30-045-28653

AGUA MOSS, LLC

TEST PLAN FOR PRESSURE FALL-OFF TEST (FOT)

Well Information						
Well:	Sunco D	isposal 1	Field:	Mesaverde SWD		
Locations	1595' fnl &1005' fwl S2, T29N, R12W San Juan Co. New Mexico		Elevations:	5859' GL 5872' RKB		
Location:			Depths:	4706' KB PBTD 4760' KB TD		
			Engineer:	J. Ryan Davis (505.324.5335)		
API;	30-045-28653		Date:	December 11, 2013		
Surface Casing:	8- 5/8" @ 209' KB w/ 150sx; Circ to surface		Production Casing:	5-1/2" @ 4750' KB w/ 230 sx stage 1, 515 sx stage 2, circ 25 sx to surf, DV tool @ 2244' KB		
Tubulars:	2-7/8" 6.5# EUE (Plastic Coated) @ 4282' KB		Packer:	Arrow XL-W retrievable seal bore @ 4282' KB		
Perforations (MV) 4350-4460' KB 2 s			spf (2000 gals 15	% HCL, Frac w/ 100,000# 20/40		
Additional Perforations						
Perforations (MV) None						

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Version 2 (updated 12/10/2013) – Procedure subject to change based on changing well conditions. DIST. 3

Proposed Test Schedule:

OIL CONS. DIV. RCVD DEC 17'13

Date	Event	Remarks
Monday, December 16 th 2013	Check conditions, Perform MIT and Begin injection	TD, Fill, Restrictions and hang Gauge
Wednesday, December 18th 2013	End Injection and Begin FOT	Shut-In and monitor
Saturday, December 21st 2013	72 hrs	Could be gauges at this point
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Test Considerations:

V.1 The triplex pump at the facility is capable of maintaining a constant rate of 1440 bpd against the anticipated injection pressures.

V.2 The injection rate of 1440 bpd will be sufficient to produce valid test data. During normal injection at 3000 bpd the surface pressure build up is approx. 700 psi with a mirrored fall off over a three day period.

- V.3 The normal waste liquid will be used during the FOT due to the cost effectiveness and availability.
- V.4 The total volume of fluid needed for the FOT is **3000** bbls.
 - a) A total of 4000 bbls will be onsite prior to starting the injection for the FOT and water will continue to be hauled to facility in the case that more fluid is needed during the injection period.
 b) Lowering the Injection rate will be considered if well conditions merit a change or storage of fluid becomes a constraint.

V.5 The gauges will be RIH and the injection period will be a minimum of 50 hrs to ensure radial flow and stabilization. A total of 15 hrs was calculated using the EPA Region 6 UIC Pressure Falloff Testing Guideline design calculations found on pg A-4. The fall off portion will be a minimum of 72 hrs justified by this being the time frame used on the previous FOT.

V.6 There will be adequate storage capacity for waste water for the duration of the FOT.

V.7 There is one offset well completed in the Point Lookout disposal formation. The McGrath #4 is a class II disposal operated by ConocoPhillips approx 1.25 miles to the north west of the Sunco #1. The last injection on the McGrath #4 was March 2013 and the well is currently shut in with injection activity during the FOT very unlikely.

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V.8 Crown valve is currently in-place on the Sunco #1 wellhead. The gauges will be RIH through a lubricator prior to the injection period.

V.9 A shut-in valve is located on the injection riser approx 3-feet from the wellhead. This valve can be shut quickly to reduce erratic pressure response and minimize the wellbore storage.

V.10 Prior to the FOT a gauge ring will be run through the tubing to ensure no restrictions in the tubing and slickline will also be used to tag up and determine wellbore fill. Test parameters will be adjusted accordingly or the needed the repairs will be made to remedy the situation.

V.11 Surface readout gauges will not be used in the FOT data collection due to cost and the fact Key performed the 2010 FOT with tandem memory down hole gauges with successful data collection. The gauges used will be latest available technology from Teftiller, Inc which will meet or exceed the pressure range, accuracy and resolution requirements. The gauges will be setup on auto resolution capture based on pressure change. Each gauge will be setup with a different auto resolution range to ensure all data in captured accurately.

V.12 A test log will be kept during the test and submitted with the FOT results. The log will include key events with date and times.

- Gauge ring run
- Tag depth
- Gauge activation
- Gauges on bottom
- Injection start
- Injection stop
- Well isolation
- Pressure stabilization
- End of Fall Off

V.13 Surface pressures will be recorded continuously using a chart recorder during the FOT. If any abnormal surface pressure change occurs the test validity will be questioned and the test will be aborted if deemed invalid.
V.14 The memory gauges being used for the FOT have auto resolution capability that changes the resolution based on rate of pressure change. First gauge will be configured to obtain data every 15 seconds and adjust to every one minute. The second gauge will be configured to obtain data every 30 seconds and adjust to every two minutes. Memory capacity is 35 day and 69 days respectfully. The minimum 15 second resolution was used during the 2010 FOT and proved to be acceptable. The length of the fall off portion is based on the 2010 FOT, 72 hours proved to be adequate.

V.15 The tri-plex injection pump at the facility that is normally used for injection will be used for the FOT. It is a positive displacement pump running at a constant RPM which will ensure constant injection rate during the FOT. A constant injection rate of 1440 bpd will be sufficient to create a 100 psi differential between final injection pressure and shut-in pressure.

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Fall Off Test Procedure:

Prepare Well for Fall Off Test

- 1. Arrange for adequate injection fluid storage
- 2. Accumulate 4000 bbls of produced water
- 3. MIRU wireline
- 4. RIH w/ Gauge ring to SN
- 5. POOH w/ Gauge ring and PU impression block (or something to run thru SN)
- 6. RIH tag and record fill depth
- 7. If no restrictions exist and fill is below the perfs continue on to FOT. Otherwise remediate problem or adjust FOT procedure before continuing.

Conduct Fall Off Test

- 8. POOH pick up pressure gauges
- 9. RIH and hang gauges off @ 4405' KB
- 10. Begin injection, (125 bph) 1440 bwpd, Record time
- 11. Inject for 50 hrs, total of 3000 bbls. Record start and stop time
 - a. Ensure injection pressures have stabilized before proceeding
- 12. S/D injection pump and close valve @ wellhead, Record time
 - a. Once surface pressure stabilizes record start time of fall off
- 13. Record pressure data for 72 hrs, Record start and stop time
- 14. POOH making gradient stops @ 4000', 3000', 2000', 1000' and surface
- 15. Secure well and bleed pressure off lubricator
- 16. R/D wireline
- 17. Put well back into service for normal operation.

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