NM OIL CONSERVATION
ARTESIA DISTRICT

Form 3160-5
(August 2007)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

NOV 09 2016
OCD Artesia

RECEIVED

FORM APPROVED
OMB NO. 1004-0135
Expires: July 31, 2010

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on reverse side.

5. Lease Serial No.
NMNM94651

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
CEDAR CANYON 28 FEDERAL 5H

2. Name of Operator
OXY USA INC.

Contact: DAVID STEWART
E-Mail: david_stewart@oxy.com

9. API Well No.
30-015-43645

3a. Address
P.O. BOX 50250
MIDLAND, TX 79710

3b. Phone No. (include area code)
Ph: 432-685-5717

10. Field and Pool, or Exploratory
PIERCE CROSSING BN SPRG E

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 29 T24S R29E SENE 1990FNL 180FEL
32.190207 N Lat, 103.998657 W Lon

11. County or Parish, and State
EDDY COUNTY, NM

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

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

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

OXY USA Inc. respectfully requests approval for the following changes to the approved APD:

1. Change the well name and number.
New - Cedar Canyon 28-27 Federal Com. #5H (317089)
Old - Cedar Canyon 28 Federal #5H

2. Amend the proposed TD.
New TD - 18855'M 8820'V

3. Amend the horizontal lateral, this proposed horizontal lateral will be outside the Producing Area and an NSL application will be filed. The Cedar Canyon 28 Federal #9H was first proposed as a NSL location in the S/2 of the N/2 of Sec 28. The BLM would only approve a proposed lateral in the

SEE ATTACHED FOR CONDITIONS OF APPROVAL

SUBJECT TO LIKE APPROVAL BY STATE

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #352321 verified by the BLM Well Information System
For OXY USA INC., sent to the Carlsbad
Committed to AFMSS for processing by DEBORAH MCKINNEY on 10/04/2016 ()

Name *(Printed/Typed)* DAVID STEWART — Title SR. REGULATORY ADVISOR

Signature (Electronic Submission) — Date 09/23/2016

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By Chris Walls — Title Eng — Date 11/3/16

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. — Office CFO

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.

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****

Additional data for EC transaction #352321 that would not fit on the form

32. Additional remarks, continued

N/2 of the S/2 and agreed to a two mile lateral including Sec 27.

The surface location will remain the same at 1990 FNL 180 FEL SENE Sec 29
New KOP - 2580 FSL 50 FWL NWSW Sec 28
New Top Perf.- 2579 FSL 340 FWL NWSW Sec 28
New Bottom Perf - 2579 FSL 340 FEL NESE Sec 27
New BHL - 2580 FSL 160 FEL NESE Sec 27

4. Amend casing/cementing program - Amend hole size, casing size, setting depth and cement, see attached.

5. Amend BOP Program, see attached.

6. Amend the Mud Program, see attached.

7. Amend the Logging Procedure, start mudlogging from the intermediate casing shoe to TD.

OXY USA Inc. - Cedar Canyon 28-27 Fed Com 5H

1. Geologic Formations

TVD of target	8820'	Pilot Hole Depth	N/A
MD at TD:	18855'	Deepest Expected fresh water:	329'

Delaware Basin

Formation	TVD - RKB	Expected Fluids
Rustler	329	
Salado	774	
Lamar/Delaware	2905	Oil/Gas
Bell Canyon*	2947	Water/Oil/Gas
Cherry Canyon*	3637	Oil/Gas
Brushy Canyon*	5048	Oil/Gas
1st Bone Spring	6588	Oil/Gas
2nd Bone Spring	**7809**	**Oil/Gas**

*H2S, water flows, loss of circulation, abnormal pressures, etc.

2. Casing Program

									Buoyant	Buoyant
Hole Size (in)	Casing Interval From (ft)	Casing Interval To (ft)	Csg. Size (in)	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	Body SF Tension	Joint SF Tension
17.5	0	400	13.375	54.5	J55	BTC	5.43	1.34	2.47	2.64
12.25	0	8140	9.625	43.5	L80	BTC	4.94	1.32	1.98	2.03
8.5	0	18855	5.5	17	P-110	DQX	1.77	1.2	2.39	2.47

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h
*Oxy requests the option to set casing shallower yet still below the salts if losses or hole conditions require this. Cement volumes may be adjusted if casing is set shallower and a DV tool will be run in case a contingency second stage is required for cement to reach surface. If cement circulated to surface during first stage we will drop a cancelation cone and not pump the second stage.

	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.	Y
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?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	

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?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program

Casing	# Sks	Wt. lb/ gal	Yld ft3/ sack	H20 gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	336	14.8	1.35	6.53	6:50	Premium Plus Cement 2% Calcium Chloride – Flake (Accelerator)
Intermediate Casing 1st Stage	1349	10.2	3.05	15.63	15:07	TUNED LIGHT (TM) SYSTEM 0.80% HR-601(Retarder), 3 lbm/sk Kol-Seal (Lost Circulation Additive), 0.125 lbm/sk Poly-E-Flake (Lost Circulation Additive)
	177	13.2	1.65	8.45	12:57	Super H Cement, 0.1 % HR-800 (Retarder), 0.5 % Halad(R)-344 (Low Fluid Loss Control), 0.3 % CFR-3 (Dispersant), 2 lbm Kol-Seal (Lost Circulation Additive), 3 lbm Salt (Salt)
DV/ECP Tool @ 2956' (We request the option to cancel the second stage if cement is circulated to surface during the first stage of cement operations)						
Intermediate Casing Contingency 2nd Stage	688	12.9	1.85	9.86	12:44	Halliburton Light Premium Plus Cement with 5% Salt (Accelerator), 0.125 lbs/sk Poly-E-Flake (Lost Circulation Additive), 5 lbs/sk Kol-Seal (Lost Circulation Additive), 0.35% HR-800 (Retarder)
	207	14.8	1.33	6.34	6:31	Premium Plus cement
Production Casing	1797	13.2	1.631	8.37	15:15	Super H Cement, 0.1 % HR-800 (Retarder), 0.5 % Halad(R)-344 (Low Fluid Loss Control), 0.4 % CFR-3 (Dispersant), 3 lbm Salt (Salt)

Casing String	Lead To (ft)	Lead From (ft)	Tail To (ft)	Tail From (ft)	% Excess Lead	% Excess Tail
Surface	N/A	N/A	0	400		50%
Intermediate Casing 1st Stage	0	7640	7640	8140	75%	75%
Intermediate Casing Contingency 2nd Stage	0	2456	2456	2956	75%	75%
Production Casing	N/A	N/A	7740	18855		15%

4. Pressure Control Equipment

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
12.25" Intermediate	13-5/8"	5M	Annular	✓	70% of working pressure
			Blind Ram	✓	250/5000psi
			Pipe Ram		
			Double Ram	✓	
			Other*		

*Specify if additional ram is utilized.

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.

	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.
	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.
	Y | Are anchors required by manufacturer?
	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. See attached schematic. We are proposing that we will run the wellhead through the rotary prior to cementing surface casing as discussed with the BLM on October 8, 2015.

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From (ft)	To (ft)				
0	400	EnerSeal (MMH)	8.4-8.6	40-60	N/C
400	2956	Brine	9.8-10.0	35-45	N/C
2956	8140	EnerSeal (MMH)	8.8-9.6	38-50	N/C
8140	18855	Oil-Based Mud	8.8-9.6	35-50	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.
Oxy proposes to drill out the " surface casing shoe with a saturated brine system from 400' - 2956', which is the base of the salt system. At this point we will swap fluid systems to a high viscosity mixed metal hydroxide system. We will drill with this system to the intermediate TD @ 8140'.

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

6. Logging and Testing Procedures

Logging, Coring and Testing.	
Yes	Will run GR from TD 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.
No	Drill stem test? If yes, explain
No	Coring? If yes, explain

Additional logs planned		Interval
No	Resistivity	
No	Density	
No	CBL	
Yes	Mud log	Intermediate Shoe - TD
No	PEX	

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4312 psi
Abnormal Temperature	No

Pump high viscosity sweeps as needed for hole cleaning. The mud system will be monitored visually/manually as well as with an electronic PVT. The necessary mud products for additional weight and fluid loss control will be on location at all times. Appropriately weighted mud will be used to isolate potential gas, oil, and water zones until such time as casing can be cemented into place for zonal isolation.

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.	
N	H2S is present
Y	H2S Plan already submitted

8. Other facets of operation

	Yes/No
Will the well be drilled with a walking/skidding operation? If yes, describe. • We plan to drill the four well pad in batch by section: all surface sections, intermediate sections and production sections. The wellhead will be secured with a night cap whenever the rig is not over the well.	Yes
Will more than one drilling rig be used for drilling operations? If yes, describe.	No

Attachments
_x__ Directional Plan

9. Company Personnel

Name	Title	Office Phone	Mobile Phone
Ludwing Franco	Drilling Engineer	713-366-5174	832-523-6392
Tim Barnard	Drilling Engineer Team Lead	713-366-5706	281-740-3084
Amrut Athavale	Drilling Engineer Supervisor	713-350-4747	281-740-4448
Simon Benavides	Drilling Superintendent	713-522-8652	281-684-6897
Angie Contreras	Drilling & Completions Manager	713-497-2012	832-605-4882
Daniel Holderman	Drilling Manager	713-497-2006	832-525-9029

Oxy

Planning Report

Database:	HOPSPP	**Local Co-ordinate Reference:**	Site Cedar Canyon 28-27 Fed Com
Company:	OXY	**TVD Reference:**	WELL @ 2974.50ft (Original Well Elev)
Project:	NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	WELL @ 2974.50ft (Original Well Elev)
Site:	Cedar Canyon 28-27 Fed Com	**North Reference:**	Grid
Well:	Cedar Canyon 28-27 Federal Com 5H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

Project NM DIRECTIONAL PLANS (NAD 1983)

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site Cedar Canyon 28-27 Fed Com

Site Position:		**Northing:**	433,092.83 usft	**Latitude:**	32° 11' 24.744621 N
From:	Map	**Easting:**	644,868.56 usft	**Longitude:**	103° 59' 55.166622 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.18 °

Well Cedar Canyon 28-27 Federal Com 5H

Well Position	**+N/-S**	0.00 ft	**Northing:**	433,092.83 usft	**Latitude:**	32° 11' 24.744621 N
	+E/-W	0.00 ft	**Easting:**	644,868.56 usft	**Longitude:**	103° 59' 55.166622 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	2,948.00 ft	**Ground Level:**	2,948.00 ft

Wellbore WB00

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	9/19/2016	7.20	60.02	48,212

Design Permitting Plan

Audit Notes:

Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	93.88

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,146.58	10.93	166.81	4,143.27	-50.61	11.86	2.00	2.00	0.00	166.81	
7,590.84	10.93	166.81	7,525.03	-686.54	160.92	0.00	0.00	0.00	0.00	
8,240.89	10.00	89.85	8,167.00	-746.65	231.73	2.00	-0.14	-11.84	-131.24	CC2827_5H_KOP
9,030.43	88.95	89.85	8,640.37	-745.16	785.52	10.00	10.00	0.00	0.00	
18,854.78	88.95	89.85	8,820.00	-718.77	10,608.20	0.00	0.00	0.00	180.00	CC2827_5H_BHL

Database:	HOPSPP	**Local Co-ordinate Reference:**	Site Cedar Canyon 28-27 Fed Com
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Project:	NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	WELL @ 2974.50ft (Original Well Elev)
Site:	Cedar Canyon 28-27 Fed Com	**North Reference:**	Grid
Well:	Cedar Canyon 28-27 Federal Com 5H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

Planned Survey:

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
329.17	0.00	0.00	329.17	0.00	0.00	0.00	0.00	0.00	0.00
Top Rustler									
773.78	0.00	0.00	773.78	0.00	0.00	0.00	0.00	0.00	0.00
Top Salado (salt)									
1,364.66	0.00	0.00	1,364.66	0.00	0.00	0.00	0.00	0.00	0.00
Top Castile (anhydrite)									
2,905.40	0.00	0.00	2,905.40	0.00	0.00	0.00	0.00	0.00	0.00
Top Lamar / Delaware									
2,947.19	0.00	0.00	2,947.19	0.00	0.00	0.00	0.00	0.00	0.00
Top Bell Canyon									
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
Stepout DLS 2.00									
3,637.21	0.74	166.81	3,637.21	-0.24	0.06	0.07	2.00	2.00	0.00
Top Cherry Canyon									
3,700.00	2.00	166.81	3,699.98	-1.70	0.40	0.51	2.00	2.00	0.00
3,800.00	4.00	166.81	3,799.84	-6.79	1.59	2.05	2.00	2.00	0.00
3,900.00	6.00	166.81	3,899.45	-15.28	3.58	4.61	2.00	2.00	0.00
4,000.00	8.00	166.81	3,998.70	-27.14	6.36	8.18	2.00	2.00	0.00
4,100.00	10.00	166.81	4,097.47	-42.37	9.93	12.77	2.00	2.00	0.00
4,146.58	10.93	166.81	4,143.27	-50.61	11.86	15.26	2.00	2.00	0.00
Hold 10° tangent									
4,200.00	10.93	166.81	4,195.72	-60.48	14.18	18.23	0.00	0.00	0.00
4,300.00	10.93	166.81	4,293.91	-78.94	18.50	23.80	0.00	0.00	0.00
4,400.00	10.93	166.81	4,392.09	-97.40	22.83	29.36	0.00	0.00	0.00
4,500.00	10.93	166.81	4,490.28	-115.86	27.16	34.93	0.00	0.00	0.00
4,600.00	10.93	166.81	4,588.46	-134.33	31.49	40.49	0.00	0.00	0.00
4,700.00	10.93	166.81	4,686.65	-152.79	35.81	46.06	0.00	0.00	0.00
4,800.00	10.93	166.81	4,784.83	-171.25	40.14	51.63	0.00	0.00	0.00
4,900.00	10.93	166.81	4,883.02	-189.72	44.47	57.19	0.00	0.00	0.00
5,000.00	10.93	166.81	4,981.20	-208.18	48.80	62.76	0.00	0.00	0.00
5,067.89	10.93	166.81	5,047.86	-220.72	51.73	66.54	0.00	0.00	0.00
Top Brushy Canyon									
5,100.00	10.93	166.81	5,079.39	-226.64	53.12	68.32	0.00	0.00	0.00
5,200.00	10.93	166.81	5,177.58	-245.11	57.45	73.89	0.00	0.00	0.00
5,300.00	10.93	166.81	5,275.76	-263.57	61.78	79.46	0.00	0.00	0.00
5,400.00	10.93	166.81	5,373.95	-282.03	66.11	85.02	0.00	0.00	0.00
5,500.00	10.93	166.81	5,472.13	-300.50	70.44	90.59	0.00	0.00	0.00
5,600.00	10.93	166.81	5,570.32	-318.96	74.76	96.15	0.00	0.00	0.00
5,700.00	10.93	166.81	5,668.50	-337.42	79.09	101.72	0.00	0.00	0.00
5,800.00	10.93	166.81	5,766.69	-355.89	83.42	107.29	0.00	0.00	0.00
5,900.00	10.93	166.81	5,864.87	-374.35	87.75	112.85	0.00	0.00	0.00
6,000.00	10.93	166.81	5,963.06	-392.81	92.07	118.42	0.00	0.00	0.00
6,100.00	10.93	166.81	6,061.24	-411.28	96.40	123.98	0.00	0.00	0.00
6,200.00	10.93	166.81	6,159.43	-429.74	100.73	129.55	0.00	0.00	0.00
6,300.00	10.93	166.81	6,257.61	-448.20	105.06	135.12	0.00	0.00	0.00
6,400.00	10.93	166.81	6,355.80	-466.67	109.38	140.68	0.00	0.00	0.00
6,500.00	10.93	166.81	6,453.99	-485.13	113.71	146.25	0.00	0.00	0.00
6,600.00	10.93	166.81	6,552.17	-503.59	118.04	151.81	0.00	0.00	0.00
6,636.10	10.93	166.81	6,587.62	-510.26	119.60	153.82	0.00	0.00	0.00
1st Bone Spring									
6,700.00	10.93	166.81	6,650.36	-522.06	122.37	157.38	0.00	0.00	0.00
6,800.00	10.93	166.81	6,748.54	-540.52	126.70	162.95	0.00	0.00	0.00

Database:	HOPSPP	**Local Co-ordinate Reference:**	Site Cedar Canyon 28-27 Fed Com
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Site:	Cedar Canyon 28-27 Fed Com	**North Reference:**	Grid
Well:	Cedar Canyon 28-27 Federal Com 5H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,900.00	10.93	166.81	6,846.73	-558.98	131.02	168.51	0.00	0.00	0.00
7,000.00	10.93	166.81	6,944.91	-577.45	135.35	174.08	0.00	0.00	0.00
7,100.00	10.93	166.81	7,043.10	-595.91	139.68	179.64	0.00	0.00	0.00
7,200.00	10.93	166.81	7,141.28	-614.37	144.01	185.21	0.00	0.00	0.00
7,300.00	10.93	166.81	7,239.47	-632.84	148.33	190.78	0.00	0.00	0.00
7,400.00	10.93	166.81	7,337.65	-651.30	152.66	196.34	0.00	0.00	0.00
7,500.00	10.93	166.81	7,435.84	-669.76	156.99	201.91	0.00	0.00	0.00
7,590.84	10.93	166.81	7,525.03	-686.54	160.92	206.96	0.00	0.00	0.00
Turn to 89.85° Azimuth									
7,600.00	10.81	166.07	7,534.03	-688.21	161.33	207.48	2.00	-1.31	-8.02
7,700.00	9.63	156.95	7,632.44	-705.02	166.86	214.14	2.00	-1.18	-9.12
7,800.00	8.75	145.68	7,731.17	-719.00	174.43	222.63	2.00	-0.88	-11.27
7,878.41	8.33	135.48	7,808.71	-727.98	181.77	230.57	2.00	-0.53	-13.00
2nd Bone Spring									
7,900.00	8.27	132.53	7,830.08	-730.14	184.01	232.95	2.00	-0.31	-13.69
8,000.00	8.25	118.57	7,929.05	-738.44	195.62	245.09	2.00	-0.02	-13.96
8,100.00	8.70	105.32	8,027.97	-743.87	209.21	259.02	2.00	0.45	-13.25
8,200.00	9.56	93.89	8,126.71	-746.43	224.79	274.74	2.00	0.85	-11.43
8,240.89	10.00	89.85	8,167.00	-746.65	231.73	281.67	2.00	1.08	-9.90
Build curve 10°/100'									
8,300.00	15.91	89.85	8,224.58	-746.62	244.98	294.89	10.00	10.00	0.00
8,400.00	25.91	89.85	8,317.88	-746.52	280.62	330.45	10.00	10.00	0.00
8,500.00	35.91	89.85	8,403.56	-746.38	331.93	381.63	10.00	10.00	0.00
8,600.00	45.91	89.85	8,479.04	-746.21	397.34	446.87	10.00	10.00	0.00
8,700.00	55.91	89.85	8,542.01	-746.00	474.85	524.20	10.00	10.00	0.00
8,800.00	65.91	89.85	8,590.57	-745.76	562.13	611.26	10.00	10.00	0.00
8,900.00	75.91	89.85	8,623.23	-745.51	656.51	705.41	10.00	10.00	0.00
9,000.00	85.91	89.85	8,639.01	-745.25	755.13	803.78	10.00	10.00	0.00
9,030.43	88.95	89.85	8,640.37	-745.16	785.52	834.10	10.00	10.00	0.00
Landing Point									
9,100.00	88.95	89.85	8,641.64	-744.98	855.08	903.49	0.00	0.00	0.00
9,200.00	88.95	89.85	8,643.47	-744.71	955.07	1,003.22	0.00	0.00	0.00
9,300.00	88.95	89.85	8,645.29	-744.44	1,055.05	1,102.96	0.00	0.00	0.00
9,400.00	88.95	89.85	8,647.12	-744.17	1,155.03	1,202.70	0.00	0.00	0.00
9,500.00	88.95	89.85	8,648.94	-743.90	1,255.02	1,302.43	0.00	0.00	0.00
9,600.00	88.95	89.85	8,650.77	-743.63	1,355.00	1,402.17	0.00	0.00	0.00
9,700.00	88.95	89.85	8,652.59	-743.36	1,454.98	1,501.90	0.00	0.00	0.00
9,800.00	88.95	89.85	8,654.42	-743.10	1,554.96	1,601.64	0.00	0.00	0.00
9,900.00	88.95	89.85	8,656.25	-742.83	1,654.95	1,701.38	0.00	0.00	0.00
10,000.00	88.95	89.85	8,658.07	-742.56	1,754.93	1,801.11	0.00	0.00	0.00
10,100.00	88.95	89.85	8,659.90	-742.29	1,854.91	1,900.85	0.00	0.00	0.00
10,200.00	88.95	89.85	8,661.72	-742.02	1,954.90	2,000.59	0.00	0.00	0.00
10,300.00	88.95	89.85	8,663.55	-741.75	2,054.88	2,100.32	0.00	0.00	0.00
10,400.00	88.95	89.85	8,665.38	-741.48	2,154.86	2,200.06	0.00	0.00	0.00
10,500.00	88.95	89.85	8,667.20	-741.22	2,254.84	2,299.79	0.00	0.00	0.00
10,600.00	88.95	89.85	8,669.03	-740.95	2,354.83	2,399.53	0.00	0.00	0.00
10,700.00	88.95	89.85	8,670.86	-740.68	2,454.81	2,499.27	0.00	0.00	0.00
10,800.00	88.95	89.85	8,672.68	-740.41	2,554.79	2,599.00	0.00	0.00	0.00
10,900.00	88.95	89.85	8,674.51	-740.14	2,654.78	2,698.74	0.00	0.00	0.00
11,000.00	88.95	89.85	8,676.34	-739.87	2,754.76	2,798.47	0.00	0.00	0.00
11,100.00	88.95	89.85	8,678.16	-739.60	2,854.74	2,898.21	0.00	0.00	0.00
11,200.00	88.95	89.85	8,679.99	-739.34	2,954.73	2,997.95	0.00	0.00	0.00
11,300.00	88.95	89.85	8,681.82	-739.07	3,054.71	3,097.68	0.00	0.00	0.00

Database:	HOPSPP	**Local Co-ordinate Reference:**	Site Cedar Canyon 28-27 Fed Com
Company:	OXY	**TVD Reference:**	WELL @ 2974.50ft (Original Well Elev)
Project:	NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	WELL @ 2974.50ft (Original Well Elev)
Site:	Cedar Canyon 28-27 Fed Com	**North Reference:**	Grid
Well:	Cedar Canyon 28-27 Federal Com 5H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,400.00	88.95	89.85	8,683.64	-738.80	3,154.69	3,197.42	0.00	0.00	0.00
11,500.00	88.95	89.85	8,685.47	-738.53	3,254.67	3,297.15	0.00	0.00	0.00
11,600.00	88.95	89.85	8,687.30	-738.26	3,354.66	3,396.89	0.00	0.00	0.00
11,700.00	88.95	89.85	8,689.12	-737.99	3,454.64	3,496.63	0.00	0.00	0.00
11,800.00	88.95	89.85	8,690.95	-737.72	3,554.62	3,596.36	0.00	0.00	0.00
11,900.00	88.95	89.85	8,692.78	-737.45	3,654.61	3,696.10	0.00	0.00	0.00
12,000.00	88.95	89.85	8,694.61	-737.19	3,754.59	3,795.83	0.00	0.00	0.00
12,100.00	88.95	89.85	8,696.43	-736.92	3,854.57	3,895.57	0.00	0.00	0.00
12,200.00	88.95	89.85	8,698.26	-736.65	3,954.55	3,995.31	0.00	0.00	0.00
12,300.00	88.95	89.85	8,700.09	-736.38	4,054.54	4,095.04	0.00	0.00	0.00
12,400.00	88.95	89.85	8,701.92	-736.11	4,154.52	4,194.78	0.00	0.00	0.00
12,500.00	88.95	89.85	8,703.74	-735.84	4,254.50	4,294.52	0.00	0.00	0.00
12,600.00	88.95	89.85	8,705.57	-735.57	4,354.49	4,394.25	0.00	0.00	0.00
12,700.00	88.95	89.85	8,707.40	-735.31	4,454.47	4,493.99	0.00	0.00	0.00
12,800.00	88.95	89.85	8,709.23	-735.04	4,554.45	4,593.72	0.00	0.00	0.00
12,900.00	88.95	89.85	8,711.05	-734.77	4,654.44	4,693.46	0.00	0.00	0.00
13,000.00	88.95	89.85	8,712.88	-734.50	4,754.42	4,793.20	0.00	0.00	0.00
13,100.00	88.95	89.85	8,714.71	-734.23	4,854.40	4,892.93	0.00	0.00	0.00
13,200.00	88.95	89.85	8,716.54	-733.96	4,954.38	4,992.67	0.00	0.00	0.00
13,300.00	88.95	89.85	8,718.37	-733.69	5,054.37	5,092.40	0.00	0.00	0.00
13,400.00	88.95	89.85	8,720.19	-733.43	5,154.35	5,192.14	0.00	0.00	0.00
13,500.00	88.95	89.85	8,722.02	-733.16	5,254.33	5,291.88	0.00	0.00	0.00
13,600.00	88.95	89.85	8,723.85	-732.89	5,354.32	5,391.61	0.00	0.00	0.00
13,700.00	88.95	89.85	8,725.68	-732.62	5,454.30	5,491.35	0.00	0.00	0.00
13,800.00	88.95	89.85	8,727.51	-732.35	5,554.28	5,591.08	0.00	0.00	0.00
13,900.00	88.95	89.85	8,729.33	-732.08	5,654.26	5,690.82	0.00	0.00	0.00
14,000.00	88.95	89.85	8,731.16	-731.81	5,754.25	5,790.56	0.00	0.00	0.00
14,100.00	88.95	89.85	8,732.99	-731.54	5,854.23	5,890.29	0.00	0.00	0.00
14,200.00	88.95	89.85	8,734.82	-731.28	5,954.21	5,990.03	0.00	0.00	0.00
14,300.00	88.95	89.85	8,736.65	-731.01	6,054.20	6,089.76	0.00	0.00	0.00
14,400.00	88.95	89.85	8,738.48	-730.74	6,154.18	6,189.50	0.00	0.00	0.00
14,500.00	88.95	89.85	8,740.31	-730.47	6,254.16	6,289.24	0.00	0.00	0.00
14,600.00	88.95	89.85	8,742.13	-730.20	6,354.15	6,388.97	0.00	0.00	0.00
14,700.00	88.95	89.85	8,743.96	-729.93	6,454.13	6,488.71	0.00	0.00	0.00
14,800.00	88.95	89.85	8,745.79	-729.66	6,554.11	6,588.44	0.00	0.00	0.00
14,900.00	88.95	89.85	8,747.62	-729.40	6,654.09	6,688.18	0.00	0.00	0.00
15,000.00	88.95	89.85	8,749.45	-729.13	6,754.08	6,787.92	0.00	0.00	0.00
15,100.00	88.95	89.85	8,751.28	-728.86	6,854.06	6,887.65	0.00	0.00	0.00
15,200.00	88.95	89.85	8,753.11	-728.59	6,954.04	6,987.39	0.00	0.00	0.00
15,300.00	88.95	89.85	8,754.94	-728.32	7,054.03	7,087.12	0.00	0.00	0.00
15,400.00	88.95	89.85	8,756.77	-728.05	7,154.01	7,186.86	0.00	0.00	0.00
15,500.00	88.95	89.85	8,758.60	-727.78	7,253.99	7,286.60	0.00	0.00	0.00
15,600.00	88.95	89.85	8,760.43	-727.52	7,353.97	7,386.33	0.00	0.00	0.00
15,700.00	88.95	89.85	8,762.26	-727.25	7,453.96	7,486.07	0.00	0.00	0.00
15,800.00	88.95	89.85	8,764.08	-726.98	7,553.94	7,585.80	0.00	0.00	0.00
15,900.00	88.95	89.85	8,765.91	-726.71	7,653.92	7,685.54	0.00	0.00	0.00
16,000.00	88.95	89.85	8,767.74	-726.44	7,753.91	7,785.28	0.00	0.00	0.00
16,100.00	88.95	89.85	8,769.57	-726.17	7,853.89	7,885.01	0.00	0.00	0.00
16,200.00	88.95	89.85	8,771.40	-725.90	7,953.87	7,984.75	0.00	0.00	0.00
16,300.00	88.95	89.85	8,773.23	-725.63	8,053.85	8,084.48	0.00	0.00	0.00
16,400.00	88.95	89.85	8,775.06	-725.37	8,153.84	8,184.22	0.00	0.00	0.00
16,500.00	88.95	89.85	8,776.89	-725.10	8,253.82	8,283.96	0.00	0.00	0.00
16,600.00	88.95	89.85	8,778.72	-724.83	8,353.80	8,383.69	0.00	0.00	0.00
16,700.00	88.95	89.85	8,780.55	-724.56	8,453.79	8,483.43	0.00	0.00	0.00

Database:	HOPSPP	**Local Co-ordinate Reference:**	Site Cedar Canyon 28-27 Fed Com
Company:	OXY	**TVD Reference:**	WELL @ 2974.50ft (Original Well Elev)
Project:	NM DIRECTIONAL PLANS (NAD 1983)	**MD Reference:**	WELL @ 2974.50ft (Original Well Elev)
Site:	Cedar Canyon 28-27 Fed Com	**North Reference:**	Grid
Well:	Cedar Canyon 28-27 Federal Com 5H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	WB00		
Design:	Permitting Plan		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
16,800.00	88.95	89.85	8,782.38	-724.29	8,553.77	8,583.16	0.00	0.00	0.00
16,900.00	88.95	89.85	8,784.21	-724.02	8,653.75	8,682.90	0.00	0.00	0.00
17,000.00	88.95	89.85	8,786.04	-723.75	8,753.73	8,782.64	0.00	0.00	0.00
17,100.00	88.95	89.85	8,787.87	-723.49	8,853.72	8,882.37	0.00	0.00	0.00
17,200.00	88.95	89.85	8,789.70	-723.22	8,953.70	8,982.11	0.00	0.00	0.00
17,300.00	88.95	89.85	8,791.53	-722.95	9,053.68	9,081.84	0.00	0.00	0.00
17,400.00	88.95	89.85	8,793.36	-722.68	9,153.67	9,181.58	0.00	0.00	0.00
17,500.00	88.95	89.85	8,795.20	-722.41	9,253.65	9,281.32	0.00	0.00	0.00
17,600.00	88.95	89.85	8,797.03	-722.14	9,353.63	9,381.05	0.00	0.00	0.00
17,700.00	88.95	89.85	8,798.86	-721.87	9,453.62	9,480.79	0.00	0.00	0.00
17,800.00	88.95	89.85	8,800.69	-721.61	9,553.60	9,580.52	0.00	0.00	0.00
17,900.00	88.95	89.85	8,802.52	-721.34	9,653.58	9,680.26	0.00	0.00	0.00
18,000.00	88.95	89.85	8,804.35	-721.07	9,753.56	9,780.00	0.00	0.00	0.00
18,100.00	88.95	89.85	8,806.18	-720.80	9,853.55	9,879.73	0.00	0.00	0.00
18,200.00	88.95	89.85	8,808.01	-720.53	9,953.53	9,979.47	0.00	0.00	0.00
18,300.00	88.95	89.85	8,809.84	-720.26	10,053.51	10,079.20	0.00	0.00	0.00
18,400.00	88.95	89.85	8,811.67	-719.99	10,153.50	10,178.94	0.00	0.00	0.00
18,500.00	88.95	89.85	8,813.50	-719.72	10,253.48	10,278.68	0.00	0.00	0.00
18,600.00	88.95	89.85	8,815.33	-719.46	10,353.46	10,378.41	0.00	0.00	0.00
18,700.00	88.95	89.85	8,817.17	-719.19	10,453.44	10,478.15	0.00	0.00	0.00
18,800.00	88.95	89.85	8,819.00	-718.92	10,553.43	10,577.88	0.00	0.00	0.00
18,854.78	88.95	89.85	8,820.00	-718.77	10,608.20	10,632.52	0.00	0.00	0.00

TD at 18854.78' MD

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
329.17	329.17	Top Rustler			
773.78	773.78	Top Salado (salt)			
1,364.66	1,364.66	Top Castile (anhydrite)			
2,905.40	2,905.40	Top Lamar / Delaware			
2,947.19	2,947.19	Top Bell Canyon			
3,637.21	3,637.21	Top Cherry Canyon			
5,067.89	5,047.86	Top Brushy Canyon			
6,636.10	6,587.62	1st Bone Spring			
7,878.41	7,808.71	2nd Bone Spring			

Plan Annotations

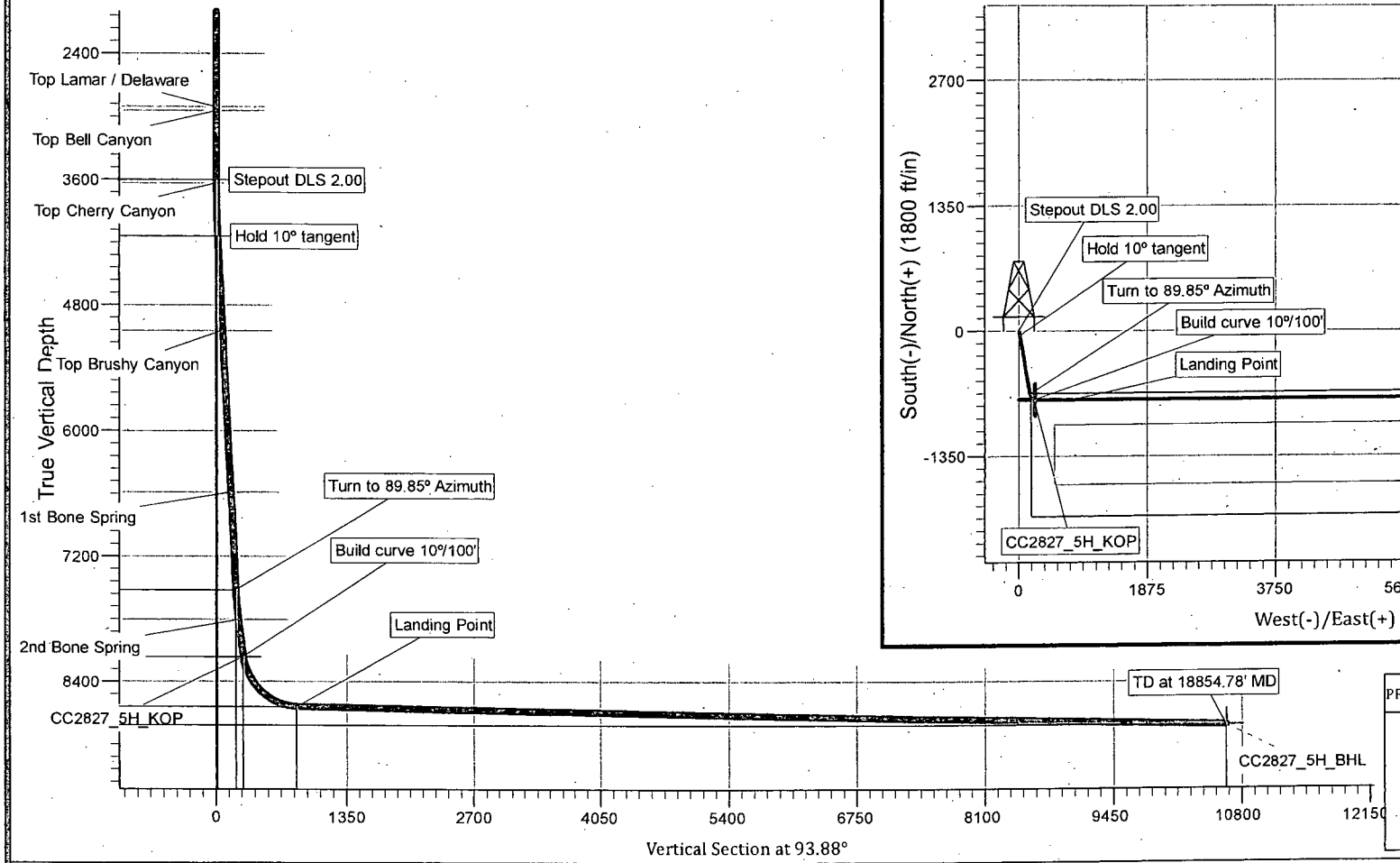
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
3,600.00	3,600.00	0.00	0.00	Stepout DLS 2.00
4,146.58	4,143.27	-50.61	11.86	Hold 10° tangent
7,590.84	7,525.03	-686.54	160.92	Turn to 89.85° Azimuth
8,240.89	8,167.00	-746.65	231.73	Build curve 10°/100'
9,030.43	8,640.37	-745.16	785.52	Landing Point
18,854.78	8,820.00	-718.77	10,608.20	TD at 18854.78' MD

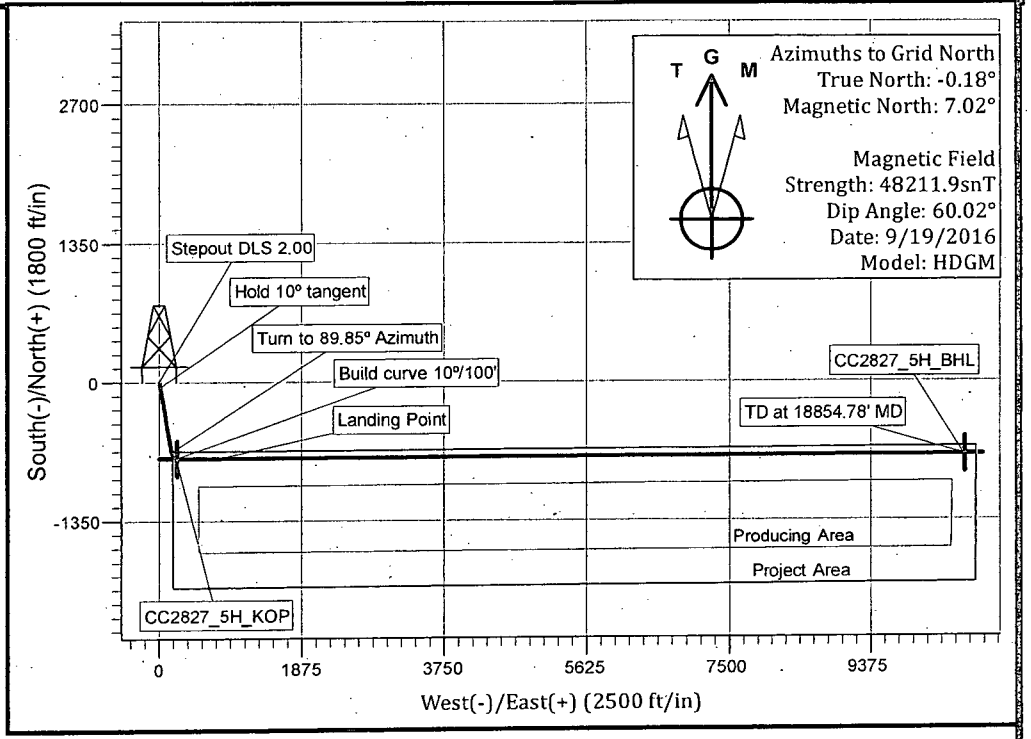
Project: NM DIRECTIONAL PLANS (NAD 1983)
Site: Cedar Canyon 28-27 Fed Com
Well: Cedar Canyon 28-27 Federal Com 5H
Wellbore: WB00
Design: Permitting Plan

WELL DETAILS: Cedar Canyon 28-27 Federal Com 5H

Ground Level: 2948.00 WELL @ 2974.50ft (Original Well Elev)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	433092.83	644868.56	32° 11' 24.744621 N	103° 59' 55.166622 W





PROJECT DETAILS: NM DIRECTIONAL PLANS (NAD 1983)

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone

System Datum: Mean Sea Level

ANNOTATIONS

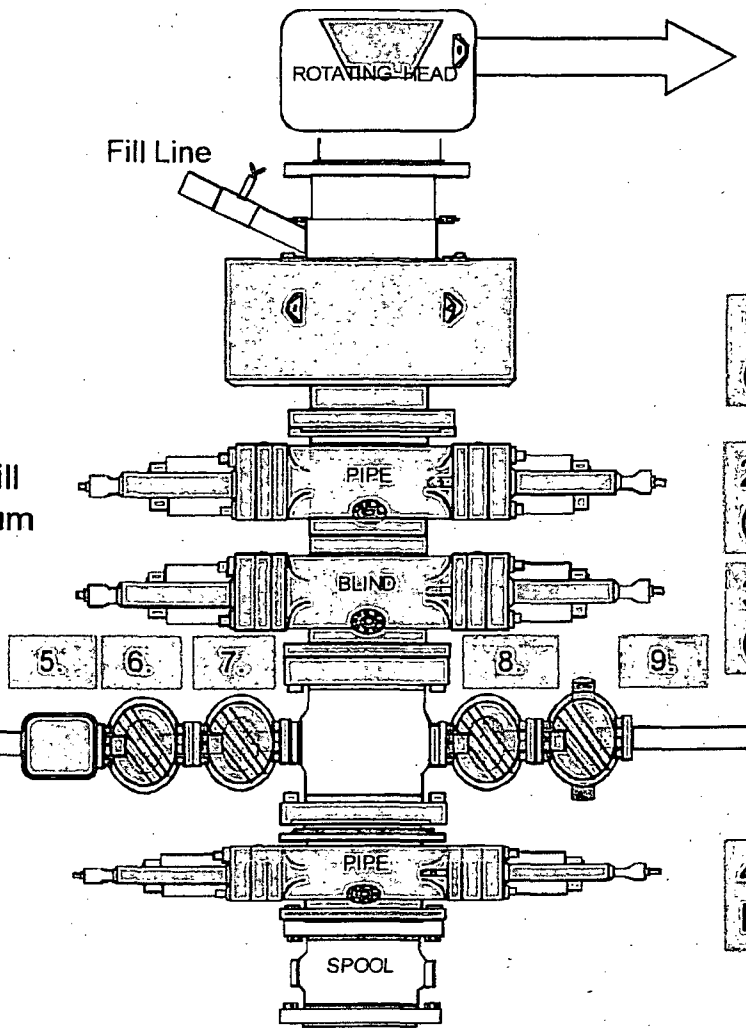
MD	TVD	Inc	Azi	+N/-S	+E/-W	VSect	Departure	Annotation
3600.00	3600.00	0.00	0.00	0.00	0.00	0.00	0.00	Stepout DLS 2.00
4146.58	4143.27	10.93	166.81	-50.61	11.86	15.26	51.98	Hold 10° tangent
7590.84	7525.03	10.93	166.81	-686.54	160.92	206.96	705.14	Turn to 89.85° Azimuth
8240.89	8167.00	10.00	89.85	-746.65	231.73	281.67	807.30	Build curve 10°/100'
9030.43	8640.37	88.95	89.85	-745.16	785.52	834.10	1361.10	Landing Point
18854.78	8820.00	88.95	89.85	-718.77	10608.20	10632.52	11183.81	TD at 18854.78' MD

5M BOP Stack

Mud Cross Valves:

5. 5M Check Valve
6. Outside 5M Kill Line Valve
7. Inside 5M Kill Line
8. Outside 5M Kill Line Valve
9. 5M HCR Valve

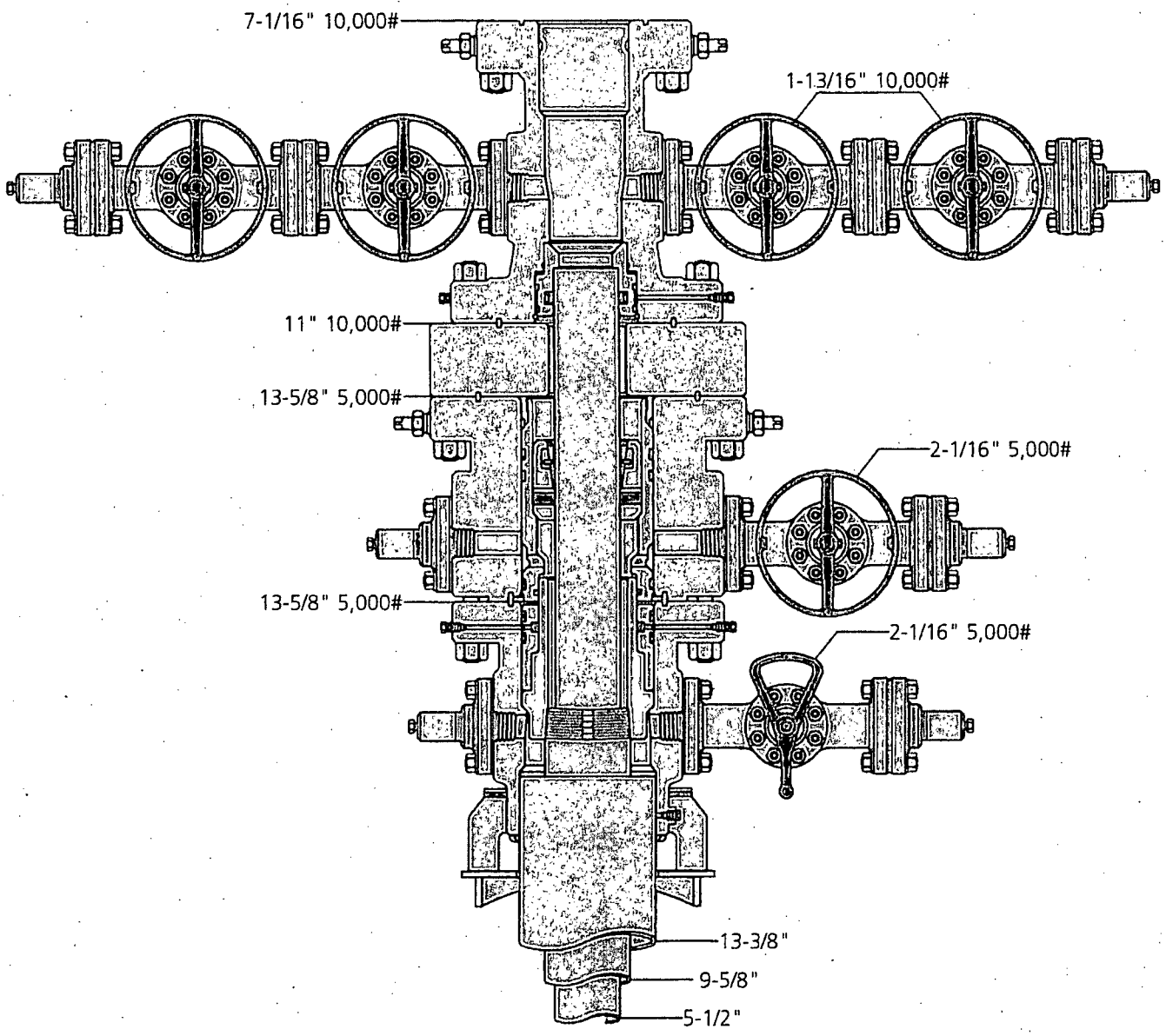
*Minimum ID = 2-1/16" on Kill Line side and 3" minimum ID on choke line side



1. 5000 psi Annular (13-5/8" ID)
2. 5,000 psi Upper Pipe Ram (13-5/8" ID)
3. 5,000 psi Blind Ram (13-5/8" ID)
4. 5,000 psi Lower Pipe Ram (13-5/8" ID)

To Kill Line

To Co-Flex and Choke Manifold



13" 5K MBS SL2 Wellhead

CAMERON
A Schlumberger Company

Name	Jeanette	Date	7-12-16	Working Pressure	#	J-9786-4

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	OXY USA Inc.
LEASE NO.:	NMNM094651
WELL NAME & NO.:	5H – Cedar Canyon 28 Federal
SURFACE HOLE FOOTAGE:	1990'/N & 180'/E
LOCATION:	Section 22, T 24 S., R 29 E., NMPM
COUNTY:	Eddy County, New Mexico

I. DRILLING

A. DRILLING OPERATIONS 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

1. **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.**

2. **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.**

3. 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 is located, this does not include the dog house or stairway area.

4. **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.

B. CASING

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.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

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. (For surface casing the BOP can be nippled up after the cement has reached 500 psi compressive strength.)

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

Medium cave/karst
Possible water flows in Castile and Salado.
Possible lost circulation in Rustler, Salado and Delaware.

1. The **13 3/8** inch surface casing shall be set at approximately **400** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, the operator shall set the casing 25' above the salt.**

    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 is to include the lead cement slurry.

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.

Formation below the 13-3/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.

The 9-5/8 inch intermediate casing must be kept liquid filled while running into hole to meet minimum BLM requirements for collapse.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

a. First stage to DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage.

Operator has proposed a contingency DV tool at 2900'. If operator circulates cement on the first stage, operator is approved to inflate the ACP and run the DV tool cancellation plug and cancel the second stage of the proposed cement plan. If cement does not circulate, operator will inflate ACP and proceed with the second stage.

b. Second stage above DV tool:

☒ 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.**

Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:

☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification.

4. 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.

C. 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. Variance approved to use flex line from BOP to choke manifold. 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.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).

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 surface 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. **Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.**
    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.**

5M 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. 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. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.

    c. 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.

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

    e. 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.**

    f. 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.

D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

E. 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.

CRW 110316