

**Blue Chip 22-10HZ**

API: 0512351418

1. Identify the hydraulic fracture treatment well(s).

a. NA

2. Identify any other wells well in which a Pressure Blanket will be applied in relation to the hydraulic fracture treatment well(s).

a.

API_UWI_NO	Well_Name	JOB TYPE
0512351929	Blue Chip 22-2HZ	CHEMICAL RECONDITION
0512351935	Blue Chip 22-4HZ	CHEMICAL RECONDITION
0512351937	Blue Chip 22-6HZ	CHEMICAL RECONDITION
0512351930	Blue Chip 22-8HZ	CHEMICAL RECONDITION
0512351931	Blue Chip 22-10HZ	CHEMICAL RECONDITION

3. Describe the relationship between the hydraulic fracture treatment well(s) and the Pressure Blanket well(s).

a. NA

4. Describe the injection process, including the major pieces of equipment to be used.

a. The injection equipment will consist of quinniplex pumps, mixing tanks and water tanks.

5. Identify the type of gas (CO<sub>2</sub>, nitrogen, natural gas, other) or water (fresh, produced, recycled, other) to be injected and the source of injected gas or water.

a. A main treatment of surfactant-based chemicals and acid will be injected to make good contact with the reservoir with the objective of improving oil and gas flow in the reservoir.

6. If natural gas will be used, include the BTU. Note: The COGCC assumes the injected gas will be low BTU, "dry" gas.

a. NA

7. Estimate the volume of gas or water that will be injected.

a. Planned volume of ~3,530 bbls.

8. Report the pre-blanket wellhead pressure, i.e. what is the Pressure Blanket well's initial shut-in pressure before injection commences?

a. 1200

9. Provide the planned injection pressure. The pressure is to be less than the fracture extension pressure and can be near or slightly above reservoir pore pressure.

a. The surface pressure is dependent upon flow rate and friction loss in the tubulars. The surface pressure will be maintained such that frac gradient of 0.83 psi/ft in not eclipsed. Expected surface pressure are 1500-2500psi based on prior jobs. Exceeding 4000 psi is not expected at maximum injection rates. The Hazen-Williams correlation was used to estimate friction loss in the tubulars for varying rates to dictate maximum allowed surface pressure while keeping formation pressure below fracture pressure. See table and chart below for a summary of those calculations:

<b>Blue Chip 22-10HZ</b>	
<b>EOT MD</b>	8116
<b>Top Perf MD</b>	8695
<b>Top Perf TVD</b>	6934
<b>Allowable Gradient</b>	0.83
<b>Fluid Gradient</b>	<b>0.433</b>
<b>Roughness Coeff</b>	<b>110</b>
<b>Csg ID</b>	<b>4.892</b>
<b>Tbg OD</b>	<b>2.375</b>
<b>Equiv. Diameter</b>	<b>4.277</b>

<b>Rate (BPM)</b>	<b>Max Surf Pressure</b>
0.00	2752.8
1.00	2758.2
2.00	2772.3
3.00	2794.1
4.00	2823.1
5.00	2859.0
6.00	2901.7
7.00	2950.8
8.00	3006.2
9.00	3068.0
10.00	3135.8
11.00	3209.6
12.00	3289.4
13.00	3375.1
14.00	3466.5
15.00	3563.7

10. Describe the withdrawal process, including the major pieces of equipment to be used.

a. After injection is complete, the combined pad of five wells will be placed on production using the existing plunger lift as well as permanent gas lift equipment.

