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District IV
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Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

Form C-101
August 1, 2011

Permit 272644

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

1. Operator Name and Address		2. OGRID Number
COG OPERATING LLC 600 W Illinois Ave Midland, TX 79701		229137 3. API Number 30-025-46420
4. Property Code 326152	5. Property Name PICKELHAUBE STATE	6. Well No. 701H

7. Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet From	N/S Line	Feet From	E/W Line	County
B	36	24S	34E	B	324	N	2503	E	Lea

8. Proposed Bottom Hole Location

UL - Lot	Section	Township	Range	Lot Idn	Feet From	N/S Line	Feet From	E/W Line	County
N	36	24S	34E	N	50	S	2310	W	Lea

9. Pool Information

WC-025 G-09 S253402N;WOLFCAMP	98116

Additional Well Information

11. Work Type	12. Well Type	13. Cable/Rotary	14. Lease Type	15. Ground Level Elevation
New Well	OIL		State	3388
16. Multiple	**17. Proposed Depth**	**18. Formation**	**19. Contractor**	**20. Spud Date**
N	17866	Wolfcamp		10/31/2019
Depth to Ground water		Distance from nearest fresh water well		Distance to nearest surface water

☒ **We will be using a closed-loop system in lieu of lined pits**

21. Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surf	14.75	10.75	45.5	1200	900	0
Int1	9.875	7.625	29.7	5440	1400	0
Int1	9.875	7.625	29.7	12300	1000	5250
Prod	6.75	5.5	23	11800	0	0
Prod	6.75	5	18	17866	1000	8000

Casing/Cement Program: Additional Comments

Drill a 14-3/4" hole to 1200' with Fresh Water into the Rustler to cover FW water depth. Run 10-3/4", 45.5# J-55 BTC casing and cement to surface. Drill 9-7/8" hole to 12,300' MD with a 595' tangent to the west-northwest. Mud system will be Diesel Brine Emulsion. We will run 7-5/8", 12,300' of 29.7# N/L80 and cement to surface in two stages with DV Tool set at approximately 5440' (Top of Lamar). Drill an 6-3/4" curve and lateral with Oil Based Mud (OBM) to approximately 17,866' MD. Run 5" 18# P110 BTC casing from TD up to 11,800', then 5-1/2" 23# P110 BTC casing from 11,800' to surface. Cement in one stage bringing cement up to 8000' in one stage.

22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Annular	3000	3000	Cameron
Annular	10000	10000	Cameron

23. I hereby certify that the information given above is true and complete to the best of my knowledge and belief. **I further certify I have complied with 19.15.14.9 (A) NMAC ☒ and/or 19.15.14.9 (B) NMAC ☒, if applicable.** Signature:		**OIL CONSERVATION DIVISION**	
Printed Name:	Electronically filed by Diane Kuykendall	Approved By:	Paul F Kautz
Title:	Production Accounting Director	Title:	Geologist
Email Address:	dkuykendall@concho.com	Approved Date:	10/10/2019 Expiration Date: 10/10/2021
Date:	10/4/2019 Phone: 432-685-4372	Conditions of Approval Attached	

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State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
30-025-	98116	WC-025 G-09 S253402N; Wolfcamp

4 Property Code	5 Property Name	6 Well Number
326152	PICKELHAUBE STATE	701H

7 OGRID NO.	8 Operator Name	9 Elevation
229137	COG OPERATING, LLC	3388'

10 Surface Location

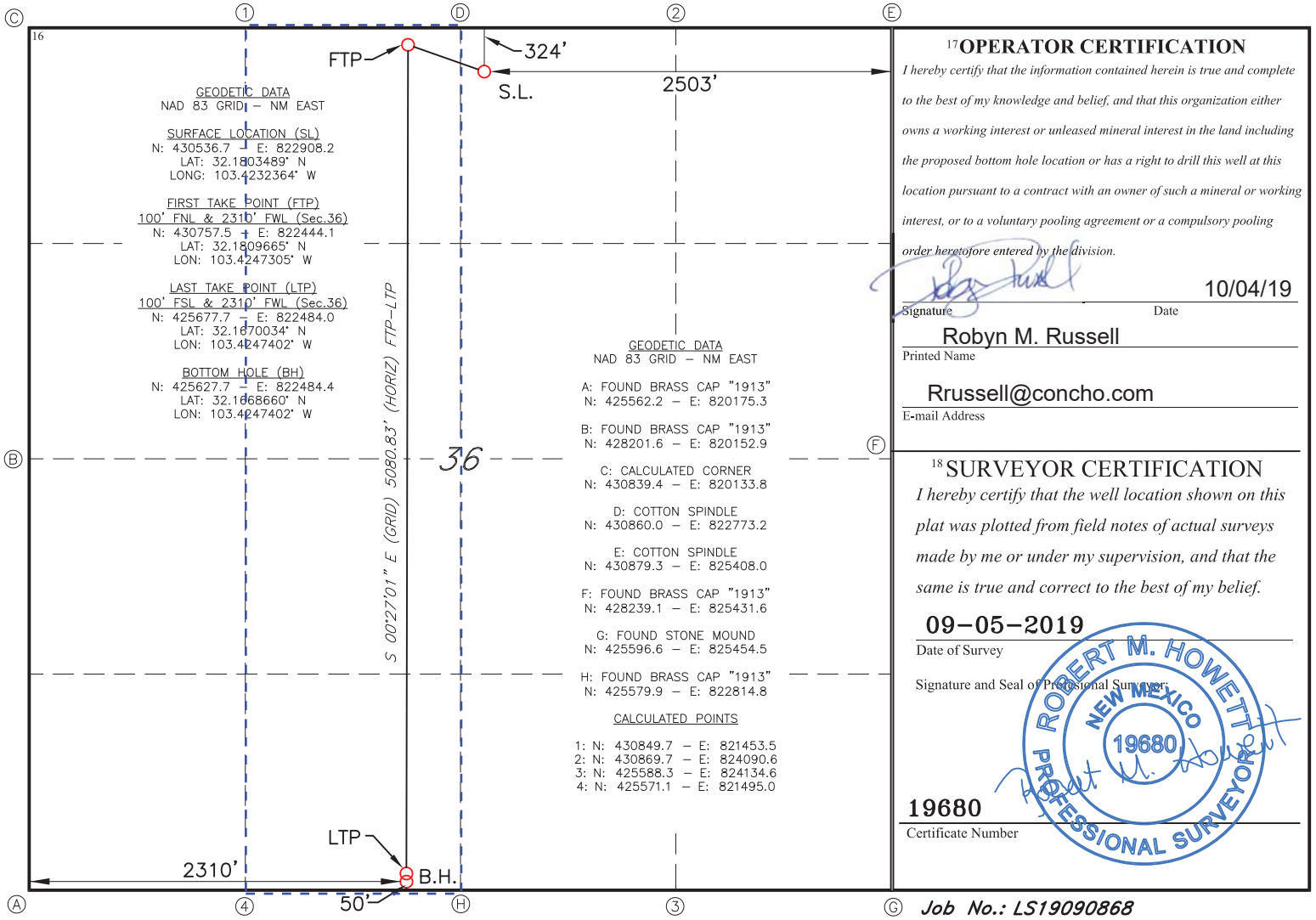
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet From the	East/West line	County
B	36	24S	34E		324	NORTH	2503	EAST	LEA

11 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
N	36	24S	34E		50	SOUTH	2310	WEST	LEA

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.
160			

No allowable will be assigned to this completion until all interest have been consolidated or a non-standard unit has been approved by the division.



17 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.

Signature — Date: 10/04/19

Robyn M. Russell
Printed Name

Rrussell@concho.com
E-mail Address

18 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.

09–05–2019
Date of Survey

Signature and Seal of Professional Surveyor:

ROBERT M. HOWETT
NEW MEXICO
19680
PROFESSIONAL SURVEYOR

19680
Certificate Number

Job No.: LS19090868

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GAS CAPTURE PLAN

Date: 10/10/2019

☒ Original

☐ Amended - Reason for Amendment:

Operator & OGRID No.: [229137] COG OPERATING LLC

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomplete to new zone, re-frac) activity.

Note: Form C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule (Subsection A of 19.15.18.12 NMAC).

Well(s)/Production Facility – Name of facility

The well(s) that will be located at the production facility are shown in the table below.

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
PICKELHAUBE STATE #701H	30-025-46420	B-36-24S-34E	0324N 2503E	1559	None	Length of additional line is not known at this time.

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility is dedicated to VERSADO GAS PROCESSORS,LLC and will be connected to VERSADO GAS PROCESSORS,LLC Low Pressure gathering system located in Lea County, New Mexico. It will require 0' of pipeline to connect the facility to Low Pressure gathering system. COG OPERATING LLC provides (periodically) to VERSADO GAS PROCESSORS,LLC a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, COG OPERATING LLC and VERSADO GAS PROCESSORS,LLC have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at VERSADO GAS PROCESSORS,LLC Processing Plant located in Sec. 36, Twn. 22S, Rng. 37E, Lea County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on VERSADO GAS PROCESSORS,LLC system at that time. Based on current information, it is COG OPERATING LLC's belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

Alternatives to Reduce Flaring

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
  - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
  - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
  - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines

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Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

PERMIT COMMENTS

Operator Name and Address:	API Number:
COG OPERATING LLC [229137] 600 W Illinois Ave Midland, TX 79701	30-025-46420
	Well: PICKELHAUBE STATE #701H

Created By	Comment	Comment Date
rodom	H2S concentrations of wells in this area from surface to TD are low enough that a contingency plan is not required.	9/24/2019

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PERMIT CONDITIONS OF APPROVAL

Operator Name and Address:	API Number:
COG OPERATING LLC [229137] 600 W Illinois Ave Midland, TX 79701	30-025-46420
	Well: PICKELHAUBE STATE #701H

OCD Reviewer	Condition
pkautz	Will require a directional survey with the C-104
pkautz	1) SURFACE & INTERMEDIATE CASING - Cement must circulate to surface -- 2) PRODUCTION CASING - Cement must tie back into intermediate casing --
pkautz	If cement does not circulate to surface, must run temperature survey or other log to determine top of cement
pkautz	Surface casing must be set 25' below top of Rustler Anhydrite in order to seal off protectable water
pkautz	1)- The Operator is to notify NMOCD by sundry (Form C-103) within ten (10) days of the well being spud 2)- Drilling Sundries Form C-103 (Casing and Cement test are to be submitted within 10 days 3)- Completion Reports & Logs are to be submitted within 45 days 4)- Deviation / Directional Drill Survey are to be filed with or prior to C-104
pkautz	It is the operator's responsibility to monitor cancellation dates of approved APDs. APD's are good for 2 years and may be extended for one year. Only one 1 year extension will be granted if submitted by C-103 before expiration date. After expiration date or after a 1 year extension must submit new APD. If an APD expires and if site construction has occurred, site remediation is required.
pkautz	Stage Tool 1) Must notify OCD Hobbs Office prior to running Stage Tool at 5753703186 2) If using Stage Tool on Surface casing, Stage Tool must be set greater than 350' from surface and a minimum of 200 feet above surface shoe. 3) When using a Stage Tool on Intermediate or Production Casing Stage must be a minimum of 50 feet below previous casing shoe.

CONCHO

NORTHERN DELAWARE BASIN

LEA COUNTY, NM
BULLDOG
PICKELHAUBE ST #701H

OWB

Plan: PWP1

Standard Survey Report

01 October, 2019

Survey Report

Company:	NORTHERN DELAWARE BASIN	**Local Co-ordinate Reference:**	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	**TVD Reference:**	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	**MD Reference:**	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP1	**Database:**	EDM_Users

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 BULLDOG

Site Position:		**Northing:**	398,637.10 usft	**Latitude:**	32° 5' 36.820 N
From:	Map	**Easting:**	741,887.40 usft	**Longitude:**	103° 33' 8.116 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.42 °

Well PICKELHAUBE ST #701H

Well Position	**+N/-S**	0.0 usft	**Northing:**	430,478.10 usft	**Latitude:**	32° 10' 48.805 N
	+E/-W	0.0 usft	**Easting:**	781,722.60 usft	**Longitude:**	103° 25' 21.959 W
Position Uncertainty		3.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,388.0 usft

Wellbore OWB

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM2015	9/9/2019	6.67	59.99	47,680.67548974

Design PWP1

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	184.94

Survey Tool Program **Date** 10/1/2019

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	17,899.4	PWP1 (OWB)	MWD+IFR1+FDIR	OWSG MWD + IFR1 + FDIR Correction

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

Survey Report

Company:	NORTHERN DELAWARE BASIN	**Local Co-ordinate Reference:**	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	**TVD Reference:**	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	**MD Reference:**	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP1	**Database:**	EDM_Users

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)
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

Survey Report

Company:	NORTHERN DELAWARE BASIN	**Local Co-ordinate Reference:**	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	**TVD Reference:**	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	**MD Reference:**	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP1	**Database:**	EDM_Users

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
Start Build 2.00									
5,600.0	2.00	301.65	5,600.0	0.9	-1.5	-0.8	2.00	2.00	0.00
5,700.0	4.00	301.65	5,699.8	3.7	-5.9	-3.1	2.00	2.00	0.00
5,714.0	4.28	301.65	5,713.8	4.2	-6.8	-3.6	2.00	2.00	0.00
Start 6717.6 hold at 5714.0 MD									
5,800.0	4.28	301.65	5,799.6	7.6	-12.3	-6.5	0.00	0.00	0.00
5,900.0	4.28	301.65	5,899.3	11.5	-18.6	-9.8	0.00	0.00	0.00
6,000.0	4.28	301.65	5,999.0	15.4	-25.0	-13.2	0.00	0.00	0.00
6,100.0	4.28	301.65	6,098.7	19.3	-31.3	-16.5	0.00	0.00	0.00
6,200.0	4.28	301.65	6,198.4	23.2	-37.7	-19.9	0.00	0.00	0.00
6,300.0	4.28	301.65	6,298.2	27.1	-44.0	-23.2	0.00	0.00	0.00
6,400.0	4.28	301.65	6,397.9	31.0	-50.4	-26.6	0.00	0.00	0.00
6,500.0	4.28	301.65	6,497.6	35.0	-56.7	-30.0	0.00	0.00	0.00
6,600.0	4.28	301.65	6,597.3	38.9	-63.1	-33.3	0.00	0.00	0.00
6,700.0	4.28	301.65	6,697.1	42.8	-69.4	-36.7	0.00	0.00	0.00
6,800.0	4.28	301.65	6,796.8	46.7	-75.8	-40.0	0.00	0.00	0.00
6,900.0	4.28	301.65	6,896.5	50.6	-82.1	-43.4	0.00	0.00	0.00
7,000.0	4.28	301.65	6,996.2	54.5	-88.5	-46.7	0.00	0.00	0.00
7,100.0	4.28	301.65	7,095.9	58.5	-94.8	-50.1	0.00	0.00	0.00
7,200.0	4.28	301.65	7,195.7	62.4	-101.2	-53.4	0.00	0.00	0.00
7,300.0	4.28	301.65	7,295.4	66.3	-107.5	-56.8	0.00	0.00	0.00
7,400.0	4.28	301.65	7,395.1	70.2	-113.9	-60.1	0.00	0.00	0.00
7,500.0	4.28	301.65	7,494.8	74.1	-120.2	-63.5	0.00	0.00	0.00
7,600.0	4.28	301.65	7,594.5	78.0	-126.6	-66.8	0.00	0.00	0.00
7,700.0	4.28	301.65	7,694.3	81.9	-132.9	-70.2	0.00	0.00	0.00
7,800.0	4.28	301.65	7,794.0	85.9	-139.3	-73.6	0.00	0.00	0.00
7,900.0	4.28	301.65	7,893.7	89.8	-145.6	-76.9	0.00	0.00	0.00
8,000.0	4.28	301.65	7,993.4	93.7	-152.0	-80.3	0.00	0.00	0.00
8,100.0	4.28	301.65	8,093.1	97.6	-158.4	-83.6	0.00	0.00	0.00
8,200.0	4.28	301.65	8,192.9	101.5	-164.7	-87.0	0.00	0.00	0.00
8,300.0	4.28	301.65	8,292.6	105.4	-171.1	-90.3	0.00	0.00	0.00
8,400.0	4.28	301.65	8,392.3	109.4	-177.4	-93.7	0.00	0.00	0.00
8,500.0	4.28	301.65	8,492.0	113.3	-183.8	-97.0	0.00	0.00	0.00
8,600.0	4.28	301.65	8,591.8	117.2	-190.1	-100.4	0.00	0.00	0.00
8,700.0	4.28	301.65	8,691.5	121.1	-196.5	-103.7	0.00	0.00	0.00
8,800.0	4.28	301.65	8,791.2	125.0	-202.8	-107.1	0.00	0.00	0.00
8,900.0	4.28	301.65	8,890.9	128.9	-209.2	-110.5	0.00	0.00	0.00
9,000.0	4.28	301.65	8,990.6	132.8	-215.5	-113.8	0.00	0.00	0.00
9,100.0	4.28	301.65	9,090.4	136.8	-221.9	-117.2	0.00	0.00	0.00
9,200.0	4.28	301.65	9,190.1	140.7	-228.2	-120.5	0.00	0.00	0.00
9,300.0	4.28	301.65	9,289.8	144.6	-234.6	-123.9	0.00	0.00	0.00

Survey Report

Company:	NORTHERN DELAWARE BASIN	**Local Co-ordinate Reference:**	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	**TVD Reference:**	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	**MD Reference:**	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP1	**Database:**	EDM_Users

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)
9,400.0	4.28	301.65	9,389.5	148.5	-240.9	-127.2	0.00	0.00	0.00
9,500.0	4.28	301.65	9,489.2	152.4	-247.3	-130.6	0.00	0.00	0.00
9,600.0	4.28	301.65	9,589.0	156.3	-253.6	-133.9	0.00	0.00	0.00
9,700.0	4.28	301.65	9,688.7	160.2	-260.0	-137.3	0.00	0.00	0.00
9,800.0	4.28	301.65	9,788.4	164.2	-266.3	-140.6	0.00	0.00	0.00
9,900.0	4.28	301.65	9,888.1	168.1	-272.7	-144.0	0.00	0.00	0.00
10,000.0	4.28	301.65	9,987.9	172.0	-279.0	-147.3	0.00	0.00	0.00
10,100.0	4.28	301.65	10,087.6	175.9	-285.4	-150.7	0.00	0.00	0.00
10,200.0	4.28	301.65	10,187.3	179.8	-291.7	-154.1	0.00	0.00	0.00
10,300.0	4.28	301.65	10,287.0	183.7	-298.1	-157.4	0.00	0.00	0.00
10,400.0	4.28	301.65	10,386.7	187.7	-304.4	-160.8	0.00	0.00	0.00
10,500.0	4.28	301.65	10,486.5	191.6	-310.8	-164.1	0.00	0.00	0.00
10,600.0	4.28	301.65	10,586.2	195.5	-317.1	-167.5	0.00	0.00	0.00
10,700.0	4.28	301.65	10,685.9	199.4	-323.5	-170.8	0.00	0.00	0.00
10,800.0	4.28	301.65	10,785.6	203.3	-329.8	-174.2	0.00	0.00	0.00
10,900.0	4.28	301.65	10,885.3	207.2	-336.2	-177.5	0.00	0.00	0.00
11,000.0	4.28	301.65	10,985.1	211.1	-342.6	-180.9	0.00	0.00	0.00
11,100.0	4.28	301.65	11,084.8	215.1	-348.9	-184.2	0.00	0.00	0.00
11,200.0	4.28	301.65	11,184.5	219.0	-355.3	-187.6	0.00	0.00	0.00
11,300.0	4.28	301.65	11,284.2	222.9	-361.6	-190.9	0.00	0.00	0.00
11,400.0	4.28	301.65	11,384.0	226.8	-368.0	-194.3	0.00	0.00	0.00
11,500.0	4.28	301.65	11,483.7	230.7	-374.3	-197.7	0.00	0.00	0.00
11,600.0	4.28	301.65	11,583.4	234.6	-380.7	-201.0	0.00	0.00	0.00
11,700.0	4.28	301.65	11,683.1	238.6	-387.0	-204.4	0.00	0.00	0.00
11,800.0	4.28	301.65	11,782.8	242.5	-393.4	-207.7	0.00	0.00	0.00
11,900.0	4.28	301.65	11,882.6	246.4	-399.7	-211.1	0.00	0.00	0.00
12,000.0	4.28	301.65	11,982.3	250.3	-406.1	-214.4	0.00	0.00	0.00
12,100.0	4.28	301.65	12,082.0	254.2	-412.4	-217.8	0.00	0.00	0.00
12,200.0	4.28	301.65	12,181.7	258.1	-418.8	-221.1	0.00	0.00	0.00
12,300.0	4.28	301.65	12,281.4	262.0	-425.1	-224.5	0.00	0.00	0.00
12,400.0	4.28	301.65	12,381.2	266.0	-431.5	-227.8	0.00	0.00	0.00
12,431.5	4.28	301.65	12,412.6	267.2	-433.5	-228.9	0.00	0.00	0.00
Start DLS 12.00 TFO -122.04									
12,500.0	6.96	210.81	12,480.8	265.0	-437.8	-226.3	12.00	3.91	-132.65
12,600.0	18.30	190.58	12,578.3	244.3	-443.8	-205.2	12.00	11.34	-20.22
12,700.0	30.14	185.80	12,669.3	203.7	-449.2	-164.3	12.00	11.85	-4.79
12,800.0	42.07	183.56	12,750.0	145.1	-453.9	-105.5	12.00	11.93	-2.24
12,900.0	54.03	182.17	12,816.7	70.9	-457.5	-31.3	12.00	11.96	-1.39
13,000.0	66.00	181.15	12,866.6	-15.5	-459.9	55.0	12.00	11.97	-1.02
13,100.0	77.97	180.31	12,897.5	-110.4	-461.1	149.7	12.00	11.97	-0.84
13,198.3	89.74	179.55	12,908.0	-208.0	-461.0	246.9	12.00	11.98	-0.77
Start 4701.1 hold at 13198.3 MD									
13,200.0	89.74	179.55	12,908.0	-209.7	-461.0	248.6	0.00	0.00	0.00
13,300.0	89.74	179.55	12,908.5	-309.7	-460.2	348.1	0.00	0.00	0.00

Survey Report

Company:	NORTHERN DELAWARE BASIN	**Local Co-ordinate Reference:**	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	**TVD Reference:**	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	**MD Reference:**	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP1	**Database:**	EDM_Users

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)
13,400.0	89.74	179.55	12,908.9	-409.7	-459.4	447.7	0.00	0.00	0.00
13,500.0	89.74	179.55	12,909.3	-509.7	-458.6	547.2	0.00	0.00	0.00
13,600.0	89.74	179.55	12,909.8	-609.7	-457.8	646.8	0.00	0.00	0.00
13,700.0	89.74	179.55	12,910.2	-709.7	-457.1	746.4	0.00	0.00	0.00
13,800.0	89.74	179.55	12,910.7	-809.6	-456.3	845.9	0.00	0.00	0.00
13,900.0	89.74	179.55	12,911.1	-909.6	-455.5	945.5	0.00	0.00	0.00
14,000.0	89.74	179.55	12,911.6	-1,009.6	-454.7	1,045.0	0.00	0.00	0.00
14,100.0	89.74	179.55	12,912.0	-1,109.6	-453.9	1,144.6	0.00	0.00	0.00
14,200.0	89.74	179.55	12,912.5	-1,209.6	-453.1	1,244.1	0.00	0.00	0.00
14,300.0	89.74	179.55	12,912.9	-1,309.6	-452.3	1,343.7	0.00	0.00	0.00
14,400.0	89.74	179.55	12,913.4	-1,409.6	-451.5	1,443.3	0.00	0.00	0.00
14,500.0	89.74	179.55	12,913.8	-1,509.6	-450.8	1,542.8	0.00	0.00	0.00
14,600.0	89.74	179.55	12,914.3	-1,609.6	-450.0	1,642.4	0.00	0.00	0.00
14,700.0	89.74	179.55	12,914.7	-1,709.6	-449.2	1,741.9	0.00	0.00	0.00
14,800.0	89.74	179.55	12,915.2	-1,809.6	-448.4	1,841.5	0.00	0.00	0.00
14,900.0	89.74	179.55	12,915.6	-1,909.6	-447.6	1,941.0	0.00	0.00	0.00
15,000.0	89.74	179.55	12,916.0	-2,009.6	-446.8	2,040.6	0.00	0.00	0.00
15,100.0	89.74	179.55	12,916.5	-2,109.6	-446.0	2,140.2	0.00	0.00	0.00
15,200.0	89.74	179.55	12,916.9	-2,209.6	-445.2	2,239.7	0.00	0.00	0.00
15,300.0	89.74	179.55	12,917.4	-2,309.6	-444.5	2,339.3	0.00	0.00	0.00
15,400.0	89.74	179.55	12,917.8	-2,409.6	-443.7	2,438.8	0.00	0.00	0.00
15,500.0	89.74	179.55	12,918.3	-2,509.6	-442.9	2,538.4	0.00	0.00	0.00
15,600.0	89.74	179.55	12,918.7	-2,609.6	-442.1	2,637.9	0.00	0.00	0.00
15,700.0	89.74	179.55	12,919.2	-2,709.6	-441.3	2,737.5	0.00	0.00	0.00
15,800.0	89.74	179.55	12,919.6	-2,809.6	-440.5	2,837.1	0.00	0.00	0.00
15,900.0	89.74	179.55	12,920.1	-2,909.6	-439.7	2,936.6	0.00	0.00	0.00
16,000.0	89.74	179.55	12,920.5	-3,009.6	-438.9	3,036.2	0.00	0.00	0.00
16,100.0	89.74	179.55	12,921.0	-3,109.6	-438.2	3,135.7	0.00	0.00	0.00
16,200.0	89.74	179.55	12,921.4	-3,209.6	-437.4	3,235.3	0.00	0.00	0.00
16,300.0	89.74	179.55	12,921.9	-3,309.5	-436.6	3,334.8	0.00	0.00	0.00
16,400.0	89.74	179.55	12,922.3	-3,409.5	-435.8	3,434.4	0.00	0.00	0.00
16,500.0	89.74	179.55	12,922.7	-3,509.5	-435.0	3,534.0	0.00	0.00	0.00
16,600.0	89.74	179.55	12,923.2	-3,609.5	-434.2	3,633.5	0.00	0.00	0.00
16,700.0	89.74	179.55	12,923.6	-3,709.5	-433.4	3,733.1	0.00	0.00	0.00
16,800.0	89.74	179.55	12,924.1	-3,809.5	-432.7	3,832.6	0.00	0.00	0.00
16,900.0	89.74	179.55	12,924.5	-3,909.5	-431.9	3,932.2	0.00	0.00	0.00
17,000.0	89.74	179.55	12,925.0	-4,009.5	-431.1	4,031.7	0.00	0.00	0.00
17,100.0	89.74	179.55	12,925.4	-4,109.5	-430.3	4,131.3	0.00	0.00	0.00
17,200.0	89.74	179.55	12,925.9	-4,209.5	-429.5	4,230.9	0.00	0.00	0.00
17,300.0	89.74	179.55	12,926.3	-4,309.5	-428.7	4,330.4	0.00	0.00	0.00
17,400.0	89.74	179.55	12,926.8	-4,409.5	-427.9	4,430.0	0.00	0.00	0.00
17,500.0	89.74	179.55	12,927.2	-4,509.5	-427.1	4,529.5	0.00	0.00	0.00
17,600.0	89.74	179.55	12,927.7	-4,609.5	-426.4	4,629.1	0.00	0.00	0.00

Survey Report

Company:	NORTHERN DELAWARE BASIN	**Local Co-ordinate Reference:**	Well PICKELHAUBE ST #701H
Project:	LEA COUNTY, NM	**TVD Reference:**	KB=31' @ 3419.0usft (Precision 106)
Site:	BULLDOG	**MD Reference:**	KB=31' @ 3419.0usft (Precision 106)
Well:	PICKELHAUBE ST #701H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP1	**Database:**	EDM_Users

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)
17,700.0	89.74	179.55	12,928.1	-4,709.5	-425.6	4,728.6	0.00	0.00	0.00
17,800.0	89.74	179.55	12,928.6	-4,809.5	-424.8	4,828.2	0.00	0.00	0.00
17,899.4	89.74	179.55	12,929.0	-4,908.9	-424.0	4,927.2	0.00	0.00	0.00
TD at 17899.4									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
FTP (PICKELHAUBE - plan misses target center by 165.7usft at 12849.8usft MD (12785.2 TVD, 109.9 N, -455.8 E) - Point	0.00	0.00	12,908.0	220.8	-464.1	430,698.90	781,258.50	32° 10' 51.029 N	103° 25' 27.337 W
PBHL (PICKELHAUB - plan hits target center - Point	0.00	0.00	12,929.0	-4,908.9	-424.0	425,569.20	781,298.60	32° 10' 0.266 N	103° 25' 27.374 W
LTP (PICKELHAUBE - plan misses target center by 49.4usft at 17800.0usft MD (12928.6 TVD, -4809.5 N, -424.8 E) - Point	0.00	0.00	12,929.0	-4,858.9	-424.4	425,619.20	781,298.20	32° 10' 0.761 N	103° 25' 27.374 W

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
5500	5500	0	0	Start Build 2.00
5714	5714	4	-7	Start 6717.6 hold at 5714.0 MD
12,432	12,413	267	-433	Start DLS 12.00 TFO -122.04
13,198	12,908	-208	-461	Start 4701.1 hold at 13198.3 MD
17,899	12,929	-4909	-424	TD at 17899.4

Checked By: _____ Approved By: _____ Date: _____

CONCHO

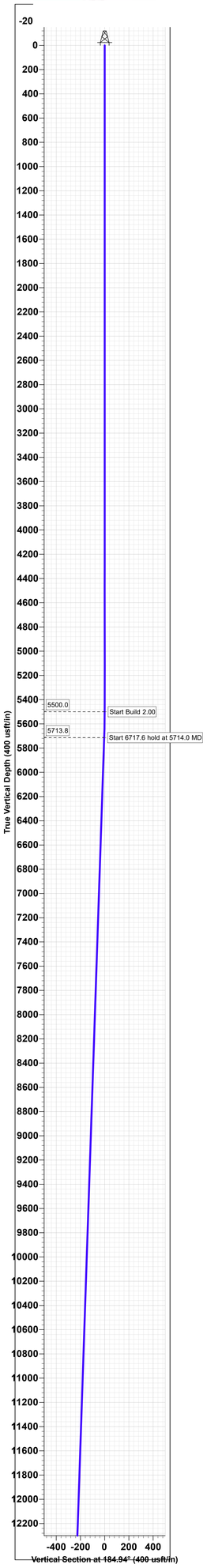
Project:	LEA COUNTY, NM
Site:	BULLDOG
Well:	PICKELHAUBE ST #701H
Wellbore:	OWB
Design:	PWP1
GL:	3388.0
KB=31' @ 3419.0usft (Precision 106)	

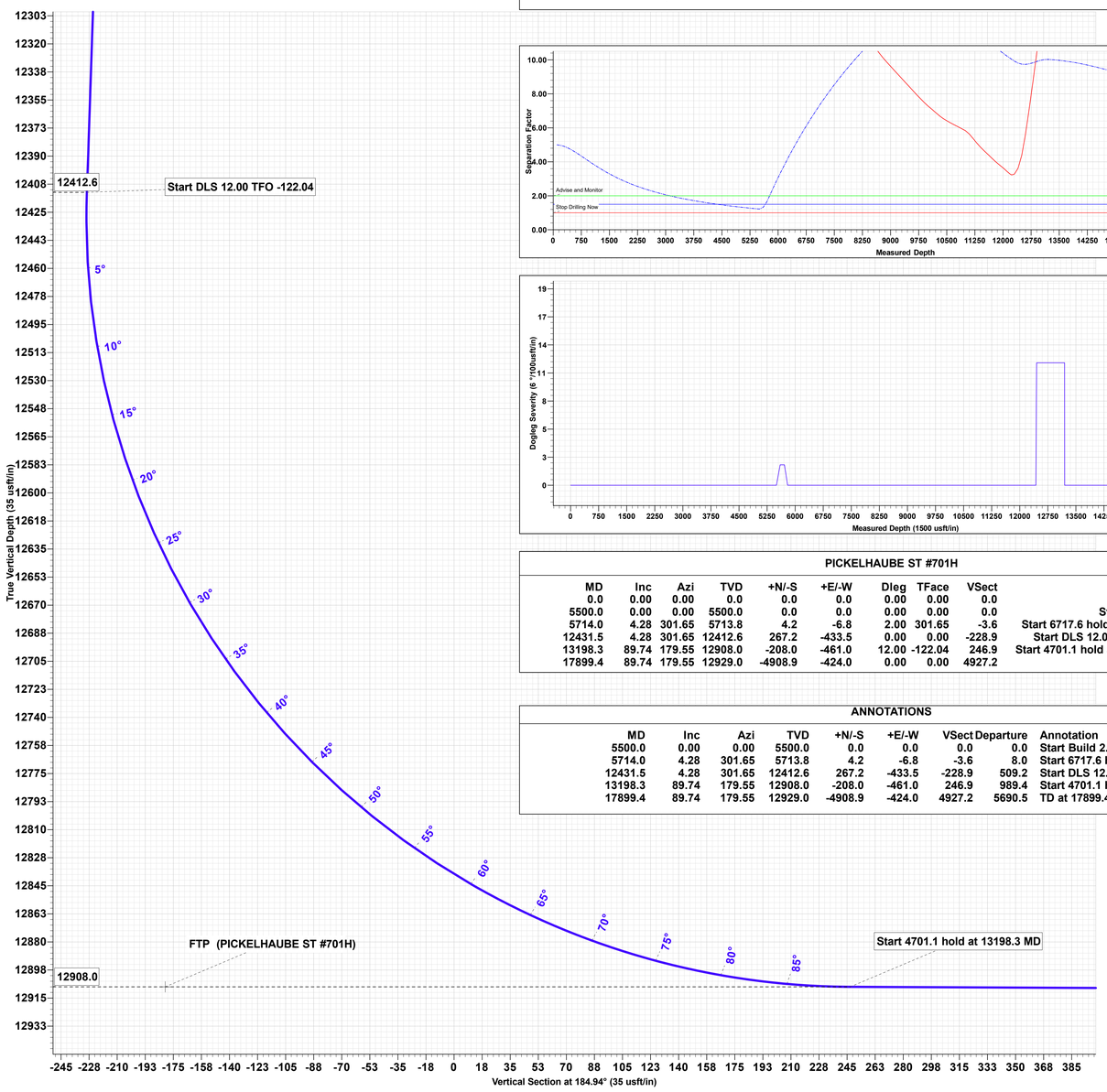
WELL DETAILS: PICKELHAUBE ST #701H

+N/-S	+E/-W	Northing	Easting	Latittude	Longitude
0.0	0.0	430478.10	781722.60	32° 10' 48.805 N	103° 25' 21.959 W

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
FTP (PICKELHAUBE ST #701H)	12908.0	220.8	-464.1	430698.90	781258.50
LTP (PICKELHAUBE ST #701H)	12929.0	-4858.9	-424.4	425619.20	781298.20
PBHL (PICKELHAUBE ST #701H)	12929.0	-4908.9	-424.0	425569.20	781298.60



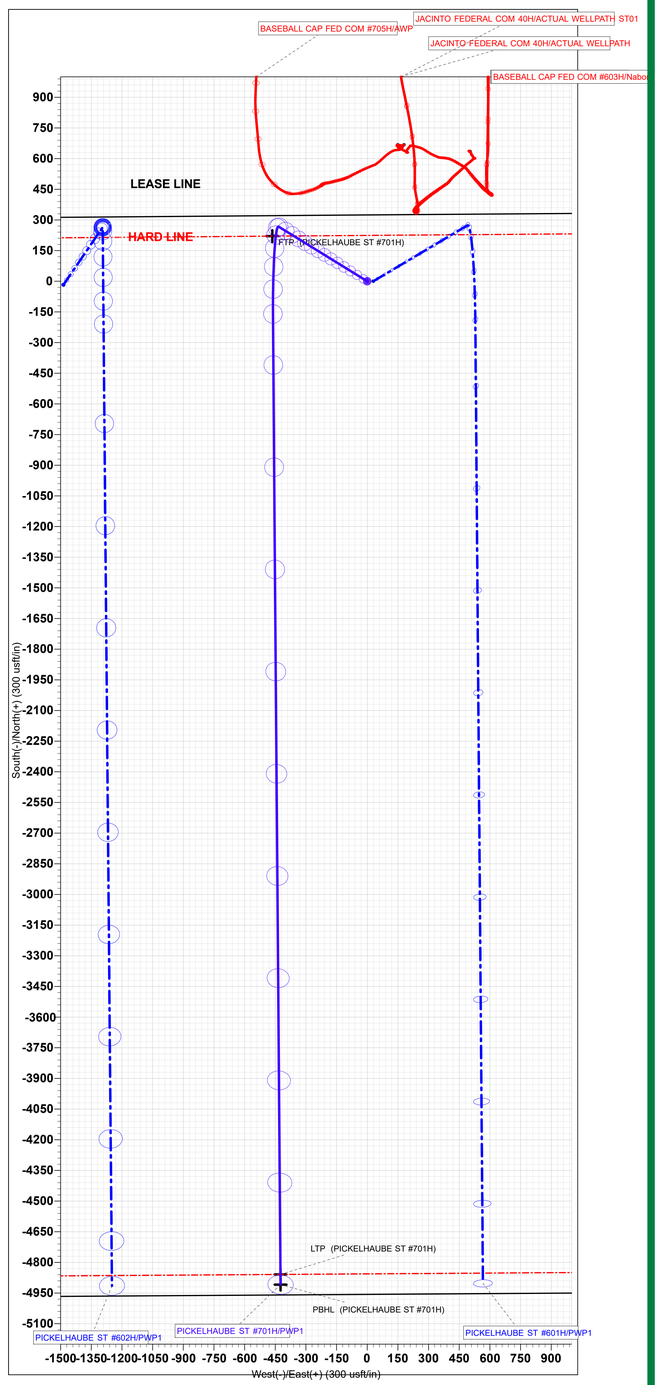


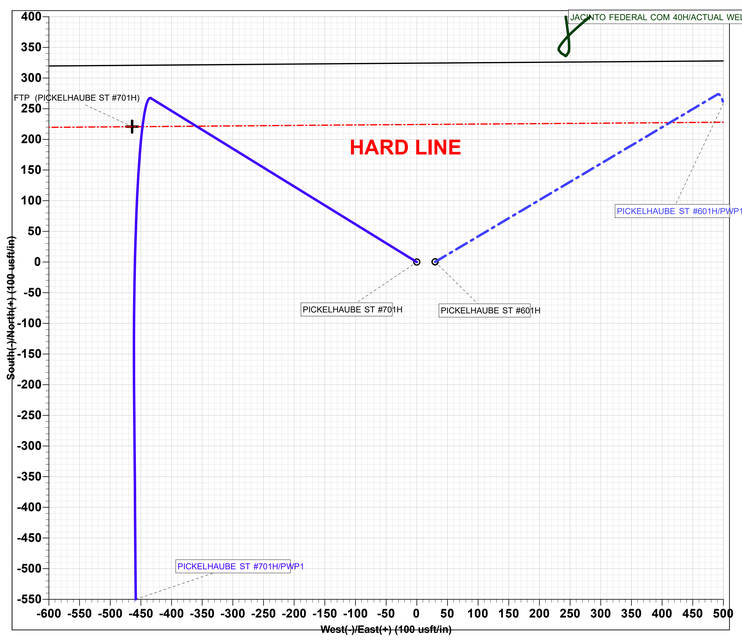
PICKELHAUBE ST #701H

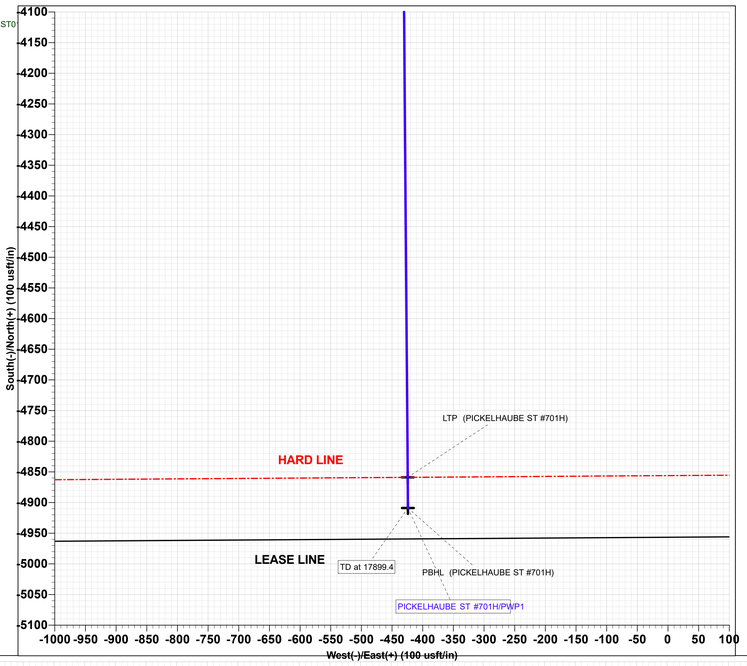
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
5500.0	0.00	0.00	5500.0	0.0	0.0	0.00	0.00	0.0	Start Build 2.00
5714.0	4.28	301.65	5713.8	4.2	-6.8	2.00	301.65	-3.6	Start 6717.6 hold at 5714.0 MD
12431.5	4.28	301.65	12412.6	267.2	-433.5	0.00	0.00	-228.9	Start DLS 12.00 TFO -122.04
13198.3	89.74	179.55	12908.0	-208.0	-461.0	12.00	-122.04	246.9	Start 4701.1 hold at 13198.3 MD
17899.4	89.74	179.55	12929.0	-4908.9	-424.0	0.00	0.00	4927.2	TD at 17899.4

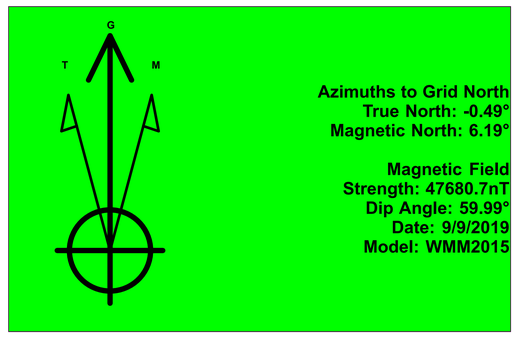
ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation
5500.0	0.00	0.00	5500.0	0.0	0.0	0.0	0.0	Start Build 2.00
5714.0	4.28	301.65	5713.8	4.2	-6.8	-3.6	8.0	Start 6717.6 hold at 5714.0 MD
12431.5	4.28	301.65	12412.6	267.2	-433.5	-228.9	509.2	Start DLS 12.00 TFO -122.04
13198.3	89.74	179.55	12908.0	-208.0	-461.0	246.9	989.4	Start 4701.1 hold at 13198.3 MD
17899.4	89.74	179.55	12929.0	-4908.9	-424.0	4927.2	5690.5	TD at 17899.4









Azimuths to Grid North
True North: -0.49°
Magnetic North: 6.19°

Magnetic Field
Strength: 47680.7nT
Dip Angle: 59.99°
Date: 9/9/2019
Model: WMM2015