

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.***SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		5. Lease Serial No. NMNM0554771
2. Name of Operator BC OPERATING INCORPORATED		6. If Indian, Allottee or Tribe Name
Contact: SARAH PRESLEY E-Mail: SPRESLEY@BCOPERATING.COM		7. If Under Lease Agreement, Name and/or No.
3a. Address 3303 VETERANS AIRPARK LANE SUITE 6101 MIDLAND, TX 79710	3b. Phone No. (include area code) Ph: 432-684-9696	8. Well Name and No. BOOTLEGGER 21 FEDERAL COM 1H
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 16 T20S R29E SESE 240FSL 360FEL		9. API Well No. 30-015-43970-00-X1
		10. Field and Pool or Exploratory Area GETTY
		11. County or Parish, State EDDY COUNTY, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original A PD
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplate horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

BC OPERATING, INC. RESPECTFULLY REQUESTS TO MAKE THE FOLLOWING CHANGES:

-CHANGE THE SURFACE HOLE FROM 24" TO 26"

-CHANGE TVD FROM 8550' TO 8071'

DIRECTIONAL PLAN, SURFACE HOLE AND CEMENT INFORMATION ATTACHED

NM OIL CONSERVATION
ARTESIA DISTRICT

MAY 30 2017

RECEIVED

All previous COA still apply.

14. I hereby certify that the foregoing is true and correct.	
Electronic Submission #376796 verified by the BLM Well Information System For BC OPERATING INCORPORATED, sent to the Carlsbad Committed to AFMSS for processing by TEUNGKU KRUENG on 05/19/2017 (17TMK0021SE)	
Name (Printed/Typed) SARAH PRESLEY	Title REGULATORY ANALYST
Signature (Electronic Submission)	Date 05/19/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By Teungku Muchlis Krueng		Title PETROLEUM ENGINEER		Date MAY 19 2017
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		Office		
Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.				

(Instructions on page 2)

** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED **

HALLIBURTON

Permian Basin, Odessa

Lab Results- Primary

Job Information

Request/Slurry	2378072/1	Rig Name		Date	15/MAY/2017
Submitted By	Laramie Poldrack	Job Type	Surface Casing	Bulk Plant	
Customer	Marathon Oil Co.	Location	Eddy	Well	Bootlegger 21 Fed Com 1H

Well Information

Casing/Liner Size	20 in	Depth MD	400 ft	BHST	83°F
Hole Size	26 in	Depth TVD	400 ft	BHCT	80°F

Cement Information - Tail Design

Conc	UOM	Cement/Additive	Cement Properties		
100	% BWOC	HalCem C	Slurry Density	14.8	lbm/gal
6.51	gal/sack	Fresh Water	Slurry Yield	1.349	ft ³ /sack
1	% BWOC	CaCl ₂ (Calcium Chloride) 94-97 % Salt	Water Requirement	6.507	gal/sack

Pilot Test Results Request ID 2378072/1

API Rheology

Temp (°F)	300	200	100	60	30	6	3	PV/YP
85	60	53	43	39	35	21	15	39.81 / 26.01

Free Fluid API 10B-2

Con. Temp (F)	Cond. Time (min)	Static T. (F)	Static time (min)	Incl. (deg)	% Fluid
85	30	80	120	0	0

Thickening Time - ON-OFF-ON

Test Temp (°F)	Pressure (psi)	Reached in (min)	70 Bc (hh:mm)	Start Bc
82	1125	17	3:24	25

UCA Comp. Strength

End Temp (°F)	Pressure (psi)	50 psi (hh:mm)	500 psi (hh:mm)	8hr CS (psi)	12 hr CS (psi)	24 hr CS (psi)	48 hr CS (psi)	End CS (psi)	End Time (hrs)
80	4000	2:37	11:47	353	507	794	1086	1279	74

This report is the property of Halliburton Energy Services and neither it nor any part thereof, nor a copy thereof, is to be published or disclosed without first securing the expressed written approval of Halliburton. It may however be used in the course of regular business operations by any person or concern receiving such report from Halliburton. This report is for information purposes only and the content is limited to the sample described. Halliburton makes no warranties, expressed or implied, as to the accuracy of the contents or results. Any user of this report agrees Halliburton shall not be liable for any loss or damage regardless of cause, including any act or omission of Halliburton, resulting from the use hereof.

HALLIBURTON

NM OIL CONSERVATION
ARTESIA DISTRICT

MAY 30 2017

RECEIVED

Marathon Oil Co
5555 San Felipe Rd
Houston, Tx., 77056

BOOTLEGGER 21 FEDERAL COM 1H
GETTY
EDDY County, NM, US
API/UWI 30-015-43970-00
SEC: 16,TWP: 20,RNG: 29

Primary Cementing Cost Estimate

Surface, 1st Intermediate, 2nd Intermediate, & Production Lateral
Proposal 242546 - Version 1.0
May 14, 2017

Submitted by:
Andrew Dennis
125 W Missouri Ave
Ste 300
Midland, TX - 797015204
575.631.7224

HALLIBURTON

Contents

1	Foreword	4
2	Surface Casing.....	6
2.1	Job Information Surface Casing.....	6
2.2	Estimated Calculations Surface Casing	7
2.3	Job Volume Estimates Surface Casing	8
2.4	Volume Estimate Table Surface Casing	9
2.5	Cost Estimate	10
2.6	Additional Services	11
3	1st Intermediate	12
3.1	Job Information 1st Intermediate	12
3.2	Estimated Calculations 1st Intermediate	13
3.3	Job Volume Estimates 1st Intermediate	14
3.4	Volume Estimate Table 1st Intermediate	15
3.5	Cost Estimate	16
3.6	Additional Services	17
4	2nd Intermediate - Single Stage	18
4.1	Job Information 2nd Intermediate - Single Stage	18
4.2	Estimated Calculations 2nd Intermediate - Single Stage	19
4.3	Job Volume Estimates 2nd Intermediate - Single Stage	20
4.4	Volume Estimate Table 2nd Intermediate - Single Stage	21
4.5	Cost Estimate	22
4.6	Additional Services	23
5	2nd Intermediate - 2 Stage	24
5.1	Job Information 2nd Intermediate - 2 Stage.....	24
5.2	Estimated Calculations 2nd Intermediate - 2 Stage	25
5.3	Job Volume Estimates 2nd Intermediate - 2 Stage	27
5.4	Volume Estimate Table 2nd Intermediate - 2 Stage	29
5.5	Cost Estimate	30
5.6	Additional Services	31
6	Production Lateral.....	32
6.1	Job Information Production Lateral	32
6.2	Estimated Calculations Production Lateral.....	33
6.3	Job Volume Estimates Production Lateral.....	34
6.4	Volume Estimate Table Production Lateral.....	35
6.5	Cost Estimate	36
6.6	Additional Services	37
7	Conditions 38	

*Halliburton appreciates the opportunity to present
this cost estimate and looks forward to being of service to you.*

1 Foreword

MIDLAND SALES OFFICE

1-800-844-8451

ODESSA DISTRICT

1-432-571-8600

CEMENTING:

Rene Lopez / Mike Kilgore
Steven Beckworth

STIMULATION:

Quincy Cole / Abraham Esparza / Emily Savage
Chris Yount / Jennifer Suarez / Wade Smith

LOGGING & PERFORATING

Xavier Emiliano / Alvaro Martinez Alvernia

TOOLS & TESTING, PROD. SVCS.,

TCP, COMPL. PRODUCTS

Steve Engleman / Kevin Warren / Jim Simmons
Patrick Corder / Ryan Reynolds

BAROID

Joseph Molina / Danny Von Krosigk
David Lee

HOBBS DISTRICT

1-575-492-5900

CEMENTING

Jaime Gonzales
Rodolfo Alvarado

DRILL BITS

Brian McPhee

SPERRY

Garrett Young

ARTIFICIAL LIFT

Sammy Ramirez

MULTI-CHEM

Jonnifer Applon / Challie Johnson / Eddie Martinez
Monte Mayo / Sarah Wilson

PREPARED BY: Bruce Day

Andrew Dennis, Sr. Account Representative

Cementing Best Practices

1. **Cement quality and weight:** You must choose cement slurry that is designed to solve the problems specific to each string of pipe.
2. **Waiting time:** You must hold the cement slurry in place and under pressure until it hardens. Cement slurry is a time-dependent liquid and must be allowed to undergo a hydration reaction to produce a competent cement sheath. Fresh cement slurry can be worked (thickening or pump time) as long as it is plastic, and the initial set of cement occurs during the rapid reaction stage. If the cement is not allowed to hydrate; it will be subject to changes in density, dilution, settling, water separation, and gas cutting that can lead to lack of zonal isolation with resultant bridging in the annulus.
3. **Pipe movement:** Pipe movement may be one of the single most influential factors in mud removal. Reciprocation and/or rotation mechanically breaks up gelled mud and constantly changes the flow patterns in the annulus for better cement bonding.
4. **Mud properties:** Plastic viscosity (PV) should be less than 15 centipoise (cp), and less than 10 cp, if possible, yield point (YP) should be less than 10 pound/100-square feet (lb/100 ft²) decreasing down to about 5 lb/100 ft².
5. **Mud gel strength:** A nonthixotropic mud is desirable for good mud removal. Mud left in the hole prior to running casing should have 10-second/10-minute/30-minute gel strength such that the 10-minute is less than double the 10-second and the 30-minute is less than 20 lb/100 ft²). Sufficient shear strength may not be achieved on a primary cement job to remove mud left in the hole should the mud develop more than 25 lb/100 ft².
6. **Mud fluid loss:** Decreasing the filtrate loss into a permeable zone enhances the creation of a thin filter cake. This increases the fluid mud in the hole, which is more easily removed. Generally, an API fluid loss of 7 or 8 milliliter (ml) is sufficient with high-temperature/high-pressure fluid loss (HTHP) no more than double this amount.
7. **Circulation:** Circulate bottoms up twice, or until well conditioned mud is being returned to the surface. There should be no cuttings in the mud returns. An annular velocity of 260 feet per minute is optimum (SPE/IADC 18617), if possible.
8. **Flow rate:** Turbulent flow is more desirable flow regime for mud removal. If turbulence cannot be achieved, better mud removal is found when maximum flow energy is used. The maximum pump rate should be determined to obtain the best flow regime.
9. **Hole size:** The optimum hole size recommended for good mud removal is 1.5 to 2 inches larger than the casing or liner size. Hole sizes larger than 2 inches annular space can be dealt with, but those that are smaller than 1.5 inches present difficult problems.
10. **Pipe Centralization:** This helps to create a uniform flow area perpendicular to flow direction. Cement will take the path of least resistance so that centralization is important in keeping the pipe off the walls of the hole. At least a 70 percent standoff should be achieved for centralization.
11. **Rat hole:** When applicable, a weighted viscous pill in the rat hole prevents cement from swapping with lighter weight mud when displacement stops.
12. **Shoe joint:** A shoe joint is recommended on all primary casings and liners. The length of the shoe joint will vary, although the absolute minimum length is one joint of pipe. If conditions exist, such as not running a bottom plug, two joints should be the minimum length.

2 Surface Casing

2.1 Job Information Surface Casing

Job Criticality Status: GREEN

Well Name: BOOTLEGGER 21 FEDERAL COM Well #: 1H

30" Conductor 0 - 90 ft (MD)

Outer Diameter 30 in
Inner Diameter 29 in

26" Hole 90 - 400 ft (MD)

Inner Diameter 26 in
Excess Factor 100 %

Surface Casing 0 - 400 ft (MD)

Outer Diameter 20 in
Inner Diameter 19.124 in
Linear Weight 94 lbm/ft
Casing Grade H-40
Shoe Joint Length 40 ft

Mud Type Fresh Water

2.2 *Estimated Calculations Surface Casing*

Stage 1

CEMENT: (400 ft fill)

$$\begin{aligned} 310 \text{ ft} * 1.5053 \text{ ft}^3/\text{ft} * 100 \% &= 933.31 \text{ ft}^3 \\ 90 \text{ ft} * 2.4053 \text{ ft}^3/\text{ft} * 0 \% &= 216.48 \text{ ft}^3 \\ \text{HalCem}^{\text{TM}} \text{ C} &= 1149.79 \text{ ft}^3 \\ &= 204.8 \text{ bbl} \end{aligned}$$

Shoe Joint Volume: (40 ft fill)

$$\begin{aligned} 40 \text{ ft} * 1.9947 \text{ ft}^3/\text{ft} &= 79.79 \text{ ft}^3 \\ &= 14.2 \text{ bbl} \end{aligned}$$

Tail plus shoe joint

$$\begin{aligned} &= 1229.59 \text{ ft}^3 \\ &= 219 \text{ bbl} \end{aligned}$$

Total Tail

$$= 912.16 \text{ sack}$$

Total Pipe Capacity:

$$\begin{aligned} 90 \text{ ft} * 1.9947 \text{ ft}^3/\text{ft} &= 179.53 \text{ ft}^3 \\ 310 \text{ ft} * 1.9947 \text{ ft}^3/\text{ft} &= 618.37 \text{ ft}^3 \\ &= 142.1 \text{ bbl} \end{aligned}$$

Displacement Volume to Shoe Joint:

$$\begin{aligned} \text{Capacity of Pipe - Shoe Joint} &= 142.1 \text{ bbl} - 14.2 \text{ bbl} \\ &= 127.9 \text{ bbl} \end{aligned}$$

2.3 *Job Volume Estimates* *Surface Casing*

Stage 1

Fluid 1: Spacer Sweep

Gel Spacer w/Red Dye

2.50 lbm/bbl CHEM,FDP-S1050-12, BULK BAG

0.05 lbm/bbl Rhodamine Red Dye No. 2

Fluid Density: 8.4 lbm/gal
Volume: 40 bbl

Fluid 2: Heavy Weight

HALCEM (TM) SYSTEM

1 % Calcium Chloride, Pellet

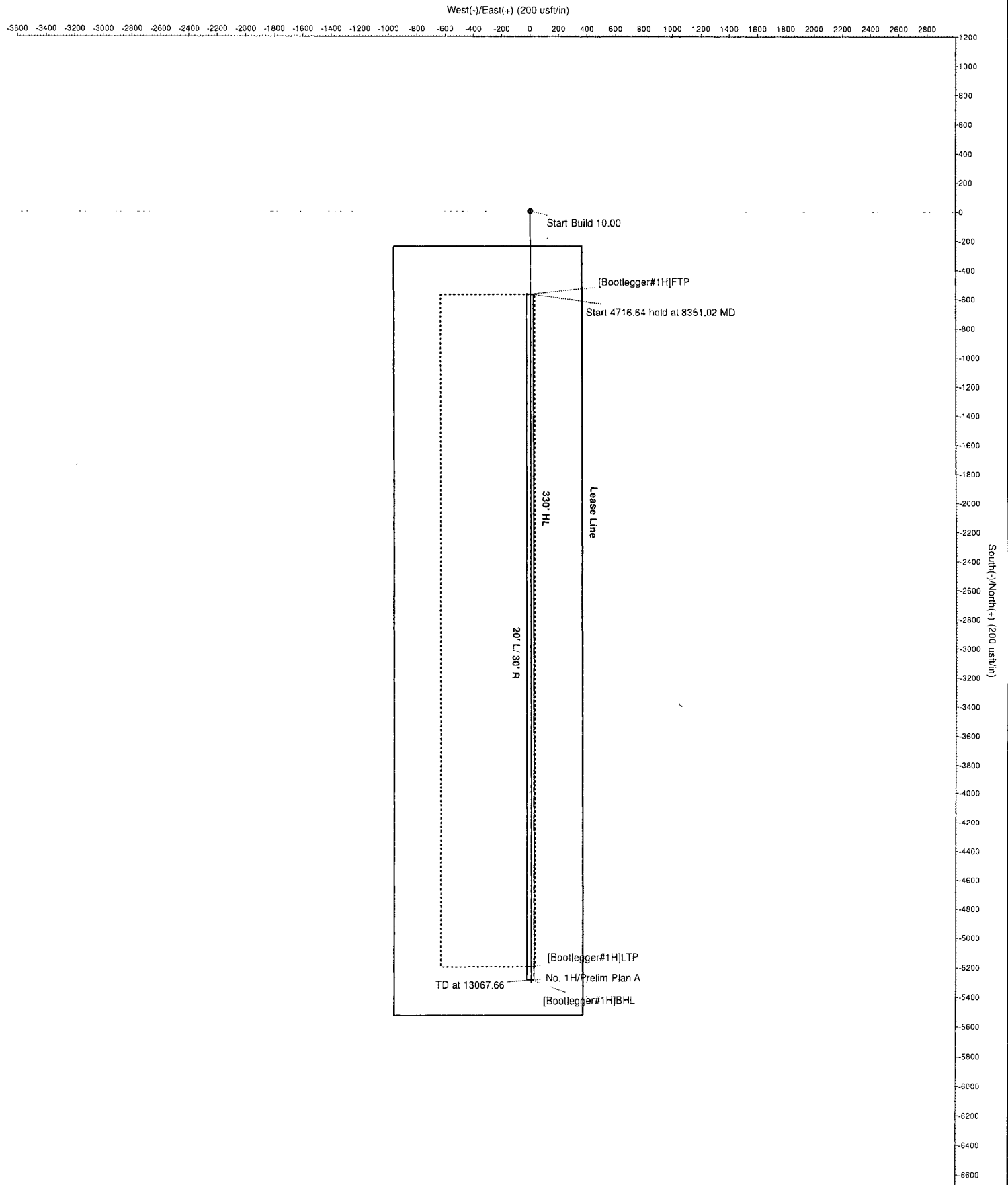
Fluid Weight: 14.8 lbm/gal
Slurry Yield: 1.348 ft3/sack
Total Mixing Fluid: 6.52 Gal/sack
Calculated Volume: 219 bbl
Proposed Volume: 219 bbl
Top Of Fluid: 0 ft
Calculated Fill: 400 ft
Calculated sack: 912.15 sack
Proposed sack: 915 sack

2.4 Volume Estimate Table Surface Casing

Calculations are used for volume estimation. Well conditions will dictate final cement job design.
Stage 1

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate	Downhole Volume
1	SPACER	Gel Spacer w/Red Dye	8.4		40 bbl
2	CEMENT	HalCem™ C	14.8		915 sack

NOTE: These slurries and spacers will require lab testing. The additives and concentrations are estimates based on field experience in the area and may need to be modified prior to the job. The proposed spacer is designed to be generally compatible with water base mud systems. Compatibility testing with field mud samples used may indicate changes in the additive package and the related costs.



Company: Marathon Oil
Project: Eddy County, NM
Site: Bootlegger 21 Fed Com
Well: No. 1H
Wellbore: OH
Design: Prelim Plan A

Local Co-ordinate Reference: Site Bootlegger 21 Fed Com
TVD Reference: Well @ 3309.00usft (GL: 3284' + KB: 25' (H&P498))
MD Reference: Well @ 3309.00usft (GL: 3284' + KB: 25' (H&P498))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Project	Eddy County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site		Bootlegger 21 Fed Com			
Site Position:		Northing:	569,997.10 usft	Latitude:	32° 34' 0.328 N
From:	Map	Easting:	580,471.50 usft	Longitude:	104° 4' 19.648 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.14 °

Well	No. 1H					
Well Position	+N/-S	0.00 usft	Northing:	569,997.10 usft	Latitude:	32° 34' 0.328 N
	+E/-W	0.00 usft	Easting:	580,471.50 usft	Longitude:	104° 4' 19.648 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,284.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	5/12/2017	7.43	60.43	48,244.80

Design	Prelim Plan A				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	179.87	

Survey Tool Program	Date	5/16/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	13,067.66	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1	

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[Bootlegger#1H]LTP - [Bootlegger#1H]FTP									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00

Company: Marathon Oil
Project: Eddy County, NM
Site: Bootlegger 21 Fed Com
Well: No. 1H
Wellbore: OH
Design: Prelim Plan A

Local Co-ordinate Reference: Site Bootlegger 21 Fed Com
TVD Reference: Well @ 3309.00usft (GL: 3284' + KB: 25' (H&P498))
MD Reference: Well @ 3309.00usft (GL: 3284' + KB: 25' (H&P498))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00

Company: Marathon Oil
Project: Eddy County, NM
Site: Bootlegger 21 Fed Com
Well: No. 1H
Wellbore: OH
Design: Prelim Plan A

Local Co-ordinate Reference: Site Bootlegger 21 Fed Com
TVD Reference: Well @ 3309.00usft (GL: 3284' + KB: 25' (H&P498))
MD Reference: Well @ 3309.00usft (GL: 3284' + KB: 25' (H&P498))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00
7,456.02	0.00	0.00	7,456.02	0.00	0.00	0.00	0.00	0.00	0.00
7,500.00	4.40	179.87	7,499.96	-1.69	0.00	1.69	10.00	10.00	0.00
7,550.00	9.40	179.87	7,549.58	-7.69	0.02	7.69	10.00	10.00	0.00
7,600.00	14.40	179.87	7,598.49	-17.99	0.04	17.99	10.00	10.00	0.00
7,650.00	19.40	179.87	7,646.32	-32.52	0.08	32.52	10.00	10.00	0.00
7,700.00	24.40	179.87	7,692.69	-51.16	0.12	51.16	10.00	10.00	0.00
7,750.00	29.40	179.87	7,737.27	-73.78	0.17	73.78	10.00	10.00	0.00
7,800.00	34.40	179.87	7,779.71	-100.19	0.23	100.19	10.00	10.00	0.00
7,850.00	39.40	179.87	7,819.68	-130.20	0.30	130.20	10.00	10.00	0.00
7,900.00	44.40	179.87	7,856.88	-163.58	0.38	163.58	10.00	10.00	0.00
7,950.00	49.40	179.87	7,891.04	-200.07	0.47	200.07	10.00	10.00	0.00
8,000.00	54.40	179.87	7,921.88	-239.41	0.56	239.41	10.00	10.00	0.00
8,050.00	59.40	179.87	7,949.18	-281.28	0.66	281.28	10.00	10.00	0.00
8,100.00	64.40	179.87	7,972.73	-325.37	0.76	325.37	10.00	10.00	0.00
8,150.00	69.40	179.87	7,992.34	-371.34	0.87	371.34	10.00	10.00	0.00
8,200.00	74.40	179.87	8,007.87	-418.85	0.98	418.85	10.00	10.00	0.00
8,250.00	79.40	179.87	8,019.20	-467.54	1.09	467.54	10.00	10.00	0.00



Pro Directional Survey Report



Company: Marathon Oil
Project: Eddy County, NM
Site: Bootlegger 21 Fed Com
Well: No. 1H
Wellbore: OH
Design: Prelim Plan A

Local Co-ordinate Reference: Site Bootlegger 21 Fed Com
TVD Reference: Well @ 3309.00usft (GL: 3284' + KB: 25' (H&P498))
MD Reference: Well @ 3309.00usft (GL: 3284' + KB: 25' (H&P498))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,300.00	84.40	179.87	8,026.25	-517.02	1.21	517.02	10.00	10.00	0.00
8,351.02	89.50	179.87	8,028.96	-567.96	1.33	567.96	10.00	10.00	0.00
8,400.00	89.50	179.87	8,029.39	-616.93	1.44	616.93	0.00	0.00	0.00
8,500.00	89.50	179.87	8,030.26	-716.93	1.68	716.93	0.00	0.00	0.00
8,600.00	89.50	179.87	8,031.13	-816.92	1.91	816.92	0.00	0.00	0.00
8,700.00	89.50	179.87	8,032.01	-916.92	2.15	916.92	0.00	0.00	0.00
8,800.00	89.50	179.87	8,032.88	-1,016.91	2.38	1,016.92	0.00	0.00	0.00
8,900.00	89.50	179.87	8,033.75	-1,116.91	2.61	1,116.91	0.00	0.00	0.00
9,000.00	89.50	179.87	8,034.62	-1,216.91	2.85	1,216.91	0.00	0.00	0.00
9,100.00	89.50	179.87	8,035.50	-1,316.90	3.08	1,316.91	0.00	0.00	0.00
9,200.00	89.50	179.87	8,036.37	-1,416.90	3.32	1,416.90	0.00	0.00	0.00
9,300.00	89.50	179.87	8,037.24	-1,516.89	3.55	1,516.90	0.00	0.00	0.00
9,400.00	89.50	179.87	8,038.11	-1,616.89	3.78	1,616.89	0.00	0.00	0.00
9,500.00	89.50	179.87	8,038.99	-1,716.89	4.02	1,716.89	0.00	0.00	0.00
9,600.00	89.50	179.87	8,039.86	-1,816.88	4.25	1,816.89	0.00	0.00	0.00
9,700.00	89.50	179.87	8,040.73	-1,916.88	4.49	1,916.88	0.00	0.00	0.00
9,800.00	89.50	179.87	8,041.60	-2,016.87	4.72	2,016.88	0.00	0.00	0.00
9,900.00	89.50	179.87	8,042.48	-2,116.87	4.96	2,116.87	0.00	0.00	0.00
10,000.00	89.50	179.87	8,043.35	-2,216.86	5.19	2,216.87	0.00	0.00	0.00
10,100.00	89.50	179.87	8,044.22	-2,316.86	5.42	2,316.87	0.00	0.00	0.00
10,200.00	89.50	179.87	8,045.10	-2,416.86	5.66	2,416.86	0.00	0.00	0.00
10,300.00	89.50	179.87	8,045.97	-2,516.85	5.89	2,516.86	0.00	0.00	0.00
10,400.00	89.50	179.87	8,046.84	-2,616.85	6.13	2,616.86	0.00	0.00	0.00
10,500.00	89.50	179.87	8,047.71	-2,716.84	6.36	2,716.85	0.00	0.00	0.00
10,600.00	89.50	179.87	8,048.59	-2,816.84	6.59	2,816.85	0.00	0.00	0.00
10,700.00	89.50	179.87	8,049.46	-2,916.84	6.83	2,916.84	0.00	0.00	0.00
10,800.00	89.50	179.87	8,050.33	-3,016.83	7.06	3,016.84	0.00	0.00	0.00
10,900.00	89.50	179.87	8,051.20	-3,116.83	7.30	3,116.84	0.00	0.00	0.00
11,000.00	89.50	179.87	8,052.08	-3,216.82	7.53	3,216.83	0.00	0.00	0.00
11,100.00	89.50	179.87	8,052.95	-3,316.82	7.76	3,316.83	0.00	0.00	0.00
11,200.00	89.50	179.87	8,053.82	-3,416.82	8.00	3,416.83	0.00	0.00	0.00
11,300.00	89.50	179.87	8,054.69	-3,516.81	8.23	3,516.82	0.00	0.00	0.00
11,400.00	89.50	179.87	8,055.57	-3,616.81	8.47	3,616.82	0.00	0.00	0.00
11,500.00	89.50	179.87	8,056.44	-3,716.80	8.70	3,716.81	0.00	0.00	0.00
11,600.00	89.50	179.87	8,057.31	-3,816.80	8.93	3,816.81	0.00	0.00	0.00
11,700.00	89.50	179.87	8,058.19	-3,916.80	9.17	3,916.81	0.00	0.00	0.00
11,800.00	89.50	179.87	8,059.06	-4,016.79	9.40	4,016.80	0.00	0.00	0.00
11,900.00	89.50	179.87	8,059.93	-4,116.79	9.64	4,116.80	0.00	0.00	0.00
12,000.00	89.50	179.87	8,060.80	-4,216.78	9.87	4,216.79	0.00	0.00	0.00
12,100.00	89.50	179.87	8,061.68	-4,316.78	10.10	4,316.79	0.00	0.00	0.00
12,200.00	89.50	179.87	8,062.55	-4,416.78	10.34	4,416.79	0.00	0.00	0.00
12,300.00	89.50	179.87	8,063.42	-4,516.77	10.57	4,516.78	0.00	0.00	0.00

Company: Marathon Oil
Project: Eddy County, NM
Site: Bootlegger 21 Fed Com
Well: No. 1H
Wellbore: OH
Design: Prelim Plan A

Local Co-ordinate Reference: Site Bootlegger 21 Fed Com
TVD Reference: Well @ 3309.00usft (GL: 3284' + KB: 25' (H&P498))
MD Reference: Well @ 3309.00usft (GL: 3284' + KB: 25' (H&P498))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,400.00	89.50	179.87	8,064.29	-4,616.77	10.81	4,616.78	0.00	0.00	0.00
12,500.00	89.50	179.87	8,065.17	-4,716.76	11.04	4,716.78	0.00	0.00	0.00
12,600.00	89.50	179.87	8,066.04	-4,816.76	11.28	4,816.77	0.00	0.00	0.00
12,700.00	89.50	179.87	8,066.91	-4,916.75	11.51	4,916.77	0.00	0.00	0.00
12,800.00	89.50	179.87	8,067.78	-5,016.75	11.74	5,016.76	0.00	0.00	0.00
12,900.00	89.50	179.87	8,068.66	-5,116.75	11.98	5,116.76	0.00	0.00	0.00
13,000.00	89.50	179.87	8,069.53	-5,216.74	12.21	5,216.76	0.00	0.00	0.00
13,067.66	89.50	179.87	8,070.12	-5,284.40	12.37	5,284.41	0.00	0.00	0.00

[Bootlegger#1H]BHL

Design Targets

Target Name

- hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
[Bootlegger#1H]LTP - plan misses target center by 5194.42usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	0.00	-5,194.41	12.16	564,802.69	580,483.66	32° 33' 8.925 N	104° 4' 19.654 W
[Bootlegger#1H]FTP - plan misses target center by 569.97usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	0.00	-569.97	1.30	569,427.13	580,472.80	32° 33' 54.687 N	104° 4' 19.649 W
[Bootlegger#1H]BHL - plan hits target center - Rectangle (sides W50.00 H4,716.00 D30.00)	0.50	179.87	8,070.12	-5,284.40	12.37	564,712.70	580,483.87	32° 33' 8.034 N	104° 4' 19.655 W

Checked By: _____ Approved By: _____ Date: _____