MERRION OIL & GAS

Ryan Davis <rdavis@merrion.bz>

30-045-28653

Sunco #1 Disposal Well

3 messages

Richard G. Dillon <rgdillon@irt-inc.com> Fri, Jun 23, 2017 at 4:01 PM
To: Ryan Davis <rdavis@merrion.bz>

Ryan,

I have taken a quick look at the estimated pressure response with the possible changes in the rates and times for the Sunco #1 WDW, including running some simple reservoir simulations to try and predict the pressure behavior.

In summary, an injection rate of 3,000 to 3,500 bwpd for 50 or 60 hours (versus, the initial estimate of 4,500 bwpd) will not have a negative effect on the time required to reach the pseudo steady state flow period. In fact the lower rate will result in reaching pseudo steady state flow slightly sooner. Based on the previous year's results, I would still plan on at least 130 hours of SI time like last year, but another 12-24 hours would be beneficial for the analysis.

Each additional hour of injection time requires about 2 to 3 more hours of shut-in time to reach the stabilized flow point.

If there is anything else you need, please let me know.

Richard

Richard G. Dillon

Senior Consultant/Vice President

International Reservoir Technologies, Inc. (IRT)

300 Union Blvd, Suite 400

Lakewood, Colorado 80228

Ph. 303-279-0877 x 15

Fax. 303-279-0936

E-mail: rgdillon@irt-inc.com

www.irt-inc.com

OIL CONS. DIV DIST. 3

JUN 26 2017

Ryan Davis <rdavis@merrion.bz> Fri, Jun 23, 2017 at 4:37 PM
To: Carl Chavez <carlj.chavez@state.nm.us>
Cc: Jeff Davis <jdaguamoss@hotmail.com>, Garye Higgins <aguamossghiggins@hotmail.com>, "rgdillon@irt-inc.com" <rgdillon@irt-inc.com>

Carl,

8

Please see Richard's comments below concerning pump rate and injection period. We had a plan to throttle the little J100 pump to achieve a flow rate of 100 gpm but we have been unsuccessful throttling so we propose to pump at 87.5 gpm (3000 bpd). Based on Richard's analysis we should obtain good data from the FallOff Test with the lower pump rate. We will extended the shutin period by 48 hrs and pull gauges on 07/05/2017.

Please let me know if you have any questions or concerns.

Thanks,

Ryan Davis
Merrion Oil & Gas
505.215.3292

Outlook for iOS

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Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us> Fri, Jun 23, 2017 at 5:01 PM
To: Ryan Davis <rdavis@merrion.bz>
Cc: Jeff Davis <jdaguamoss@hotmail.com>, Garye Higgins <aguamossghiggins@hotmail.com>, "rgdillon@irt-inc.com" <rgdillon@irt-inc.com>, "Griswold, Jim, EMNRD" <Jim.Griswold@state.nm.us>, "Kuehling, Monica, EMNRD" <monica.kuehling@state.nm.us>, "Smith, Cory, EMNRD" <Cory.Smith@state.nm.us>

Ryan:

Ok. Please proceed. Let's try to achieve the Pseudo-Steady State Injection Rate (+/- 10% on pressure gauge as confirmation) before shut-in this year.

Good luck.

Thank you.

Mr. Carl J. Chavez, CHMM (#13099)

New Mexico Oil Conservation Division

Energy Minerals and Natural Resources Department

1220 South St Francis Drive

Santa Fe, New Mexico 87505

Ph. (505) 476-3490

E-mail: CarlJ.Chavez@state.nm.us

"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD **and see "Publications")**

From: Ryan Davis [mailto:rdavis@merrion.bz]
Sent: Friday, June 23, 2017 4:38 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
Cc: Jeff Davis <jdaguamoss@hotmail.com>; Garye Higgins <aguamossghiggins@hotmail.com>; rgdillon@irt-inc.com
Subject: Fwd: Sunco #1 Disposal Well

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AGUA MOSS, LLC

OIL CONS. DIV DIST. 3

JUN 26 2017

TEST PLAN FOR PRESSURE FALL-OFF TEST (FOT)

Well Information			
Well:	Sunco Disposal 1	Field:	Mesaverde SWD
Location:	1595' fnl &1005' fwl S2, T29N, R12W San Juan Co. New Mexico	Elevations:	5859' GL 5872' RKB
		Depths:	4706' KB PBTD 4760' KB TD
		Engineer:	J. Ryan Davis (505.324.5335)
API:	30-045-28653	Date:	June 26, 2017
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 (Epoxy Coated) @ 4282' KB	Packer:	Arrow XL-W retrievable seal bore @ 4282' KB.
Perforations (MV)	4350-4460' KB 2 spf (2000 gals 15% HCL, Frac w/ 100,000# 20/40)		
Additional Perforations			
Perforations (MV)	None		

Version 2 : Lowereed proposed injection rate. Procedure subject to change based on changing well conditions.

Proposed Test Schedule:

Date	Event	Remarks
Monday, June 26th 2017	Check conditions, Perform MIT and Begin injection (50 hrs)	TD, Fill, Restrictions and hang Gauges
Wednesday, June 28th 2017	End Injection and Begin FOT	Shut-In and monitor
Wednesday, July 5th 2017	164 hrs	Could pull gauges at this point

Test Considerations:

V.1 The triplex pump at the facility is capable of maintaining a constant rate of **3000** bpd against the anticipated .injection pressures.

V.2 The injection rate of **3000** bpd (87.5 gpm) will be sufficient to produce valid test data. (For reference: *During normal injection at 3600 bpd (8 hrs) the surface pressure build up is approx. 200 psi with a mirrored fall off over a 8 hr 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 **6250** bbls.

a) A total of 3600 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.

c) City water will be purchased for the FOT if it becomes necessary to make up the volume required for the test.

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 well has been P&A'd, so there will not be any injection activity from offset wells during the FOT.

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 2016 FOT, 120 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 approximately 3000 bpd will be sufficient to create a minimum of 100 psi differential between final injection pressure and shut-in pressure. The rate will be carefully monitored prior to shut down to ensure a steady state injection is maintained prior to beginning the fall-off portion of the test.

Fall Off Test Procedure:

Prepare Well for Fall Off Test

1. Arrange for adequate injection fluid storage
2. Accumulate 3000 bbls of produced water
3. Perform MIT
4. MIRU wireline
5. RIH w/ Gauge ring to SN
6. POOH w/ Gauge ring and PU impression block (or something to run thru SN)
7. RIH tag and record fill depth
8. 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

9. POOH pick up pressure gauges
10. RIH and hang gauges off @ 4405' KB
11. Begin injection, (125 bph) 3000 bwpd, Record time
12. Inject for 50 hrs, total of 6250 bbls. Record start and stop time
    a. Ensure injection pressures have stabilized before proceeding
13. S/D injection pump and close valve @ wellhead, Record time
    a. Once surface pressure stabilizes record start time of fall off
14. Record pressure data for 164 hrs, Record start and stop time
15. POOH making gradient stops @ 4000', 3000', 2000', 1000' and surface
16. Secure well and bleed pressure off lubricator
17. R/D wireline
18. Put well back into service for normal operation.