

INJECTION WELL PLUGGING PLAN 40 CFR 146.92(b)

SAN JOAQUIN RENEWABLES

Facility Information

Facility name: San Joaquin Renewables
Injection Well: SJR-II

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Well location: McFarland, Kern County, California
35.688330, -119.276642

San Joaquin Renewables (SJR) will conduct injection well plugging and abandonment according to the procedures below.

Planned Tests or Measures to Determine Bottom-Hole Reservoir Pressure

Bottomhole pressure will be determined with a downhole pressure gage using methods described in the Testing and Monitoring Plan.

Planned External Mechanical Integrity Test(s)

SJR will conduct at least one of the tests listed in Table 1 to verify external mechanical integrity prior to plugging the injection well as required by 40 CFR 146.92(a), with methods described in the Testing and Monitoring Plan.

Table 1. Planned MITs.

Test Description	Location
Temperature Log	Wireline log along wellbore
Oxygen Activation Log	Wireline log along wellbore

Information on Plugs

SJR will use the materials and methods noted in Table 2 to plug the injection well. The volume and depth of the plug or plugs will depend on the final geology and downhole conditions of the well as assessed during construction. The cement(s) formulated for plugging will be compatible

with the carbon dioxide stream. 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.

Table 2. Plugging details.

Plug Information	Plug #1	Plug #2	Plug #3	Plug #4
Diameter of boring in which plug will be placed (inches)	7" 29# casing			
Depth to bottom of tubing or drill pipe (feet)	8700 feet			
Slurry volume to be pumped (cubic feet)	93 cu ft	25 cu ft	80 cu ft	1616 cu ft
Calculated top of plug (feet)	8255 feet	8135 feet	7750 feet	Surface
Bottom of plug (feet)	8700 feet	8255 feet	8135 feet	7750 feet
Type of cement or other material	Class G / CO2 compatible	Class G / CO2 compatible	Class G / CO2 compatible	Class G / CO2 compatible
Method of emplacement (e.g., balance method, retainer method, or two-plug method)	Balance	Retainer	Retainer	Balance

Narrative Description of Plugging Procedures

Notifications, Permits, and Inspections

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

Plugging Procedures

After CO2 injection is discontinued, the injection well must be abandoned. The recommended plugging and abandonment (P&A) operations described below will remove the injection tubing and packer, and squeeze cement into the perforations through a cement retainer. A coiled tubing unit (CTU) will be used to place cement at intervals from plugged back total depth (PBSD) to surface to conform with applicable U.S. EPA standards for a Class VI well.

Objective: Kill well, remove completion equipment, squeeze perforations with cement.

Summary Procedure:

1. Move in and rig up (MIRU) equipment on location including blowout prevention equipment (BOPE).
2. Run wireline survey to measure bottomhole pressure and confirm PBTD.
3. Kill well with brine of appropriate density to prevent flowback. KCl or CaCl weighted brine water to be placed in well prior to cementing (“flushing”).
4. Pull completion tubing and packers.
5. Land corrosion resistant cement retainer at 7700’.
6. Rig up (RU) cementers. Down squeeze cement through tubing and retainer until pressure increases but remains below formation fracture gradient. Calculate maximum allowable injection pressure based on bottomhole pressure data.
7. Un-sting tubing from retainer and pull out of hole (POOH).
8. RU CTU and place continuous cement plug from top of retainer at 7700’ to surface.
9. Rig down CTU and cementers.
10. Nipple down (ND) BOPE. Rig down move out (RDMO).
11. Dig out cellar, cut casing five feet below ground level (GL) and flush with outer casings.
12. Weld steel plate on top of casing marked with well API and injection permit number.
13. Survey final well location.
14. Backfill cellar, clean location, and remove all debris. RDMO all equipment and commence applicable surface reclamation efforts to match surrounding land.

A plugging schematic is included on the following page.

Plan revision number: Rev.2
Plan revision date: 9/7/2022

Proposed Abandonment Wellbore Schematic				
CO2 Injection Well Two Injection Zones, Two Strings Short String: Pyramid Hill + Vedder 1 + Vedder 2 Long String: Vedder 3				
Geo Marker	Hole		Casing & Perf	Details
	26"		<i>Depths are MD</i> 20" 94# J-55 to 250' Cement Plug #2 7750'-Surface	489 cf cemented to surface
BFW @ ~1750' USDW @ ~2495'	17-1/2"		13-3/8" 61# J-55 BTC to 2600'	2377 cf cemented to surface
Confining Zone: Freeman-Jewett @ 6474'	12-1/4"			
Injection Zones: Pyramid Hills @ 7775' Vedder 1 @ 7789' Vedder 2 @ 8040' Vedder 3 @ 8167' Vedder 4 @ 8344'	8-1/2"		9-5/8" 53.5# N-80 LTC to 7700' Cement Retainer #2 @ 7750' Cement Squeeze #2 8135'-7750' Cement Retainer #1 @ 8135' Cement Squeeze #1 8255'-8135' Cement Plug #1 8700'-8255' 7" 29# L-80 Cr13 LTC to 8700'	3207 cf cemented to surface Perforated 7775'-7789' (PH) 7789'-7900' (V1) 8040'-8132' (V2) Perforated 8167'-8255' (V3)
	TD @ 8700'			1166 cf w/ latex additive in tail cemented to surface

Creator & Date: JM 07/27/2021