Form 3160-3
(June 2015)

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☐ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☐ Gas Well ☐ Other

1c. Type of Completion: ☐ Hydraulic Fracturing ☐ Single Zone ☐ Multiple Zone

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

8. Lease Name and Well No.

2. Name of Operator

9. API Well No.
30 015 47993

Purple Sage Wolfcamp

3a. Address

3b. Phone No. *(include area code)*

10. Field and Pool, or Exploratory

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface

At proposed prod. zone

11. Sec., T. R. M. or Blk. and Survey or Area

14. Distance in miles and direction from nearest town or post office*

12. County or Parish

13. State

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

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

25. Signature	Name *(Printed/Typed)*	Date
Title		
Approved by *(Signature)*	Name *(Printed/Typed)*	Date
Title	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.

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.

APPROVED WITH CONDITIONS

(Continued on page 2)

*(Instructions on page 2)

Approval Date: 09/11/2020

Entered - KMS NMOCD

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 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 Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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
30-015 47993	98220	Purple Sage Wolfcamp (Gas)

4 Property Code	5 Property Name	6 Well Number
330003	ECHOLS 12-1 FEDERAL COM	3H

7 OGRID No.	8 Operator Name	9 Elevation
215099	CIMAREX ENERGY CO.	3245.2'

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
N	12	23S	26E		437	SOUTH	1991	WEST	EDDY

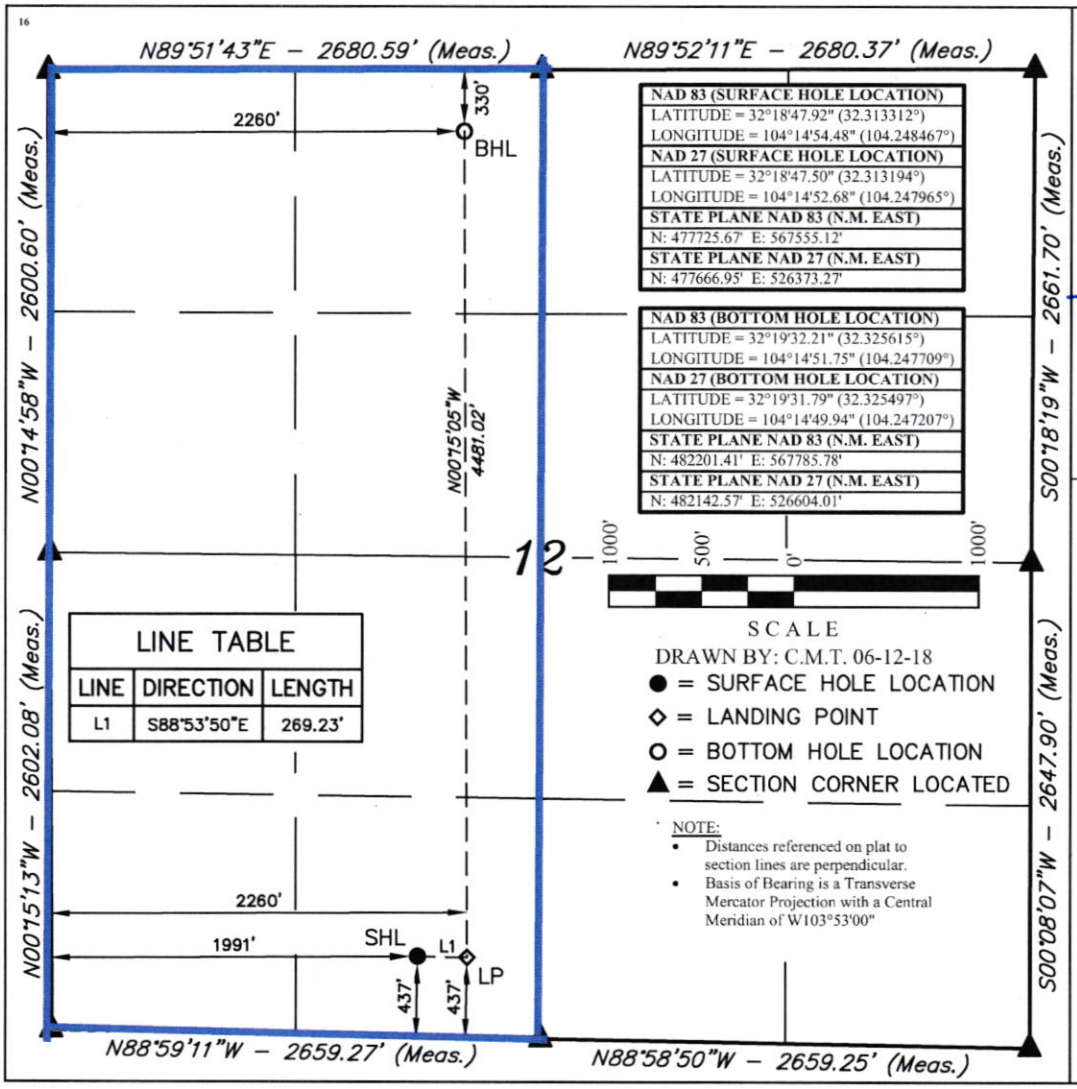
11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	12	23S	26E		330	NORTH	2260	WEST	EDDY

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.
320			

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.

16



NAD 83 (SURFACE HOLE LOCATION)
LATITUDE = 32°18'47.92" (32.313312°)
LONGITUDE = 104°14'54.48" (104.248467°)
NAD 27 (SURFACE HOLE LOCATION)
LATITUDE = 32°18'47.50" (32.313194°)
LONGITUDE = 104°14'52.68" (104.247965°)
STATE PLANE NAD 83 (N.M. EAST)
N: 477725.67' E: 567555.12'
STATE PLANE NAD 27 (N.M. EAST)
N: 477666.95' E: 526373.27'

NAD 83 (BOTTOM HOLE LOCATION)
LATITUDE = 32°19'32.21" (32.325615°)
LONGITUDE = 104°14'51.75" (104.247709°)
NAD 27 (BOTTOM HOLE LOCATION)
LATITUDE = 32°19'31.79" (32.325497°)
LONGITUDE = 104°14'49.94" (104.247207°)
STATE PLANE NAD 83 (N.M. EAST)
N: 482201.41' E: 567785.78'
STATE PLANE NAD 27 (N.M. EAST)
N: 482142.57' E: 526604.01'

LINE TABLE		
LINE	DIRECTION	LENGTH
L1	S88°53'50"E	269.23'

NOTE:
- Distances referenced on plat to section lines are perpendicular.
- Basis of Bearing is a Transverse Mercator Projection with a Central Meridian of W103°53'00"

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 7/3/18 Date

Aricka Easterling
Printed Name

aeasterling@cimarex.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.

June 5, 2018
Date of Survey

Signature and Seal of Professional Surveyor:

PAUL BUCHELE NEW MEXICO 23782 PROFESSIONAL SURVEYOR 06-25-18

Certificate Number:

District I
1625 N. French Dr., Hobbs, NM 88240
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1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

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

Submit Original to Appropriate District Office

GAS CAPTURE PLAN

Date: 6/28/18

☒ Original Operator & OGRID No.: Cimarex Energy Co- 215099

☐ Amended - Reason for Amendment: _____

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
Echols 12-1 Federal Com 3H	Pending	12-23S-26E	437'FNL & 1991' FWL			

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 Sendero and will be connected to Sendero low/high pressure gathering system located in _Lea___ County, New Mexico. It will require _2489_' of pipeline to connect the facility to low/high pressure gathering system. Cimarex provides (periodically) to Sendero a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Cimarex and Sendero have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at Sendero Processing Plant located in Sec 19-19S-32E , 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 Sendero system at that time. Based on current information, it is Cimarex'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

1. Geological Formations

TVD of target 8,910
MD at TD 13,160

Pilot Hole TD N/A
Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	0	N/A	
Salado	535	N/A	
Castille	1850	N/A	
Bell Canyon	1982	N/A	
Cherry Canyon	2620	N/A	
Brushy Canyon	3780	Hydrocarbons	
Bone Spring	5245	Hydrocarbons	
1st Bone Spring	6300	Hydrocarbons	
2nd Bone Spring	6787	Hydrocarbons	
3rd Bone Spring	8407	Hydrocarbons	
Wolfcamp	8898	Hydrocarbons	
Wolfcamp Target	8910	Hydrocarbons	

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	450	13-3/8"	48.00	H-40	ST&C	3.59	8.40	14.91
12 1/4	0	1962	9-5/8"	36.00	J-55	LT&C	1.94	3.38	6.41
8 3/4	0	8409	7"	29.00	L-80	LT&C	1.78	2.07	2.53
8 3/4	8409	9409	7"	26.00	N-80	BT&C	1.30	1.74	46.37
6	8409	13160	4-1/2"	11.60	P-110	BT&C	1.56	2.20	63.15
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	N
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	N
Is well within the designated 4 string boundary.	N
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	N
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	N
Is 2nd string set 100' to 600' below the base of salt?	N
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	N
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	N
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	N
Is AC Report included?	N

3. Cementing Program

Casing	# Sks	Wt. lb/gal	Yld ft3/sack	H2O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	115	14.80	1.36	6.57	9.5	Lead: Class C + Retarder
	195	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	371	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	115	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Production	393	10.30	3.64	22.18		Lead: Tuned Light + LCM
	180	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS
Completion System	270	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS

Casing String	TOC	% Excess
Surface	0	33
Intermediate	0	50
Production	1762	25
Completion System	9409	10

4. Pressure Control Equipment

	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.

BOP installed and tested before drilling which hole?	Size	Min Required WP	Type		Tested To
12 1/4	13 5/8	2M	Annular	X	50% of working pressure
			Blind Ram		2M
			Pipe Ram		
			Double Ram	X	
			Other		
8 3/4	13 5/8	3M	Annular	X	50% of working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	X	
			Other		
6	13 5/8	5M	Annular	X	50% of working pressure
			Blind Ram		5M
			Pipe Ram		
			Double Ram	X	
			Other		

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

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. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

X	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.	
X	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.	
	N	Are anchors required by manufacturer?

5. Mud Program

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0' to 450'	FW Spud Mud	8.30 - 8.80	30-32	N/C
450' to 1962'	Brine Water	9.70 - 10.20	30-32	N/C
1962' to 9409'	FW/Cut Brine	8.50 - 9.00	30-32	N/C
9409' to 13160'	Oil Based Mud	10.00 - 10.50	50-70	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring

6. Logging and Testing Procedures

	Logging, Coring and Testing
X	Will run GR/CNL fromTD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No logs are planned based on well control or offset log information.
	Drill stem test?
	Coring?

Additional Logs Planned	Interval

7. Drilling Conditions

Condition	
BH Pressure at deepest TVD	4864 psi
Abnormal Temperature	No

	Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.
X	H2S is present
X	H2S plan is attached

8. Other Facets of Operation

9. Wellhead

A multi-bowl wellhead system will be utilized.

After running the 13-3/8" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2.

The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office.

The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor representative.

All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type.

A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

A solid steel body pack-off will be utilized after running and cementing the production casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater.

The casing string utilizing steel body pack-off will be tested to 70% of casing burst.

If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Schlumberger

Cimarex Echols 12-1 Federal Com 3H Rev0 RM 2July18 Proposal
Geodetic Report
(Non-Def Plan)

CIMAREX

Report Date:	July 02, 2018 - 04:54 PM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	Cimarex Energy	**Vertical Section Azimuth:**	359.747 ° (Grid North)
Field:	NM Eddy County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Cimarex Echols 12-1 Federal Com 3H / New Slot	**TVD Reference Datum:**	RKB
Well:	Echols 12-1 Federal Com 3H	**TVD Reference Elevation:**	3271.200 ft above MSL
Borehole:	Echols 12-1 Federal Com 3H	**Seabed / Ground Elevation:**	3245.200 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	7.358 °
Survey Name:	Cimarex Echols 12-1 Federal Com 3H Rev0 RM 2July18	**Total Gravity Field Strength:**	998.4644mgn (9.80665 Based)
Survey Date:	July 02, 2018	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	98.186 ° / 4726.643 ft / 5.836 / 0.530	**Total Magnetic Field Strength:**	47969.266 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	**Magnetic Dip Angle:**	60.024 °
Location Lat / Long:	N 32° 18' 47.92355", W 104° 14' 54.48216"	**Declination Date:**	July 02, 2018
Location Grid N/E Y/X:	N 477725.670 ftUS, E 567555.120 ftUS	**Magnetic Declination Model:**	HDGM 2018
CRS Grid Convergence Angle:	0.0454 °	**North Reference:**	Grid North
Grid Scale Factor:	0.99990988	**Grid Convergence Used:**	0.0454 °
Version / Patch:	2.10.715.0	**Total Corr Mag North->Grid North:**	7.3128 °
		Local Coord Referenced To:	Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL [437' FSL, 1991' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	100.00	0.00	90.00	100.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	200.00	0.00	90.00	200.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	300.00	0.00	90.00	300.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	400.00	0.00	90.00	400.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	500.00	0.00	90.00	500.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
Salado (Top Salt)	*535.00*	*0.00*	*90.00*	*535.00*	*0.00*	*0.00*	*0.00*	*0.00*	*477725.67*	*567555.12*	*N 32 18 47.92*	*W 104 14 54.48*
	600.00	0.00	90.00	600.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	700.00	0.00	90.00	700.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	800.00	0.00	90.00	800.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	900.00	0.00	90.00	900.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	1000.00	0.00	90.00	1000.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	1100.00	0.00	90.00	1100.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	1200.00	0.00	90.00	1200.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	1300.00	0.00	90.00	1300.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	1400.00	0.00	90.00	1400.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	1500.00	0.00	90.00	1500.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	1600.00	0.00	90.00	1600.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	1700.00	0.00	90.00	1700.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	1800.00	0.00	90.00	1800.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
Castille (Base Salt)	*1850.00*	*0.00*	*90.00*	*1850.00*	*0.00*	*0.00*	*0.00*	*0.00*	*477725.67*	*567555.12*	*N 32 18 47.92*	*W 104 14 54.48*
	1900.00	0.00	90.00	1900.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
Bell Canyon (Top Delaware)	*1982.00*	*0.00*	*90.00*	*1982.00*	*0.00*	*0.00*	*0.00*	*0.00*	*477725.67*	*567555.12*	*N 32 18 47.92*	*W 104 14 54.48*
	2000.00	0.00	90.00	2000.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	2100.00	0.00	90.00	2100.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	2200.00	0.00	90.00	2200.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	2300.00	0.00	90.00	2300.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	2400.00	0.00	90.00	2400.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
Nudge 2°/100' DLS	2500.00	0.00	90.00	2500.00	0.00	0.00	0.00	0.00	477725.67	567555.12	N 32 18 47.92	W 104 14 54.48
	2600.00	2.00	90.00	2599.98	-0.01	0.00	1.75	2.00	477725.67	567556.86	N 32 18 47.92	W 104 14 54.46
Cherry Canyon	*2620.04*	*2.40*	*90.00*	*2620.00*	*-0.01*	*0.00*	*2.51*	*2.00*	*477725.67*	*567557.63*	*N 32 18 47.92*	*W 104 14 54.45*
	2700.00	4.00	90.00	2699.84	-0.03	0.00	6.98	2.00	477725.67	567562.10	N 32 18 47.92	W 104 14 54.40
Hold Nudge	2704.66	4.09	90.00	2704.49	-0.03	0.00	7.31	2.00	477725.67	567562.43	N 32 18 47.92	W 104 14 54.40
	2800.00	4.09	90.00	2799.58	-0.06	0.00	14.11	0.00	477725.67	567569.23	N 32 18 47.92	W 104 14 54.32
	2900.00	4.09	90.00	2899.33	-0.09	0.00	21.25	0.00	477725.67	567576.37	N 32 18 47.92	W 104 14 54.23
	3000.00	4.09	90.00	2999.07	-0.13	0.00	28.39	0.00	477725.67	567583.51	N 32 18 47.92	W 104 14 54.15
	3100.00	4.09	90.00	3098.82	-0.16	0.00	35.53	0.00	477725.67	567590.64	N 32 18 47.92	W 104 14 54.07
	3200.00	4.09	90.00	3198.56	-0.19	0.00	42.66	0.00	477725.67	567597.78	N 32 18 47.92	W 104 14 53.99
	3300.00	4.09	90.00	3298.31	-0.22	0.00	49.80	0.00	477725.67	567604.92	N 32 18 47.92	W 104 14 53.90
	3400.00	4.09	90.00	3398.05	-0.25	0.00	56.94	0.00	477725.67	567612.05	N 32 18 47.92	W 104 14 53.82
	3500.00	4.09	90.00	3497.80	-0.28	0.00	64.08	0.00	477725.67	567619.19	N 32 18 47.92	W 104 14 53.74
	3600.00	4.09	90.00	3597.54	-0.31	0.00	71.22	0.00	477725.67	567626.33	N 32 18 47.92	W 104 14 53.65
	3700.00	4.09	90.00	3697.29	-0.35	0.00	78.35	0.00	477725.67	567633.47	N 32 18 47.92	W 104 14 53.57
Brushy Canyon	*3782.92*	*4.09*	*90.00*	*3780.00*	*-0.37*	*0.00*	*84.27*	*0.00*	*477725.67*	*567639.39*	*N 32 18 47.92*	*W 104 14 53.50*
	3800.00	4.09	90.00	3797.03	-0.38	0.00	85.49	0.00	477725.67	567640.60	N 32 18 47.92	W 104 14 53.49
	3900.00	4.09	90.00	3896.78	-0.41	0.00	92.63	0.00	477725.67	567647.74	N 32 18 47.92	W 104 14 53.40
	4000.00	4.09	90.00	3996.52	-0.44	0.00	99.77	0.00	477725.67	567654.88	N 32 18 47.92	W 104 14 53.32
	4100.00	4.09	90.00	4096.27	-0.47	0.00	106.91	0.00	477725.67	567662.02	N 32 18 47.92	W 104 14 53.24
	4200.00	4.09	90.00	4196.01	-0.50	0.00	114.04	0.00	477725.67	567669.15	N 32 18 47.92	W 104 14 53.15
	4300.00	4.09	90.00	4295.76	-0.54	0.00	121.18	0.00	477725.67	567676.29	N 32 18 47.92	W 104 14 53.07
	4400.00	4.09	90.00	4395.50	-0.57	0.00	128.32	0.00	477725.67	567683.43	N 32 18 47.92	W 104 14 52.99
	4500.00	4.09	90.00	4495.25	-0.60	0.00	135.46	0.00	477725.67	567690.56	N 32 18 47.92	W 104 14 52.90
	4600.00	4.09	90.00	4594.99	-0.63	0.00	142.59	0.00	477725.67	567697.70	N 32 18 47.92	W 104 14 52.82
	4700.00	4.09	90.00	4694.74	-0.66	0.00	149.73	0.00	477725.67	567704.84	N 32 18 47.92	W 104 14 52.74
	4800.00	4.09	90.00	4794.48	-0.69	0.00	156.87	0.00	477725.67	567711.98	N 32 18 47.92	W 104 14 52.65
	4900.00	4.09	90.00	4894.23	-0.72	0.00	164.01	0.00	477725.67	567719.11	N 32 18 47.92	W 104 14 52.57
	5000.00	4.09	90.00	4993.97	-0.76	0.00	171.15	0.00	477725.67	567726.25	N 32 18 47.92	W 104 14 52.49
	5100.00	4.09	90.00	5093.72	-0.79	0.00	178.28	0.00	477725.67	567733.39	N 32 18 47.92	W 104 14 52.40
	5200.00	4.09	90.00	5193.46	-0.82	0.00	185.42	0.00	477725.67	567740.53	N 32 18 47.92	W 104 14 52.32
Top Bone Spring	*5251.67*	*4.09*	*90.00*	*5245.00*	*-0.84*	*0.00*	*189.11*	*0.00*	*477725.67*	*567744.21*	*N 32 18 47.92*	*W 104 14 52.28*
	5300.00	4.09	90.00	5293.21	-0.85	0.00	192.56	0.00	477725.67	567747.66	N 32 18 47.92	W 104 14 52.24
	5400.00	4.09	90.00	5392.95	-0.88	0.00	199.70	0.00	477725.67	567754.80	N 32 18 47.92	W 104 14 52.16
	5500.00	4.09	90.00	5492.70	-0.91	0.00	206.84	0.00	477725.67	567761.94	N 32 18 47.92	W 104 14 52.07
	5600.00	4.09	90.00	5592.44	-0.94	0.00	213.97	0.00	477725.67	567769.07	N 32 18 47.92	W 104 14 51.99
	5700.00	4.09	90.00	5692.19	-0.98	0.00	221.11	0.00	477725.67	567776.21	N 32 18 47.92	W 104 14 51.91
	5800.00	4.09	90.00	5791.93	-1.01	0.00	228.25	0.00	477725.67	567783.35	N 32 18 47.92	W 104 14 51.82
	5900.00	4.09	90.00	5891.68	-1.04	0.00	235.39	0.00	477725.67	567790.49	N 32 18 47.92	W 104 14 51.74
	6000.00	4.09	90.00	5991.42	-1.07	0.00	242.53	0.00	477725.67	567797.62	N 32 18 47.92	W 104 14 51.66
Drop to Vertical 2°/100' DLS	6008.60	4.09	90.00	6000.00	-1.07	0.00	243.14	0.00	477725.67	567798.24	N 32 18 47.92	W 104 14 51.65
	6100.00	2.27	90.00	6091.25	-1.10	0.00	248.21	2.00	477725.67	567803.31	N 32 18 47.92	W 104 14 51.59
	6200.00	0.27	90.00	6191.22	-1.11	0.00	250.42	2.00	477725.67	567805.51	N 32 18 47.92	W 104 14 51.56
Hold Vertical	6213.26	0.00	90.00	6204.49	-1.11	0.00	250.45	2.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	6300.00	0.00	90.00	6291.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
Top 1st BSPG SS	*6308.78*	*0.00*	*90.00*	*6300.00*	*-1.11*	*0.00*	*250.45*	*0.00*	*477725.67*	*567805.54*	*N 32 18 47.92*	*W 104 14 51.56*
	6400.00	0.00	90.00	6391.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	6500.00	0.00	90.00	6491.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	6600.00	0.00	90.00	6591.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	6700.00	0.00	90.00	6691.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
Top 2nd BSPG SS	*6795.78*	*0.00*	*90.00*	*6787.00*	*-1.11*	*0.00*	*250.45*	*0.00*	*477725.67*	*567805.54*	*N 32 18 47.92*	*W 104 14 51.56*

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	6800.00	0.00	90.00	6791.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	6900.00	0.00	90.00	6891.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	7000.00	0.00	90.00	6991.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	7100.00	0.00	90.00	7091.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	7200.00	0.00	90.00	7191.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	7300.00	0.00	90.00	7291.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	7400.00	0.00	90.00	7391.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	7500.00	0.00	90.00	7491.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	7600.00	0.00	90.00	7591.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	7700.00	0.00	90.00	7691.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	7800.00	0.00	90.00	7791.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	7900.00	0.00	90.00	7891.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	8000.00	0.00	90.00	7991.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	8100.00	0.00	90.00	8091.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	8200.00	0.00	90.00	8191.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	8300.00	0.00	90.00	8291.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
	8400.00	0.00	90.00	8391.22	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
KOP - Build 12°/100' DLS	8408.77	0.00	90.00	8400.00	-1.11	0.00	250.45	0.00	477725.67	567805.54	N 32 18 47.92	W 104 14 51.56
Top 3rd BSPG SS	*8415.78*	*0.84*	*359.75*	*8407.00*	*-1.05*	*0.05*	*250.45*	*12.00*	*477725.72*	*567805.54*	*N 32 18 47.92*	*W 104 14 51.56*
	8500.00	10.95	359.75	8490.67	7.58	8.69	250.41	12.00	477734.36	567805.51	N 32 18 48.01	W 104 14 51.56
	8600.00	22.95	359.75	8586.15	36.68	37.78	250.28	12.00	477763.45	567805.38	N 32 18 48.30	W 104 14 51.57
	8700.00	34.95	359.75	8673.50	84.99	86.10	250.07	12.00	477811.76	567805.16	N 32 18 48.77	W 104 14 51.57
	8800.00	46.95	359.75	8748.89	150.41	151.51	249.78	12.00	477877.17	567804.87	N 32 18 49.42	W 104 14 51.57
Top Wolfcamp	*8824.26*	*49.86*	*359.75*	*8765.00*	*168.55*	*169.66*	*249.70*	*12.00*	*477895.31*	*567804.79*	*N 32 18 49.60*	*W 104 14 51.57*
	8900.00	58.95	359.75	8809.04	230.07	231.17	249.43	12.00	477956.82	567804.52	N 32 18 50.21	W 104 14 51.57
	9000.00	70.95	359.75	8851.31	320.50	321.60	249.03	12.00	478047.24	567804.12	N 32 18 51.10	W 104 14 51.58
Build 4°/100' DLS	9033.77	75.00	359.75	8861.19	352.78	353.88	248.88	12.00	478079.52	567803.98	N 32 18 51.42	W 104 14 51.58
	9100.00	77.65	359.75	8876.85	417.13	418.23	248.60	4.00	478143.86	567803.70	N 32 18 52.06	W 104 14 51.58
	9200.00	81.65	359.75	8894.81	515.48	516.58	248.17	4.00	478242.20	567803.26	N 32 18 53.03	W 104 14 51.59
Top Wolfcamp Y SS	*9223.23*	*82.58*	*359.75*	*8898.00*	*538.49*	*539.59*	*248.06*	*4.00*	*478265.21*	*567803.16*	*N 32 18 53.26*	*W 104 14 51.59*
	9300.00	85.65	359.75	8905.87	614.85	615.95	247.73	4.00	478341.56	567802.82	N 32 18 54.02	W 104 14 51.59
	9400.00	89.65	359.75	8909.97	714.74	715.84	247.29	4.00	478441.44	567802.38	N 32 18 55.00	W 104 14 51.59
Landing Point	9408.77	90.00	359.75	8910.00	723.51	724.61	247.25	4.00	478450.21	567802.34	N 32 18 55.09	W 104 14 51.59
	9500.00	90.00	359.75	8910.00	814.74	815.84	246.84	0.00	478541.43	567801.94	N 32 18 55.99	W 104 14 51.60
	9600.00	90.00	359.75	8910.00	914.74	915.84	246.40	0.00	478641.42	567801.50	N 32 18 56.98	W 104 14 51.60
	9700.00	90.00	359.75	8910.00	1014.74	1015.84	245.96	0.00	478741.41	567801.06	N 32 18 57.97	W 104 14 51.61
	9800.00	90.00	359.75	8910.00	1114.74	1115.84	245.52	0.00	478841.40	567800.62	N 32 18 58.96	W 104 14 51.61
	9900.00	90.00	359.75	8910.00	1214.74	1215.83	245.08	0.00	478941.39	567800.18	N 32 18 59.95	W 104 14 51.62
	10000.00	90.00	359.75	8910.00	1314.74	1315.83	244.64	0.00	479041.38	567799.73	N 32 19 0.94	W 104 14 51.62
	10100.00	90.00	359.75	8910.00	1414.74	1415.83	244.19	0.00	479141.37	567799.29	N 32 19 1.93	W 104 14 51.62
	10200.00	90.00	359.75	8910.00	1514.74	1515.83	243.75	0.00	479241.36	567798.85	N 32 19 2.92	W 104 14 51.63
	10300.00	90.00	359.75	8910.00	1614.74	1615.83	243.31	0.00	479341.35	567798.41	N 32 19 3.91	W 104 14 51.63
	10400.00	90.00	359.75	8910.00	1714.74	1715.83	242.87	0.00	479441.34	567797.97	N 32 19 4.90	W 104 14 51.64
	10500.00	90.00	359.75	8910.00	1814.74	1815.83	242.43	0.00	479541.33	567797.53	N 32 19 5.89	W 104 14 51.64
	10600.00	90.00	359.75	8910.00	1914.74	1915.83	241.99	0.00	479641.32	567797.08	N 32 19 6.88	W 104 14 51.64
	10700.00	90.00	359.75	8910.00	2014.74	2015.83	241.55	0.00	479741.31	567796.64	N 32 19 7.87	W 104 14 51.65
	10800.00	90.00	359.75	8910.00	2114.74	2115.83	241.10	0.00	479841.30	567796.20	N 32 19 8.86	W 104 14 51.65
	10900.00	90.00	359.75	8910.00	2214.74	2215.82	240.66	0.00	479941.29	567795.76	N 32 19 9.85	W 104 14 51.66
	11000.00	90.00	359.75	8910.00	2314.74	2315.82	240.22	0.00	480041.28	567795.32	N 32 19 10.84	W 104 14 51.66
	11100.00	90.00	359.75	8910.00	2414.74	2415.82	239.78	0.00	480141.27	567794.88	N 32 19 11.83	W 104 14 51.67
	11200.00	90.00	359.75	8910.00	2514.74	2515.82	239.34	0.00	480241.26	567794.44	N 32 19 12.82	W 104 14 51.67
	11300.00	90.00	359.75	8910.00	2614.74	2615.82	238.90	0.00	480341.25	567793.99	N 32 19 13.81	W 104 14 51.67
	11400.00	90.00	359.75	8910.00	2714.74	2715.82	238.45	0.00	480441.24	567793.55	N 32 19 14.79	W 104 14 51.68
	11500.00	90.00	359.75	8910.00	2814.74	2815.82	238.01	0.00	480541.23	567793.11	N 32 19 15.78	W 104 14 51.68
	11600.00	90.00	359.75	8910.00	2914.74	2915.82	237.57	0.00	480641.22	567792.67	N 32 19 16.77	W 104 14 51.69

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	11700.00	90.00	359.75	8910.00	3014.74	3015.82	237.13	0.00	480741.21	567792.23	N 32 19 17.76	W 104 14 51.69
	11800.00	90.00	359.75	8910.00	3114.74	3115.82	236.69	0.00	480841.20	567791.79	N 32 19 18.75	W 104 14 51.70
	11900.00	90.00	359.75	8910.00	3214.74	3215.82	236.25	0.00	480941.19	567791.34	N 32 19 19.74	W 104 14 51.70
	12000.00	90.00	359.75	8910.00	3314.74	3315.81	235.81	0.00	481041.18	567790.90	N 32 19 20.73	W 104 14 51.70
	12100.00	90.00	359.75	8910.00	3414.74	3415.81	235.36	0.00	481141.17	567790.46	N 32 19 21.72	W 104 14 51.71
	12200.00	90.00	359.75	8910.00	3514.74	3515.81	234.92	0.00	481241.16	567790.02	N 32 19 22.71	W 104 14 51.71
	12300.00	90.00	359.75	8910.00	3614.74	3615.81	234.48	0.00	481341.15	567789.58	N 32 19 23.70	W 104 14 51.72
	12400.00	90.00	359.75	8910.00	3714.74	3715.81	234.04	0.00	481441.14	567789.14	N 32 19 24.69	W 104 14 51.72
	12500.00	90.00	359.75	8910.00	3814.74	3815.81	233.60	0.00	481541.13	567788.70	N 32 19 25.68	W 104 14 51.72
	12600.00	90.00	359.75	8910.00	3914.74	3915.81	233.16	0.00	481641.12	567788.25	N 32 19 26.67	W 104 14 51.73
	12700.00	90.00	359.75	8910.00	4014.74	4015.81	232.71	0.00	481741.11	567787.81	N 32 19 27.66	W 104 14 51.73
	12800.00	90.00	359.75	8910.00	4114.74	4115.81	232.27	0.00	481841.10	567787.37	N 32 19 28.65	W 104 14 51.74
	12900.00	90.00	359.75	8910.00	4214.74	4215.81	231.83	0.00	481941.09	567786.93	N 32 19 29.64	W 104 14 51.74
	13000.00	90.00	359.75	8910.00	4314.74	4315.80	231.39	0.00	482041.08	567786.49	N 32 19 30.63	W 104 14 51.75
	13100.00	90.00	359.75	8910.00	4414.74	4415.80	230.95	0.00	482141.07	567786.05	N 32 19 31.62	W 104 14 51.75
Cimarex Echols 12-1 Federal Com 3H - PBHL [330' FNL, 2260' FWL]	13160.35	90.00	359.75	8910.00	4475.09	4476.15	230.68	0.00	482201.41	567785.78	N 32 19 32.21	W 104 14 51.75

Survey Type: Non-Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	26.000	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS-Depth Only	Echols 12-1 Federal Com 3H / Cimarex Echols 12-1 Federal Com 3H Rev0 RM 2July18
	1	26.000	13160.349	1/100.000	30.000	30.000		NAL_MWD_IFR1+MS	Echols 12-1 Federal Com 3H / Cimarex Echols 12-1 Federal

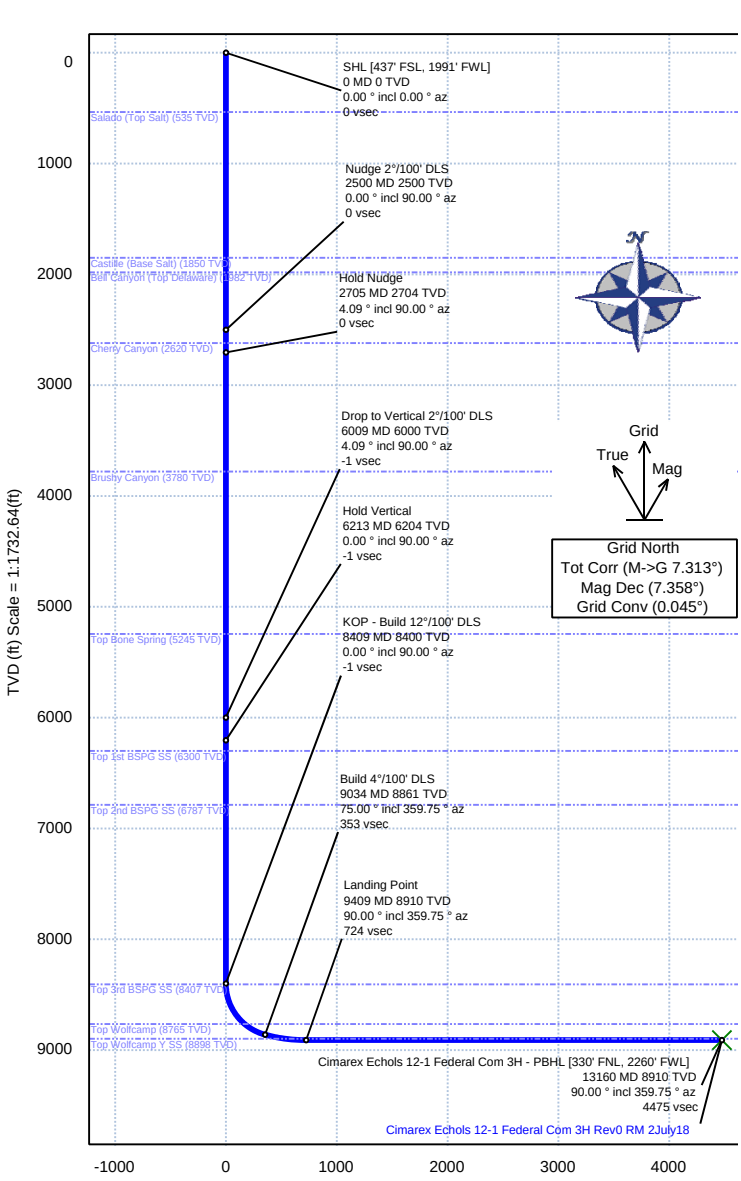
Schlumberger

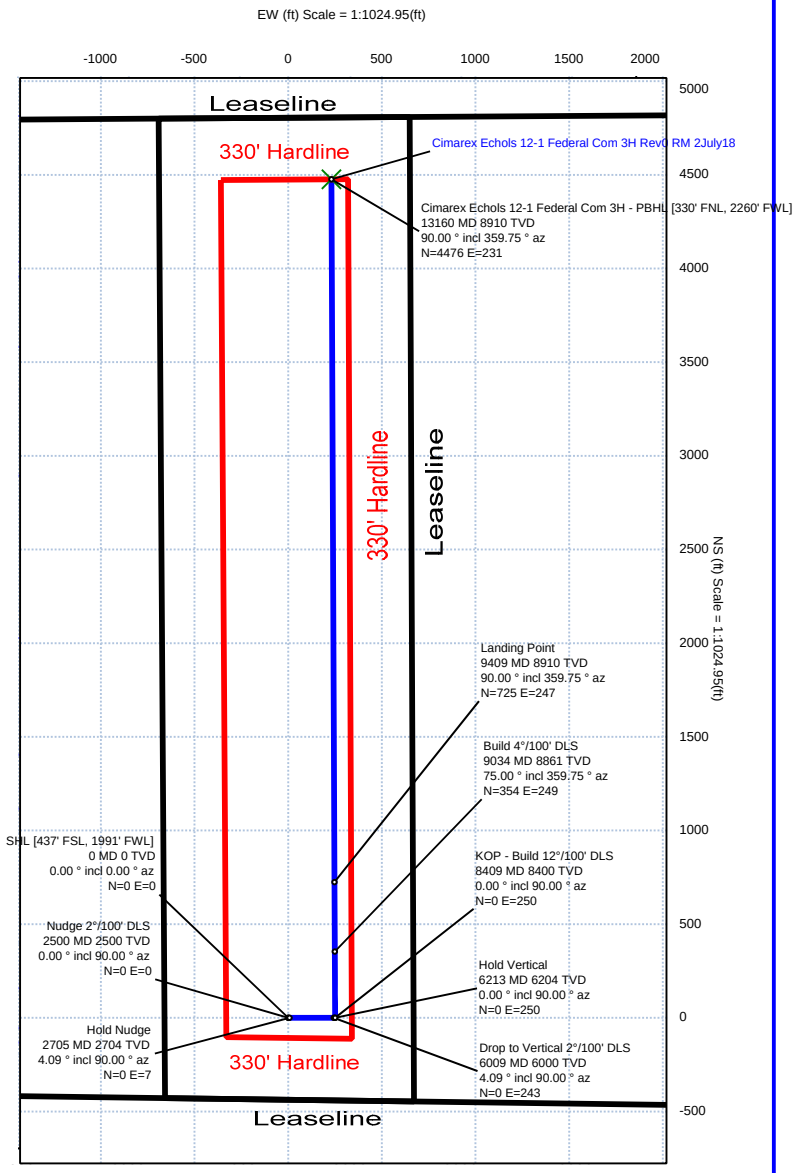
Cimarex Energy Rev 0

CIMAREX

Borehole:	Well:	Field:	Structure:
Echols 12-1 Federal Com 3H	Echols 12-1 Federal Com 3H	NM Eddy County (NAD 83)	Cimarex Echols 12-1 Federal Com 3H

Gravity & Magnetic Parameters						Surface Location	NAD83 New Mexico State Plane, Eastern Zone, US Feet					Miscellaneous				
Model:	HDGM 2018	Dip:	60.024°	Date:	02-Jul-2018	Lat:	N 32 18 47.92	Northing:	477725.67ftUS	Grid Conv:	0.0454°	Slot:	New Slot	TVD Ref:	RKB(3271.2ft above MSL)
MagDec:	7.358°	FS:	47969.266nT	Gravity FS:	998.464mgn (9.80665 Based)	Lon:	W 104 14 54.48	Easting:	567555.12ftUS	Scale Fact:	0.99990988	Plan:	Cimarex Echols 12-1 Federal Com 3H Rev0 RM 2July18			





Vertical Section (ft) Azim = 359.75° Scale = 1:1732.64(ft) Origin = 0N/-S, 0E/-W

Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [437' FSL, 1991' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Salado (Top Salt)	535.00	0.00	90.00	535.00	0.00	0.00	0.00	0.00
Castille (Base Salt)	1850.00	0.00	90.00	1850.00	0.00	0.00	0.00	0.00
Bell Canyon (Top Delaware)	1982.00	0.00	90.00	1982.00	0.00	0.00	0.00	0.00
Nudge 2°/100' DLS	2500.00	0.00	90.00	2500.00	0.00	0.00	0.00	0.00
Cherry Canyon	2620.04	2.40	90.00	2620.00	-0.01	0.00	2.51	2.00
Hold Nudge	2704.66	4.09	90.00	2704.49	-0.03	0.00	7.31	2.00
Brushy Canyon	3782.92	4.09	90.00	3780.00	-0.37	0.00	84.27	0.00
Top Bone Spring	5251.67	4.09	90.00	5245.00	-0.84	0.00	189.11	0.00
Drop to Vertical 2°/100' DLS	6008.60	4.09	90.00	6000.00	-1.07	0.00	243.14	0.00
Hold Vertical	6213.26	0.00	90.00	6204.49	-1.11	0.00	250.45	2.00
Top 1st BSPG SS	6308.78	0.00	90.00	6300.00	-1.11	0.00	250.45	0.00
Top 2nd BSPG SS	6795.78	0.00	90.00	6787.00	-1.11	0.00	250.45	0.00
KOP - Build 12°/100' DLS	8408.77	0.00	90.00	8400.00	-1.11	0.00	250.45	0.00
Top 3rd BSPG SS	8415.78	0.84	359.75	8407.00	-1.05	0.05	250.45	12.00
Top Wolfcamp	8824.26	49.86	359.75	8765.00	168.55	169.66	249.70	12.00
Build 4°/100' DLS	9033.77	75.00	359.75	8861.19	352.78	353.88	248.88	12.00
Top Wolfcamp Y SS	9223.23	82.58	359.75	8898.00	538.49	539.59	248.06	4.00
Landing Point	9408.77	90.00	359.75	8910.00	723.51	724.61	247.25	4.00
Cimarex Echols 12-1 Federal Com 3H - PBHL [330' FNL, 2260' FWL]	13160.35	90.00	359.75	8910.00	4475.09	4476.15	230.68	0.00
Base Wolfcamp Y SS	NaN			8927.00				

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Cimarex Energy Company**
LEASE NO.:	**NMNM0027994D**
WELL NAME & NO.:	Echols 12-1 Fed Com 3H
SURFACE HOLE FOOTAGE:	437'/S & 1991'/W
BOTTOM HOLE FOOTAGE	330'/N & 2260'/W
LOCATION:	Section 12, T.23 S., R.26 E., NMPM
COUNTY:	Eddy County, New Mexico

COA

H2S	○ Yes	◉ No	
Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	○ Low	○ Medium	◉ High
Cave/Karst Potential	○ Critical		
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	◉ Multibowl	○ Both
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP
Other	☐ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☑ COM	☐ Unit

A. HYDROGEN SULFIDE

Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

B. CASING

1. The **13-3/8 inch** surface casing shall be set at approximately **450 feet** (a minimum of **70 feet (Eddy County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
d. If cement falls back, remedial cementing will be done prior to drilling out that string.

2. The minimum required fill of cement behind the **9-5/8 inch** intermediate casing and shall be set at approximately **1,962 feet** is:

- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

❖ In High Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

3. The minimum required fill of cement behind the **7 inch** production casing is:

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

4. The minimum required fill of cement behind the **4-1/2 inch** production liner is:

- Cement should tie-back **100 feet** into the previous casing. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'

2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M) psi**.

3. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **3000 (3M) psi**.

4. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the production casing shoe shall be **5000 (5M) psi**.

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
    e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Santa Fe Office, 301 Dinosaur Trail Santa Fe, New Mexico 87508, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

a. Spudding well (minimum of 24 hours)
b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
c. BOPE tests (minimum of 4 hours)

☒ Eddy County
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 393-3612

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
    e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

5. The appropriate BLM office shall be notified a minimum of **4** hours in advance for a representative to witness the tests.

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including

lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

e. The results of the test shall be reported to the appropriate BLM office.

f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

D. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

YJ (07/30/2020)

Hydrogen Sulfide Drilling Operations Plan
Echols 12-1 Federal Com 3H
Cimarex Energy Co.
UL: N, Sec. 12, 23S, 26E
Eddy Co., NM

1 All Company and Contract personnel admitted on location must be trained by a qualified H2S safety instructor to the following:

A. Characteristics of H_2S
B. Physical effects and hazards
C. Principal and operation of H2S detectors, warning system and briefing areas.
D. Evacuation procedure, routes and first aid.
E. Proper use of safety equipment & life support systems
F. Essential personnel meeting Medical Evaluation criteria will receive additional training on the proper use of 30 minute pressure demand air packs.

H_2S Detection and Alarm Systems:

A. H2S sensors/detectors to be located on the drilling rig floor, in the base of the sub structure/cellar area, on the mud pits in the shale shaker area. Additional H2S detectors may play placed as deemed necessary.

B. An audio alarm system will be installed on the derrick floor and in the top doghouse.

3 Windsock and/or wind streamers:

A. Windsock at mudpit area should be high enough to be visible.
B. Windsock on the rig floor and / or top doghouse should be high enough to be visible.

4 Condition Flags and Signs

A. Warning sign on access road to location.
B. Flags to be displayed on sign at entrance to location. Green flag indicates normal safe condition. Yellow flag indicates potential pressure and danger. Red flag indicates danger (H_2S present in dangerous concentration). Only H2S trained and certified personnel admitted to location.

5 Well control equipment:

A. See exhibit "E-1"

6 Communication:

A. While working under masks chalkboards will be used for communication.
B. Hand signals will be used where chalk board is inappropriate.
C. Two way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at most drilling foreman's trailer or living quarters.

7 Drillstem Testing:
No DSTs r cores are planned at this time.

8 Drilling contractor supervisor will be required to be familiar with the effects H_2S has on tubular goods and other mechanical equipment.

9 If H2S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H2S scavengers if necessary.

H_2S Contingency Plan
Echols 12-1 Federal Com 3H
Cimarex Energy Co.
UL: N, Sec. 12, 23S, 26E
Eddy Co., NM

Emergency Procedures

In the event of a release of gas containing H_2S, the first responder(s) must:

« Isolate the area and prevent entry by other persons into the 100 ppm ROE.
« Evacuate any public places encompassed by the 100 ppm ROE.
« Be equipped with H_2S monitors and air packs in order to control the release.
« Use the "buddy system" to ensure no injuries occur during the 432-620-1975
« Take precautions to avoid personal injury during this operation.
« Contact operator and/or local officials to aid in operation. See list of phone numbers attached.
« Have received training in the:
  · Detection of H_2S, and
  · Measures for protection against the gas,
  · Equipment used for protection and emergency response.

Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO_2). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally, the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas.

Characteristics of H_2S and SO_2

Please see attached International Chemical Safety Cards.

Contacting Authorities

Cimarex Energy Co. of Colorado's personnel must liaise with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available including directions to site. The following call list of essential and potential responders has been prepared for use during a release. Cimarex Energy Co. of Colorado's response must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan" (HMER).

H_2S Contingency Plan Emergency Contacts
Echols 12-1 Federal Com 3H
Cimarex Energy Co.
UL: N, Sec. 12, 23S, 26E
Eddy Co., NM

Company Office			
Cimarex Energy Co. of Colorado		800-969-4789	
Co. Office and After-Hours Menu			

Key Personnel

Name	**Title**	**Office**	**Mobile**
Larry Seigrist	Drilling Manager	432-620-1934	580-243-8485
Charlie Pritchard	Drilling Superintendent	432-620-1975	432-238-7084
Roy Shirley	Construction Superintendent		432-634-2136

Artesia			
Ambulance		911	
State Police		575-746-2703	
City Police		575-746-2703	
Sheriff's Office		575-746-9888	
Fire Department		**575-746-2701**	
Local Emergency Planning Committee		575-746-2122	
New Mexico Oil Conservation Division		575-748-1283	

Carlsbad			
Ambulance		911	
State Police		575-885-3137	
City Police		575-885-2111	
Sheriff's Office		575-887-7551	
Fire Department		**575-887-3798**	
Local Emergency Planning Committee		575-887-6544	
US Bureau of Land Management		575-887-6544	

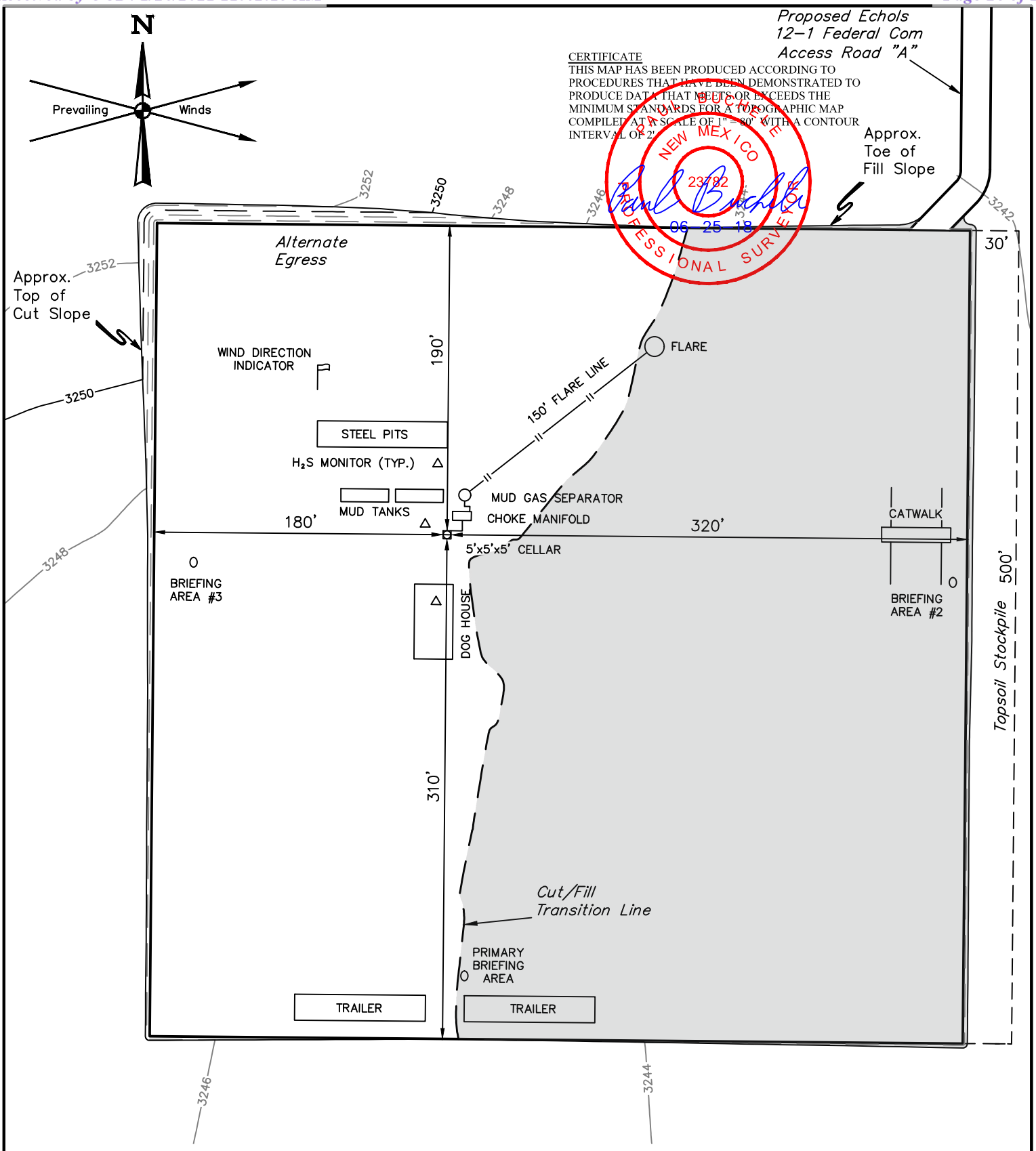
Santa Fe			
New Mexico Emergency Response Commission (Santa Fe)		505-476-9600	
New Mexico Emergency Response Commission (Santa Fe) 24 Hrs		505-827-9126	
New Mexico State Emergency Operations Center		505-476-9635	

National			
National Emergency Response Center (Washington, D.C.)		800-424-8802	

Medical			
Flight for Life - 4000 24th St.; Lubbock, TX		806-743-9911	
Aerocare - R3, Box 49F; Lubbock, TX		806-747-8923	
Med Flight Air Amb - 2301 Yale Blvd S.E., #D3; Albuquerque, NM		505-842-4433	
SB Air Med Service - 2505 Clark Carr Loop S.E.; Albuquerque, NM		505-842-4949	

Other			
Boots & Coots IWC		800-256-9688	or 281-931-8884
Cudd Pressure Control		432-699-0139	or 432-563-3356
Halliburton		575-746-2757	
B.J. Services		575-746-3569	

I further certify that Cimarex will comply with Rule 19.15.17 NMAC by using a Closed Loop System



NOTES:

- Contours shown at 2' intervals.

CIMAREX ENERGY CO.

ECHOLS 12-1 FEDERAL COM 3H
437' FSL 1991' FWL
SE 1/4 SW 1/4, SECTION 12, T23S, R26E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

SURVEYED BY	C.S., R.G., J.J.	06-05-18	**SCALE**
DRAWN BY	J.N.	06-14-18	1" = 80'

Typical Rig Layout and Closed Loop Equipment Diagram

UINTAH ENGINEERING & LAND SURVEYING
UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 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
1220 S. St Francis Dr., Santa Fe, NM 87505
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

COMMENTS

Action 15673

COMMENTS

Operator:	OGRID:	Action Number:	Action Type:
CIMAREX ENERGY CO. OF COLORADO 600 N. Marienfeld Street Suite 600 Midland, TX79701	162683	15673	FORM 3160-3

Created By	Comment	Comment Date
kpickford	KP GEO Review 1/26/2021	01/26/2021

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CONDITIONS

Action 15673

CONDITIONS OF APPROVAL

Operator:	OGRID:	Action Number:	Action Type:
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OCD Reviewer	Condition
kpickford	Notify OCD 24 hours prior to casing & cement
kpickford	Will require a File As Drilled C-102 and a Directional Survey with the C-104
kpickford	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
kpickford	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system