UIC - I - ___8___

C-103s

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, September 4, 2018 1:29 PM
To: 'Dade, Lewis (Randy)'; Newton, Kevin; Acosta, Jesus; Larry K. McDonald (larry.mcdonald@wsp.com)
Subject: RE: C-103 for Mewbourne WDW-1 Fall Off Test
Attachments: OCD WDW-1 FOT C-103 Approval 9-4-2018.pdf

Randy, et al.:

Please find attached the OCD approval and conditions.

Please contact me if you have questions. 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: Dade, Lewis (Randy) <Lewis.Dade@HollyFrontier.com>
Sent: Tuesday, September 4, 2018 1:06 PM
To: Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>; Newton, Kevin <Kevin.Newton@HollyFrontier.com>; Acosta, Jesus <Jesus.Acosta@HollyFrontier.com>; Larry K. McDonald (larry.mcdonald@wsp.com) <larry.mcdonald@wsp.com>
Cc: Dade, Lewis (Randy) <Lewis.Dade@HollyFrontier.com>
Subject: C-103 for Mewbourne WDW-1 Fall Off Test

Carl,
Please find attached the C-103 for the Mewbourne WDW-1; (30-015-27592) Fall off test. We are looking to start the fall off test on September 21st, 2018. If you have any comments or questions, please feel free to contact me. Thanks, Randy.

Dade, Lewis (RANDY)
HF Navajo Ref LLC
Environmental Specialist IV
Environmental - Artesia
(575) 746-5281 Work
(575) 703-4735 Mobile
Lewis.Dade@HollyFrontier.com
501 E. MAIN
ARTESIA, NM. 88210

Submit 1 Copy To Appropriate District Office
District I – (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II – (575) 748-1283
811 S. First St., Artesia, NM 88210
District III – (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV – (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised July 18, 2013

WELL API NO.
30-015-27592

5. Indicate Type of Lease
STATE ☒ FEE ☐

6. State Oil & Gas Lease No.
B-2071-28

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name

1. Type of Well: Oil Well ☐ Gas Well ☒ Other: INJECTION WELL

8. Well Number: MEWBOURNE WDW-1

2. Name of Operator
HollyFrontier Navajo Refining LLC.

9. OGRID Number: 15694

3. Address of Operator
P.O. Box 159, Artesia, NM. 88210

10. Pool name or Wildcat:
NAVAJO PERMO-PENN 96918

4. Well Location
Unit Letter: O : 660 feet from the SOUTH line and 2210 feet from the EAST line
Section: 31 Township: 17S Range: 28E NMPM County: EDDY

11. Elevation *(Show whether DR, RKB, RT, GR, etc.)*
3678' GL

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	P AND A	☐
PULL OR ALTER CASING	☐	MULTIPLE COMPL	☐	CASING/CEMENT JOB	☐		
DOWNHOLE COMMINGLE	☐						
CLOSED-LOOP SYSTEM	☐			OTHER:			☐
OTHER: Perform Fall Off Test	☒						

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

SEPT,2018; Day 1; Install bottomhole gauge into Mewbourne WDW-1 . Continue Injection into all three (3) wells.
SEPT,2018: Day 2; Continue normal Injection into all three (3) wells.
SEPT,2018: Day 3 : A constant Injection Rate will be estabilished in WDW-2 and WDW-3. A constant injection rate will be established in the Mewbourne WDW-1 at 160 gpm and continue for a 30 hour injection period. Wellhead pressure will not exceed 1400 psig. Plant personnel will record rate, volume, and pressure during this 30 hours for all wells to confirm that a constant pre-falloff injection rate is maintained. Samples of the injection fluid will be collected every 10 hours and analyzed for ph and specific gravity.
SEPT,2018: Day 4: Mewbourne WDW-1 will be shut in for a 30-hour falloff period. WDW-2 and WDW-3 will continue constant injection rates of 160 gpm.
SEPT, 2018: Day 5: Mewbourne WDW-1 will continue to be shut in while monitoring falloff pressure.
SEPT,2018: Day 6: Acquire downhole pressure guage from Mewbourne WDW-1. Tag bottom of fill and come out of hole very slowly, making 7-minute gradient stops every 1000 feet (7000 ft, 6000 ft,5000 ft, 4000 ft, 3000 ft, 2000 ft, 1000 ft, surface). Well turned back over to Navajo.

Spud Date: Rig Release Date:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Lewis R. Dade TITLE: Env. Specialist DATE: 9/4/2018

Type or print name: Lewis R. Dade E-mail address: Lewis.Dade@hollyfrontier.com PHONE: 575-746-5281

For State Use Only

APPROVED BY: Carl J. Chavez TITLE Environmental Engineer DATE 9/4/2018
Conditions of Approval (if any):

- Follow Fall-off Test plan WDW-1

Submit 1 Copy To Appropriate District Office
District I – (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II – (575) 748-1283
811 S. First St., Artesia, NM 88210
District III – (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV – (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised July 18, 2013

WELL API NO. 30-015-27592	
5. Indicate Type of Lease STATE ☐ FEE ☐	
6. State Oil & Gas Lease No. B-2071-28	
SUNDRY NOTICES AND REPORTS ON WELLS (DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.) 1. Type of Well: Oil Well ☐ Gas Well ☐ Other	7. Lease Name or Unit Agreement Name MEWBOURNE WDW - 1
	8. Well Number: WDW-1
2. Name of Operator HollyFrontier Navajo Refining LLC	9. OGRID Number: 15694
3. Address of Operator P O BOX 159, ARTESIA, NM. 88201	10. Pool name or Wildcat PENN 96918
4. Well Location Unit Letter O : 660 feet from the SOUTH line and 2210 feet from the EAST line Section 31 Township 17S Range 28E NMPM County: EDDY	
	11. Elevation *(Show whether DR, RKB, RT, GR, etc.)* 3678' GL

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	X	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	P AND A	☐
PULL OR ALTER CASING	☐	MULTIPLE COMPL	☐	CASING/CEMENT JOB	☐		
DOWNHOLE COMMINGLE	☐						
CLOSED-LOOP SYSTEM	☐						
OTHER:	☐			OTHER:	☐		

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

On January 8, 2018, WDW-1 experienced an increase of annulus fluid and pressure from the well.

(1) Feb. 23, 2018: Move in/rig up.
(2) Kill fluid consisting of a 10.8 ppg calcium chloride brine mixture was pumped down the annulus and through the tubing to kill the well (almost 1100 psig shut-in wellhead pressure).
(3) The Model 1X packer and 4-1/2" tubing was removed from the well.
(4) A 7" casing scraper was run into the well and a casing inspection log (Micro Vertilog) was conducted.
(5) The casing inspection log found an anomaly in the 7-inch casing (0.19" wall thickness) just below ground. The top 6' of the 7" casing was replaced with a new collar of 7" casing and welded in place.
(6) A bridge plug was set in the well at 7,900 ft KB and a successful pressure test on the 7" casing was conducted to 1650 psig for 12 hours.
(7) A Weatherford Arrowset 1X injection packer was run into the well and set at 7,869 ft KB.
(8) A new string of 4-1/2" 11.6 lb/ft, L-80 LTC tubing was run into the well.
(9) The annulus was pressured up to 1000 psig for 30 minutes and tested successfully.
(10) On March 7, NM OCD representative Richard Inge witnessed the successful MIT (annulus pressure test).
(11) Well was put back into service on March 8, 2018.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

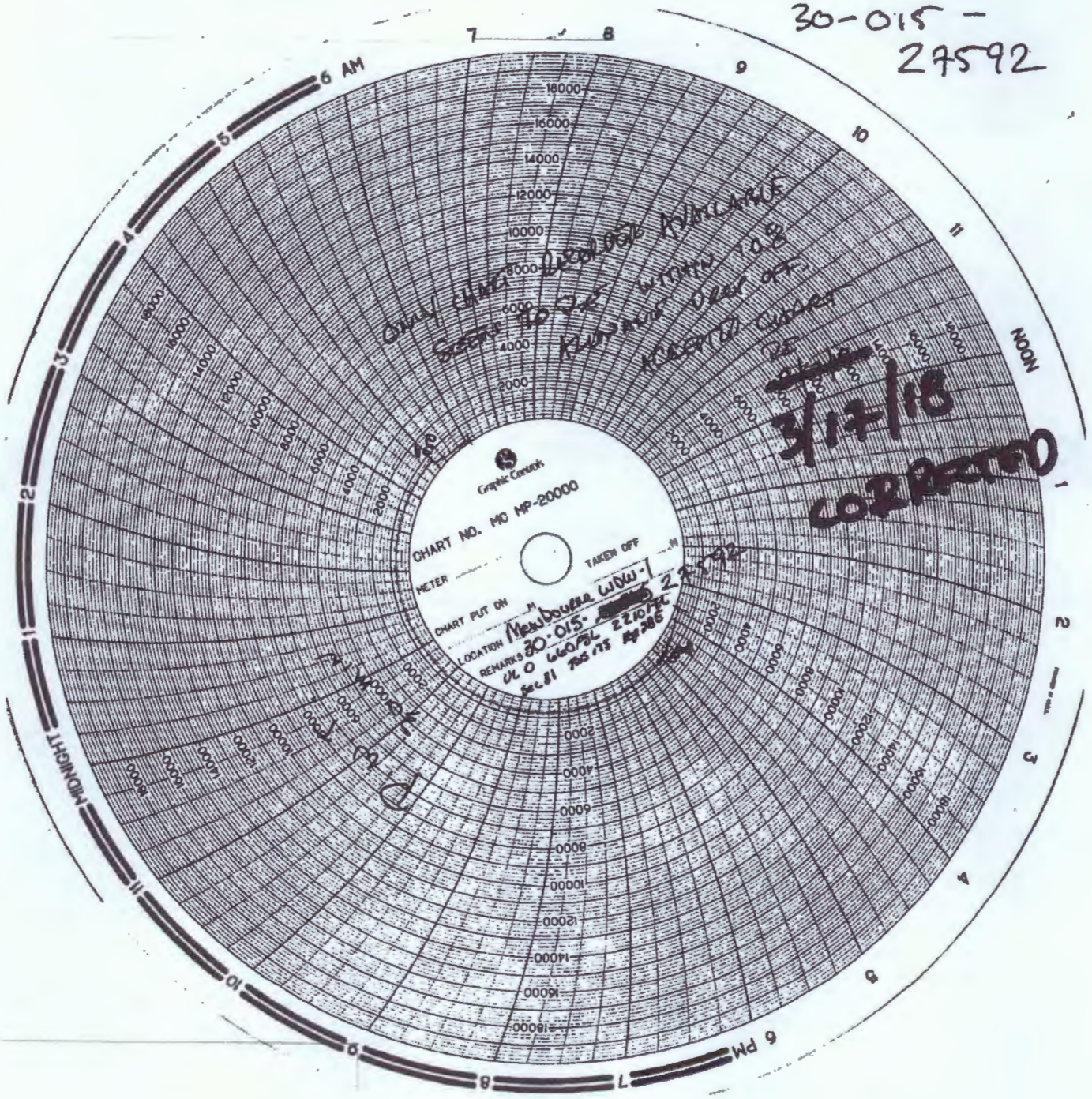
SIGNATURE [signature] TITLE Environmental Manager DATE 3/28/18

Type or print name Scott M. Deaton E-mail address: Scott.Deaton@HollyFrontier.com PHONE: 575-746-5487

For State Use Only

APPROVED BY: [signature] TITLE Environmental Engineer DATE 3/28/2018

Conditions of Approval (if any):


30-015-
27592
6 AM
NOON
MIDNIGHT
6 PM
Graphic Controls
CHART NO. MP-20000
METER
TAKEN OFF
CHART PUT ON
LOCATION
REMARKS
sec 11
3/1-18
CORRECTED

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, November 04, 2011 4:23 PM
To: 'Timothy Jones'
Cc: Dade, Randy, EMNRD; Moore, Darrell (Darrell.Moore@hollyfrontier.com); Glen.Rhodes@hollyfrontier.com; glen.rhodes@grandecom.net; Ken Davis; Rusty Smith; Sanchez, Daniel J., EMNRD
Subject: RE: Response to OCD Comments And Signed C-103 Form
Attachments: C-103 Approval w Conditions 11-4-2011.pdf

Tim, et al.:

Please find attached the OCD approval of your C-103 with conditions.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/
"Why not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward with the Rest of the Nation?" To see how, go to "Pollution Prevention & Waste Minimization" at:
http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental)

From: Timothy Jones [mailto:tjones@subsurfacegroup.com]
Sent: Friday, November 04, 2011 8:49 AM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; Moore, Darrell (Darrell.Moore@hollyfrontier.com); Glen.Rhodes@hollyfrontier.com; glen.rhodes@grandecom.net; Ken Davis; Rusty Smith
Subject: FW: Response to OCD Comments And Signed C-103 Form

Carl,

Please find Subsurface' response to the OCD Comments about the Test Plan as well as a C-103 Form for the testing to be done on WDW-1 next week.
Also attached is a procedure for the testing of WDW-1. Testing will commence on Tuesday, November 8th.

Thanks,

Tim Jones
Project Engineer
Subsurface Group
6925 Portwest Drive Suite 110
Houston, TX 77024
O: (713) 880-4640
C: (713) 560-4905
Email 1: tjones@subsurfacegroup.com
Email 2: timothyjones23@gmail.com

From: Moore, Darrell [mailto:Darrell.Moore@hollyfrontier.com]
Sent: Friday, November 04, 2011 9:43 AM
To: Timothy Jones
Cc: Ken Davis; TW Cook; T Walter Cook; Rusty Smith; Wayne Landon; Larry McDonald
Subject: RE: Response to OCD Comments And Signed C-103 Form

Yes...forward this to them Tim

From: Timothy Jones [mailto:tjones@subsurfacegroup.com]
Sent: Thursday, November 03, 2011 10:38 AM
To: Moore, Darrell
Cc: Ken Davis; TW Cook; T Walter Cook; Rusty Smith; Wayne Landon; Larry McDonald
Subject: Response to OCD Comments And Signed C-103 Form

Darrell,

Please find attached Subsurface' response to the OCD Comments with Exhibit I and Table I as auxiliary documents. In addition, a signed C-103 Form is attached.
Would you like Subsurface to forward this information to Carl and Randy with the OCD or have Subsurface send these documents to them?

Thanks,

Tim Jones
Project Engineer
Subsurface Group
6925 Portwest Drive Suite 110
Houston, TX 77024
O: (713) 880-4640
C: (713) 560-4905
Email 1: tjones@subsurfacegroup.com
Email 2: timothyjones23@gmail.com

Submit 1 Copy To Appropriate District Office
District I – (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II – (575) 748-1283
811 S. First St., Artesia, NM 88210
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1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised August 1, 2011

WELL API NO. 30-015-~~26592~~ 27592 OCC 11/4/2011	
5. Indicate Type of Lease STATE ☒ FEE ☐	
6. State Oil & Gas Lease No. **B-2071-28**	
SUNDRY NOTICES AND REPORTS ON WELLS (DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)	7. Lease Name or Unit Agreement Name **Mewbourne WDW-1**
1. Type of Well: Oil Well ☐ Gas Well ☐ Other **Injection Well**	8. Well Number **WDW-1**
2. Name of Operator **Navajo Refining Company**	9. OGRID Number
3. Address of Operator **Post Office Box 159, Artesia, New Mexico 88211**	10. Pool name or Wildcat: **Navajo Permo-Penn 96918**
4. Well Location Unit Letter **O** : **660** feet from the **South** line and **2210** feet from the **East** line Section **31** Township **17S** Range **28E** NMPM County **Eddy**	
11. Elevation *(Show whether DR, RKB, RT, GR, etc.)* **3678' GL**	

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK ☐	PLUG AND ABANDON ☐	REMEDIAL WORK ☐	ALTERING CASING ☐
TEMPORARILY ABANDON ☐	CHANGE PLANS ☐	COMMENCE DRILLING OPNS. ☐	P AND A ☐
PULL OR ALTER CASING ☐	MULTIPLE COMPL ☐	CASING/CEMENT JOB ☐	
DOWNHOLE COMMINGLE ☐			
OTHER: **PERFORM PRESSURE FALLOFF TEST** ☒		OTHER:	☐

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

November 8, 2011 –Install bottomhole gauges into WDW-1, WDW-2, and WDW-3 by 11:45am. Continue injection into all three wells.
November 9, 2011 – Continue injection into all three wells.
November 10, 2011 – At 12:15pm, the offset wells WDW-2 and WDW-3 will be shut-in. A constant injection rate will be established for WDW-1 and continue for a 30 hour injection period. Do not exceed 1000 psig wellhead pressure.
November 11, 2011 – At 7:00pm, WDW-1 will be shut in for a 30-hour falloff period. WDW-2 and WDW-3 will remain shut-in.
November 12, 2011 – All three wells will continue to be shut in while monitoring falloff pressure in all three wells.
November 13, 2011 – At 7:00am, acquire downhole pressure gauges from all three wells. Tag bottom of fill and come out of hole very slowly, making 7-minute gradient stops while coming out of WDW-1 every 1000 feet (7000 ft, 6000 ft, 5000 ft, 4000 ft, 3000 ft, 2000 ft, 1000 ft, surface). Run in hole with a temperature tool and conduct temperature survey from the surface to the top of the fill. Turn the wells back to Navajo personnel.

Spud Date: | Rig Release Date:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Timothy Jones TITLE Project Engineer DATE 11/3/2011

Type or print name Timothy Jones E-mail address: tjones@subsurfacegroup.com PHONE: (713) 560-4905

For State Use Only

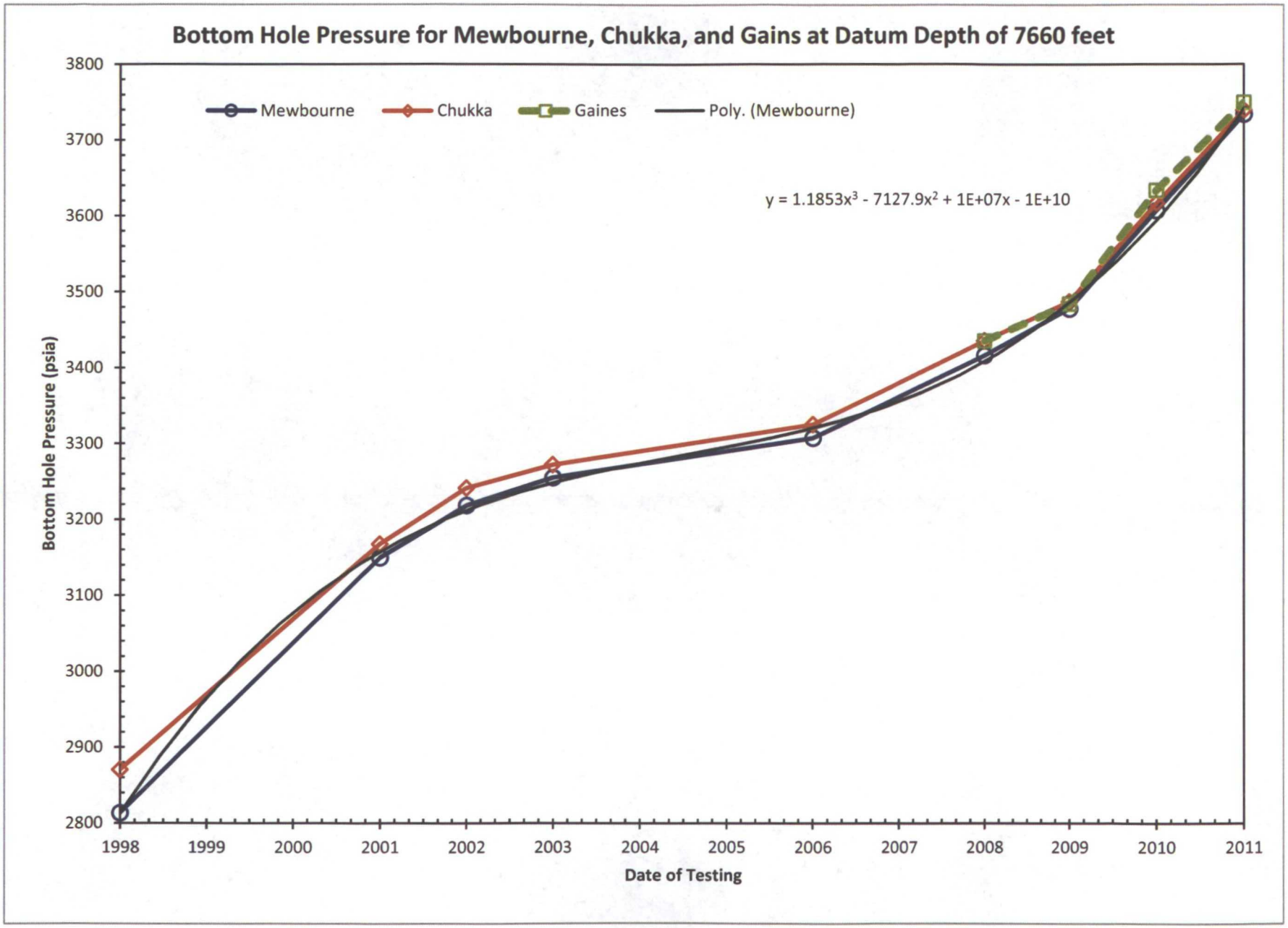
APPROVED BY: Carl Chavez TITLE Environmental Engineer DATE 11/4/2011

Conditions of Approval (if any):

- Fall-off tests to be run at each UIC1 – class I (NH) well.
- Issue of injection well interconnection w/ injection zone and future Fall-off Test schedule to be resolved at a later date based on the preferred tests for demonstrating inter-connection between injection well(s) and injection zone.

Navajo BHP Comparison

	WDW-1			WDW-2			WDW-3		
Year Test was Performed	BHP	depth	Calculated BHP @ 7660	BHP	depth	Calculated BHP @ 7660	BHP	depth	Calculated BHP @ 7660
1998	2928	7924	2814	2940	7820	2871	-	-	-
2001	3264	7924	3150	3237	7820	3168	-	-	-
2002	3333	7924	3219	3311	7820	3242	-	-	-
2003	3370	7924	3256	3342	7820	3273	-	-	-
2006	3422	7924	3308	3395	7820	3326	-	-	-
2008	3531	7924	3417	3397	7570	3436	3440	7670	3436
2009	3592	7924	3478	3448	7570	3487	3484	7660	3484
2010	3722	7924	3608	3578	7570	3617	3634	7660	3634
2011	3849	7924	3735	3701	7570	3740	3750	7660	3750


Bottom Hole Pressure for Mewbourne, Chukka, and Gains at Datum Depth of 7660 feet
Mewbourne
Chukka
Gaines
Poly. (Mewbourne)
y = 1.1853x³ - 7127.9x² + 1E+07x - 1E+10
Bottom Hole Pressure (psia)
3800
3700
3600
3500
3400
3300
3200
3100
3000
2900
2800
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date of Testing

Subsurface Response to OCD Concerns about PFO Testing on WDW-1, WDW-2, and WDW-3

Comments

"The OCD approved the original Fall-Off Test (FOT) Plan based on OCD Guidance dated December 3, 2007. There should not be any significant changes to this FOT Plan because it is flexible where needed to allow operators to implement it on each injection well."

The current Fall-Off Test Plan is built upon the approved original FOT from 2007 and any changes made were of a minimal nature.

"OCD likes to be notified to witness the installation of bottom hole gauges and be present at least one hour before injection shut-off and commencement of FOT monitoring."

We will notify the OCD of the installation of bottom hole gauges and when the Mewbourne (WDW-1) and Gaines (WDW-3) wells will be shut-in for the pressure falloff portion of the testing.

"OCD is concerned about the Section VI No. 1(e) WDW-3 Cement Bond Log quality being poor from 900 ft to 1200 ft – especially at the depths: 2662-2160; 4876-5372; 6750-7600 ft. micro annulus scenario"

The temperature survey run during the re-entry and completion of WDW-3 was conducted on October 13, 2006. The temperature survey displayed no anomalies from the surface to 9020 feet. No anomalies were observed at the depth intervals with poor cement bond at 900-1200 feet, 2160-2662 feet, 4876-5372 feet, and 6750-7600 feet.

A review will be undertaken of the WDW-3 temperature survey when it is run in the coming months. Interpretation of the temperature survey will determine if there is any upward migration of fluid which could be caused by any of these poor cement bond intervals.

Observations

"Section V No.2: The objective of the FOT is NOT to achieve or limit a 100 psig pressure differential before vs. after FOT injection vs. shut-off, but it is a minimum pressure differential that OCD stipulates in its guidance for a successful FOT and injection zone that may still continue to be utilized for disposal, i.e., not too pressured up and subject to continued fracturing under daily allowed maximum surface injection pressure operational limits."

Section V No.2 of the Fall-Off Test Plan will be revised to include the above information. The 100 psig pressure differential before versus after FOT injection versus shut-off is a minimum pressure differential that OCD stipulates in its guidance for a successful FOT.

"Section V No. 7 and Exhibit 1: OCD observes a bottom hole pressure chart for WDWs 1, 2 and 3 at 7660 feet that the operator presented in the 2010 FOT and again during a May 2011 meeting in Santa Fe, New Mexico to show the interconnection between injection wells and the injection formation. The OCD had commented that there was no explanation or conclusion provided from the Certified PE who conducted and completed the 2010 FOT report that supports the operator's claim that all injection wells are interconnected based on Exhibit 1...."

The conclusion provided by Subsurface and certified by a PE is as follows.

Prior to the addition of WDW 3 (Gaines) in 2008; the Mewbourne (WDW-1) and Chukka (WDW-2) wells exhibited a difference in bottomhole pressures (psid) of (57 psid (1998), 18 psid (2001), 23 psid (2002), 17 psid (2003), 18 psid (2006) and 29 psid (2008) at the datum depth of 7660 feet. Beginning in 2009, the differential was reduced; 9 psid (2009), 9 psid (2010) and 5 psid (2011). (Please refer to exhibit 1) While Subsurface reservoir engineers feel that the above indicates that there is communication between the wells; to prove communication, further testing would be necessary.

Interference testing would be conducted on all three wells beginning with the WDW-3. First, a 72 hour shut in of all wells would take place to stabilize them and remove any transient behavior not related to the test. WDW-3 would then be injected into for 4 hours and shut in. The other wells would be monitored to observe the bottom hole pressure reactions. After the 4 hour shut in period, WDW-3 would be injected into again for 4 hours, shut-in, and the other wells' reactions recorded. This procedure would be repeated for each of the other wells also.

Navajo does not presently have sufficient storage to allow diversion of the waste streams for time periods necessary to allow this.

"Exhibit 6: OCD observes in Section B a proposed MIT once every 5 years. OCD's UIC Program requires annual MITs and/or after down hole work is performed on a well."

In the OCD UIC Program Manual, on Page 32 under Section IV. B., it states that:

"Prior to the start of well injection and at least once every five years, each Class I Non-hazardous Waste Disposal Well and each Class III Brine Extraction Well must be tested for mechanical integrity as follows:

(1) For evaluation of leaks,
   (a) Monitoring of annulus pressure (after an initial pressure test with liquid or gas before operation commences), or

(b) Pressure test with liquid or gas

(2) For determination of conduits for fluid movement,

(a) The results of a temperature or noise log, or

(b) Where the nature of the casing used for Class III wells precludes use of these logs, demonstrate the presence of adequate cement to prevent such movement."

Recommendations

"Operator is running survey logs to the bottom of fill or below USDW (fresh water) zones, which excludes an evaluation of casing in the fresh water zone. Please run logs up to surface."

All logs will be run from the surface to the top of the fill. The temperature survey conducted on WDW-2 on October 22, 2011 was run from the surface to the top of the fill.

"Be sure to also record and provide injection flow rate and pressure leading up to shut-off and monitoring throughout the FOT monitoring period. OCD needs to confirm that a pseudo steady-state condition was achieved before shut-off. This data is also needed for software modeling of the FOT."

All injection flow rate and pressure data has been recorded for WDW-2 from the constant injection period through the falloff period after well shut-in. This data should confirm that a pseudo-steady state condition was achieved before shut-in. All of the injection flow rate and pressure data for WDW-1 and WDW-3 will also be recorded as such.

"Please provide electronic data from the FOTs at each well in order for the OCD to run its software model to confirm the results in the report."

Electronic data will be provided on a CD in each FOT report that is submitted to the OCD so that the OCD can confirm the pressure falloff results in their software model.

"Section V No. 13: Surface pressure monitoring and Horner Plot during injection should be used to confirm radial flow condition is achieved instead of waiting a set period if operator wishes to reduce the injection period."

Radial flow condition is achieved during the falloff portion of the test. It was shown that radial flow occurred in WDW-2 in 2010 at approximately 5.6 hours after the well was shut-in. The duration of the 30-hour injection period and subsequent 30-hour shut-in period was set at 30 hours in order to make certain that radial flow would last an appropriate length of time to optimize results.

SUBSURFACE

Procedure for Testing Well #1 (Mewbourne)
November 8, 2011

Monday, November 7, 2011

Travel to Artesia, NM (Tim Jones)

Tuesday, November 8, 2011

1. Install bottom hole memory gauges in all three wells and continue normal injection for 48 hours. Gauges need to be in wells by 11:45 am. Install surface pressure recorder on Mewbourne Well No. 1. Gauges to be set at the top of the perforations in all three wells as follows;

Mewbourne Well No. 1	7924 feet
Chukka Well No. 2	7570 feet
Gaines Well No. 3	7660 feet

Subsurface personnel (Tim Jones) will return to Houston.

Wednesday, November 9, 2011

Continue normal injection into the wells.

Thursday, November 10, 2011

1. At 12:15 pm, Navajo personnel will shut-in offset wells, Chukka Well No. 2 and Gaines Well No. 3, start the 30-hour injection period for Mewbourne Well No. 1. The Chukka Well No. 2 and Gaines Well No. 3 will have to be isolated at the wing valve, MOV, and at the main pipeline valve.
2. Navajo Refining is to maintain a constant injection rate into the Mewbourne Well No. 1 for a minimum of 30 hours prior to shutting in the well. The 30 hours was the agreed upon time interval by the OCD and Navajo in the approved test plan.
3. The rate should be constant during the 30-hour injection period. This might be best accomplished by opening the pipe line and wellhead valves wide open allowing full flow to the well. Record the rate and wellhead pressure in the control room on a minimum of 15 second intervals during the injection period. Do not exceed 1000 psig wellhead pressure.
4. Plant personnel will record rate, volume, and pressure during the injection period for all wells to confirm that a constant pre-falloff injection rate is maintained.
5. Collect a grab sample of the injection fluid every 10 hours; analyze the fluid for pH and Specific Gravity.

SUBSURFACE

Friday, November 11, 2011

6. At 7:00 pm, Navajo personnel will shut in Mewbourne Well No. 1 for the 30-hour falloff period. Chukka Well No. 2 and Gaines Well No. 3 will remain shut-in during the 30-hour falloff period. The Mewbourne No. 2 will need to be isolated at the wing valve, MOV, and at the main pipeline valve.

Saturday, November 12, 2011

7. Leave all three wells shut in and continue to monitor falloff pressures in all three wells. Subsurface personnel (Tim Jones) to return to site.

Sunday, November 13, 2011

8. At 7:00 am, acquire downhole pressure memory gauges from all three wells.
9. Tag bottom of fill and come out of hole very slowly (no faster than 30 feet per minute), making 7-minute gradient stops while coming out of Mewbourne Well No. 1 every 1000 feet (7000 feet, 6000 feet, 5000 feet, 4000 feet, 3000 ft., 2000 feet, 1000 feet, Surface).
10. Run in hole with the temperature tool from the surface to the top of fill. Remove the temperature tool.
11. Turn well over to Navajo personnel. Subsurface personnel (Tim Jones) to return to Houston, TX.