

15-1027

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HOBBS OCD

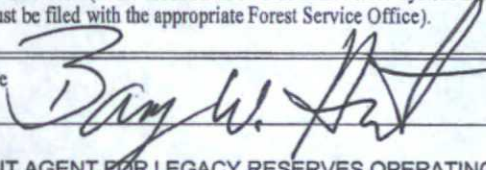
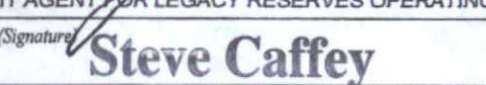
NOV 18 2015

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. SHL: NM-06531A, BHL: NM-080262
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator LEGACY RESERVES OPERATING, L. P. (240974)		7. If Unit or CA Agreement, Name and No. LEA UNIT (NMNM-70976B)
3a. Address P. O. BOX 10848 MIDLAND, TX. 79702		8. Lease Name and Well No. LEA UNIT 54H (302802)
3b. Phone No. (include area code) 432-221-6334 (Craig Sparkman)		9. API Well No. 30-025-42949
4. Location of Well (Report location clearly and in accordance with any State requirements.)* At surface 170 FNL & 1740 FEL Section 11 (First Take: 330 FNL & 1750 FEL Section 11) At proposed prod. zone 2310 FNL & 1750 FEL Section 14 (Last take)		10. Field and Pool, or Exploratory LEA: BONE SPRING (37570)
14. Distance in miles and direction from nearest town or post office* 26 MILES SOUTHWEST OF HOBBS, NM		11. Sec., T. R. M. or Blk. and Survey or Area SHL: SECTION 11, T. 20 S., R. 34 E. BHL: SECTION 14, T. 20 S., R. 34 E.
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) SHL: 170' BHL: 330'	16. No. of acres in lease SHL: 280 BHL: 120	17. Spacing Unit dedicated to this well 240
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 1090' #57H	19. Proposed Depth TVD: 10,900' MD: 18,073'	20. BLM/BIA Bond No. on file NMB001014 & NMB001015
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3661' GL	22. Approximate date work will start* ASAP	23. Estimated duration 45 DAYS
24. Attachments		

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

- Well plat certified by a registered surveyor.
- A Drilling Plan.
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- Operator certification
- Such other site specific information and/or plans as may be required by the BLM.

25. Signature 	Name (Printed/Typed) BARRY W. HUNT	Date 9/25/15
Title PERMIT AGENT FOR LEGACY RESERVES OPERATING, L. P.		
Approved by (Signature) 	Name (Printed/Typed) Steve Caffey	Date NOV 10 2015
Title FIELD MANAGER		
Office CARLSBAD FIELD OFFICE		

Application approval 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.
Conditions of approval, if any, are attached.

APPROVAL FOR TWO YEARS

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.

(Continued on page 2)

Carlsbad Controlled Water Basin

K2
11/18/15

*(Instructions on page 2)
new comp _____ Add New Well _____
Cancel Well _____ Create Pool _____
E-PERMITTING - - New Well K2
Comp _____ P&A _____ TA _____
CSNG _____ Loc Chng _____
B.C. _____ Add New Well _____

Approval Subject to General Requirements
& Special Stipulations AttachedSEE ATTACHED FOR
CONDITIONS OF APPROVAL
NOV 19 2015

DRILLING PLAN
LEA UNIT 54H
LEGACY RESERVES OPERATING LP
SHL: Unit B, Section 11
BHL: Unit G, Section 14
T20S-R34E, Lea County, New Mexico

HOBBS OCD

NOV 18 2015

RECEIVED

To satisfy requirements of Onshore Oil and Gas Order No. 1, Legacy Reserves Operating LP submits the following for your consideration:

1. **Location:** SHL: 170' FNL & 1740' FEL, Sec. 11, T20S-R34E (First Take: 330 FNL & 1750 FEL)
BHL: 2310' FNL & 1750' FEL, Sec. 14, T20S-R34E (Last Take)

2. **Elevations:** 3,661' GL

3. **Geological Name of Surface Formation:** Quaternary alluvium deposits

4. **Drilling Tools and Associated Equipment:** Rotary drilling rig using fluid as a means for removal of solid cuttings from the well.

5. **Proposed Drilling Depth:** 18,073' MD 10,900' TVD

6. **Estimated Tops of Geological Markers:**

Rustler	1,680'	Delaware	5,666'
Top Salt	1,720'	Bone Spring Lime	8,205'
Bottom Salt	3,150'	Avalon	8,760'
Top of Capitan Reef	3,150'	1 st . Bone Spring	9,501'
Capitan Reef Bottom	4,710'	2 nd Bone Spring	10,034'
San Andres	4,710'	3 rd . Bone Spring	10,745'

Possible mineral bearing formations:

Primary: Bone Spring (oil); Secondary: Delaware (oil), Avalon (oil), fresh water (~125')

7. **Proposed Mud System:**

Depth	Mud Wt.	Visc	Fluid Loss	Type Mud
0' to 1800' 1750	8.4-8.9	30-32	NC	Fresh water gel spud mud
1800' to 5400'	9.8-10	28-29	NC	Brine water
5400' to 10,900'	8.4-8.6	28-29	NC	Fresh water/brine, use hi-viscosity Weeps to clean hole
10,900' to 18,073'	8.9-9.1	28-29	18-20	Fresh water/brine

Sufficient mud materials will be kept on location at all times in order to combat lost circulation or unexpected kicks. A Pason PVT system will be rigged up prior to spudding this well. A volume monitoring system that measures, calculates and displays readings from the mud system on the rig to alert the rig crew of impending

gas kicks and lost circulation. In order to effectively run open hole logs and casing, the mud viscosity and fluid loss properties may be adjusted.

8. **Proposed Drilling Plan:**

Set surface and intermediate casing and cement to surface. Drill 8-3/4" to ~10,900', Kick off and drill 8-3/4" hole to TD of ~18,073'. Set 5-1/2" casing from surface to TD (~ 18,073'). Cement 5-1/2" production casing back to surface.

9. **Casing Information:**

See COA

String	Hole size	Depth	Casing OD	Collar	Weight	Grade
Surface	17-1/2"	1750' - 1800' MD	New 13-3/8"	STC	54.5#	J-55
Intermediate	12-1/4"	3901' MD	New 9-5/8"	LTC	40#	J-55
Intermediate	12-1/4"	5400' MD	New 9-5/8"	LTC	40#	HCK-55
Production	8-3/4"	18,073' MD	New 5-1/2"	BTC	20#	P-110

5-1/2", P-110:

Collapse Factor:	1.55	Collapse Factor:	1.28
Burst Factor:	1.29	Burst Factor:	2.03
Tension Factor:	3.06	Tension Factor:	3.33

9-5/8", HCK-55

9-5/8, J-55

Collapse Factor:	1.24	Collapse Factor:	3.08
Burst Factor:	1.82	Burst Factor:	3.54
Tension Factor:	3.12	Tension Factor:	5.66

13-3/8, J-55

10. **Cementing Information:**

Surface Casing (75% excess on lead & 75% excess on tail to design for cement top at surface):

Lead: 1100 sxs class C cement + 4% bwoc bentonite II + 2% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.005% bwoc Static Free + 0.005 gps FP-6L (13.50 ppg, 1.93 cfps, 9.71 gps wtr).

Tail: 200 sxs class C cement + 1.5% bwoc Calcium Chloride + 0.005 lbs/sack Static Free + 0.005 gps FP-6L (14.80 ppg, 1.34 cfps, 6.35 gps wtr).

Intermediate Casing (80% excess on lead & 80% excess on tail to design for cement top at surface):

A DV tool and ECP will be used to cement the 9-5/8" casing if losses greater than 50% are encountered in the Capitan Reef. DV tool will be placed at approximately 3,950'.

No DV tool:

Lead: 1300 sxs (35:65) poz (fly ash) class C cement + 4% bwoc bentonite II + 5% bwoc MPA-5 + 0.25% bwoc FL-52 + 5 lbs/sack LCM-1 + 0.125 lbs/sk Cello Flake + 0.005 lbs/sk Static Free + 0.005 gps FP-6L + 1.2% bwoc Sodium Metasilicate + 5% bwoc Sodium Chloride (12.5 ppg, 2.13 cf/sx, 8.81 gps wtr).

Tail: 300 sxs class C cement (14.80 ppg, 1.33 cfps, 6.35 gps wtr).

With DV Tool:

Stage 1

Lead: 300 sxs (35:65) poz (fly ash) class C cement + 4% bwoc bentonite II + 5% bwoc MPA-5 + 0.25% bwoc FL-52 + 5 lbs/sack LCM-1 + 0.125 lbs/sk Cello Flake + 0.005 lbs/sk Static Free + 0.005 gps FP-6L + 1.2% bwoc Sodium Metasilicate + 5% bwow Sodium Chloride (12.5 ppg, 2.13 cf/sx, 8.81 gps wtr).

Tail: 300 sxs class C cement (14.80 ppg, 1.33 cfps, 6.35 gps wtr).

Stage 2

Lead: 800 sxs (35:65) poz (fly ash) class C cement + 4% bwoc bentonite II + 5% bwoc MPA-5 + 0.25% bwoc FL-52 + 5 lbs/sack LCM-1 + 0.125 lbs/sk Cello Flake + 0.005 lbs/sk Static Free + 0.005 gps FP-6L + 1.2% bwoc Sodium Metasilicate + 5% bwow Sodium Chloride (12.5 ppg, 2.13 cf/sx, 8.81 gps wtr).

Tail: 200 sxs class C cement (14.80 ppg, 1.33 cfps, 6.35 gps wtr).

Production Casing (80% excess on lead & 20% excess on tail to design for cement top at surface):

Lead: 1600 sxs (50:50) poz (fly ash) class H cement + 10% bwoc bentonite II + 5% bwow sodium chloride + 5 pps LCM-1 + 0.005 lbs/sk Static Free + 0.005 gps FP-6L (11.90 ppg, 2.38 cf/sx, 13.22 gps wtr).

Tail: 1700 sxs Class H (15:61:11) poz (fly ash): class H cement: CSE-2 + 4% bwow sodium chloride + 3 pps LCM-1 + 0.6% bwoc FL-25 + 0.005 gps FP-6L + 0.005% bwoc Static Free (13.20 ppg, 1.62 cf/sx, 9.45 gps wtr).

11. Pressure Control Eqpt/BOP:

Legacy Reserves plans to use a 13-5/8" 5000-psi working pressure BOP system consisting of a double ram BOP with one ram being pipe and one ram being blind, a 5000-psi annular type preventer, a 5000-psi choke manifold and 80 gallon accumulator with floor, five remote operating stations and an auxiliary power system. A rotating head will be utilized as needed. A drill string safety valve in the open position will be available on the rig floor. A mud gas separator will be available for use if needed.

A 3M BOP will be used to drill from the surface casing shoe (~1800') to the intermediate casing shoe (~5400'). The BOP will be a 5M system, however the "A" section wellhead will be a 3M wellhead (see attached BOP Diagram).

The BOP unit will be hydraulically operated. The BOP will be operated at least once per day while drilling and the blind rams will be operated when out of hole during trips. No abnormal pressure or temperature is expected while drilling

The BOPs will be tested by an independent service company to 250 psi low and 5000 psi high.

12. Testing, Logging, and Coring Program:

- A. Mud logging program: 2 man unit from approximately after setting intermediate casing.
- B. No open hole logs, DST's or cores are planned.

13. Potential Hazards

No abnormal pressures or temperatures are expected during the drilling of this well. If H2S is encountered the operator will comply with provisions of Onshore Order 6. Since there will be an H2S Safety package on location, attached is an "H2S Drilling Operations Plan". Adequate flare lines will be installed on the mud/gas separator so gas may be flared safely. All personnel will be familiar with all aspects of safe operations of equipment being used. Lost circulation may occur and a cement contingency plan is included in this plan along with mud materials to be kept on location at all times in order to combat lost circulation or unexpected kicks. Estimated BHP: 4796 psi, estimated BHT: 162°F.

14. **Road and Location**

Road and location construction will begin after BLM approval of the APD. Drilling is expected to take 30-35 days and an additional 10 days for the completion.

15. **Additional Requirements of Project:**

Completion: The targeted Bone Spring pay zone will be perforated and stimulated in multiple stages using acid and hydraulic fracturing treatments. Fresh water used in the drilling and completion of this well will be transferred from off-site via temporary flowlines and stored in frac tanks on the location.



EXTRA COPY

Legacy Reserves

Lea County, NM (NAD-27 2015)

Lea Unit #54H

Lea Unit #54H

OH

Plan #1

Anticollision Summary Report

05 November, 2015



Company: Legacy Reserves
Project: Lea County, NM (NAD-27 2015)
Reference Site: Lea Unit #54H
Site Error: 0.00 usft
Reference Well: Lea Unit #54H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well Lea Unit #54H
TVD Reference: KB @ 3679.00usft (McVay 4)
MD Reference: KB @ 3679.00usft (McVay 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date 11/5/2015	
From (usft)	To (usft)	Survey (Wellbore)
0.00	18,073.20	Plan #1 (OH)
		Tool Name
		MWD
		Description
		MWD - Standard

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						
Lea Unit						
#18 - OH - OH	9,915.28	9,919.28	509.30	476.02	15.303	CC
#18 - OH - OH	10,000.00	10,000.00	509.32	475.75	15.176	ES, SF
#20 - OH - OH	16,753.40	7,221.00	2.04	-119.68	0.017	Level 1, CC, ES, SF
#6 - OH - OH	13,796.30	10,133.00	736.73	688.00	15.120	CC
#6 - OH - OH	13,800.00	10,133.00	736.74	687.99	15.113	ES
#6 - OH - OH	13,900.00	10,133.00	743.99	694.69	15.092	SF

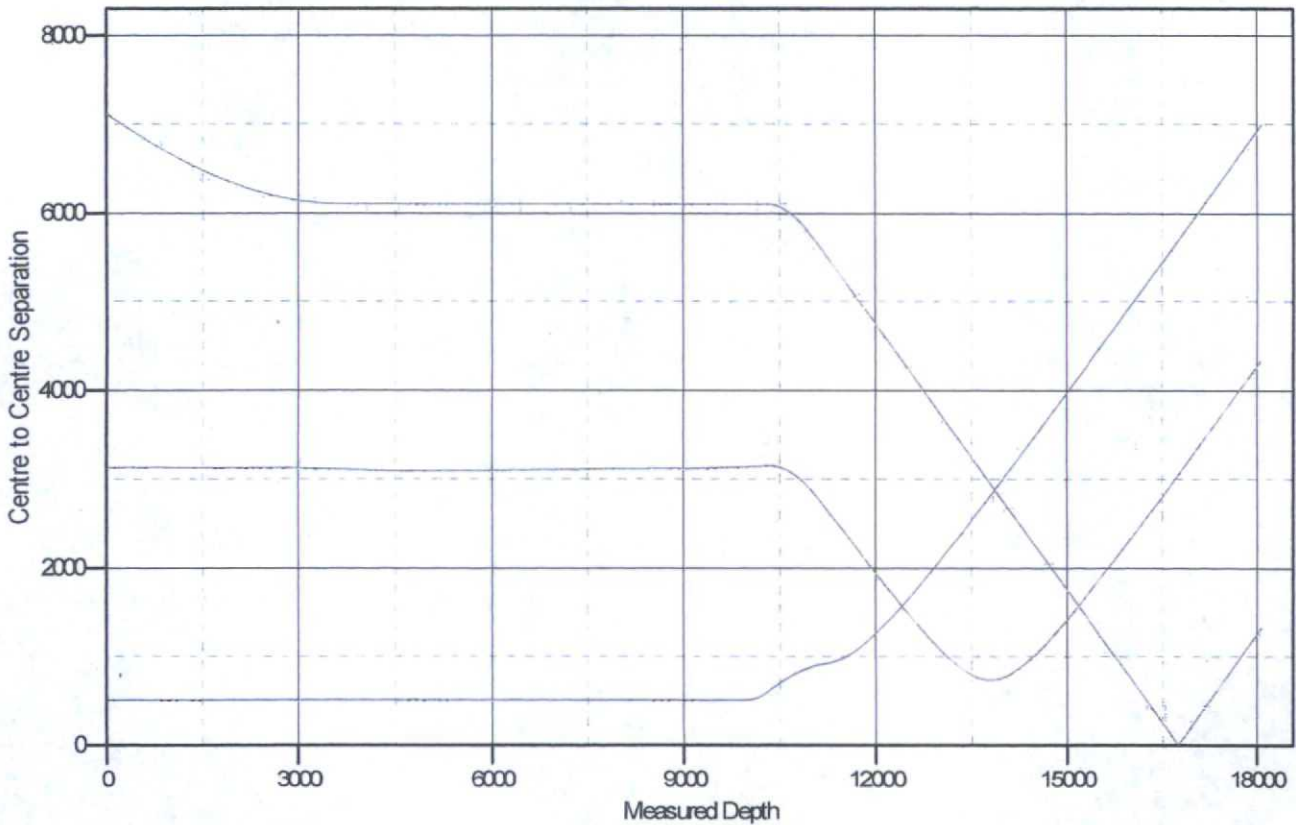
Company: Legacy Reserves
Project: Lea County, NM (NAD-27 2015)
Reference Site: Lea Unit #54H
Site Error: 0.00 usft
Reference Well: Lea Unit #54H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well Lea Unit #54H
TVD Reference: KB @ 3679.00usft (McVay 4)
MD Reference: KB @ 3679.00usft (McVay 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3679.00usft (McVay 4)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Lea Unit #54H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.43°

Ladder Plot



LEGEND

✕ #6, OH, OHV0 ● #18, OH, OHV0 ■ #20, OH, OHV0

Company: Legacy Reserves
Project: Lea County, NM (NAD-27 2015)
Reference Site: Lea Unit #54H
Site Error: 0.00 usft
Reference Well: Lea Unit #54H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well Lea Unit #54H
TVD Reference: KB @ 3679.00usft (McVay 4)
MD Reference: KB @ 3679.00usft (McVay 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3679.00usft (McVay 4)

Offset Depths are relative to Offset Datum

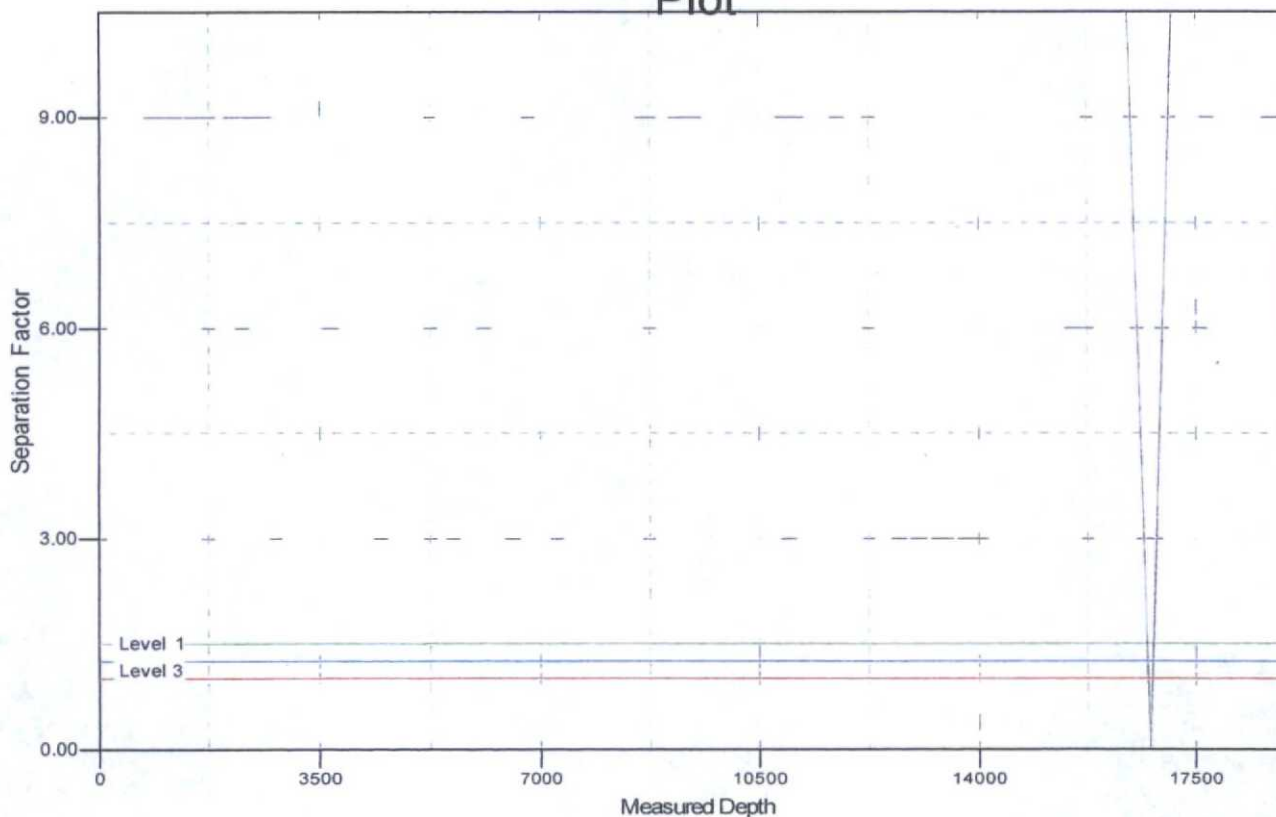
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Lea Unit #54H

Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30

Grid Convergence at Surface is: 0.43°

Separation Factor Plot



LEGEND

x #6, OH, OHV0 ● #18, OH, OHV0 ■ #20, OH, OHV0

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Legacy Reserves

Lea County, NM (NAD-27 2015)

Lea Unit #54H

Lea Unit #54H

OH

Plan #1

Anticollision Summary Report

05 November, 2015



Company:	Legacy Reserves	Local Co-ordinate Reference:	Well Lea Unit #54H
Project:	Lea County, NM (NAD-27 2015)	TVD Reference:	KB @ 3679.00usft (McVay 4)
Reference Site:	Lea Unit #54H	MD Reference:	KB @ 3679.00usft (McVay 4)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Lea Unit #54H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000.1 Single User Db
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:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	11/5/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	18,073.20	Plan #1 (OH)	MWD	MWD - Standard	

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						
Lea Unit						
#18 - OH - OH	9,915.28	9,919.28	509.30	476.02	15.303	CC
#18 - OH - OH	10,000.00	10,000.00	509.32	475.75	15.176	ES, SF
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#6 - OH - OH	13,900.00	10,133.00	743.99	694.69	15.092	SF

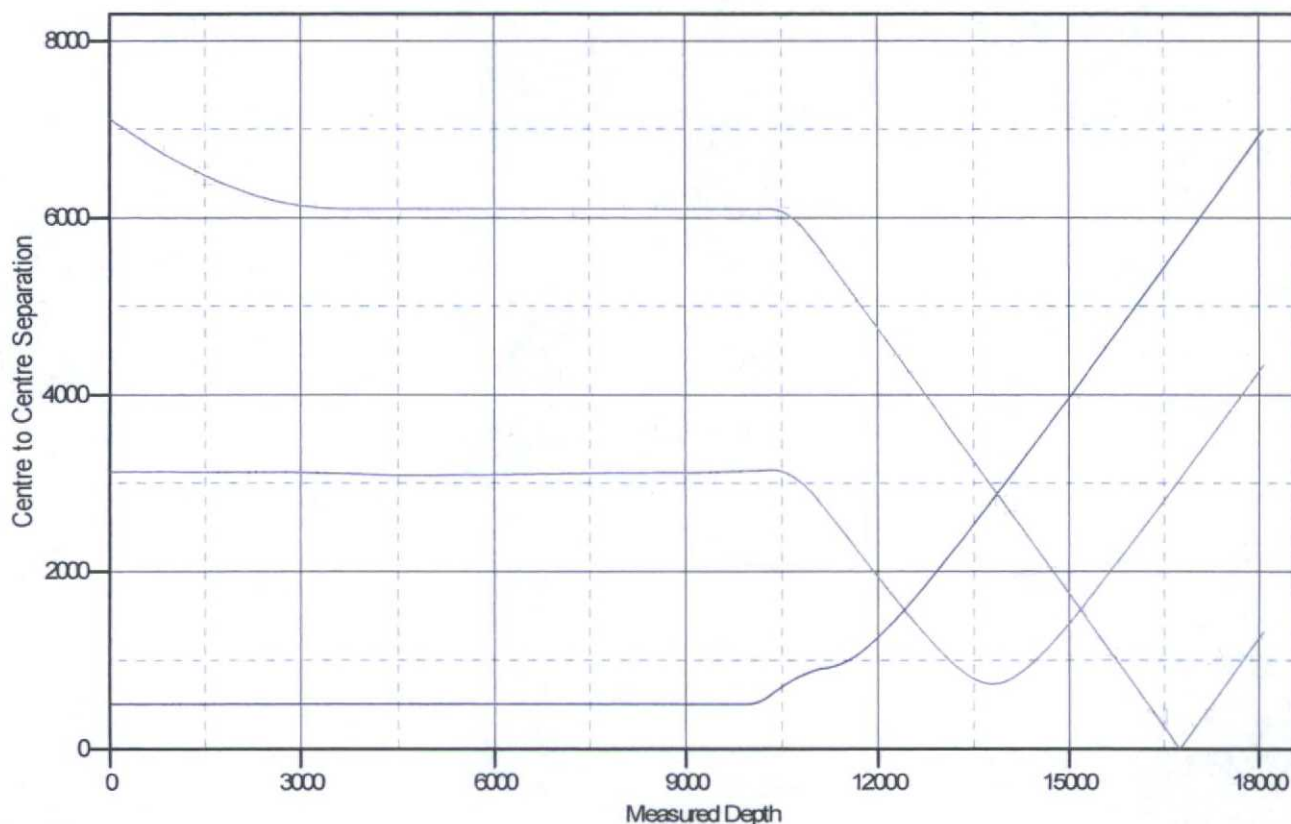
Company: Legacy Reserves
Project: Lea County, NM (NAD-27 2015)
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Well Error: 0.00 usft
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Local Co-ordinate Reference: Well Lea Unit #54H
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MD Reference: KB @ 3679.00usft (McVay 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3679.00usft (McVay 4)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Lea Unit #54H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.43°

Ladder Plot



LEGEND

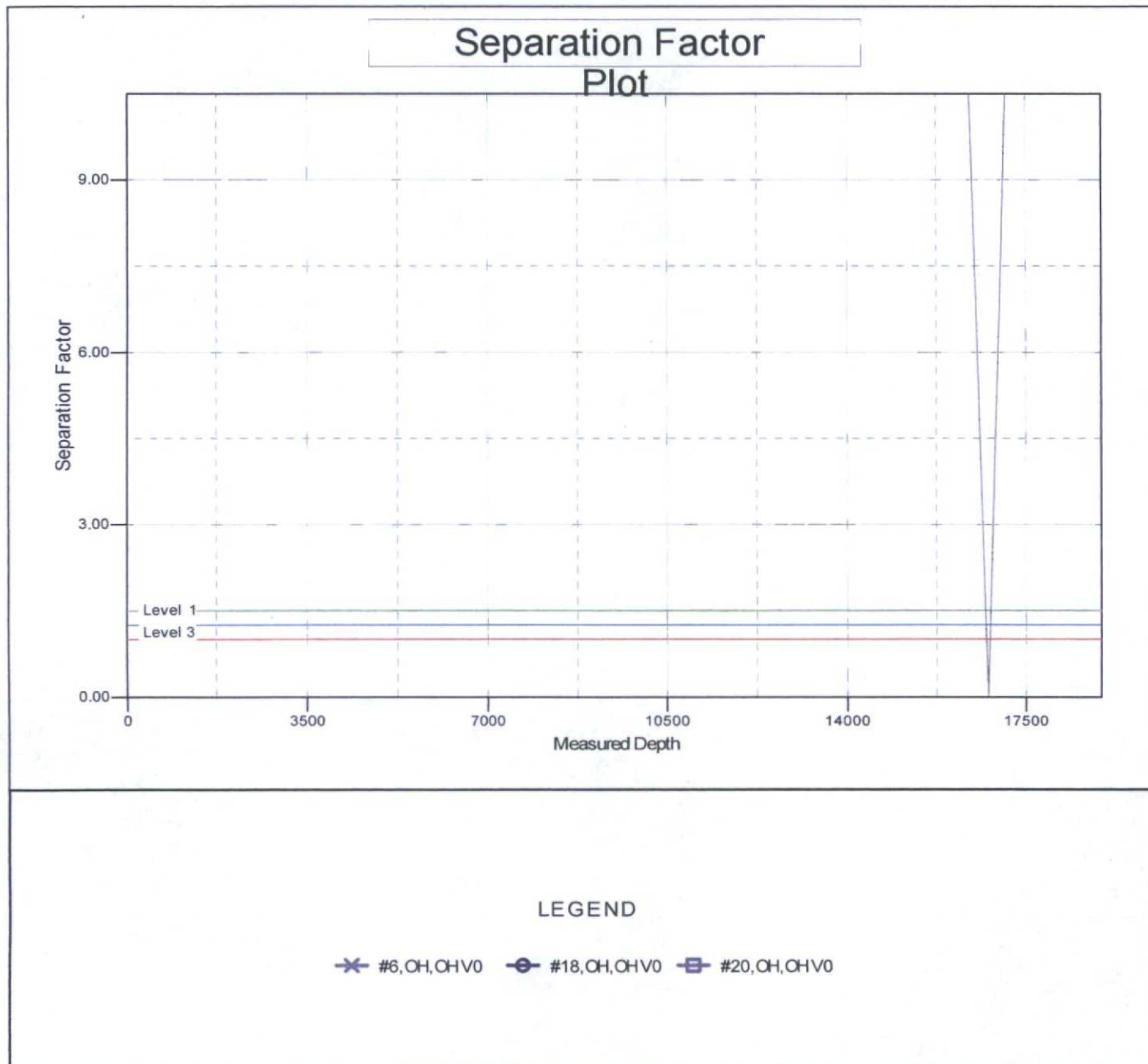
✕ #6, OH, OHV0 ○ #18, OH, OHV0 □ #20, OH, OHV0

Company: Legacy Reserves
Project: Lea County, NM (NAD-27 2015)
Reference Site: Lea Unit #54H
Site Error: 0.00 usft
Reference Well: Lea Unit #54H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #1

Local Co-ordinate Reference: Well Lea Unit #54H
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3679.00usft (McVay 4)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Lea Unit #54H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
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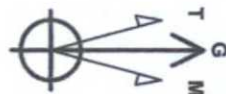


Legacy Reserves
Project: Lea County, NM
Site: Lea Unit
Well: #54H
Wellbore: OH
Plan: Plan #1 (#54H/OH)

Section Details									
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dieg	TFace	Vsect
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0
2	10327.0	0.00	0.00	10327.0	0.0	0.0	0.00	0.00	0.0
3	11227.0	90.00	179.63	10900.0	-572.9	3.7	10.00	179.63	573.0
4	18073.2	90.00	179.63	10900.0	-7419.0	48.1	0.00	0.00	7419.2

WELL DETAILS: #54H

Ground Elevation: 3661.0
RKB Elevation: KB @ 3679.0usft (McVay 4)
Rig Name: McVay 4
Northing 60086.20 Easting 748186.30
Latitude 32° 36' 38.460 N Longitude 103° 31' 36.960 W

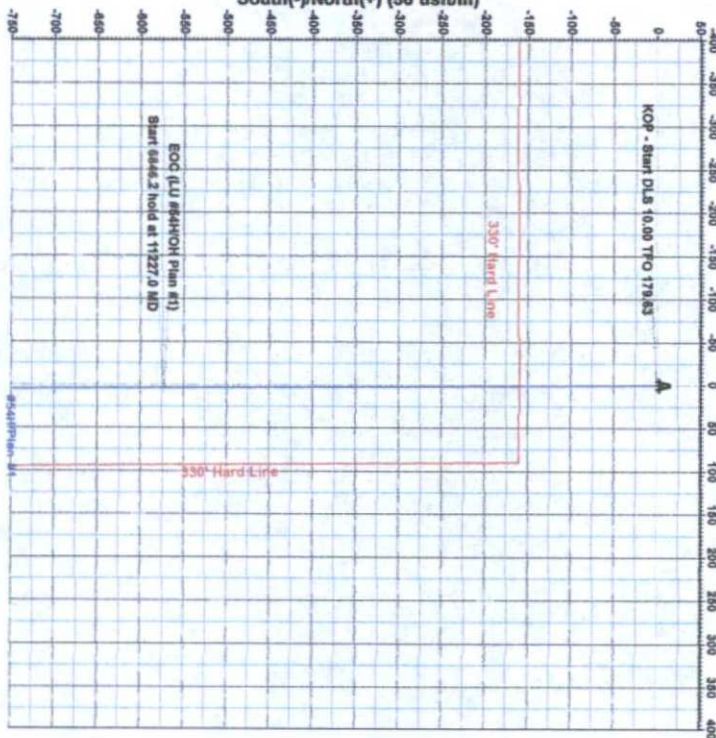


Azimuths to Grid North
True North: -0.43°
Magnetic North: 8.72°
Magnetic Field
Strength: 48346.3nT
Dip Angle: 60.43°
Date: 9/2/2015
Model: IGRF2015

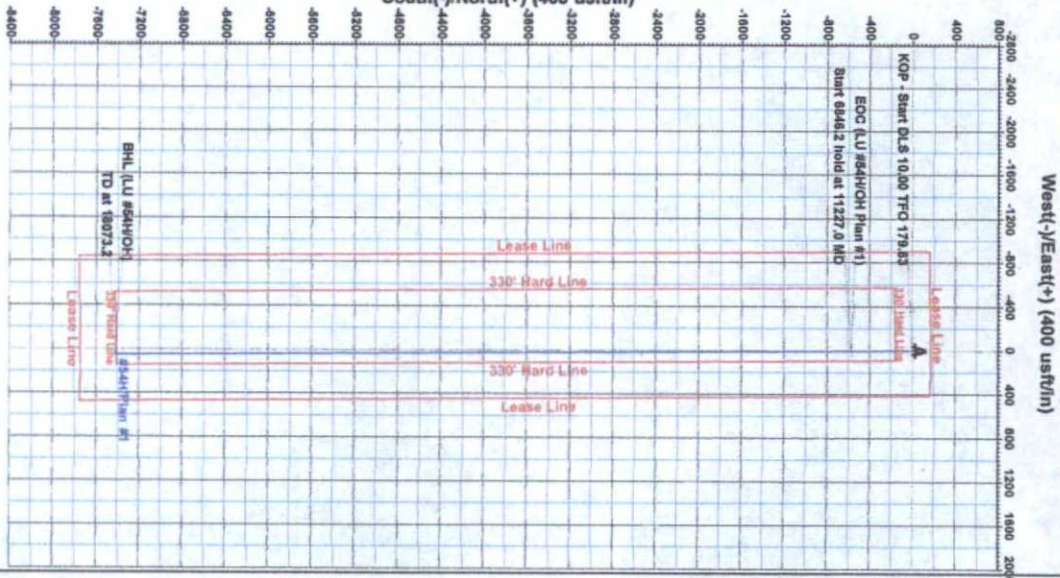
True Vertical Depth (200 usft/in)



South(-)/North(+) (50 usft/in)



South(-)/North(+) (400 usft/in)



Plan: Plan #1 (#54H/OH)
Created By: Well Planner Date: 10/23, September 02 2015

Terra Directional Services
3706 South County Road 1210, Midland, TX 79706
Office: (432) 618-1210

PROJECT DETAILS: Lea County, NM
Geodetic System: US State Plane 1927 (East solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid



Legacy Reserves

Lea County, NM

Lea Unit

#54H

OH

Plan: Plan #1

Standard Planning Report

02 September, 2015



Database: EDM 5000.1 Single User Db
Company: Legacy Reserves
Project: Lea County, NM
Site: Lea Unit
Well: #54H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #54H
TVD Reference: KB @ 3679.0usft (McVay 4)
MD Reference: KB @ 3679.0usft (McVay 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	Lea 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	Lea Unit		
Site Position:	Northing:	567,504.40 usft	Latitude: 32° 33' 26.922 N
From: Map	Easting:	753,784.90 usft	Longitude: 103° 30' 34.732 W
Position Uncertainty:	0.0 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.44 °

Well	#54H		
Well Position	+N/-S	13,351.8 usft	Northing: 580,856.20 usft
	+E/-W	-5,598.6 usft	Easting: 748,186.30 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	3,677.0 usft
			Ground Level: 3,661.0 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	9/2/2015	7.15
			Dip Angle
			60.43
			Field Strength
			48,346

Design	Plan #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			179.63

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
10,327.0	0.00	0.00	10,327.0	0.0	0.0	0.00	0.00	0.00	0.00	
11,227.0	90.00	179.63	10,900.0	-572.9	3.7	10.00	10.00	19.96	179.63	
18,073.2	90.00	179.63	10,900.0	-7,419.0	48.1	0.00	0.00	0.00	0.00	BHL (LU #54H/OH)

Database: EDM 5000.1 Single User Db
Company: Legacy Reserves
Project: Lea County, NM
Site: Lea Unit
Well: #54H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well #54H
KB @ 3679.0usft (McVay 4)
KB @ 3679.0usft (McVay 4)
Grid
Minimum Curvature

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00

Database: EDM 5000.1 Single User Db
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Well: #54H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #54H
TVD Reference: KB @ 3679.0usft (McVay 4)
MD Reference: KB @ 3679.0usft (McVay 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	0.00	0.00	0.00
7,800.0	0.00	0.00	7,800.0	0.0	0.0	0.0	0.00	0.00	0.00
7,900.0	0.00	0.00	7,900.0	0.0	0.0	0.0	0.00	0.00	0.00
8,000.0	0.00	0.00	8,000.0	0.0	0.0	0.0	0.00	0.00	0.00
8,100.0	0.00	0.00	8,100.0	0.0	0.0	0.0	0.00	0.00	0.00
8,200.0	0.00	0.00	8,200.0	0.0	0.0	0.0	0.00	0.00	0.00
8,300.0	0.00	0.00	8,300.0	0.0	0.0	0.0	0.00	0.00	0.00
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00
8,600.0	0.00	0.00	8,600.0	0.0	0.0	0.0	0.00	0.00	0.00
8,700.0	0.00	0.00	8,700.0	0.0	0.0	0.0	0.00	0.00	0.00
8,800.0	0.00	0.00	8,800.0	0.0	0.0	0.0	0.00	0.00	0.00
8,900.0	0.00	0.00	8,900.0	0.0	0.0	0.0	0.00	0.00	0.00
9,000.0	0.00	0.00	9,000.0	0.0	0.0	0.0	0.00	0.00	0.00
9,100.0	0.00	0.00	9,100.0	0.0	0.0	0.0	0.00	0.00	0.00
9,200.0	0.00	0.00	9,200.0	0.0	0.0	0.0	0.00	0.00	0.00
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	0.00	0.00	0.00
9,400.0	0.00	0.00	9,400.0	0.0	0.0	0.0	0.00	0.00	0.00
9,500.0	0.00	0.00	9,500.0	0.0	0.0	0.0	0.00	0.00	0.00
9,600.0	0.00	0.00	9,600.0	0.0	0.0	0.0	0.00	0.00	0.00
9,700.0	0.00	0.00	9,700.0	0.0	0.0	0.0	0.00	0.00	0.00
9,800.0	0.00	0.00	9,800.0	0.0	0.0	0.0	0.00	0.00	0.00
9,900.0	0.00	0.00	9,900.0	0.0	0.0	0.0	0.00	0.00	0.00
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.0	0.00	0.00	0.00
10,100.0	0.00	0.00	10,100.0	0.0	0.0	0.0	0.00	0.00	0.00
10,200.0	0.00	0.00	10,200.0	0.0	0.0	0.0	0.00	0.00	0.00
10,300.0	0.00	0.00	10,300.0	0.0	0.0	0.0	0.00	0.00	0.00
10,327.0	0.00	0.00	10,327.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start DLS 10.00 TFO 179.63									
10,350.0	2.30	179.63	10,350.0	-0.5	0.0	0.5	10.00	10.00	0.00

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Well #54H
KB @ 3679.0usft (McVay 4)
KB @ 3679.0usft (McVay 4)
Grid
Minimum Curvature

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)
10,400.0	7.30	179.63	10,399.8	-4.6	0.0	4.6	10.00	10.00	0.00
10,450.0	12.30	179.63	10,449.1	-13.2	0.1	13.2	10.00	10.00	0.00
10,500.0	17.30	179.63	10,497.4	-25.9	0.2	25.9	10.00	10.00	0.00
10,550.0	22.30	179.63	10,544.4	-42.9	0.3	42.9	10.00	10.00	0.00
10,600.0	27.30	179.63	10,589.8	-63.8	0.4	63.8	10.00	10.00	0.00
10,650.0	32.30	179.63	10,633.2	-88.7	0.6	88.7	10.00	10.00	0.00
10,700.0	37.30	179.63	10,674.2	-117.2	0.8	117.2	10.00	10.00	0.00
10,750.0	42.30	179.63	10,712.6	-149.2	1.0	149.2	10.00	10.00	0.00
10,800.0	47.30	179.63	10,748.1	-184.4	1.2	184.4	10.00	10.00	0.00
10,850.0	52.30	179.63	10,780.3	-222.6	1.4	222.6	10.00	10.00	0.00
10,900.0	57.30	179.63	10,809.2	-263.4	1.7	263.4	10.00	10.00	0.00
10,950.0	62.30	179.63	10,834.3	-306.6	2.0	306.6	10.00	10.00	0.00
11,000.0	67.30	179.63	10,855.6	-351.8	2.3	351.8	10.00	10.00	0.00
11,050.0	72.30	179.63	10,872.8	-398.8	2.6	398.8	10.00	10.00	0.00
11,100.0	77.30	179.63	10,885.9	-447.0	2.9	447.0	10.00	10.00	0.00
11,150.0	82.30	179.63	10,894.8	-496.2	3.2	496.2	10.00	10.00	0.00
11,200.0	87.30	179.63	10,899.3	-546.0	3.5	546.0	10.00	10.00	0.00
11,227.0	90.00	179.63	10,900.0	-572.9	3.7	573.0	10.00	10.00	0.00
EOC - Start 6846.2 hold at 11227.0 MD									
11,300.0	90.00	179.63	10,900.0	-645.9	4.2	646.0	0.00	0.00	0.00
11,400.0	90.00	179.63	10,900.0	-745.9	4.8	746.0	0.00	0.00	0.00
11,500.0	90.00	179.63	10,900.0	-845.9	5.5	846.0	0.00	0.00	0.00
11,600.0	90.00	179.63	10,900.0	-945.9	6.1	946.0	0.00	0.00	0.00
11,700.0	90.00	179.63	10,900.0	-1,045.9	6.8	1,046.0	0.00	0.00	0.00
11,800.0	90.00	179.63	10,900.0	-1,145.9	7.4	1,146.0	0.00	0.00	0.00
11,900.0	90.00	179.63	10,900.0	-1,245.9	8.1	1,246.0	0.00	0.00	0.00
12,000.0	90.00	179.63	10,900.0	-1,345.9	8.7	1,346.0	0.00	0.00	0.00
12,100.0	90.00	179.63	10,900.0	-1,445.9	9.4	1,446.0	0.00	0.00	0.00
12,200.0	90.00	179.63	10,900.0	-1,545.9	10.0	1,546.0	0.00	0.00	0.00
12,300.0	90.00	179.63	10,900.0	-1,645.9	10.7	1,646.0	0.00	0.00	0.00
12,400.0	90.00	179.63	10,900.0	-1,745.9	11.3	1,746.0	0.00	0.00	0.00
12,500.0	90.00	179.63	10,900.0	-1,845.9	12.0	1,846.0	0.00	0.00	0.00
12,600.0	90.00	179.63	10,900.0	-1,945.9	12.6	1,946.0	0.00	0.00	0.00
12,700.0	90.00	179.63	10,900.0	-2,045.9	13.3	2,046.0	0.00	0.00	0.00
12,800.0	90.00	179.63	10,900.0	-2,145.9	13.9	2,146.0	0.00	0.00	0.00
12,900.0	90.00	179.63	10,900.0	-2,245.9	14.6	2,246.0	0.00	0.00	0.00
13,000.0	90.00	179.63	10,900.0	-2,345.9	15.2	2,346.0	0.00	0.00	0.00
13,100.0	90.00	179.63	10,900.0	-2,445.9	15.9	2,446.0	0.00	0.00	0.00
13,200.0	90.00	179.63	10,900.0	-2,545.9	16.5	2,546.0	0.00	0.00	0.00
13,300.0	90.00	179.63	10,900.0	-2,645.9	17.2	2,646.0	0.00	0.00	0.00
13,400.0	90.00	179.63	10,900.0	-2,745.9	17.8	2,746.0	0.00	0.00	0.00
13,500.0	90.00	179.63	10,900.0	-2,845.9	18.5	2,846.0	0.00	0.00	0.00
13,600.0	90.00	179.63	10,900.0	-2,945.9	19.1	2,946.0	0.00	0.00	0.00
13,700.0	90.00	179.63	10,900.0	-3,045.9	19.7	3,046.0	0.00	0.00	0.00
13,800.0	90.00	179.63	10,900.0	-3,145.9	20.4	3,146.0	0.00	0.00	0.00
13,900.0	90.00	179.63	10,900.0	-3,245.9	21.0	3,246.0	0.00	0.00	0.00
14,000.0	90.00	179.63	10,900.0	-3,345.9	21.7	3,346.0	0.00	0.00	0.00
14,100.0	90.00	179.63	10,900.0	-3,445.9	22.3	3,446.0	0.00	0.00	0.00
14,200.0	90.00	179.63	10,900.0	-3,545.9	23.0	3,546.0	0.00	0.00	0.00
14,300.0	90.00	179.63	10,900.0	-3,645.9	23.6	3,646.0	0.00	0.00	0.00
14,400.0	90.00	179.63	10,900.0	-3,745.9	24.3	3,746.0	0.00	0.00	0.00
14,500.0	90.00	179.63	10,900.0	-3,845.9	24.9	3,846.0	0.00	0.00	0.00
14,600.0	90.00	179.63	10,900.0	-3,945.9	25.6	3,946.0	0.00	0.00	0.00
14,700.0	90.00	179.63	10,900.0	-4,045.9	26.2	4,046.0	0.00	0.00	0.00

Database: EDM 5000.1 Single User Db
Company: Legacy Reserves
Project: Lea County, NM
Site: Lea Unit
Well: #54H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well #54H
KB @ 3679.0usft (McVay 4)
KB @ 3679.0usft (McVay 4)
Grid
Minimum Curvature

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)
14,800.0	90.00	179.63	10,900.0	-4,145.9	26.9	4,146.0	0.00	0.00	0.00
14,900.0	90.00	179.63	10,900.0	-4,245.9	27.5	4,246.0	0.00	0.00	0.00
15,000.0	90.00	179.63	10,900.0	-4,345.9	28.2	4,346.0	0.00	0.00	0.00
15,100.0	90.00	179.63	10,900.0	-4,445.9	28.8	4,446.0	0.00	0.00	0.00
15,200.0	90.00	179.63	10,900.0	-4,545.9	29.5	4,546.0	0.00	0.00	0.00
15,300.0	90.00	179.63	10,900.0	-4,645.9	30.1	4,646.0	0.00	0.00	0.00
15,400.0	90.00	179.63	10,900.0	-4,745.9	30.8	4,746.0	0.00	0.00	0.00
15,500.0	90.00	179.63	10,900.0	-4,845.9	31.4	4,846.0	0.00	0.00	0.00
15,600.0	90.00	179.63	10,900.0	-4,945.9	32.1	4,946.0	0.00	0.00	0.00
15,700.0	90.00	179.63	10,900.0	-5,045.9	32.7	5,046.0	0.00	0.00	0.00
15,800.0	90.00	179.63	10,900.0	-5,145.8	33.4	5,146.0	0.00	0.00	0.00
15,900.0	90.00	179.63	10,900.0	-5,245.8	34.0	5,246.0	0.00	0.00	0.00
16,000.0	90.00	179.63	10,900.0	-5,345.8	34.7	5,346.0	0.00	0.00	0.00
16,100.0	90.00	179.63	10,900.0	-5,445.8	35.3	5,446.0	0.00	0.00	0.00
16,200.0	90.00	179.63	10,900.0	-5,545.8	36.0	5,546.0	0.00	0.00	0.00
16,300.0	90.00	179.63	10,900.0	-5,645.8	36.6	5,646.0	0.00	0.00	0.00
16,400.0	90.00	179.63	10,900.0	-5,745.8	37.3	5,746.0	0.00	0.00	0.00
16,500.0	90.00	179.63	10,900.0	-5,845.8	37.9	5,846.0	0.00	0.00	0.00
16,600.0	90.00	179.63	10,900.0	-5,945.8	38.5	5,946.0	0.00	0.00	0.00
16,700.0	90.00	179.63	10,900.0	-6,045.8	39.2	6,046.0	0.00	0.00	0.00
16,800.0	90.00	179.63	10,900.0	-6,145.8	39.8	6,146.0	0.00	0.00	0.00
16,900.0	90.00	179.63	10,900.0	-6,245.8	40.5	6,246.0	0.00	0.00	0.00
17,000.0	90.00	179.63	10,900.0	-6,345.8	41.1	6,346.0	0.00	0.00	0.00
17,100.0	90.00	179.63	10,900.0	-6,445.8	41.8	6,446.0	0.00	0.00	0.00
17,200.0	90.00	179.63	10,900.0	-6,545.8	42.4	6,546.0	0.00	0.00	0.00
17,300.0	90.00	179.63	10,900.0	-6,645.8	43.1	6,646.0	0.00	0.00	0.00
17,400.0	90.00	179.63	10,900.0	-6,745.8	43.7	6,746.0	0.00	0.00	0.00
17,500.0	90.00	179.63	10,900.0	-6,845.8	44.4	6,846.0	0.00	0.00	0.00
17,600.0	90.00	179.63	10,900.0	-6,945.8	45.0	6,946.0	0.00	0.00	0.00
17,700.0	90.00	179.63	10,900.0	-7,045.8	45.7	7,046.0	0.00	0.00	0.00
17,800.0	90.00	179.63	10,900.0	-7,145.8	46.3	7,146.0	0.00	0.00	0.00
17,900.0	90.00	179.63	10,900.0	-7,245.8	47.0	7,246.0	0.00	0.00	0.00
18,000.0	90.00	179.63	10,900.0	-7,345.8	47.6	7,346.0	0.00	0.00	0.00
18,073.2	90.00	179.63	10,900.0	-7,419.0	48.1	7,419.2	0.00	0.00	0.00

TD at 18073.2

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
EOC (LU #54H/OH Plan	0.00	0.00	10,900.0	-572.9	3.7	580,283.26	748,190.01	32° 35' 33.791 N	103° 31' 38.968 W
- plan hits target center									
- Point									
BHL (LU #54H/OH)	0.00	0.00	10,900.0	-7,419.0	48.1	573,437.20	748,234.40	32° 34' 26.047 N	103° 31' 39.055 W
- plan hits target center									
- Point									

Database: EDM 5000.1 Single User Db
Company: Legacy Reserves
Project: Lea County, NM
Site: Lea Unit
Well: #54H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #54H
TVD Reference: KB @ 3679.0usft (McVay 4)
MD Reference: KB @ 3679.0usft (McVay 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,327.0	10,327.0	0.0	0.0	KOP - Start DLS 10.00 TFO 179.63
11,227.0	10,900.0	-572.9	3.7	EOC - Start 6846.2 hold at 11227.0 MD
18,073.2	10,900.0	-7,419.0	48.1	TD at 18073.2

Legacy Reserves
#54H - Plan #1

Lea County, NM
Lea Unit
Your Ref:

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0	0	0	0	0	0	0	0
100	0	0	100	0	0	0	0
200	0	0	200	0	0	0	0
300	0	0	300	0	0	0	0
400	0	0	400	0	0	0	0
500	0	0	500	0	0	0	0
600	0	0	600	0	0	0	0
700	0	0	700	0	0	0	0
800	0	0	800	0	0	0	0
900	0	0	900	0	0	0	0
1000	0	0	1000	0	0	0	0
1100	0	0	1100	0	0	0	0
1200	0	0	1200	0	0	0	0
1300	0	0	1300	0	0	0	0
1400	0	0	1400	0	0	0	0
1500	0	0	1500	0	0	0	0
1600	0	0	1600	0	0	0	0
1700	0	0	1700	0	0	0	0
1800	0	0	1800	0	0	0	0
1900	0	0	1900	0	0	0	0
2000	0	0	2000	0	0	0	0
2100	0	0	2100	0	0	0	0
2200	0	0	2200	0	0	0	0
2300	0	0	2300	0	0	0	0
2400	0	0	2400	0	0	0	0
2500	0	0	2500	0	0	0	0
2600	0	0	2600	0	0	0	0
2700	0	0	2700	0	0	0	0
2800	0	0	2800	0	0	0	0
2900	0	0	2900	0	0	0	0
3000	0	0	3000	0	0	0	0
3100	0	0	3100	0	0	0	0

3200	0	0	3200	0	0	0	0
3300	0	0	3300	0	0	0	0
3400	0	0	3400	0	0	0	0
3500	0	0	3500	0	0	0	0
3600	0	0	3600	0	0	0	0
3700	0	0	3700	0	0	0	0
3800	0	0	3800	0	0	0	0
3900	0	0	3900	0	0	0	0
4000	0	0	4000	0	0	0	0
4100	0	0	4100	0	0	0	0
4200	0	0	4200	0	0	0	0
4300	0	0	4300	0	0	0	0
4400	0	0	4400	0	0	0	0
4500	0	0	4500	0	0	0	0
4600	0	0	4600	0	0	0	0
4700	0	0	4700	0	0	0	0
4800	0	0	4800	0	0	0	0
4900	0	0	4900	0	0	0	0
5000	0	0	5000	0	0	0	0
5100	0	0	5100	0	0	0	0
5200	0	0	5200	0	0	0	0
5300	0	0	5300	0	0	0	0
5400	0	0	5400	0	0	0	0
5500	0	0	5500	0	0	0	0
5600	0	0	5600	0	0	0	0
5700	0	0	5700	0	0	0	0
5800	0	0	5800	0	0	0	0
5900	0	0	5900	0	0	0	0
6000	0	0	6000	0	0	0	0
6100	0	0	6100	0	0	0	0
6200	0	0	6200	0	0	0	0
6300	0	0	6300	0	0	0	0
6400	0	0	6400	0	0	0	0
6500	0	0	6500	0	0	0	0
6600	0	0	6600	0	0	0	0
6700	0	0	6700	0	0	0	0
6800	0	0	6800	0	0	0	0
6900	0	0	6900	0	0	0	0
7000	0	0	7000	0	0	0	0
7100	0	0	7100	0	0	0	0
7200	0	0	7200	0	0	0	0
7300	0	0	7300	0	0	0	0
7400	0	0	7400	0	0	0	0
7500	0	0	7500	0	0	0	0
7600	0	0	7600	0	0	0	0
7700	0	0	7700	0	0	0	0
7800	0	0	7800	0	0	0	0

7900	0	0	7900	0	0	0	0
8000	0	0	8000	0	0	0	0
8100	0	0	8100	0	0	0	0
8200	0	0	8200	0	0	0	0
8300	0	0	8300	0	0	0	0
8400	0	0	8400	0	0	0	0
8500	0	0	8500	0	0	0	0
8600	0	0	8600	0	0	0	0
8700	0	0	8700	0	0	0	0
8800	0	0	8800	0	0	0	0
8900	0	0	8900	0	0	0	0
9000	0	0	9000	0	0	0	0
9100	0	0	9100	0	0	0	0
9200	0	0	9200	0	0	0	0
9300	0	0	9300	0	0	0	0
9400	0	0	9400	0	0	0	0
9500	0	0	9500	0	0	0	0
9600	0	0	9600	0	0	0	0
9700	0	0	9700	0	0	0	0
9800	0	0	9800	0	0	0	0
9900	0	0	9900	0	0	0	0
10000	0	0	10000	0	0	0	0
10100	0	0	10100	0	0	0	0
10200	0	0	10200	0	0	0	0
10300	0	0	10300	0	0	0	0
10327	0	0	10327	0	0	0	0
10350	2.3	179.629	10349.99	-0.46	0	0.46	10
10400	7.3	179.629	10399.8	-4.64	0.03	4.64	10
10450	12.3	179.629	10449.06	-13.15	0.09	13.15	10
10500	17.3	179.629	10497.38	-25.92	0.17	25.92	10
10550	22.3	179.629	10544.41	-42.85	0.28	42.85	10
10600	27.3	179.629	10589.79	-63.82	0.41	63.82	10
10650	32.3	179.629	10633.16	-88.66	0.57	88.66	10
10700	37.3	179.629	10674.21	-117.18	0.76	117.19	10
10750	42.3	179.629	10712.61	-149.18	0.97	149.18	10
10800	47.3	179.629	10748.08	-184.4	1.2	184.4	10
10850	52.3	179.629	10780.34	-222.57	1.44	222.58	10
10900	57.3	179.629	10809.15	-263.42	1.71	263.42	10
10950	62.3	179.629	10834.29	-306.62	1.99	306.62	10
11000	67.3	179.629	10855.58	-351.84	2.28	351.85	10
11050	72.3	179.629	10872.83	-398.75	2.59	398.76	10
11100	77.3	179.629	10885.94	-446.99	2.9	447	10
11150	82.3	179.629	10894.79	-496.18	3.22	496.19	10
11200	87.3	179.629	10899.32	-545.96	3.54	545.97	10
11227	90	179.629	10899.96	-572.94	3.71	572.95	10
11300	90	179.629	10899.96	-645.94	4.19	645.96	0
11400	90	179.629	10899.96	-745.94	4.84	745.96	0

11500	90	179.629	10899.96	-845.94	5.48	845.96	0
11600	90	179.629	10899.96	-945.94	6.13	945.96	0
11700	90	179.629	10899.96	-1045.94	6.78	1045.96	0
11800	90	179.629	10899.96	-1145.93	7.43	1145.96	0
11900	90	179.629	10899.96	-1245.93	8.08	1245.96	0
12000	90	179.629	10899.96	-1345.93	8.73	1345.96	0
12100	90	179.629	10899.96	-1445.93	9.37	1445.96	0
12200	90	179.629	10899.96	-1545.93	10.02	1545.96	0
12300	90	179.629	10899.96	-1645.92	10.67	1645.96	0
12400	90	179.629	10899.97	-1745.92	11.32	1745.96	0
12500	90	179.629	10899.97	-1845.92	11.97	1845.96	0
12600	90	179.629	10899.97	-1945.92	12.62	1945.96	0
12700	90	179.629	10899.97	-2045.91	13.26	2045.96	0
12800	90	179.629	10899.97	-2145.91	13.91	2145.96	0
12900	90	179.629	10899.97	-2245.91	14.56	2245.96	0
13000	90	179.629	10899.97	-2345.91	15.21	2345.96	0
13100	90	179.629	10899.97	-2445.91	15.86	2445.96	0
13200	90	179.629	10899.97	-2545.9	16.51	2545.96	0
13300	90	179.629	10899.97	-2645.9	17.15	2645.96	0
13400	90	179.629	10899.97	-2745.9	17.8	2745.96	0
13500	90	179.629	10899.97	-2845.9	18.45	2845.96	0
13600	90	179.629	10899.97	-2945.9	19.1	2945.96	0
13700	90	179.629	10899.97	-3045.89	19.75	3045.96	0
13800	90	179.629	10899.97	-3145.89	20.4	3145.96	0
13900	90	179.629	10899.97	-3245.89	21.04	3245.96	0
14000	90	179.629	10899.97	-3345.89	21.69	3345.96	0
14100	90	179.629	10899.98	-3445.89	22.34	3445.96	0
14200	90	179.629	10899.98	-3545.88	22.99	3545.96	0
14300	90	179.629	10899.98	-3645.88	23.64	3645.96	0
14400	90	179.629	10899.98	-3745.88	24.29	3745.96	0
14500	90	179.629	10899.98	-3845.88	24.93	3845.96	0
14600	90	179.629	10899.98	-3945.87	25.58	3945.96	0
14700	90	179.629	10899.98	-4045.87	26.23	4045.96	0
14800	90	179.629	10899.98	-4145.87	26.88	4145.96	0
14900	90	179.629	10899.98	-4245.87	27.53	4245.96	0
15000	90	179.629	10899.98	-4345.87	28.18	4345.96	0
15100	90	179.629	10899.98	-4445.86	28.82	4445.96	0
15200	90	179.629	10899.98	-4545.86	29.47	4545.96	0
15300	90	179.629	10899.98	-4645.86	30.12	4645.96	0
15400	90	179.629	10899.98	-4745.86	30.77	4745.96	0
15500	90	179.629	10899.98	-4845.86	31.42	4845.96	0
15600	90	179.629	10899.98	-4945.85	32.07	4945.96	0
15700	90	179.629	10899.99	-5045.85	32.71	5045.96	0
15800	90	179.629	10899.99	-5145.85	33.36	5145.96	0
15900	90	179.629	10899.99	-5245.85	34.01	5245.96	0
16000	90	179.629	10899.99	-5345.85	34.66	5345.96	0
16100	90	179.629	10899.99	-5445.84	35.31	5445.96	0

16200	90	179.629	10899.99	-5545.84	35.96	5545.96	0
16300	90	179.629	10899.99	-5645.84	36.6	5645.96	0
16400	90	179.629	10899.99	-5745.84	37.25	5745.96	0
16500	90	179.629	10899.99	-5845.83	37.9	5845.96	0
16600	90	179.629	10899.99	-5945.83	38.55	5945.96	0
16700	90	179.629	10899.99	-6045.83	39.2	6045.96	0
16800	90	179.629	10899.99	-6145.83	39.85	6145.96	0
16900	90	179.629	10899.99	-6245.83	40.49	6245.96	0
17000	90	179.629	10899.99	-6345.82	41.14	6345.96	0
17100	90	179.629	10899.99	-6445.82	41.79	6445.96	0
17200	90	179.629	10899.99	-6545.82	42.44	6545.96	0
17300	90	179.629	10900	-6645.82	43.09	6645.96	0
17400	90	179.629	10900	-6745.82	43.74	6745.96	0
17500	90	179.629	10900	-6845.81	44.38	6845.96	0
17600	90	179.629	10900	-6945.81	45.03	6945.96	0
17700	90	179.629	10900	-7045.81	45.68	7045.96	0
17800	90	179.629	10900	-7145.81	46.33	7145.96	0
17900	90	179.629	10900	-7245.81	46.98	7245.96	0
18000	90	179.629	10900	-7345.8	47.63	7345.96	0
18073.2	90	179.629	10900	-7419	48.1	7419.16	0

All data are in feet unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to KB. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100 feet.

Vertical Section is from Slot and calculated along an Azimuth of 179.629° (Grid).

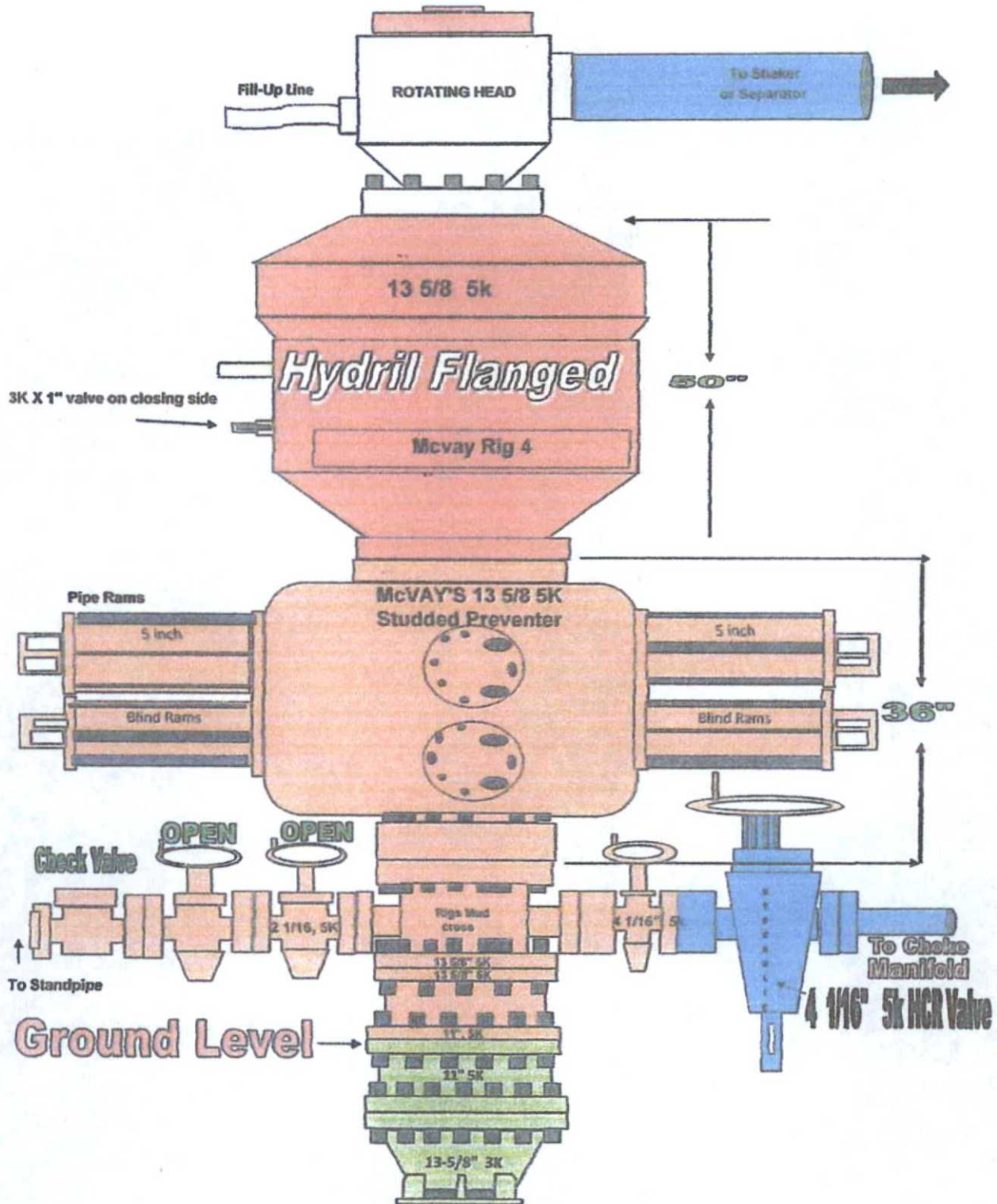
Coordinate System is NAD 1927 (NADCON CONUS) US State Plane 1927 (Exact solution), New Mexico East 3001.

Central meridian is -104.333°.

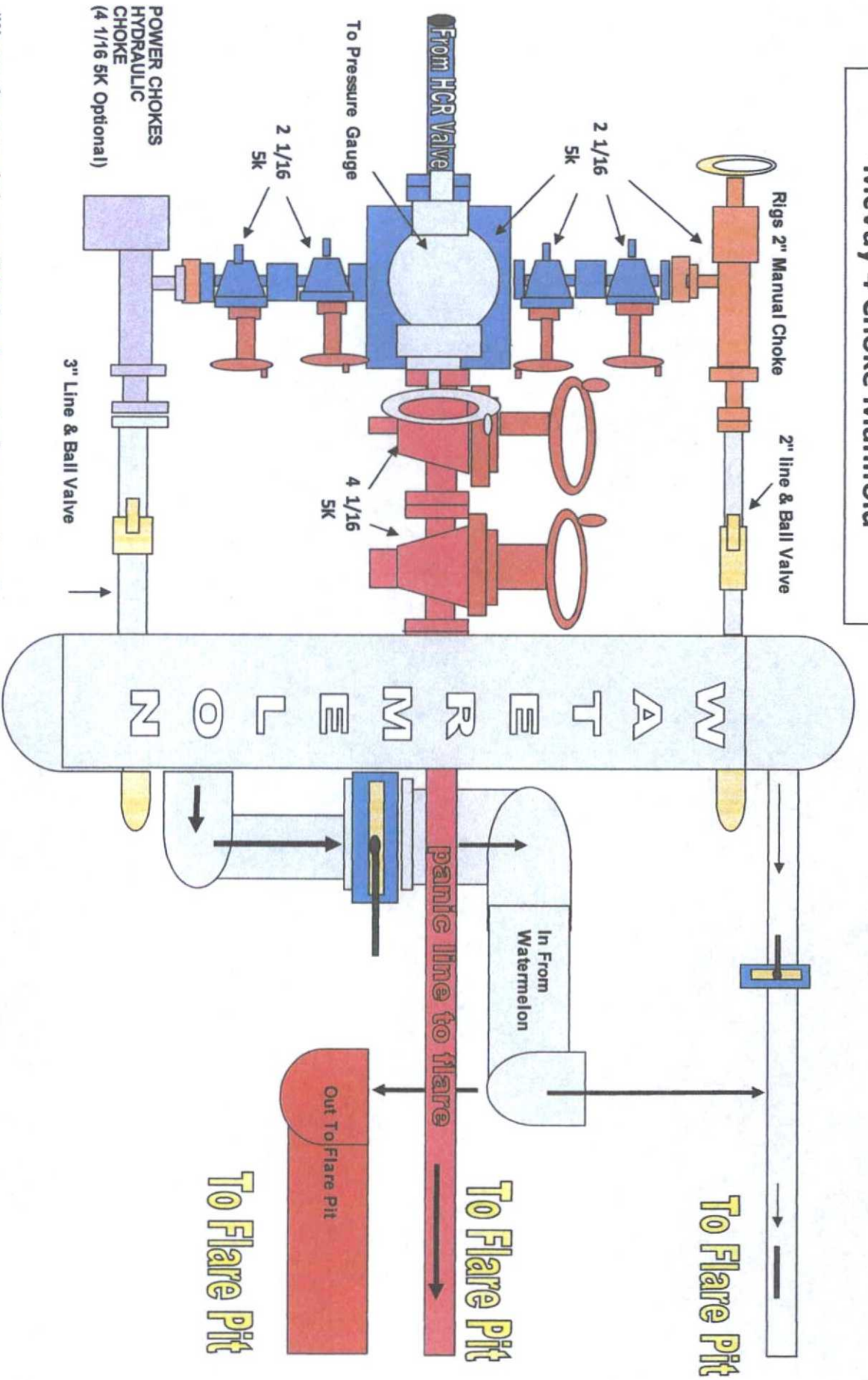
Grid Convergence at Surface is 0.434°.

Based upon Minimum Curvature type calculations, at a Measured Depth of 18073.20ft.,
the Bottom Hole Displacement is 7419.16ft., in the Direction of 179.629° (Grid).

McVay Rig 4



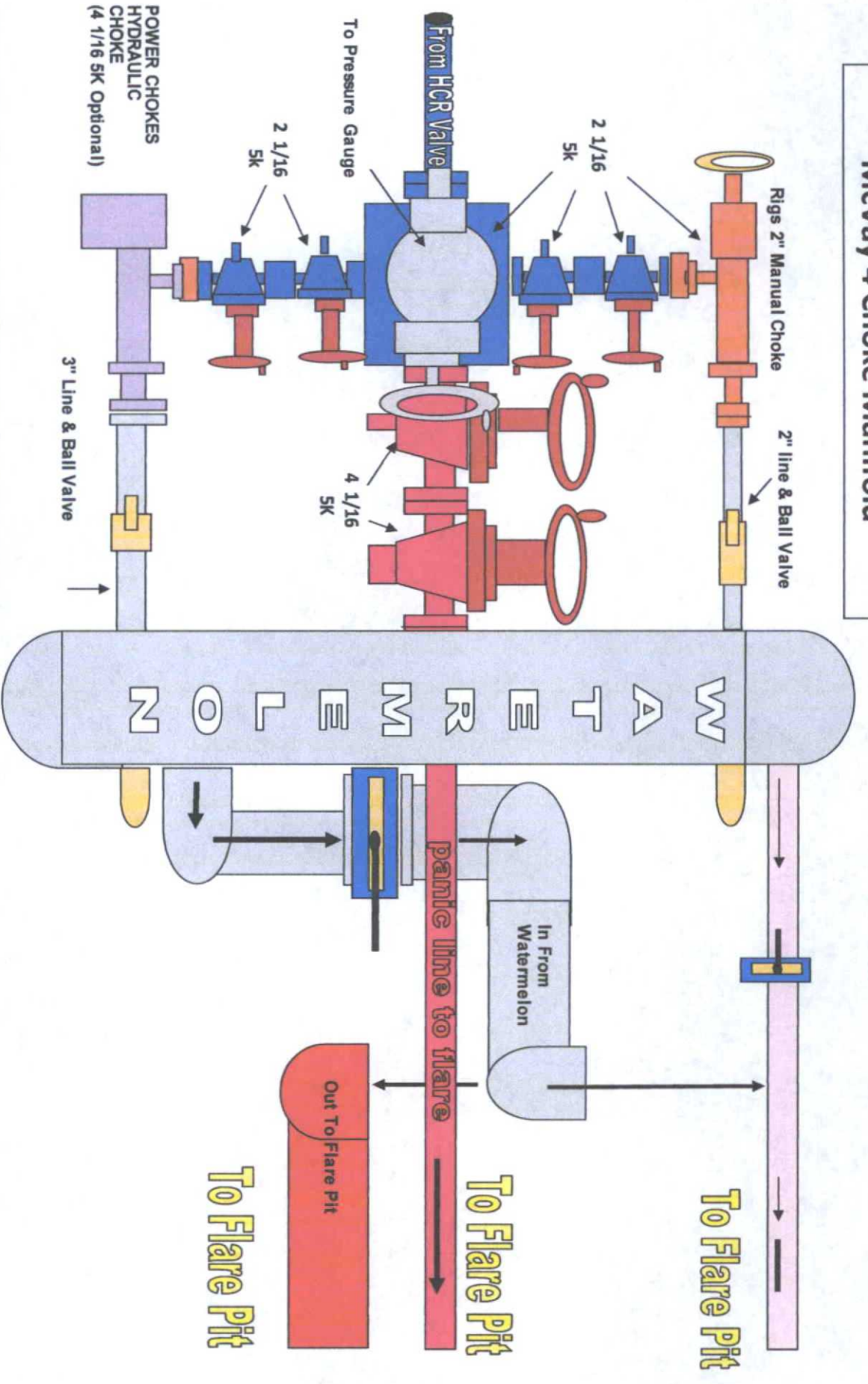
McVay 4 Choke Manifold



*We use the same choke manifolds for all aspects of our operations & all are rated to 10K;

* All connections downstream from BOP thru chokes Are Flanged, All connections downstream from chokes are Flanged .

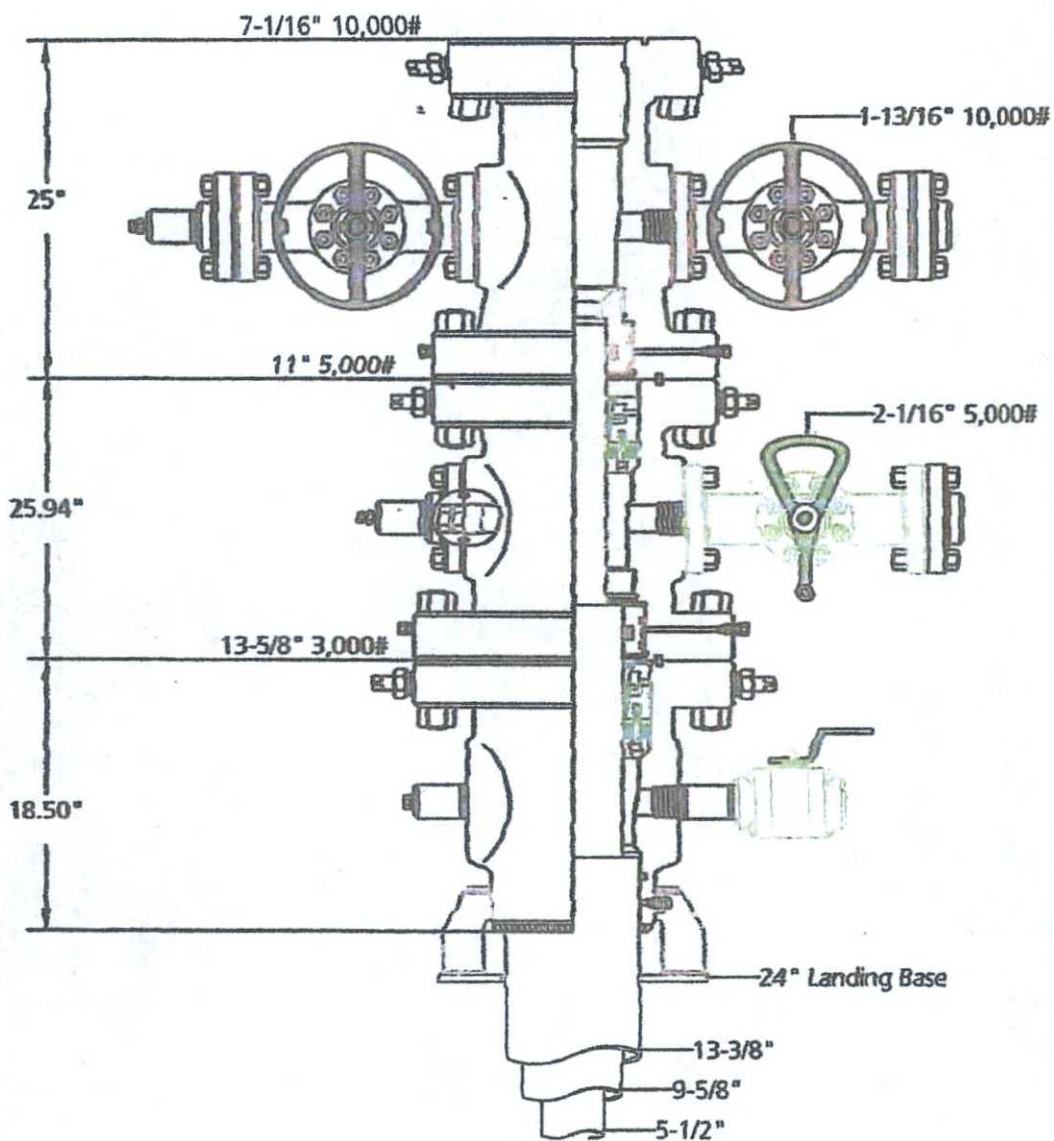
McVay 4 Choke Manifold



*We use the same choke manifolds for all aspects of our operations & all are rated to 10K;

* All connections downstream from BOP thru chokes Are Flanged, All connections downstream from chokes are Flanged .

Note: Dimensional information reflected on this drawing are estimated measurements only.



Legacy Reserves
Conventional 3-String

 **CAMERON**

NAME	jeanette	DATE	7-15-15	WORKING DRAWING	#	1274616
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Design Plan, Operating & Maintenance Plan & Closure Plan for the OCD Form C-144

DESIGN PLAN:

Fluid & cuttings coming from drilling operations will pass over the Shale Shaker with the cuttings going to the CRI haul off bin and the cleaned fluid returning to the working steel pits.

Equipment includes:

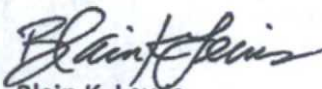
2-500 bbl steel tanks (fresh water for drilling)
2-700 bbl steel working pits (1400 bbls total)
2-20 cu yards steel haul off bins
2-pumps (CE FB1300)
2-shale shakers
1-mud cleaner (if needed)
1-centrifuge (if needed)

OPERATING AND MAINTENANCE PLAN:

Inspection to occur every tour for proper operation of system and individual components. If any problems are found they will be repaired and/or corrected immediately.

CLOSURE PLAN:

All haul bins containing cuttings will be removed from location and hauled to Controlled Recovery, Inc. (NM-01-0006) disposal site located near mile marker 66 on Highway 62/180.



Blain K. Lewis

Senior Operations Engineer

Plat for Closed Loop System

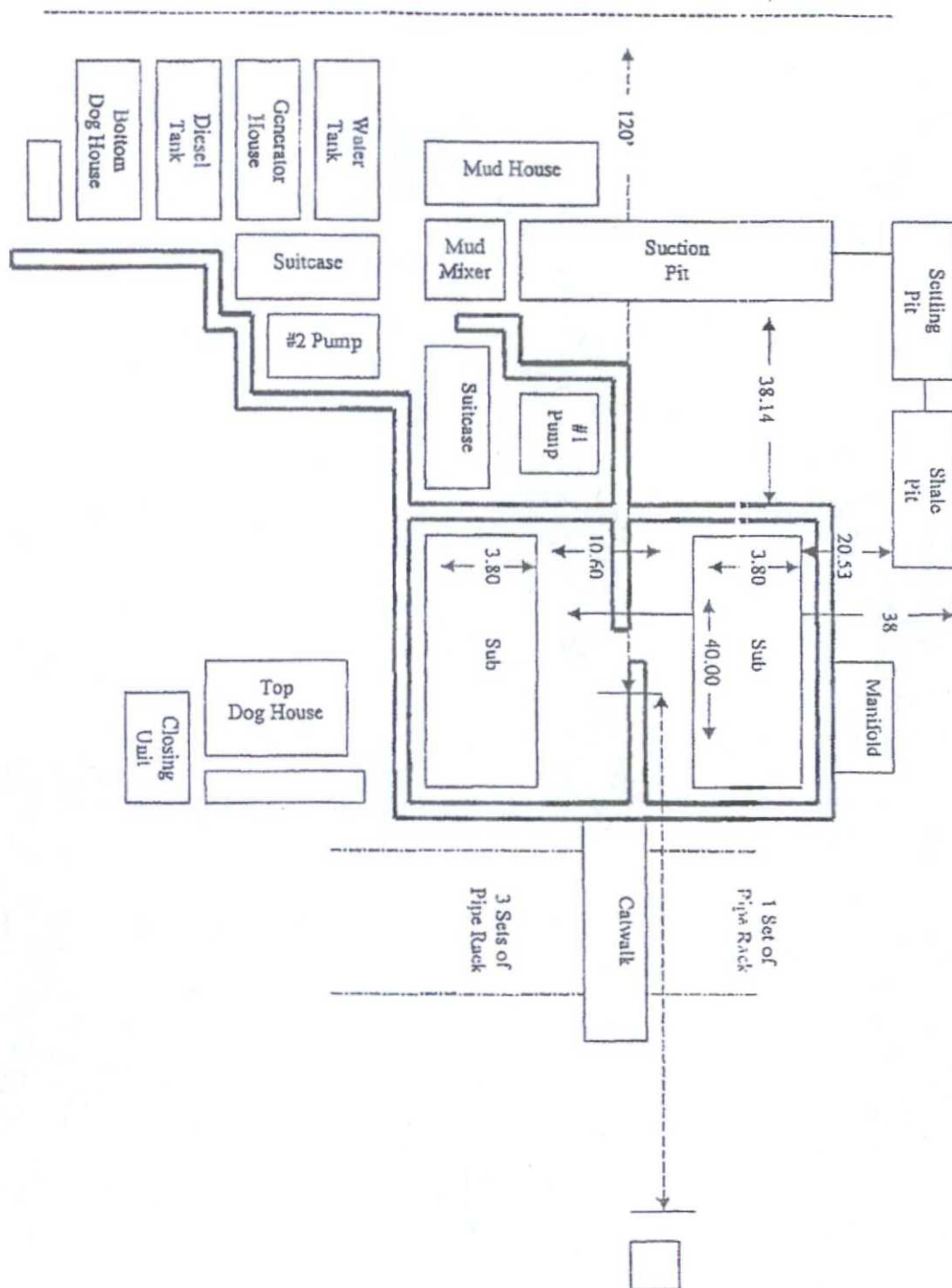


EXHIBIT D

**Rig Plat Only
LEA UNIT 54H
V-DOOR EAST**

