

## APPENDIX 7: P&A PROCEDURE FOR WELLS TO BE ABANDONED PRIOR TO INJECTION

### CTV V

CTV will abandon four wells within the AoR prior to injection of CO<sub>2</sub> to isolate the injection zone from other permeable reservoirs and to ensure confinement through the Upper Confining Zone. **Appendix 6** provides the list of all wells within the AoR and indicates which wells will be abandoned prior to injection. This appendix provides the plugging and abandonment procedures to demonstrate that plugging will ensure isolation of the injection zone.

Abandonment operations will be conducted using methods designed to prevent the movement of fluid into USDW and will include the use of materials compatible with the carbon dioxide stream. As these are oil and gas wells regulated through CalGEM primacy, procedures and cement plug placement will also adhere to regulations established within the California Code of Regulations, Chapter 4, Article 3, §1723.

#### ***Plugging Procedures***

The following procedures describe the proposed plugging operations:

1. Blowout Prevention Equipment (BOPE) is installed on the wellhead.
2. Downhole production or injection equipment is removed from the casing, and the well is cleaned out to Plugback Measured Depth (PBMD). The cleanout depth will be witnessed by CalGEM and approved.
3. Plug 1 will be placed from the approved cleanout depth across the production interval and >100' into the confining layer. The plug will be tagged and witnessed by CalGEM to ensure the plug depth and length satisfy permit requirements.
4. Plug 2 will be placed across the top of the Upper Injection Zone and >100' into the Upper Confining Zone. The plug may or may not be required by CalGEM, and the plug may be tagged and witnessed accordingly by CalGEM to ensure the plug depth and length satisfy permit requirements.
5. Plug 3 will be placed as a balanced plug at the base of the USDW in undifferentiated marine sediments. The plug will be extended to cover >100' above the base of the USDW. The plug will be tagged and witnessed by CalGEM to ensure the plug depth and length satisfy permit requirements.
6. Plug 4 will be placed such that the surface plug is >25' in length, and well casing can be cut off between 5' and 10' from surface. The surface plug will be witnessed and approved by CalGEM.
7. BOPE will be removed, and well casing will be cut between 5' and 10' below surface.

8. A steel plate will be stamped with the last five digits of the API well number for identification. The steel plate will be at least as thick as the outer well casing, and it will be welded around the circumference.

All portions of the well not plugged with cement are filled with inert mud meeting specifications according to California Code of Regulations, Chapter 4, Article 3, §1723(b) to prevent migration of fluids within the wellbore.

### ***Plugging Details for Wells to be Abandoned***

Well-specific plugging plans are provided in the following tables for each well to be abandoned prior to CO<sub>2</sub> injection. Cement type, volume, density, and placement method for each plug described above are indicated. The indicated top and bottom plug depths necessary to ensure isolation of the injection zone and meet CalGEM abandonment requirements are determined based on the well-specific measured depths of the relevant geologic formations described above.

Well	Piacentine 1				
Plugs	Plug 1	Plug 2	Plug 3	Plug 4	Plug 5
Hole Size (in.)	8.75	8.75	8.75	8.75	8.921
Bottom of tubing (ft)	7,781	5,133	3,969	2,202	40
Cement Volume (sacks)	533	45	45	82	9
Slurry Volume (bbl)	109.26	9.30	9.30	16.73	1.93
Slurry Weight (lb/gal)	15.8	15.8	15.8	15.8	15.8
Top of plug (ft)	6,312	5,008	3,844	1,977	15
Bottom of Plug (ft)	7,781	5,133	3,969	2,202	40
Type of Cement	Class G	Class G	Class G	Class G	Class G
Method of placement	Balanced Plug, Retainer, or CT Plug				

Well	Rio Blanco 1			
Plugs	Plug 1	Plug 2	Plug 3	Plug 4
Hole Size (in.)	7.875	7.875	7.875	8.097
Bottom of tubing (ft)	4,874	3,851	2,068	46
Cement Volume (sacks)	37	37	66	8
Slurry Volume (bbl)	7.53	7.53	13.55	1.59
Slurry Weight (lb/gal)	15.8	15.8	15.8	15.8
Top of plug (ft)	4,749	3,726	1,843	21
Bottom of Plug (ft)	4,874	3,851	2,068	46
Type of Cement	Class G	Class G	Class G	Class G
Method of placement	Balanced Plug, Retainer, or CT Plug			

Well	King Island 33-1			
Plugs	Plug 1	Plug 2	Plug 3	Plug 4
Hole Size (in.)	7.875	7.875	7.875	8.097
Bottom of tubing (ft)	5,071	3,940	2,185	43
Cement Volume (sacks)	37	37	66	8
Slurry Volume (bbl)	7.53	7.53	13.55	1.59
Slurry Weight (lb/gal)	15.8	15.8	15.8	15.8
Top of plug (ft)	4,946	3,815	1,960	18
Bottom of Plug (ft)	5,071	3,940	2,185	43
Type of Cement	Class G	Class G	Class G	Class G
Method of placement	Balanced Plug, Retainer, or CT Plug			

Well	Victor Leonardini 1		
<b>Plugs</b>	<b>Plug 1</b>	<b>Plug 2</b>	<b>Plug 3</b>
Hole Size (in.)	6.25	6.25	6.276
Bottom of tubing (ft)	4,166	2,432	39
Cement Volume (sacks)	23	42	5
Slurry Volume (bbl)	4.74	8.54	0.96
Slurry Weight (lb/gal)	15.8	15.8	15.8
Top of plug (ft)	4,041	2,207	14
Bottom of Plug (ft)	4,166	2,432	39
Type of Cement	Class G	Class G	Class G
Method of placement	Balanced Plug, Retainer, or CT Plug		