ATTACHMMENT D: INJECTION WELL PLUGGING PLAN
40 CFR 146.92(b)

Facility Information

Facility Name: CTV II

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Location: [redacted]

Carbon TerraVault Holdings, LLC (CTV) will conduct injection well plugging and abandonment according to the procedures below. The proposed injection well plugging plan will ensure that the proposed materials and procedures for injection well plugging are appropriate to the well's construction and the site's geology and geochemistry.

Planned Tests or Measures to Determine Bottom-Hole Reservoir Pressure

Before beginning the plugging and abandonment process, the pressure used to squeeze the cement will be determined from the bottom hole pressure gauge. During plugging operations, the weighted cement slurry displacement fluids will be overbalanced to the reservoir pressure ensuring that no reservoir fluids will be able to enter the wellbore during cementing operations.

Planned External Mechanical Integrity Test(s)

CTV will conduct at least one external mechanical integrity prior to plugging the injection well as required by 40 CFR 146.92(a).

A temperature log will be run over the entire depth of each sequestration well. Data from the logging runs will be evaluated for anomalies in the temperature curve, which would be indicative of fluid migration out of the injection zone. Data will be compared to the data from temperature logs performed prior to injection of CO2. Deviations between the temperature log performed before, after and during injection may indicate issues related to the integrity of the well casing or cement.

Information on Plugs

CTV will use the materials and methods noted in *Appendix C-1: Injection and Monitoring Well Schematics* to plug the injection well. This appendix provides proposed abandonment well schematics and tabulated descriptions of all abandonment cement plugs for all injection and monitoring wells associated with the project.

The cementing design will consider reservoir temperature and pressure and will ensure compatibility with injectate and formation fluid geochemistry. The cement formulation and required certification documents will be submitted to the agency with the well plugging plan. The owner or operator will report the wet density and will retain duplicate samples of the cement used for each plug.

A Portland cement blend, such as Class G, will be utilized that has a minimum 1,000 psi compressive strength and a maximum liquid permeability of 0.1 mD. The wells will have this cement placed inside casing from total depth (TD) of the well to surface. The cement will be set in plug segments per CTV's standard procedures.

Narrative Description of Plugging Procedures

Notifications, Permits, and Inspections

In compliance with 40 CFR 146.92(c), CTV will notify the regulatory agency at least 60 days before plugging the well and provide an updated Injection Well Plugging Plan, if applicable.

Plugging Procedures

The following plugging procedures are planned assuming a coiled tubing unit (CTU) is utilized for cement plug placement after all completion equipment is removed. The placement method may vary depending on the type of service equipment used. For instance, a maintenance rig may place the cement plug of same specification at same depths using jointed pipe and achieve the same result.

1. Bottom hole pressure from downhole pressure gauge is recorded and kill fluid density is calculated.
2. Kill fluid of appropriate density to prevent fluid inflow to the wellbore is circulated throughout the wellbore, and the well is observed to ensure static conditions.
3. Well equipment is removed from the casing, and the well is cleaned out to TD during rig operations. Kill fluid is added to the wellbore to account for displacement of equipment that is removed, and the well is again observed to ensure static conditions.
4. The CTU runs in the hole to TD and begins placing cement in the casing. The coiled tubing is kept about 100' inside of the cement plug and is pulled up-hole while cementing operations continue. Once the full plug is placed, the coiled tubing is pulled above the plug and the well is circulated to ensure the depth of the top of the plug. The tubing is then pulled up-hole while operations are paused to wait on cement. Once the cement has set, the coiled tubing is run back in the hole to witness the depth and hardness of the plug before initiating the next cemented plug interval. This process is repeated until cement is placed to surface.