

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HOBBS OCD

MAR 12 2018

FORM 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.

RECEIVED

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		8. Well Name and No. DESERT ROSE FEDERAL COM 1H
2. Name of Operator CAZA OPERATING LLC		9. API Well No. 30-025-42972-00-X1
3a. Address 200 NORTH LORRAINE SUITE 1550 MIDLAND, TX 79701		10. Field and Pool or Exploratory Area WC-025 G08 S203517M
3b. Phone No. (include area code) Ph: 505-466-8120		11. County or Parish, State LEA COUNTY, NM
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 17 T20S R35E SWSW 190FSL 467FWL		

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

TYPE OF SUBMISSION	TYPE OF ACTION
☒ Notice of Intent	☐ Acidize
☐ Subsequent Report	☐ Deepen
☐ Final Abandonment Notice	☐ Hydraulic Fracturing
	☐ Production (Start/Resume)
	☐ Reclamation
	☐ Recombine
	☐ Temporarily Abandon
	☐ Water Shut-Off
	☐ Well Integrity
	☒ Other
	Change to Original APD
	☐ Plug and Abandon
	☐ 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 recomple 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 recomple 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.

Will change goal from Wolfcamp to Bone Spring (3rd) and extend lateral. Following changes will result:

- 1) Well name changes to Desert Rose 17-8 Fed Com 1H;
- 2) Pilot hole has been canceled;
- 3) TVD @ BHL will change from 11250' to 11198';
- 4) MD @ BHL will deepen from 15774' to 18808';
- 5) Production lead cement will change from 900 sx (2259 cu. ft) to 1100 sx (2761 cu. ft.);
- 6) Production tail cement will change from 1140 sx (1425 cu. ft) to 1380 sx (1725 cu. ft.);
- 7) See attached C-102, Drill Plan, well bore diagrams, planning report.

Pad has been built. Original APD expires 11-30-17. Extension requested 10-26-17 vis WIS.

14. I hereby certify that the foregoing is true and correct. Electronic Submission #393869 verified by the BLM Well Information System For CAZA OPERATING LLC, sent to the Hobbs Committed to AFMSS for processing by ZOTA STEVENS on 03/08/2018 (18ZS0053SE)	
Name (Printed/Typed) BRIAN WOOD	Title CONSULTANT
Signature (Electronic Submission)	Date 11/02/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By <u>ZOTA STEVENS</u>	Title <u>PETROLEUM ENGINEER</u>	Date <u>03/08/2018</u>
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 Hobbs

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 **

K3

Additional data for EC transaction #393869 that would not fit on the form

32. Additional remarks, continued

This replaces Sundry dated June 3, 2017.

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone (575) 393-6101 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, NM 88210
Phone (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1226 S. St. Francis Dr., Santa Fe, NM 87505
Phone (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised August 1, 2011

Submit one copy to appropriate
District Office

OIL CONSERVATION DIVISION
1226 South St. Francis Dr.
Santa Fe, New Mexico 87505

(Change well name,
dedication, & pool)
X AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-025-42972	Pool Code 24250	Pool Name FEATHERSTONE; BONE SPRING
Property Code	Property Name DESERT ROSE 17-8 FED COM	Well Number 1H
OGRID No. 249099	Operator Name CAZA OPERATING, LLC.	Elevation 3692'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	FEET from the	North/South line	FEET from the	East/West line	County
M	17	20 S	35 E		190	SOUTH	467	WEST	LEA

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	FEET from the	North/South line	FEET from the	East/West line	County
L	8	20 S	35 E		2335	SOUTH	456	WEST	LEA
Dedicated Acres 240	Joint or Infill	Consolidation Code C	Order No.						

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

N: 581217.9
E: 801674.9
(NAD 83)

PROPOSED BOTTOM HOLE LOCATION
Lat - N 32.586842
Long - W 103.486536
NMSPCE- N 578262.0
E 802153.0
(NAD-83)

N: 575927.3
E: 801713.9
(NAD 83)

PENETRATION POINT
330 FSL & 467 FWL
Lat - N 32.566825
Long - W 103.486514
NMSPCE- N 570980.0
E 802218.0
(NAD-83)

SURFACE LOCATION
Lat - N 32.566442
Long - W 103.486514
NMSPCE- N 570840.0
E 802219.0
(NAD-83)

N: 570982.7
E: 807035.4
(NAD 83)

456' B.H.

2335'

7422.6'

90'

467'

PRODUCING AREA

PROJECT AREA

OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Brian Wood 10-24-17

Signature Date

Printed Name
brian@permitswest.com

Email Address

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

SEPTEMBER 26, 2017

Date Surveyed

Signature of Professional Surveyor

Certificate of Professional Surveyor 7977

Scale: 1" = 2000'

WO Num.: 33296

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM 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.*

5. Lease Serial No. SH: NM-132076 BH: NMNM-007484

6. If Indian, Allottee or Tribe Name

N/A

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator CAZA OPERATING, LLC

3a. Address 200 N. LORRAINE, SUITE 1550
MIDLAND TX 79701

3b. Phone No. (include area code)
(432) 682-7424

7. If Unit of CA/Agreement, Name and/or No.

N/A

8. Well Name and No. Desert Rose 17-8 Fed Com 1H

9. API Well No. 30-025-42972

10. Field and Pool or Exploratory Area
FEATHERSTONE; BONE SPRING

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

SHL: 190' FNL & 467' FWL 17-20S-35E BHL: 2335 FSL & 456 FWL 8-20S-35E NMPM

11. Country or Parish, State

LEA 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

☐ Subsequent Report

☐ Final Abandonment Notice

☐ Acidize

☐ Alter Casing

☐ Casing Repair

☐ Change Plans

☐ Convert to Injection

☒ Deepen

☐ Hydraulic Fracturing

☐ New Construction

☐ Plug and Abandon

☐ Plug Back

☐ Production (Start/Resume)

☐ Reclamation

☐ Recomplete

☐ Temporarily Abandon

☐ Water Disposal

☐ Water Shut-Off

☐ Well Integrity

☐ Other

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Pad has been built.

Original APD approval expires 11-30-17 Approval extension requested 10-26-17 via WIS.

This replaces Sundry dated June 3, 2017.

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed)

BRIAN WOOD (505 466-8120)

CONSULTANT

Title

Signature

Date

11/01/2017

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

Date

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

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(Instructions on page 2)

Caza Operating, LLC
Desert Rose Fed Com 17-8 1H
SHL: 190' FSL & 467' FWL Sec. 17
BHL: 2335' FSL & 456' FWL Sec. 8
T. 20 S., R. 35 E., Lea County, NM

DRILL PLAN PAGE 1

30-025-42972

Drilling Program

1. ESTIMATED TOPS

<u>Name</u>	<u>TVD</u>	<u>MD</u>	<u>Content</u>
Quaternary	0'	0'	fresh water
Rustler	1,835'	1,835'	anhydrite
Top salt	2,045'	2,045'	salt
Base salt	3,533'	3,534'	salt
Yates	3,749'	3,750'	oil, gas
Capitan	4,065'	4,066'	brackish water
Delaware	5,822'	5,824'	oil, gas
Cherry Canyon	5,950'	5,952'	oil, gas
Brushy Canyon	6,706'	6,709'	oil, gas
Bone Spring/Glorieta	8,460'	8,463'	---
1st Bone Spring Sandstone	9,745'	9,748'	oil, gas
2nd Bone Spring Sandstone	10,450'	10,453'	oil, gas
(KOP	10,897'	10,900'	oil, gas)
2nd Bone Spring Limestone	10,951'	10,954'	oil, gas
3rd Bone Spring Sandstone	11,418'	11,600'	oil, gas
BHL	11,198'	18,808'	oil, gas

2. NOTABLE ZONES

Water zones will be protected with casing, cement, and weighted mud. Fresh water found while drilling will be recorded. Water was reported at a depth of 600' in a P & A well (30-025-03354) that is 6,354' southeast. Closest water well (CP 00665) is 8,514' southwest. Depth to water is 270'.

Caza Operating, LLC
Desert Rose Fed Com 17-8 1H
SHL: 190' FSL & 467' FWL Sec. 17
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T. 20 S., R. 35 E., Lea County, NM

DRILL PLAN PAGE 2

30-025-42972

3. PRESSURE CONTROL

Will nipple up on 13-3/8" casing with minimum 2M annular BOP which will be tested to 50% of the working pressure. An independent contract tester will test the remainder of the system to 2000 psi.

Will nipple up on 9-5/8" casing with minimum 5M annular and double ram preventers. Annular will be tested to 50% of working pressure. An independent contract tester will test the remainder of the system to 5000 psi.

Pipe rams will be operationally checked each 24-hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. A 2" kill line and minimum 3" choke line will be included in the drilling spool located below the ran-type BOP. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold with 5000 psi working pressure rating.

Auxiliary equipment will include an upper Kelly cock and a full opening stabbing valve.

4. CASING & CEMENT

Casing will be kept full at all times to avoid collapse.

Hole O. D.	Interval (ft MD)	Casing O. D.	Age	lb/ft	Grade	Connection	Collapse Min SF	Burst Min SF	Tension Min SF
17.5"	GL - 1930'	13.375"	New	54.5	J-55	ST&C	1.125	1.125	1.6
12.25"	GL - 3800'	9.625"	New	36	J-55	LT&C	1.125	1.125	1.6
7.875"	GL - 18808'	5.5"	New	17	P-110	LT&C	1.125	1.125	1.6

Caza Operating, LLC
Desert Rose Fed Com 17-8 1H
SHL: 190' FSL & 467' FWL Sec. 17
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T. 20 S., R. 35 E., Lea County, NM

DRILL PLAN PAGE 3

30-025-42972

casing	interval	sacks cement	TOC	pounds per gallon	ft ³ per sack	gallons per sack	total cubic feet	% excess	blend
surface lead	0' - 1930'	890	GL	13.5	1.75	9.08	1557	40	1
surface tail		225		14.8	1.34	6.31	301		2
intermediate lead	0' - 3800'	860	GL	13.5	1.75	9.08	1505	80	3
intermediate tail		210		14.8	1.34	6.31	281		4
production lead	3500' - 18808'	1125	3500'	11.9	2.51	9.08	2823	70	5
production tail		1425		14.4	1.25	5.7	1781		6

Surface Casing:

Centralizers will be installed on each of the first 3 joints.

Blend 1 (lead) will consist of Class C + 4% gel + 2% CaCl₂.

Blend 2 (tail) will consist of Class C + 2% CaCl₂.

Intermediate Casing:

Centralizers will be installed on each of the first 3 joints.

Blend 3 (lead) will consist of Class C + 4% gel + 1% CaCl₂.

Blend 4 (tail) will consist of Class C + 2% CaCl₂.

Production Casing:

Centralizers, suitable for horizontal wells, will be set at least on every other joint through the pay zone.

Blend 5 (lead) will consist of Class H 50/50/10 + 8 pounds salt per sack + 5 pounds per pack coal seal + 0.5% Halad-322 + 0.3% HR-601 + ¼ pound per sack D-Air 500.

Blend 6 (tail) will consist of Class H 50/50/2 + 1% salt + 0.4% gas stop + 0.3% CFR-3 + 0.1% HR601.

Caza Operating, LLC
Desert Rose Fed Com 17-8 1H
SHL: 190' FSL & 467' FWL Sec. 17
BHL: 2335' FSL & 456' FWL Sec. 8
T. 20 S., R. 35 E., Lea County, NM

DRILL PLAN PAGE 4

30-025-42972

5. MUD PROGRAM

A visual and electronic mud monitoring system with a minimum pit volume totalizer, stroke counter, and flow sensor will be rigged up prior to spud. After setting intermediate casing, a third-party gas unit detection system will be installed.

Interval	Type	Weight	Viscosity	Fluid Loss
0' - 1930'	fresh water	8.5	29	no control
1930' - 3800'	brine water	10.0	29	no control
3800' - TD	cut brine	8.6 - 9.2	29	no control

Sufficient mud materials will be kept on location at all times in order to control lost circulation or abnormal pressures. In the event of poor hole conditions, mud properties may have to be adjusted in order to run open hole logs or casing.

6. CORES, TESTS, & LOGS

No core is planned.

Drill stem tests will depend on mud log shows.

A 2-person mud logging unit will be used from 3800' to TD.

Dual laterolog-micro laterolog, gamma ray, compensated neutron - Z density log, and caliper logs will be run from TD to intermediate casing. Compensated neutron and gamma ray logs will be run from TD to surface.

7. DOWN HOLE CONDITIONS

No abnormal pressure or temperature is expected. Maximum expected bottom hole pressure is 5035 psi and expected bottom hole temperature is 160° F.

Caza Operating, LLC
Desert Rose Fed Com 17-8 1H
SHL: 190' FSL & 467' FWL Sec. 17
BHL: 2335' FSL & 456' FWL Sec. 8
T. 20 S., R. 35 E., Lea County, NM

DRILL PLAN PAGE 5

30-025-42972

No H₂S is expected while drilling. Nevertheless, a H₂S safety package will be on site before drilling out of the surface casing until the long string is cemented.

Adequate flare lines will be installed to safely vent gas from the mud gas separator away from the rig to a point at least 150' from the wellhead.

8. OTHER INFORMATION

The anticipated spud date is upon approval. It is expected it will take 3 months to drill and complete the well.

This will be a 3rd Bone Spring completion.



LEA COUNTY, NM (NAD 27 NME)
DESERT ROSE
17-8 FED #1H
FLAN #1
RFL TBD

WELL DETAILS:

Ground Level: 3692.00
+N/-S 0.00 +E/-W 0.00
Northing 570777.40 Easting 761037.70
Latitude 32° 33' 58.745 N Longitude 103° 29' 9.693 W



To convert Magnetic North to Grid, Add 6.24°
To convert True North to Grid, Subtract 0.46°

Azimuths to Grid North
True North -0.46°
Magnetic North 6.24°

Magnetic Field
Strength: 48257.5nT
Dip Angle: 60.57°
Date: 10/4/2017
Model: HDGM

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
BHL(DR17-891)	11199.00	7421.80	-65.80	576199.20	760971.90
FTP(DR17-891)	11454.00	740.00	-1.00	570917.40	761036.70

SITE DETAILS: Desert Rose
Site Centre Northing: 570777.40
Easting: 761037.70

Positional Uncertainty: 0.00
Convergence: 0.46
Local North: Grid

PROJECT DETAILS: Lea County, NM (NAD 27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001

System Datum: Mean Sea Level

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1835.00	1835.00	Rustler
2045.00	2045.00	Top of Salt
3533.00	3533.89	Base of Salt
3749.00	3750.03	Yates
4065.00	4066.22	Capitan
5822.00	5824.29	Delaware
5950.00	5952.37	Cherry Canyon
6706.00	6708.83	Brushy Canyon
8460.00	8463.12	Bone Spring/Glorieta
9745.00	9748.12	1st Bone Spring Sand
10450.00	10453.12	2nd Bone Spring Sand
10951.00	10954.38	2nd Bone Spring Lime
11418.00	11600.12	Top of 3rd Bone Spring Sand

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

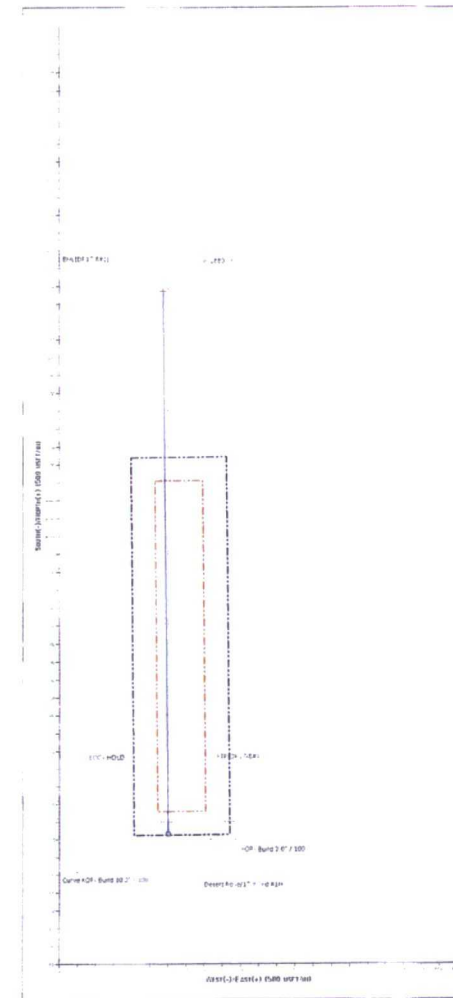
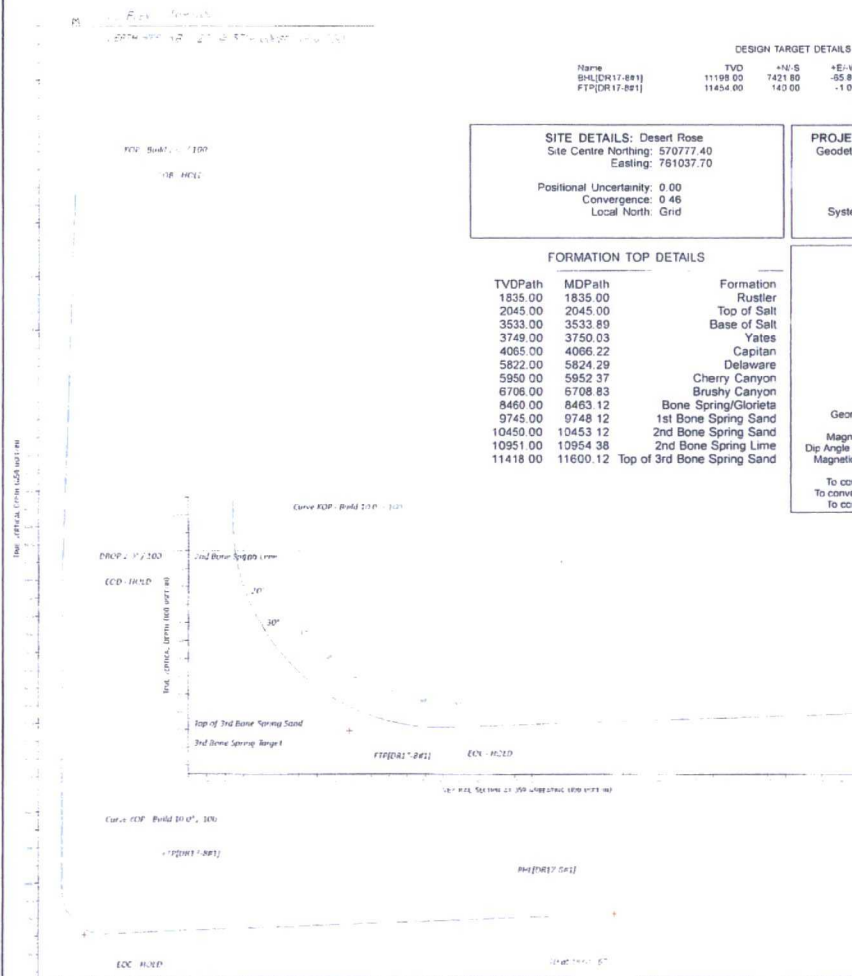
Local Origin: Well 17-8 Fed #1H, Grid North

Latitude: 32° 33' 58.745 N
Longitude: 103° 29' 9.693 W

Grid East: 761037.70
Grid North: 570777.40
Scale Factor: 1.000

Geomagnetic Model: HDGM
Sample Date: 04-Oct-17
Magnetic Declination: 6.70°
Dip Angle from Horizontal: 60.57°
Magnetic Field Strength: 48258

To convert Magnetic North to Grid, Add 6.24°
To convert Magnetic North to True, Add 6.70° East
To convert True North to Grid, Subtract 0.46°



Wellbore Path
True North: 0.46°
Magnetic North: 6.24°
Date: 10/4/2017
Model: HDGM

Planning Report

Database:	Midland District	Local Co-ordinate Reference:	Well 17-8 Fed #1H
Company:	Caza Operating, LLC	TVD Reference:	KB = 27' @ 3719.00usft (Rig TBD)
Project:	Lea County, NM (NAD 27 NME)	MD Reference:	KB = 27' @ 3719.00usft (Rig TBD)
Site:	Desert Rose	North Reference:	Grid
Well:	17-8 Fed #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Project	Lea County, NM (NAD 27 NME)		
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	Desert Rose				
Site Position:		Northing:	570,777.40 usft	Latitude:	32° 33' 58.745 N
From:	Map	Easting:	761,037.70 usft	Longitude:	103° 29' 9.693 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.46 °

Well	17-8 Fed #1H					
Well Position	+N/-S	0.00 usft	Northing:	570,777.40 usft	Latitude:	32° 33' 58.745 N
	+E/-W	0.00 usft	Easting:	761,037.70 usft	Longitude:	103° 29' 9.693 W
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,692.00 usft	

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	HDGM	10/4/2017	6.70	60.57	48,258

Design	Plan #1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(bearing)	
	0.00	0.00	0.00	359.49	

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	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	2.00	179.00	2,099.98	-1.74	0.03	2.00	2.00	0.00	179.00	
7,150.00	2.00	179.00	7,146.90	-177.96	3.11	0.00	0.00	0.00	0.00	
7,250.00	0.00	0.00	7,246.88	-179.71	3.14	2.00	-2.00	0.00	180.00	
10,874.49	0.00	0.00	10,871.37	-179.71	3.14	0.00	0.00	0.00	0.00	
11,794.59	92.01	359.48	11,443.98	413.32	-2.24	10.00	10.00	0.00	359.48	
18,807.67	92.01	359.48	11,198.00	7,421.80	-65.80	0.00	0.00	0.00	0.00	BHL[DR17-8#1]

Planning Report

Database: Midland District
 Company: Caza Operating, LLC
 Project: Lea County, NM (NAD 27 NME)
 Site: Desert Rose
 Well: 17-8 Fed #1H
 Wellbore: OH
 Design: Plan #1

Local Co-ordinate Reference: Well 17-8 Fed #1H
 TVD Reference: KB = 27' @ 3719.00usft (Rig TBD)
 MD Reference: KB = 27' @ 3719.00usft (Rig TBD)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	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
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
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
1,835.00	0.00	0.00	1,835.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
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
KOP - Build 2.0° / 100									
2,045.00	0.90	179.00	2,045.00	-0.35	0.01	-0.35	2.00	2.00	0.00
Top of Salt									
2,100.00	2.00	179.00	2,099.98	-1.74	0.03	-1.75	2.00	2.00	0.00
EOB - HOLD									
2,200.00	2.00	179.00	2,199.92	-5.23	0.09	-5.23	0.00	0.00	0.00
2,300.00	2.00	179.00	2,299.86	-8.72	0.15	-8.72	0.00	0.00	0.00
2,400.00	2.00	179.00	2,399.80	-12.21	0.21	-12.21	0.00	0.00	0.00
2,500.00	2.00	179.00	2,499.74	-15.70	0.27	-15.70	0.00	0.00	0.00
2,600.00	2.00	179.00	2,599.68	-19.19	0.33	-19.19	0.00	0.00	0.00
2,700.00	2.00	179.00	2,699.61	-22.68	0.40	-22.68	0.00	0.00	0.00
2,800.00	2.00	179.00	2,799.55	-26.17	0.46	-26.17	0.00	0.00	0.00
2,900.00	2.00	179.00	2,899.49	-29.66	0.52	-29.66	0.00	0.00	0.00
3,000.00	2.00	179.00	2,999.43	-33.15	0.58	-33.15	0.00	0.00	0.00
3,100.00	2.00	179.00	3,099.37	-36.64	0.64	-36.64	0.00	0.00	0.00
3,200.00	2.00	179.00	3,199.31	-40.13	0.70	-40.13	0.00	0.00	0.00
3,300.00	2.00	179.00	3,299.25	-43.62	0.76	-43.62	0.00	0.00	0.00
3,400.00	2.00	179.00	3,399.19	-47.11	0.82	-47.11	0.00	0.00	0.00
3,500.00	2.00	179.00	3,499.13	-50.60	0.88	-50.60	0.00	0.00	0.00
3,533.89	2.00	179.00	3,533.00	-51.78	0.90	-51.79	0.00	0.00	0.00
Base of Salt									
3,600.00	2.00	179.00	3,599.07	-54.09	0.94	-54.09	0.00	0.00	0.00
3,700.00	2.00	179.00	3,699.01	-57.58	1.00	-57.58	0.00	0.00	0.00
3,750.03	2.00	179.00	3,749.00	-59.32	1.04	-59.33	0.00	0.00	0.00
Yates									
3,800.00	2.00	179.00	3,798.94	-61.06	1.07	-61.07	0.00	0.00	0.00
3,900.00	2.00	179.00	3,898.88	-64.55	1.13	-64.56	0.00	0.00	0.00
4,000.00	2.00	179.00	3,998.82	-68.04	1.19	-68.05	0.00	0.00	0.00
4,066.22	2.00	179.00	4,065.00	-70.35	1.23	-70.36	0.00	0.00	0.00
Capitan									

Planning Report

Database: Midland District
 Company: Caza Operating, LLC
 Project: Lea County, NM (NAD 27 NME)
 Site: Desert Rose
 Well: 17-8 Fed #1H
 Wellbore: OH
 Design: Plan #1

Local Co-ordinate Reference: Well 17-8 Fed #1H
 TVD Reference: KB = 27' @ 3719.00usft (Rig TBD)
 MD Reference: KB = 27' @ 3719.00usft (Rig TBD)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,100.00	2.00	179.00	4,098.76	-71.53	1.25	-71.54	0.00	0.00	0.00
4,200.00	2.00	179.00	4,198.70	-75.02	1.31	-75.03	0.00	0.00	0.00
4,300.00	2.00	179.00	4,298.64	-78.51	1.37	-78.52	0.00	0.00	0.00
4,400.00	2.00	179.00	4,398.58	-82.00	1.43	-82.01	0.00	0.00	0.00
4,500.00	2.00	179.00	4,498.52	-85.49	1.49	-85.50	0.00	0.00	0.00
4,600.00	2.00	179.00	4,598.46	-88.98	1.55	-88.99	0.00	0.00	0.00
4,700.00	2.00	179.00	4,698.40	-92.47	1.61	-92.48	0.00	0.00	0.00
4,800.00	2.00	179.00	4,798.34	-95.96	1.67	-95.97	0.00	0.00	0.00
4,900.00	2.00	179.00	4,898.27	-99.45	1.74	-99.46	0.00	0.00	0.00
5,000.00	2.00	179.00	4,998.21	-102.94	1.80	-102.95	0.00	0.00	0.00
5,100.00	2.00	179.00	5,098.15	-106.43	1.86	-106.44	0.00	0.00	0.00
5,200.00	2.00	179.00	5,198.09	-109.92	1.92	-109.93	0.00	0.00	0.00
5,300.00	2.00	179.00	5,298.03	-113.41	1.98	-113.42	0.00	0.00	0.00
5,400.00	2.00	179.00	5,397.97	-116.90	2.04	-116.91	0.00	0.00	0.00
5,500.00	2.00	179.00	5,497.91	-120.39	2.10	-120.40	0.00	0.00	0.00
5,600.00	2.00	179.00	5,597.85	-123.87	2.16	-123.89	0.00	0.00	0.00
5,700.00	2.00	179.00	5,697.79	-127.36	2.22	-127.38	0.00	0.00	0.00
5,800.00	2.00	179.00	5,797.73	-130.85	2.28	-130.87	0.00	0.00	0.00
5,824.29	2.00	179.00	5,822.00	-131.70	2.30	-131.72	0.00	0.00	0.00
Delaware									
5,900.00	2.00	179.00	5,897.66	-134.34	2.34	-134.36	0.00	0.00	0.00
5,952.37	2.00	179.00	5,950.00	-136.17	2.38	-136.19	0.00	0.00	0.00
Cherry Canyon									
6,000.00	2.00	179.00	5,997.60	-137.83	2.41	-137.85	0.00	0.00	0.00
6,100.00	2.00	179.00	6,097.54	-141.32	2.47	-141.34	0.00	0.00	0.00
6,200.00	2.00	179.00	6,197.48	-144.81	2.53	-144.83	0.00	0.00	0.00
6,300.00	2.00	179.00	6,297.42	-148.30	2.59	-148.32	0.00	0.00	0.00
6,400.00	2.00	179.00	6,397.36	-151.79	2.65	-151.81	0.00	0.00	0.00
6,500.00	2.00	179.00	6,497.30	-155.28	2.71	-155.30	0.00	0.00	0.00
6,600.00	2.00	179.00	6,597.24	-158.77	2.77	-158.79	0.00	0.00	0.00
6,700.00	2.00	179.00	6,697.18	-162.26	2.83	-162.28	0.00	0.00	0.00
6,708.83	2.00	179.00	6,706.00	-162.57	2.84	-162.58	0.00	0.00	0.00
Brushy Canyon									
6,800.00	2.00	179.00	6,797.12	-165.75	2.89	-165.77	0.00	0.00	0.00
6,900.00	2.00	179.00	6,897.06	-169.24	2.95	-169.26	0.00	0.00	0.00
7,000.00	2.00	179.00	6,996.99	-172.73	3.01	-172.75	0.00	0.00	0.00
7,100.00	2.00	179.00	7,096.93	-176.22	3.08	-176.24	0.00	0.00	0.00
7,150.00	2.00	179.00	7,146.90	-177.96	3.11	-177.98	0.00	0.00	0.00
DROP 2.0° / 100									
7,200.00	1.00	179.00	7,196.89	-179.27	3.13	-179.29	2.00	-2.00	0.00
7,250.00	0.00	0.00	7,246.88	-179.71	3.14	-179.73	2.00	-2.00	0.00
EOD - HOLD									
7,300.00	0.00	0.00	7,296.88	-179.71	3.14	-179.73	0.00	0.00	0.00
7,400.00	0.00	0.00	7,396.88	-179.71	3.14	-179.73	0.00	0.00	0.00
7,500.00	0.00	0.00	7,496.88	-179.71	3.14	-179.73	0.00	0.00	0.00
7,600.00	0.00	0.00	7,596.88	-179.71	3.14	-179.73	0.00	0.00	0.00
7,700.00	0.00	0.00	7,696.88	-179.71	3.14	-179.73	0.00	0.00	0.00
7,800.00	0.00	0.00	7,796.88	-179.71	3.14	-179.73	0.00	0.00	0.00
7,900.00	0.00	0.00	7,896.88	-179.71	3.14	-179.73	0.00	0.00	0.00
8,000.00	0.00	0.00	7,996.88	-179.71	3.14	-179.73	0.00	0.00	0.00
8,100.00	0.00	0.00	8,096.88	-179.71	3.14	-179.73	0.00	0.00	0.00
8,200.00	0.00	0.00	8,196.88	-179.71	3.14	-179.73	0.00	0.00	0.00
8,300.00	0.00	0.00	8,296.88	-179.71	3.14	-179.73	0.00	0.00	0.00
8,400.00	0.00	0.00	8,396.88	-179.71	3.14	-179.73	0.00	0.00	0.00

Planning Report

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Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,463.12	0.00	0.00	8,460.00	-179.71	3.14	-179.73	0.00	0.00	0.00
Bone Spring/Glorieta									
8,500.00	0.00	0.00	8,496.88	-179.71	3.14	-179.73	0.00	0.00	0.00
8,600.00	0.00	0.00	8,596.88	-179.71	3.14	-179.73	0.00	0.00	0.00
8,700.00	0.00	0.00	8,696.88	-179.71	3.14	-179.73	0.00	0.00	0.00
8,800.00	0.00	0.00	8,796.88	-179.71	3.14	-179.73	0.00	0.00	0.00
8,900.00	0.00	0.00	8,896.88	-179.71	3.14	-179.73	0.00	0.00	0.00
9,000.00	0.00	0.00	8,996.88	-179.71	3.14	-179.73	0.00	0.00	0.00
9,100.00	0.00	0.00	9,096.88	-179.71	3.14	-179.73	0.00	0.00	0.00
9,200.00	0.00	0.00	9,196.88	-179.71	3.14	-179.73	0.00	0.00	0.00
9,300.00	0.00	0.00	9,296.88	-179.71	3.14	-179.73	0.00	0.00	0.00
9,400.00	0.00	0.00	9,396.88	-179.71	3.14	-179.73	0.00	0.00	0.00
9,500.00	0.00	0.00	9,496.88	-179.71	3.14	-179.73	0.00	0.00	0.00
9,600.00	0.00	0.00	9,596.88	-179.71	3.14	-179.73	0.00	0.00	0.00
9,700.00	0.00	0.00	9,696.88	-179.71	3.14	-179.73	0.00	0.00	0.00
9,748.12	0.00	0.00	9,745.00	-179.71	3.14	-179.73	0.00	0.00	0.00
1st Bone Spring Sand									
9,800.00	0.00	0.00	9,796.88	-179.71	3.14	-179.73	0.00	0.00	0.00
9,900.00	0.00	0.00	9,896.88	-179.71	3.14	-179.73	0.00	0.00	0.00
10,000.00	0.00	0.00	9,996.88	-179.71	3.14	-179.73	0.00	0.00	0.00
10,100.00	0.00	0.00	10,096.88	-179.71	3.14	-179.73	0.00	0.00	0.00
10,200.00	0.00	0.00	10,196.88	-179.71	3.14	-179.73	0.00	0.00	0.00
10,300.00	0.00	0.00	10,296.88	-179.71	3.14	-179.73	0.00	0.00	0.00
10,400.00	0.00	0.00	10,396.88	-179.71	3.14	-179.73	0.00	0.00	0.00
10,453.12	0.00	0.00	10,450.00	-179.71	3.14	-179.73	0.00	0.00	0.00
2nd Bone Spring Sand									
10,500.00	0.00	0.00	10,496.88	-179.71	3.14	-179.73	0.00	0.00	0.00
10,600.00	0.00	0.00	10,596.88	-179.71	3.14	-179.73	0.00	0.00	0.00
10,700.00	0.00	0.00	10,696.88	-179.71	3.14	-179.73	0.00	0.00	0.00
10,800.00	0.00	0.00	10,796.88	-179.71	3.14	-179.73	0.00	0.00	0.00
10,874.49	0.00	0.00	10,871.37	-179.71	3.14	-179.73	0.00	0.00	0.00
Curve KOP - Build 10.0° / 100									
10,900.00	2.55	359.48	10,896.87	-179.14	3.13	-179.16	10.00	10.00	0.00
10,950.00	7.55	359.48	10,946.66	-174.74	3.09	-174.76	10.00	10.00	0.00
10,954.38	7.99	359.48	10,951.00	-174.15	3.09	-174.17	10.00	10.00	0.00
2nd Bone Spring Lime									
11,000.00	12.55	359.48	10,995.88	-166.01	3.01	-166.03	10.00	10.00	0.00
11,050.00	17.55	359.48	11,044.15	-153.03	2.89	-153.05	10.00	10.00	0.00
11,100.00	22.55	359.48	11,091.11	-135.90	2.74	-135.92	10.00	10.00	0.00
11,150.00	27.55	359.48	11,136.39	-114.73	2.55	-114.75	10.00	10.00	0.00
11,200.00	32.55	359.48	11,179.65	-89.70	2.32	-89.72	10.00	10.00	0.00
11,250.00	37.55	359.48	11,220.57	-61.00	2.06	-61.01	10.00	10.00	0.00
11,300.00	42.55	359.48	11,258.83	-28.84	1.77	-28.85	10.00	10.00	0.00
11,350.00	47.55	359.48	11,294.15	6.54	1.45	6.52	10.00	10.00	0.00
11,400.00	52.55	359.48	11,326.24	44.86	1.10	44.84	10.00	10.00	0.00
11,450.00	57.55	359.48	11,354.87	85.82	0.73	85.81	10.00	10.00	0.00
11,500.00	62.55	359.48	11,379.83	129.13	0.34	129.12	10.00	10.00	0.00
11,541.16	66.67	359.48	11,397.47	166.31	0.00	166.30	10.00	10.00	0.00
FTP[DR17-8#1]									
11,550.00	67.55	359.48	11,400.91	174.45	-0.08	174.44	10.00	10.00	0.00
11,600.00	72.55	359.48	11,417.96	221.43	-0.50	221.43	10.00	10.00	0.00
11,600.12	72.55	359.48	11,418.00	221.55	-0.50	221.54	0.00	0.00	0.00
Top of 3rd Bone Spring Sand									

Planning Report

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Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,650.00	77.55	359.48	11,430.86	269.72	-0.94	269.72	10.02	10.02	0.00
11,700.00	82.55	359.48	11,439.49	318.95	-1.39	318.95	10.00	10.00	0.00
11,750.00	87.55	359.48	11,443.81	368.75	-1.84	368.75	10.00	10.00	0.00
11,794.59	92.01	359.48	11,443.98	413.32	-2.24	413.33	10.00	10.00	0.00
EOC - HOLD									
11,800.00	92.01	359.48	11,443.79	418.73	-2.29	418.74	0.00	0.00	0.00
11,900.00	92.01	359.48	11,440.28	518.67	-3.20	518.67	0.00	0.00	0.00
12,000.00	92.01	359.48	11,436.77	618.60	-4.10	618.61	0.00	0.00	0.00
12,100.00	92.01	359.48	11,433.26	718.54	-5.01	718.55	0.00	0.00	0.00
12,200.00	92.01	359.48	11,429.76	818.47	-5.92	818.49	0.00	0.00	0.00
12,300.00	92.01	359.48	11,426.25	918.40	-6.82	918.43	0.00	0.00	0.00
12,400.00	92.01	359.48	11,422.74	1,018.34	-7.73	1,018.37	0.00	0.00	0.00
12,500.00	92.01	359.48	11,419.23	1,118.27	-8.63	1,118.31	0.00	0.00	0.00
12,600.00	92.01	359.48	11,415.73	1,218.21	-9.54	1,218.24	0.00	0.00	0.00
12,700.00	92.01	359.48	11,412.22	1,318.14	-10.45	1,318.18	0.00	0.00	0.00
12,800.00	92.01	359.48	11,408.71	1,418.08	-11.35	1,418.12	0.00	0.00	0.00
12,900.00	92.01	359.48	11,405.21	1,518.01	-12.26	1,518.06	0.00	0.00	0.00
13,000.00	92.01	359.48	11,401.70	1,617.94	-13.17	1,618.00	0.00	0.00	0.00
13,100.00	92.01	359.48	11,398.19	1,717.88	-14.07	1,717.94	0.00	0.00	0.00
13,200.00	92.01	359.48	11,394.68	1,817.81	-14.98	1,817.87	0.00	0.00	0.00
13,300.00	92.01	359.48	11,391.18	1,917.75	-15.88	1,917.81	0.00	0.00	0.00
13,400.00	92.01	359.48	11,387.67	2,017.68	-16.79	2,017.75	0.00	0.00	0.00
13,500.00	92.01	359.48	11,384.16	2,117.62	-17.70	2,117.69	0.00	0.00	0.00
13,600.00	92.01	359.48	11,380.65	2,217.55	-18.60	2,217.63	0.00	0.00	0.00
13,700.00	92.01	359.48	11,377.15	2,317.49	-19.51	2,317.57	0.00	0.00	0.00
13,800.00	92.01	359.48	11,373.64	2,417.42	-20.42	2,417.51	0.00	0.00	0.00
13,900.00	92.01	359.48	11,370.13	2,517.35	-21.32	2,517.44	0.00	0.00	0.00
14,000.00	92.01	359.48	11,366.62	2,617.29	-22.23	2,617.38	0.00	0.00	0.00
14,100.00	92.01	359.48	11,363.12	2,717.22	-23.13	2,717.32	0.00	0.00	0.00
14,200.00	92.01	359.48	11,359.61	2,817.16	-24.04	2,817.26	0.00	0.00	0.00
14,300.00	92.01	359.48	11,356.10	2,917.09	-24.95	2,917.20	0.00	0.00	0.00
14,400.00	92.01	359.48	11,352.59	3,017.03	-25.85	3,017.14	0.00	0.00	0.00
14,500.00	92.01	359.48	11,349.09	3,116.96	-26.76	3,117.08	0.00	0.00	0.00
14,600.00	92.01	359.48	11,345.58	3,216.89	-27.67	3,217.01	0.00	0.00	0.00
14,700.00	92.01	359.48	11,342.07	3,316.83	-28.57	3,316.95	0.00	0.00	0.00
14,800.00	92.01	359.48	11,338.56	3,416.76	-29.48	3,416.89	0.00	0.00	0.00
14,900.00	92.01	359.48	11,335.06	3,516.70	-30.39	3,516.83	0.00	0.00	0.00
15,000.00	92.01	359.48	11,331.55	3,616.63	-31.29	3,616.77	0.00	0.00	0.00
15,100.00	92.01	359.48	11,328.04	3,716.57	-32.20	3,716.71	0.00	0.00	0.00
15,200.00	92.01	359.48	11,324.54	3,816.50	-33.10	3,816.64	0.00	0.00	0.00
15,300.00	92.01	359.48	11,321.03	3,916.44	-34.01	3,916.58	0.00	0.00	0.00
15,400.00	92.01	359.48	11,317.52	4,016.37	-34.92	4,016.52	0.00	0.00	0.00
15,500.00	92.01	359.48	11,314.01	4,116.30	-35.82	4,116.46	0.00	0.00	0.00
15,600.00	92.01	359.48	11,310.51	4,216.24	-36.73	4,216.40	0.00	0.00	0.00
15,700.00	92.01	359.48	11,307.00	4,316.17	-37.64	4,316.34	0.00	0.00	0.00
15,800.00	92.01	359.48	11,303.49	4,416.11	-38.54	4,416.28	0.00	0.00	0.00
15,900.00	92.01	359.48	11,299.98	4,516.04	-39.45	4,516.21	0.00	0.00	0.00
16,000.00	92.01	359.48	11,296.48	4,615.98	-40.35	4,616.15	0.00	0.00	0.00
16,100.00	92.01	359.48	11,292.97	4,715.91	-41.26	4,716.09	0.00	0.00	0.00
16,200.00	92.01	359.48	11,289.46	4,815.84	-42.17	4,816.03	0.00	0.00	0.00
16,300.00	92.01	359.48	11,285.95	4,915.78	-43.07	4,915.97	0.00	0.00	0.00
16,400.00	92.01	359.48	11,282.45	5,015.71	-43.98	5,015.91	0.00	0.00	0.00
16,500.00	92.01	359.48	11,278.94	5,115.65	-44.89	5,115.84	0.00	0.00	0.00
16,600.00	92.01	359.48	11,275.43	5,215.58	-45.79	5,215.78	0.00	0.00	0.00

Planning Report

Database: Midland District
 Company: Caza Operating, LLC
 Project: Lea County, NM (NAD 27 NME)
 Site: Desert Rose
 Well: 17-8 Fed #1H
 Wellbore: OH
 Design: Plan #1

Local Co-ordinate Reference: Well 17-8 Fed #1H
 TVD Reference: KB = 27' @ 3719.00usft (Rig TBD)
 MD Reference: KB = 27' @ 3719.00usft (Rig TBD)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,700.00	92.01	359.48	11,271.92	5,315.52	-46.70	5,315.72	0.00	0.00	0.00
16,800.00	92.01	359.48	11,268.42	5,415.45	-47.60	5,415.66	0.00	0.00	0.00
16,900.00	92.01	359.48	11,264.91	5,515.39	-48.51	5,515.60	0.00	0.00	0.00
17,000.00	92.01	359.48	11,261.40	5,615.32	-49.42	5,615.54	0.00	0.00	0.00
17,100.00	92.01	359.48	11,257.89	5,715.25	-50.32	5,715.48	0.00	0.00	0.00
17,200.00	92.01	359.48	11,254.39	5,815.19	-51.23	5,815.41	0.00	0.00	0.00
17,300.00	92.01	359.48	11,250.88	5,915.12	-52.14	5,915.35	0.00	0.00	0.00
17,400.00	92.01	359.48	11,247.37	6,015.06	-53.04	6,015.29	0.00	0.00	0.00
17,500.00	92.01	359.48	11,243.87	6,114.99	-53.95	6,115.23	0.00	0.00	0.00
17,600.00	92.01	359.48	11,240.36	6,214.93	-54.86	6,215.17	0.00	0.00	0.00
17,700.00	92.01	359.48	11,236.85	6,314.86	-55.76	6,315.11	0.00	0.00	0.00
17,800.00	92.01	359.48	11,233.34	6,414.79	-56.67	6,415.04	0.00	0.00	0.00
17,900.00	92.01	359.48	11,229.84	6,514.73	-57.57	6,514.98	0.00	0.00	0.00
18,000.00	92.01	359.48	11,226.33	6,614.66	-58.48	6,614.92	0.00	0.00	0.00
18,100.00	92.01	359.48	11,222.82	6,714.60	-59.39	6,714.86	0.00	0.00	0.00
18,200.00	92.01	359.48	11,219.31	6,814.53	-60.29	6,814.80	0.00	0.00	0.00
18,300.00	92.01	359.48	11,215.81	6,914.47	-61.20	6,914.74	0.00	0.00	0.00
18,400.00	92.01	359.48	11,212.30	7,014.40	-62.11	7,014.68	0.00	0.00	0.00
18,500.00	92.01	359.48	11,208.79	7,114.33	-63.01	7,114.61	0.00	0.00	0.00
18,600.00	92.01	359.48	11,205.28	7,214.27	-63.92	7,214.55	0.00	0.00	0.00
18,700.00	92.01	359.48	11,201.78	7,314.20	-64.82	7,314.49	0.00	0.00	0.00
18,807.67	92.01	359.48	11,198.00	7,421.80	-65.80	7,422.09	0.00	0.00	0.00

TD at 18807.67 - BHL[DR17-8#1]

Design Targets

Target Name

- hit/miss target - Shape	Dip Angle (°)	Dip Dir. (bearing)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BHL[DR17-8#1] - plan hits target center - Point	0.00	0.00	11,198.00	7,421.80	-65.80	578,199.20	760,971.90	32° 35' 12.187 N	103° 29' 9.771 W
FTP[DR17-8#1] - plan misses target center by 62.36usft at 11541.16usft MD (11397.47 TVD, 166.31 N, 0.00 E) - Point	0.00	0.00	11,454.00	140.00	-1.00	570,917.40	761,036.70	32° 34' 0.130 N	103° 29' 9.691 W

Planning Report

Database: Midland District
Company: Caza Operating, LLC
Project: Lea County, NM (NAD 27 NME)
Site: Desert Rose
Well: 17-8 Fed #1H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well 17-8 Fed #1H
TVD Reference: KB = 27' @ 3719.00usft (Rig TBD)
MD Reference: KB = 27' @ 3719.00usft (Rig TBD)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (bearing)
1,835.00	1,835.00	Rustler			
2,045.00	2,045.00	Top of Salt			
3,533.89	3,533.00	Base of Salt			
3,750.03	3,749.00	Yates			
4,066.22	4,065.00	Capitan			
5,824.29	5,822.00	Delaware			
5,952.37	5,950.00	Cherry Canyon			
6,708.83	6,706.00	Brushy Canyon			
8,463.12	8,460.00	Bone Spring/Glorieta			
9,748.12	9,745.00	1st Bone Spring Sand			
10,453.12	10,450.00	2nd Bone Spring Sand			
10,954.38	10,951.00	2nd Bone Spring Lime			
11,600.12	11,418.00	Top of 3rd Bone Spring Sand			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,000.00	2,000.00	0.00	0.00	KOP - Build 2.0° / 100
2,100.00	2,099.98	-1.74	0.03	EOB - HOLD
7,150.00	7,146.90	-177.96	3.11	DROP 2.0° / 100
7,250.00	7,246.88	-179.71	3.14	EOD - HOLD
10,874.49	10,871.37	-179.71	3.14	Curve KOP - Build 10.0° / 100
11,794.59	11,443.98	413.32	-2.24	EOC - HOLD
18,807.67	11,198.00	7,421.80	-65.80	TD at 18807.67

Caza Operating, LLC

Lea County, NM (NAD 27 NME)

Desert Rose

17-8 Fed #1H

OH

Plan #1

Anticollision Report

04 October, 2017



www.scientificdrilling.com



Anticollision Report

Company:	Caza Operating, LLC	Local Co-ordinate Reference:	Well 17-8 Fed #1H
Project:	Lea County, NM (NAD 27 NME)	TVD Reference:	KB = 27' @ 3719.00usft (Rig TBD)
Reference Site:	Desert Rose	MD Reference:	KB = 27' @ 3719.00usft (Rig TBD)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	17-8 Fed #1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Midland District
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD Interval 100.00usft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 2,099.49 usft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Elliptical Conic
Casing Method:	Not applied

Survey Tool Program Date 10/4/2017

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	18,807.67	Plan #1 (OH)	MWD+HDGM	OWSG MWD + HDGM

Summary

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Eagleclaw						
#2H - OH - Plan #2	18,807.67	19,134.66	1,763.31	1,521.96	7.306	CC, ES, SF
8-5 Federal #1H - Pilot Hole - Pilot Hole						Out of range
8-5 Federal #1H - ST1 - ST1	18,807.67	18,171.00	1,015.09	857.34	6.435	CC, ES, SF

Offset Design Eagleclaw - #2H - OH - Plan #2

Survey Program: 0-MWD+HDGM												Offset Site Error:	0.00 usft
Reference												Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
17,000.00	11,261.40	19,865.57	11,297.00	92.27	135.10	92.32	6,716.62	1,705.31	2,071.97	1,844.74	227.23	9.119	
17,100.00	11,257.89	19,865.57	11,297.00	93.59	135.10	92.32	6,716.62	1,705.31	2,021.47	1,792.93	228.55	8.845	
17,200.00	11,254.39	19,865.57	11,297.00	94.91	135.10	92.32	6,716.62	1,705.31	1,974.76	1,744.88	229.87	8.591	
17,300.00	11,250.88	19,865.57	11,297.00	96.24	135.10	92.32	6,716.62	1,705.31	1,932.09	1,700.89	231.20	8.357	
17,400.00	11,247.37	19,865.57	11,297.00	97.58	135.10	92.32	6,716.62	1,705.31	1,893.74	1,661.21	232.53	8.144	
17,500.00	11,243.87	19,865.57	11,297.00	98.91	135.10	92.32	6,716.62	1,705.31	1,859.99	1,626.12	233.87	7.953	
17,600.00	11,240.36	19,865.57	11,297.00	100.25	135.10	92.32	6,716.62	1,705.31	1,831.08	1,595.88	235.21	7.785	
17,700.00	11,236.85	19,865.57	11,297.00	101.60	135.10	92.32	6,716.62	1,705.31	1,807.25	1,570.70	236.55	7.640	
17,800.00	11,233.34	19,865.57	11,297.00	102.94	135.10	92.32	6,716.62	1,705.31	1,788.70	1,550.81	237.89	7.519	
17,900.00	11,229.84	19,865.57	11,297.00	104.29	135.10	92.32	6,716.62	1,705.31	1,775.60	1,536.36	239.24	7.422	
18,000.00	11,226.33	19,865.57	11,297.00	105.64	135.10	92.32	6,716.62	1,705.31	1,768.07	1,527.47	240.59	7.349	
18,100.00	11,222.82	19,865.57	11,297.00	107.00	134.78	92.34	6,739.97	1,704.99	1,766.02	1,524.40	241.62	7.309	
18,200.00	11,219.31	19,742.24	11,294.74	108.36	133.38	92.39	6,839.92	1,703.63	1,765.63	1,524.06	241.57	7.309	
18,300.00	11,215.81	19,642.25	11,292.91	109.72	131.98	92.45	6,939.88	1,702.26	1,765.24	1,523.72	241.53	7.309	
18,400.00	11,212.30	19,542.27	11,291.07	111.08	130.58	92.50	7,039.84	1,700.90	1,764.86	1,523.37	241.49	7.308	
18,500.00	11,208.79	19,442.28	11,289.24	112.45	129.19	92.56	7,139.80	1,699.54	1,764.48	1,523.03	241.45	7.308	
18,600.00	11,205.28	19,342.30	11,287.41	113.82	127.79	92.61	7,239.76	1,698.18	1,764.10	1,522.68	241.42	7.307	
18,700.00	11,201.78	19,242.31	11,285.57	115.19	126.40	92.67	7,339.72	1,696.81	1,763.72	1,522.33	241.39	7.307	
18,800.00	11,198.27	19,142.33	11,283.74	116.56	125.01	92.72	7,439.68	1,695.45	1,763.34	1,521.98	241.36	7.306	
18,807.67	11,198.00	19,134.66	11,283.60	116.66	124.91	92.73	7,447.34	1,695.35	1,763.31	1,521.96	241.36	7.306	CC, ES, SF

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company: Caza Operating, LLC
 Project: Lea County, NM (NAD 27 NME)
 Reference Site: Desert Rose
 Site Error: 0.00 usft
 Reference Well: 17-8 Fed #1H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan #1

Local Co-ordinate Reference: Well 17-8 Fed #1H
 TVD Reference: KB = 27' @ 3719.00usft (Rig TBD)
 MD Reference: KB = 27' @ 3719.00usft (Rig TBD)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: Midland District
 Offset TVD Reference: Offset Datum

Offset Design Eagleclaw - 8-5 Federal #1H - ST1 - ST1													Offset Site Error: 0.00 usft
Survey Program: 275-MWD+HDGM, 10443-MWD+HDGM													Offset Well Error: 0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference Offset (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
17,800.00	11,233.34	18,171.00	11,294.89	102.94	110.69	147.56	8,429.76	7.80	2,016.88	1,868.87	148.01	13.627	
17,900.00	11,229.84	18,171.00	11,294.89	104.29	110.69	147.56	8,429.76	7.80	1,917.19	1,768.22	148.97	12.870	
18,000.00	11,226.33	18,171.00	11,294.89	105.64	110.69	147.56	8,429.76	7.80	1,817.53	1,667.60	149.93	12.123	
18,100.00	11,222.82	18,171.00	11,294.89	107.00	110.69	147.56	8,429.76	7.80	1,717.91	1,567.02	150.89	11.385	
18,200.00	11,219.31	18,171.00	11,294.89	108.36	110.69	147.56	8,429.76	7.80	1,618.34	1,466.48	151.86	10.657	
18,300.00	11,215.81	18,171.00	11,294.89	109.72	110.69	147.56	8,429.76	7.80	1,518.82	1,366.00	152.82	9.939	
18,400.00	11,212.30	18,171.00	11,294.89	111.08	110.69	147.56	8,429.76	7.80	1,419.38	1,265.59	153.79	9.229	
18,500.00	11,208.79	18,171.00	11,294.89	112.45	110.69	147.56	8,429.76	7.80	1,320.01	1,165.26	154.76	8.529	
18,600.00	11,205.28	18,171.00	11,294.89	113.82	110.69	147.56	8,429.76	7.80	1,220.76	1,065.03	155.73	7.839	
18,700.00	11,201.78	18,171.00	11,294.89	115.19	110.69	147.56	8,429.76	7.80	1,121.63	964.93	156.70	7.158	
18,800.00	11,198.27	18,171.00	11,294.89	116.56	110.69	147.56	8,429.76	7.80	1,022.67	864.99	157.68	6.486	
18,807.67	11,198.00	18,171.00	11,294.89	116.66	110.69	147.56	8,429.76	7.80	1,015.09	857.34	157.75	6.435	CC, ES, SF

Anticollision Report

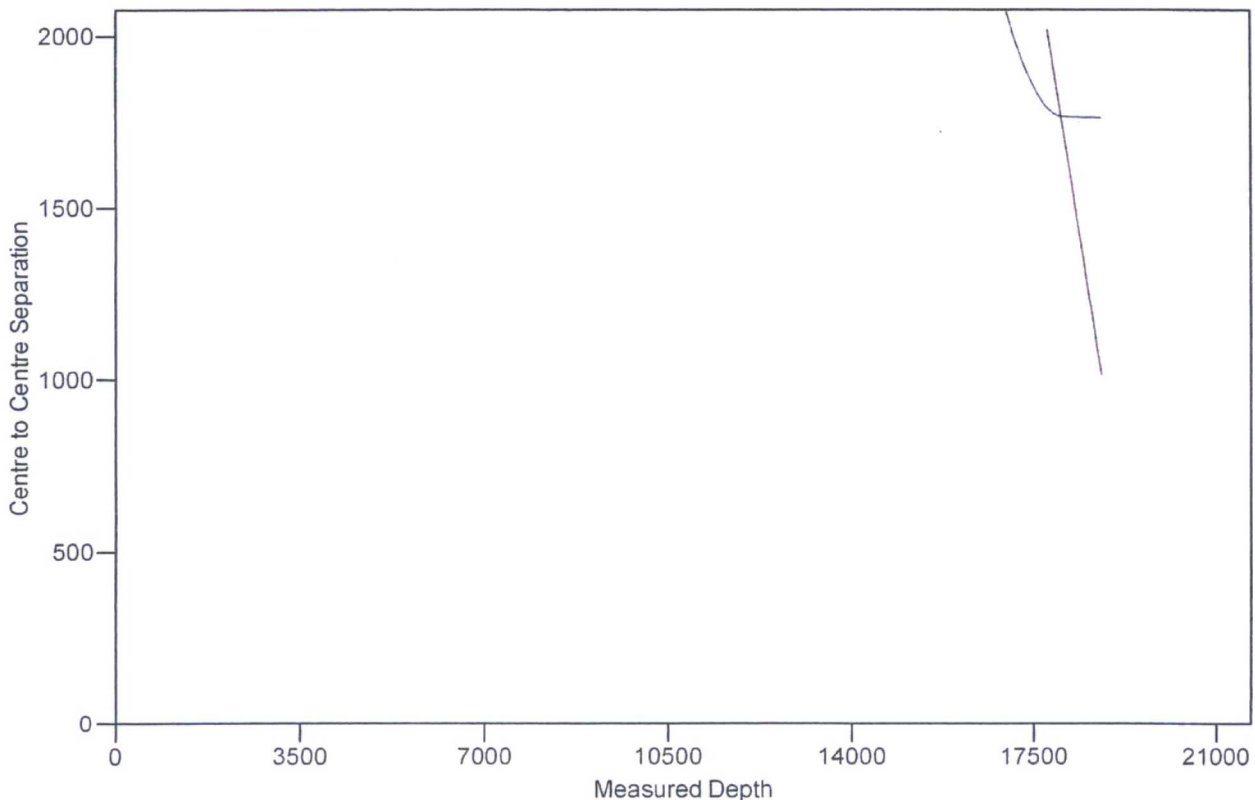
Company: Caza Operating, LLC
Project: Lea County, NM (NAD 27 NME)
Reference Site: Desert Rose
Site Error: 0.00 usft
Reference Well: 17-8 Fed #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well 17-8 Fed #1H
TVD Reference: KB = 27' @ 3719.00usft (Rig TBD)
MD Reference: KB = 27' @ 3719.00usft (Rig TBD)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Midland District
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB = 27' @ 3719.00usft (Rig TBD)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: 17-8 Fed #1H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.46°

Ladder Plot



LEGEND

—◆— 8-5 Federal #1H, ST1, ST1 V0 —✕— #2H, OH, Plan #2 V0

Anticollision Report

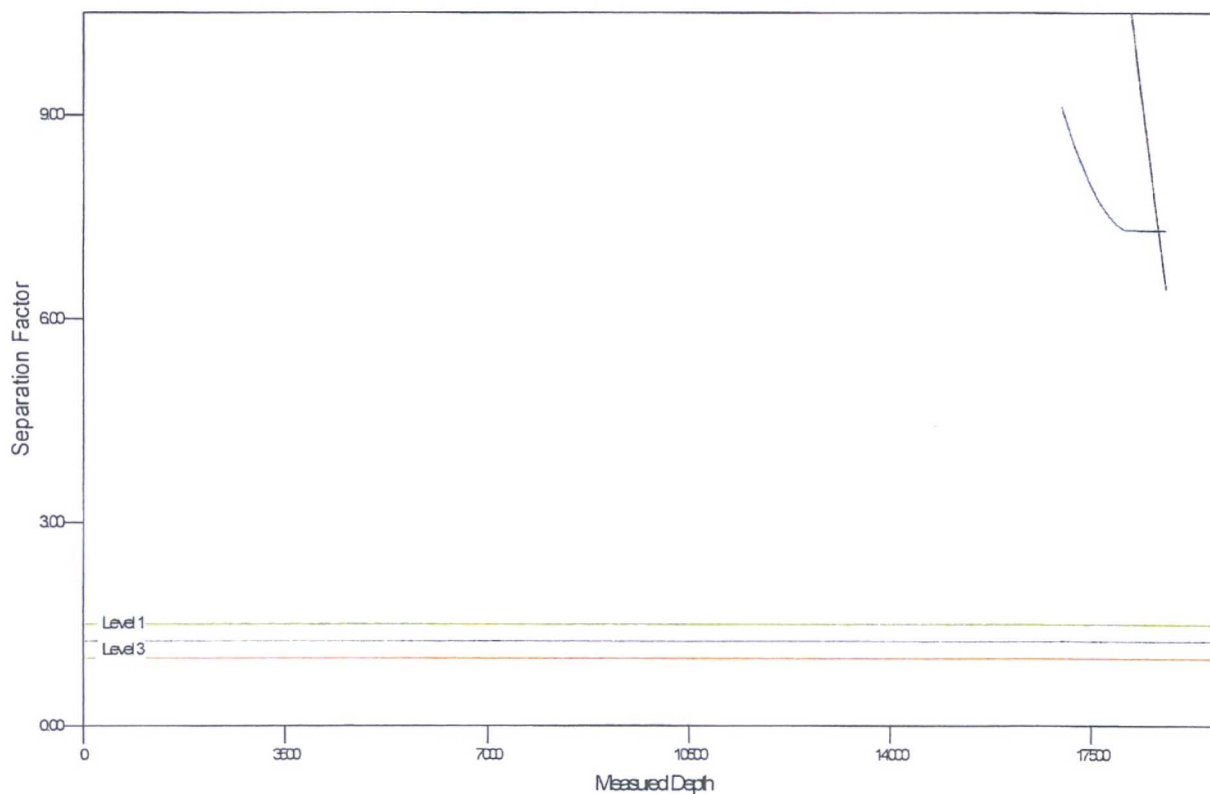
Company: Caza Operating, LLC
 Project: Lea County, NM (NAD 27 NME)
 Reference Site: Desert Rose
 Site Error: 0.00 usft
 Reference Well: 17-8 Fed #1H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan #1

Local Co-ordinate Reference: Well 17-8 Fed #1H
 TVD Reference: KB = 27' @ 3719.00usft (Rig TBD)
 MD Reference: KB = 27' @ 3719.00usft (Rig TBD)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: Midland District
 Offset TVD Reference: Offset Datum

Reference Depths are relative to KB = 27' @ 3719.00usft (Rig TBD)
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: 17-8 Fed #1H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.46°

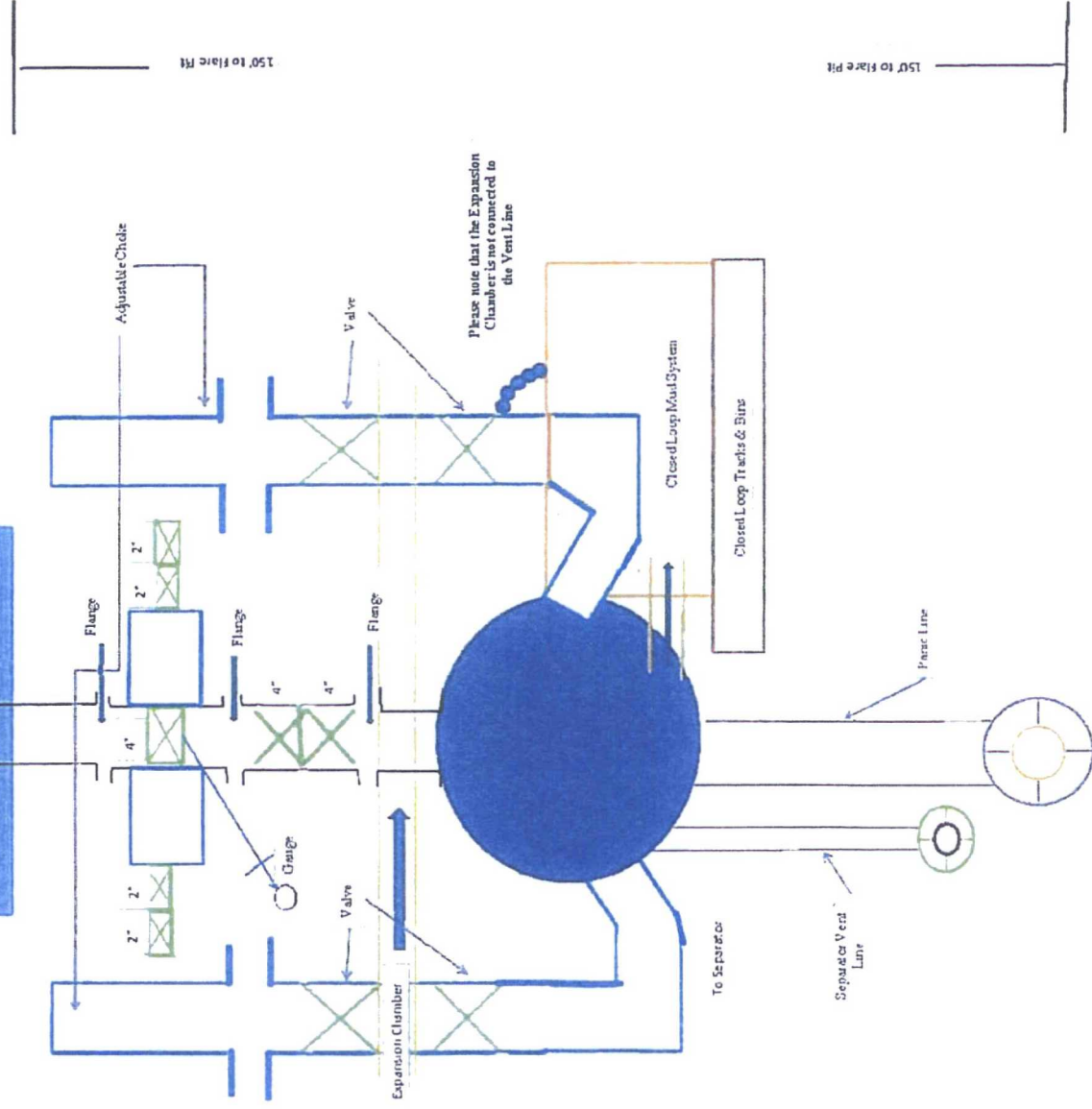
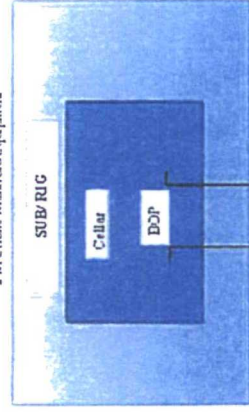
Separation Factor Plot



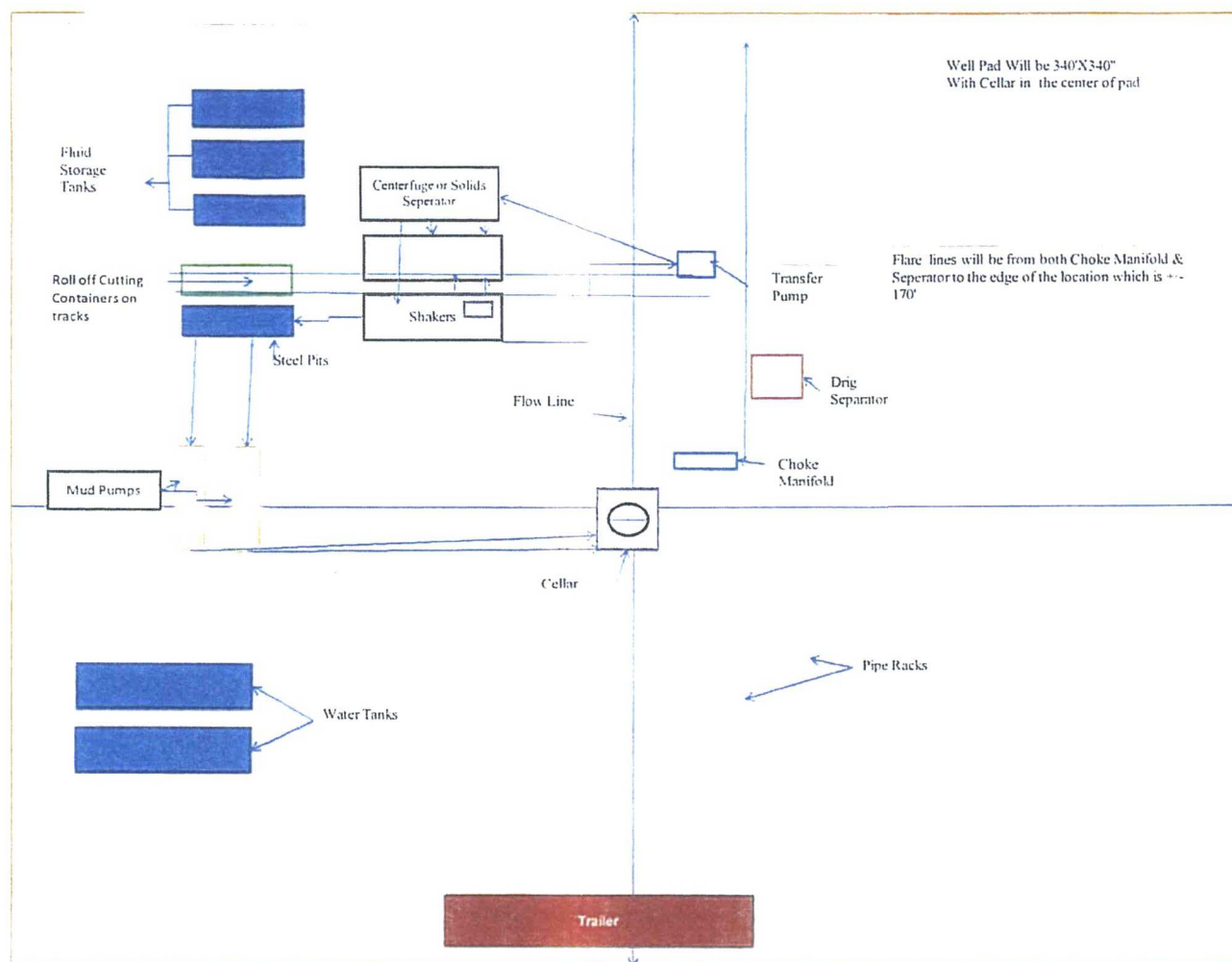
LEGEND

8-5 Federal#1H, ST1, ST1 V0 #2H, OH, Plan #2 V0

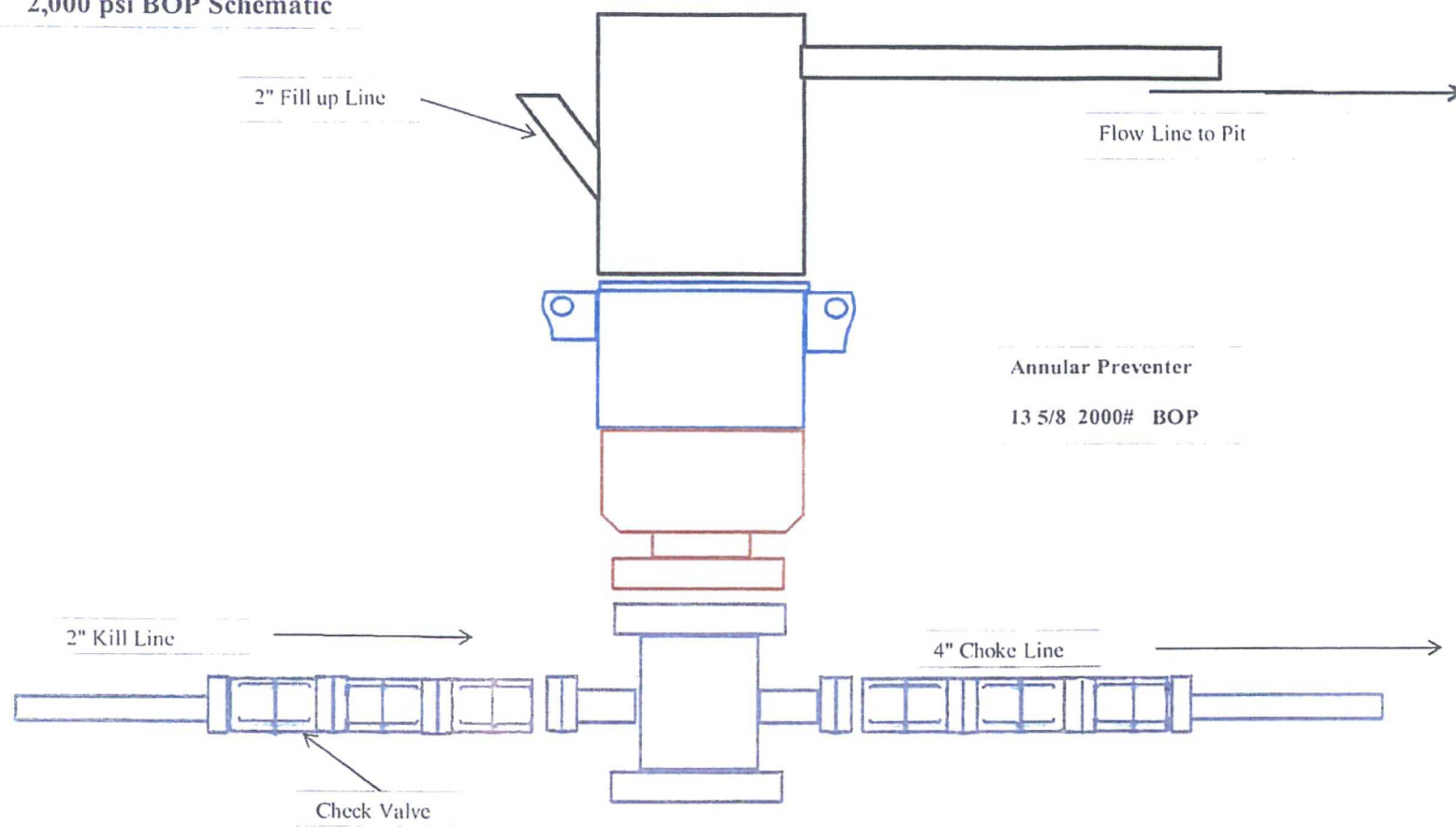
2 MChoda Marafold Equipment



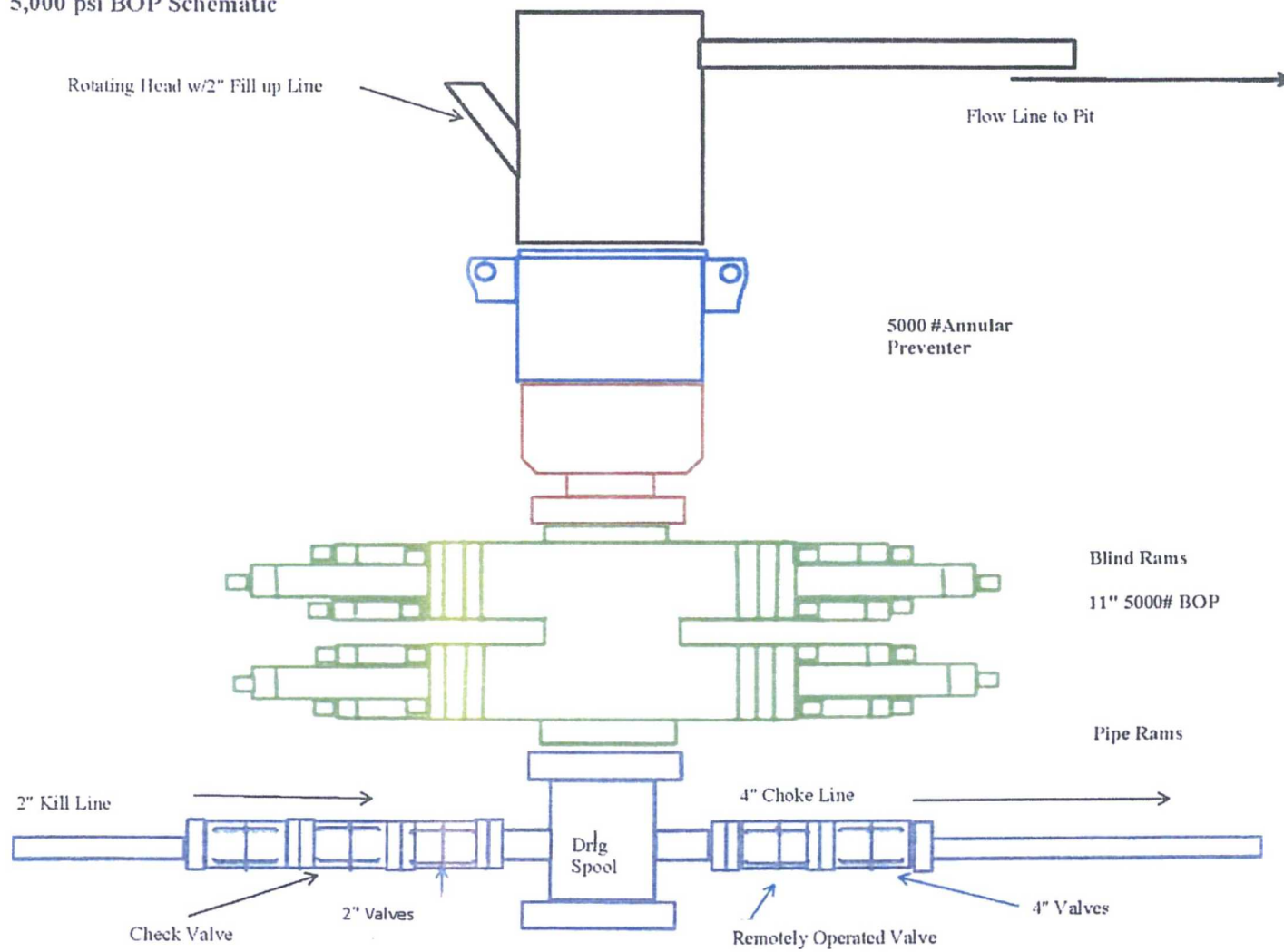
RIG Plat & Closed Loop Equipment Diagram



2,000 psi BOP Schematic



5,000 psi BOP Schematic



PECOS DISTRICT

DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	CAZA OPERATING LLC
LEASE NO.:	NMNM132076
WELL NAME & NO.:	Desert Rose Federal COM 1H
SURFACE HOLE FOOTAGE:	190'/S & 467'/W
BOTTOM HOLE FOOTAGE:	330'/N & 467'/W
LOCATION:	Section 17, T.20 S., R.35 E., NMPM
COUNTY:	Lea County, New Mexico

COA

All pervious COAs still apply expect the following

H2S	☐ Yes	☒ No	
Potash	☒ None	☐ Secretary	☐ R-111-P
Cave/Karst Potential	☒ Low	☐ Medium	☐ High
Variance	☒ None	☐ Flex Hose	☐ Other
Wellhead	☒ Conventional	☐ Multibowl	☐ Both
Other	☐ 4 String Area	☒ Capitan Reef	☐ WIPP

- ❖ **Special Capitan Reef requirements.** If lost circulation (50% or greater) occurs below the Base of the Salt, the operator shall do the following:

(Use this for 3 string wells in the Capitan Reef, if 4 string well ensure FW based mud used across the capitan interval)

- Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.
- Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by 0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports. The daily drilling report should show mud volume per shift/tour. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.

Operator shall fill 1/3rd casing with fluid while running intermediate casing to maintain collapse safety factor.

1. The minimum required fill of cement behind the **9-5/8** inch intermediate casing, which shall be set at approximately **3800** feet, is:
Cement to surface. If cement does not circulate see B.1.a-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to Capitan Reef.**
2. The minimum required fill of cement behind the **5-1/2** inch production casing is:
 - Cement should tie-back at least 50 feet above the **Capitan Reef (estimated top of the Capitan Reef is 5115 ft)** . Operator shall provide method of verification.

ZS 030818

203517M APDSUNDRY DESERT ROSE 17-8 FEDERAL COM 1H 30015 NMNM132076
CAZA OPERATING LLC 12-55 393869 03082018 ZS

Cap KFC

13 3/8	surface csg in a	17 1/2	inch hole.	Design Factors			SURFACE		
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	54.50	J 55	ST&C	4.99	1.35	1.38	1,890	103,005	
"B"							0	0	
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,086			Tail Cmt	does not	circ to sfc.	Totals:	1,890	103,005	
Comparison of Proposed to Minimum Required Cement Volumes									
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist
Size	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg
17 1/2	0.6946	1115	1859	1367	36	8.50	1138	2M	1.56

9 5/8	casing inside the	13 3/8	Design Factors				INTERMEDIATE		
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	36.00	J 55	LT&C	3.31	1.02	0.64	3,800	136,800	
"B"							0	0	
w/8.4#/g mud, 30min Sfc Csg Test psig:							Totals:	3,800	136,800
The cement volume(s) are intended to achieve a top of					0	ft from surface or a		1890	overlap.
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist
Size	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg
12 1/4	0.3132	1070	1786	1303	37	10.00	2951	3M	0.81

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 0.93, b, c, d
All > 0.70, OK.

ALT COLLAPSE SF: 1.02*1.5=1.53

5 1/2	casing inside the		9 5/8	Design Factors			PRODUCTION		
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight	
"A"	17.00	P 110	LT&C	2.34	1.44	1.95	10,894	185,198	
"B"	17.00	P 110	LT&C	6.81	1.28	1.95	7,914	134,538	
w/8.4#/g mud, 30min Sfc Csg Test psig: 2,397							Totals:	18,808 319,736	
B	would be:			86.11	1.40	if it were a vertical wellbore.			
	00	MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC	
		18808	11443	11198	10894	92	10	11795	
The cement volume(s) are intended to achieve a top of				5065	ft from surface or a		-1265	overlap.	
Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
7 7/8	0.1733	2550	4605	2387	93	9.20			0.91
Class 'H' tail cmt yld > 1.20									

Class 'H' tail cmt yld > 1.20