will be submitted after the well is operating, based on site-specific data; or

  4) a statement that no stimulation/acidization is planned for the project (note that if this last option is selected, it is at the UIC Program Director's discretion to request a stimulation plan).

Go back to Checklist L. Proposed Stimulation Plan.

Appendix M: Reference Materials for Checklist M. Injection Depth Waiver Request

This appendix has regulatory citations and helpful tips to expedite the review of application items required in Checklist M. Injection Depth Waiver Request.

M.1. Injection Depth Waiver Request [40 CFR 146.95]

An Injection Depth Waiver Request is not required for Class VI applicants planning to inject below the lowermost USDW. However, if the applicant requests a waiver to inject below the lowermost USDW, the supplemental report must include (or reference) the following items (denoted by *):

- **Additional Application Tip:** If requesting an injection depth waiver, remember to submit a separate narrative report, accompanied by maps, cross sections, tables, or schematics.

Go back to Checklist M. Injection Depth Waiver Request.

Appendix N: Reference Materials for Checklist N. Aquifer Exemption Expansion Request

This appendix has regulatory citations and helpful tips to expedite the review of application items required in Checklist N. Aquifer Exemption Expansion Request.

N.1. Aquifer Exemption Expansion Request [40 CFR 146.4(d)]

An aquifer exemption expansion is likely not relevant for most Class VI projects. However, owners or operators of Class II enhanced oil recovery or enhanced gas recovery wells may request that the Director approve an expansion to the areal extent of an aquifer exemption already in place for a Class II enhanced oil recovery or enhanced gas recovery well for the exclusive purpose of Class VI injection for geologic sequestration.

- **Additional Application Tip:** Requesting an expansion of an existing aquifer exemption for a Class II enhanced oil recovery or enhanced gas recovery permit for the purposes of geologic sequestration is a separate determination. If requesting an aquifer exemption expansion, keep in mind that EPA will need to make this determination before issuing the Class VI permit for a project.

Go back to Checklist N. Aquifer Exemption Expansion Request.