OCD Artesia

Form 3160-3
(March 2012)

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM114348

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

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

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone

8. Lease Name and Well No.
POPULUS FEDERAL 4H 315065

2. Name of Operator
COG OPERATING LLC 229137

9. API Well No.
30-015-44103

3a. Address
600 West Illinois Ave Midland TX 79701

3b. Phone No. *(include area code)*
(432)683-7443

10. Field and Pool, or Exploratory
WC-015 G-03 S252636M / BONE SPRIN 97818

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface NWNW / 210 FNL / 990 FWL / LAT 32.1074707 / LONG -104.2168804
At proposed prod. zone SWSW / 200 FSL / 660 FWL / LAT 32.0940326 / LONG -104.2180841

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 29 / T25S / R27E / NMP

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

12. County or Parish
EDDY

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)
200 feet

16. No. of acres in lease
640

17. Spacing Unit dedicated to this well
160

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
1037 feet

19. Proposed Depth
7400 feet / 12113 feet

20. BLM/BIA Bond No. on file
FED: NMB000215

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3138 feet

22. Approximate date work will start*
02/01/2016

23. Estimated duration
30 days

24. Attachments

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

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 required by the BLM.

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Mayte Reyes / Ph: (575)748-6945	12/28/2016

Title
Regulatory Analyst

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	03/07/2017

Title	Office
Supervisor Multiple Resources	CARLSBAD

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.

(Continued on page 2)

*(Instructions on page 2)

APPROVED WITH CONDITIONS

NM OIL CONSERVATION
ARTESIA DISTRICT
MAR 09 2017

Accepted for record - NMOCD

RWP 3-9-2017

RECEIVED

NM OIL CONSERVATION
ARTESIA DISTRICT
MAR 09 2017
RECEIVED

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 - 44103	97818	WC-015 G-03 S252636M; Bone Spring

[4] Property Code	[5] Property Name	[6] Well Number
315065	POPULUS FEDERAL	4H

[7] OGRID No.	[8] Operator Name	[9] Elevation
229137	COG OPERATING, LLC.	3137.9

[10] Surface Location

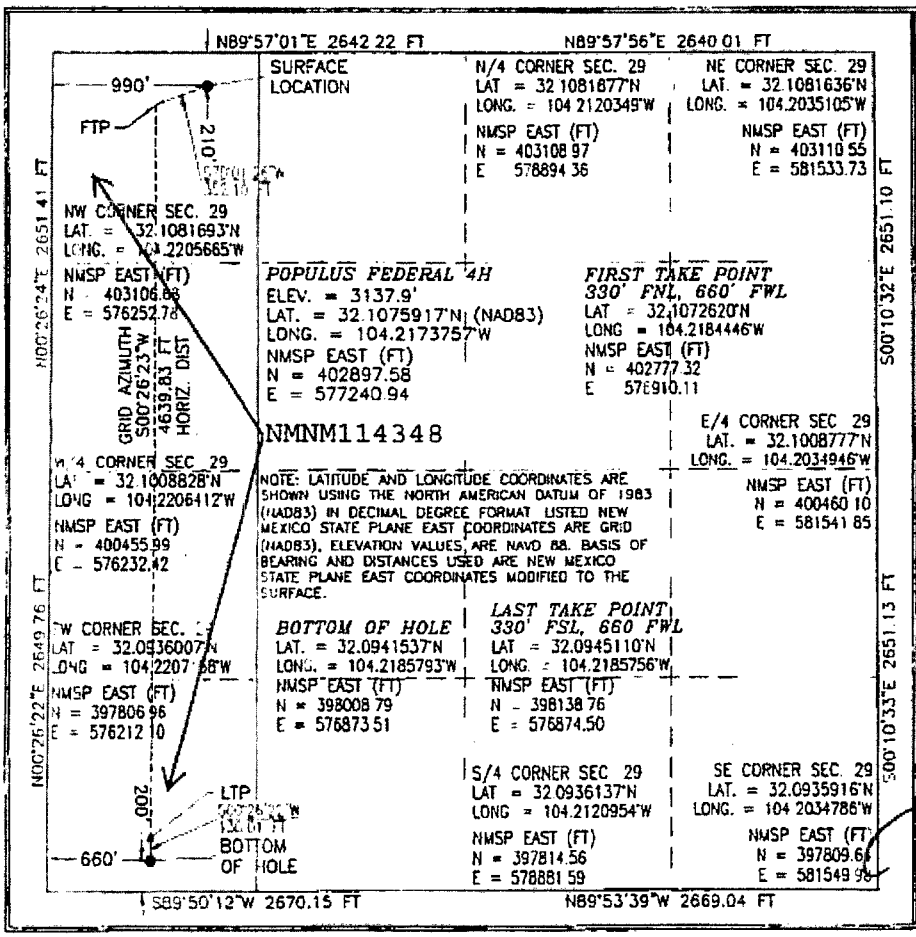
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	29	25 S	27 E		210	NORTH	990	WEST	EDDY

[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
M	29	25 S	27 E		200	SOUTH	660	WEST	EDDY

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

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.



[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 under heretofore entered by the division.

Mayte Reyes 12-22-16
Signature Date

Mayte Reyes
Printed Name

mreyes1@concho.com
E-mail Address

[18] SURVEYOR CERTIFICATION

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

DECEMBER 21, 2016
Date of Survey

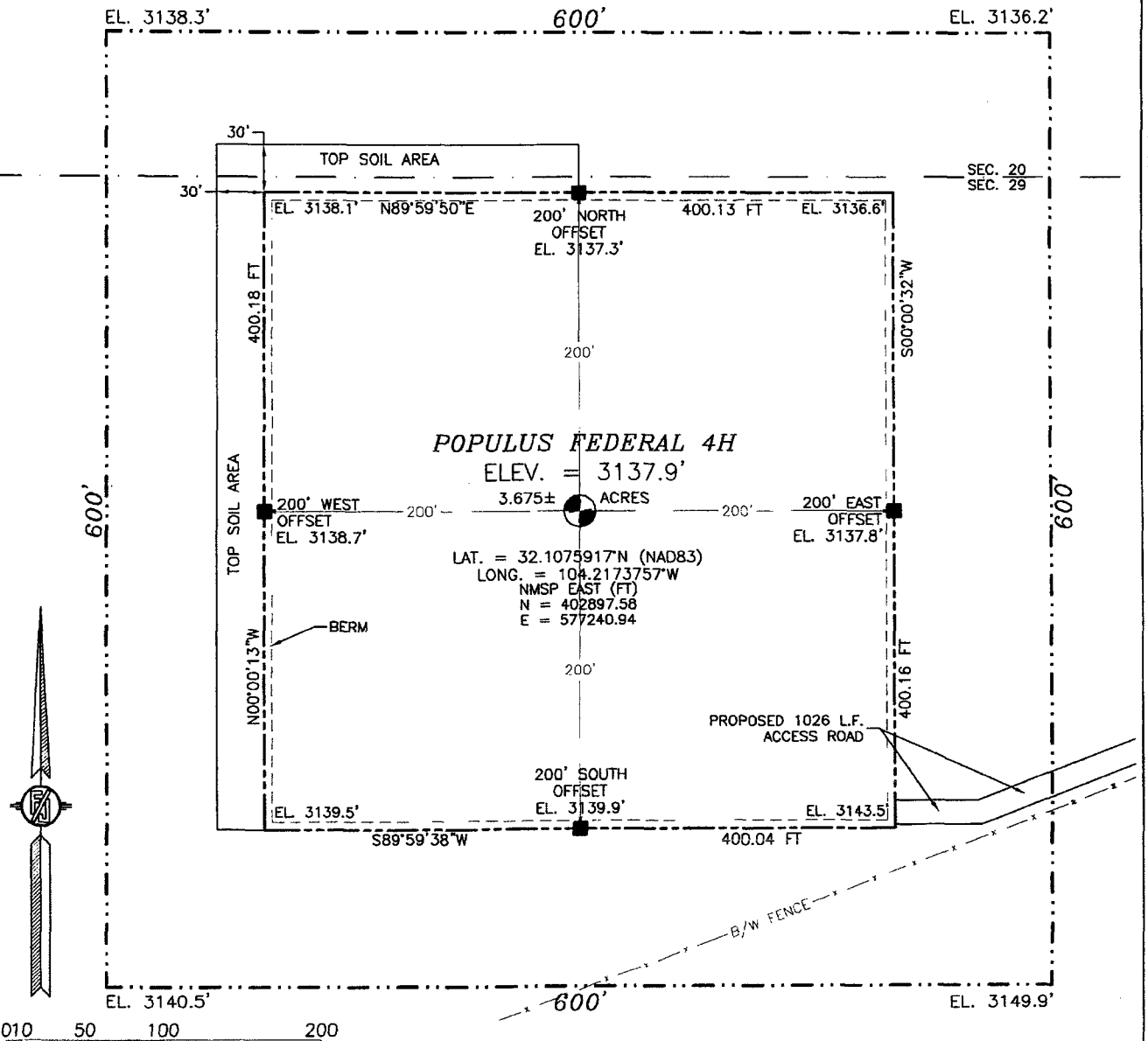
Signature and Seal of Professional Surveyor

Certificate Number FILIMON F. JARAMILLO, PLS 12797

SURVEY NO. 4895A

SITE MAP

NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83) IN DECIMAL DEGREE FORMAT. LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD83), ELEVATION VALUES ARE NAVD88. BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST COORDINATES MODIFIED TO THE SURFACE.



010 50 100 200

SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM STATE HWY. 285 AND CR. 724 (WHITE'S CITY) GO WEST ON CR. 724 6.9 MILES, TURN RIGHT ON CR. 774 (ROAD RUNNER) AND GO NORTH 3.9 MILES, TURN LEFT ON CALICHE ROAD AND GO WEST 1.0 MILE TO PROPOSED ROAD SURVEY AND FOLLOW FLAGS SOUTHWEST 973', THEN WEST 53' TO THE SOUTHEAST PAD CORNER FOR THIS LOCATION.

I, FILIMON F. JARAMILLO, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

FILIMON F. JARAMILLO PLS 12797 DATE 12/21/16

COG OPERATING, LLC

POPULUS FEDERAL 4H

LOCATED 210 FT. FROM THE NORTH LINE AND 990 FT. FROM THE WEST LINE OF SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO

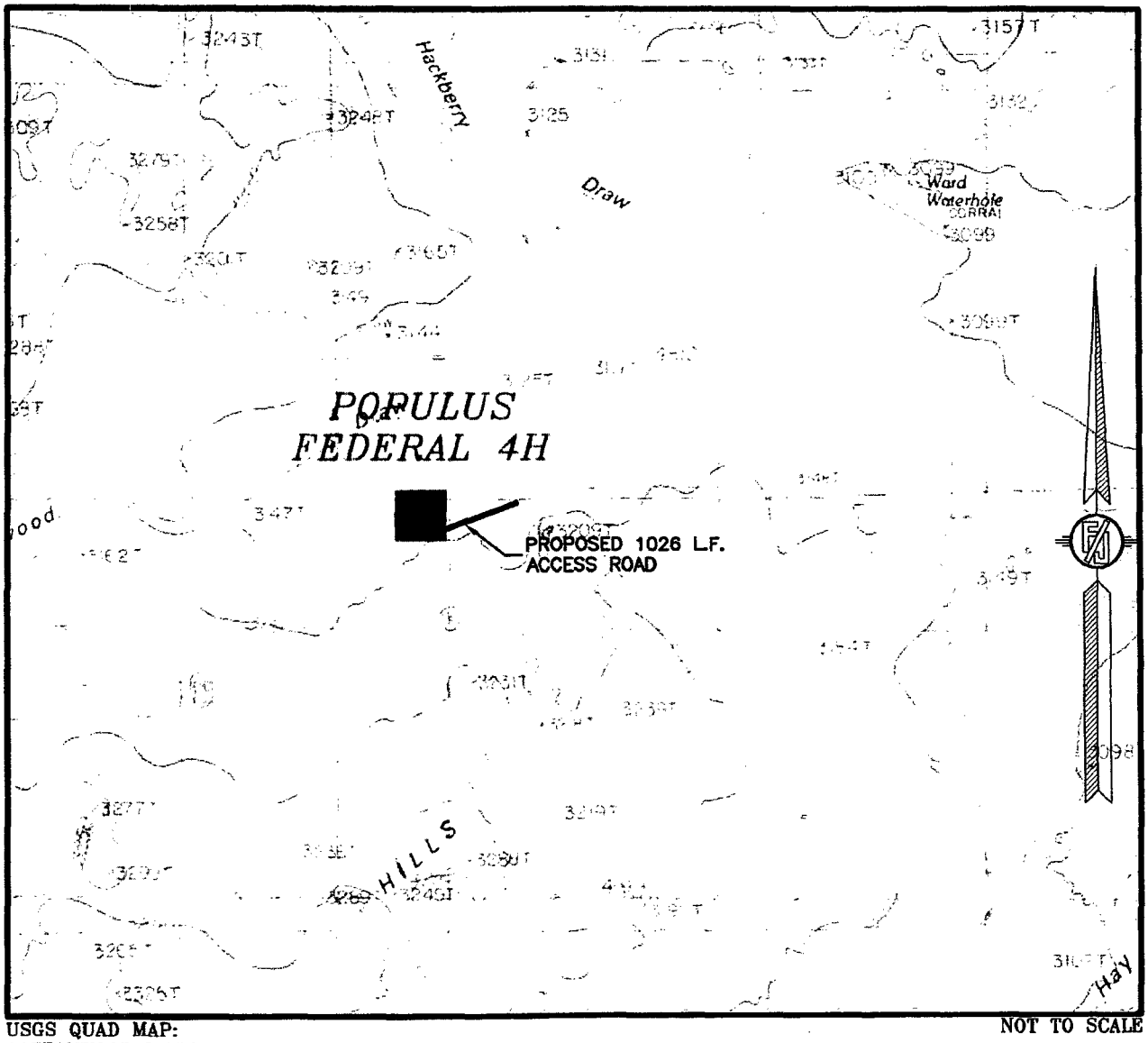
DECEMBER 21, 2016

SURVEY NO. 4895A

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

LOCATION VERIFICATION MAP



USGS QUAD MAP:
COTTONWOOD HILLS

NOT TO SCALE

COG OPERATING, LLC
POPULUS FEDERAL 4H
LOCATED 210 FT. FROM THE NORTH LINE
AND 990 FT. FROM THE WEST LINE OF
SECTION 29, TOWNSHIP 25 SOUTH,
RANGE 27 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

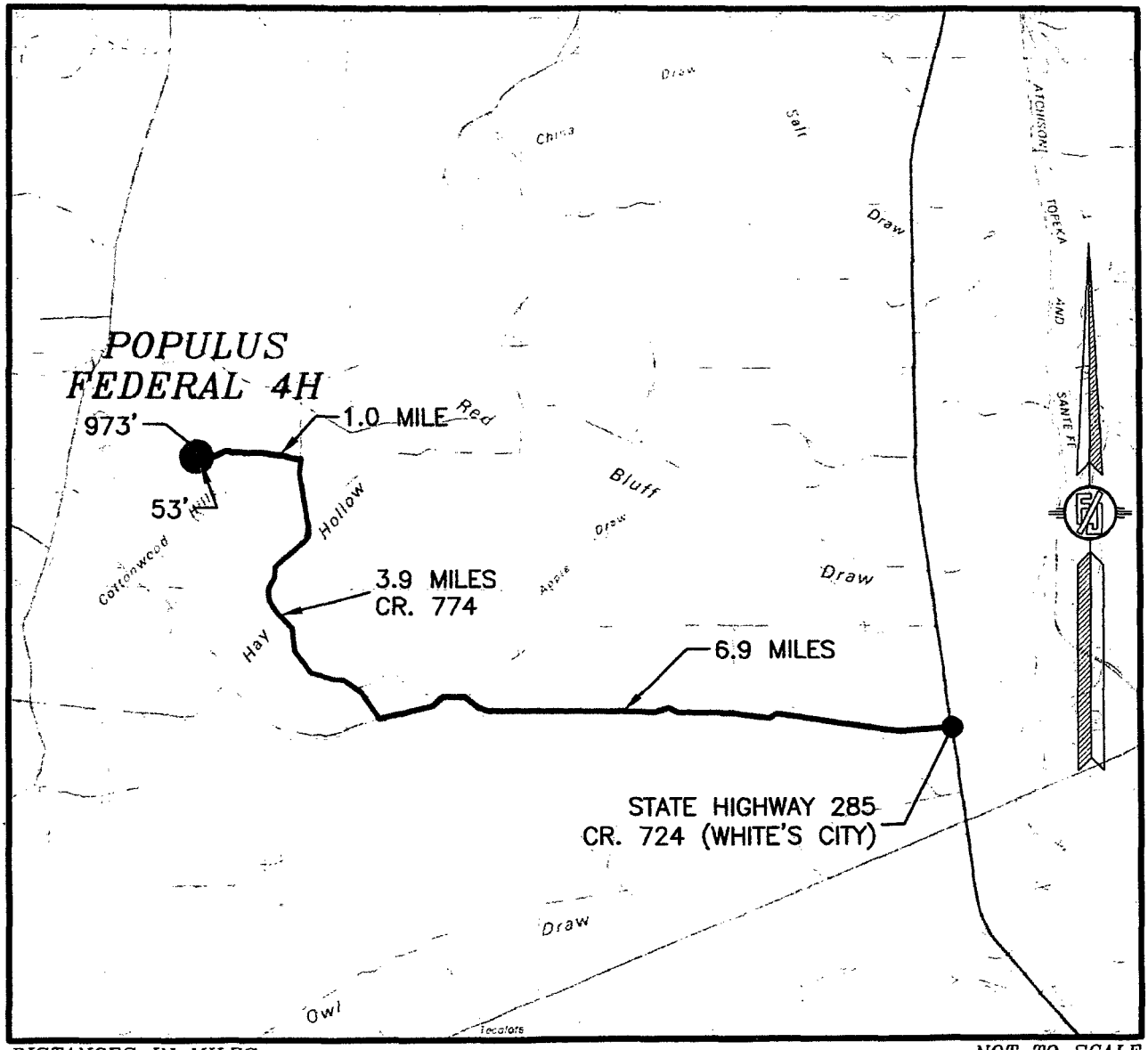
DECEMBER 21, 2016

SURVEY NO. 4895A

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

VICINITY MAP



DISTANCES IN MILES

NOT TO SCALE

DIRECTIONS TO LOCATION
FROM STATE HWY. 285 AND CR. 724 (WHITE'S CITY) GO WEST ON CR. 724 6.9 MILES, TURN RIGHT ON CR. 774 (ROAD RUNNER) AND GO NORTH 3.9 MILES, TURN LEFT ON CALICHE ROAD AND GO WEST 1.0 MILE TO PROPOSED ROAD SURVEY AND FOLLOW FLAGS SOUTHWEST 973', THEN WEST 53' TO THE SOUTHEAST PAD CORNER FOR THIS LOCATION.

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SECTION 29, TOWNSHIP 25 SOUTH,
RANGE 27 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

DECEMBER 21, 2016

SURVEY NO. 4895A

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

AERIAL PHOTO

NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
OCT. 2014

COG OPERATING, LLC

POPULUS FEDERAL 4H

LOCATED 210 FT. FROM THE NORTH LINE
AND 990 FT. FROM THE WEST LINE OF
SECTION 29, TOWNSHIP 25 SOUTH,
RANGE 27 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

DECEMBER 21, 2016

SURVEY NO. 4895A

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

AERIAL ACCESS ROUTE MAP

NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
OCT. 2014

COG OPERATING, LLC

POPULUS FEDERAL 4H

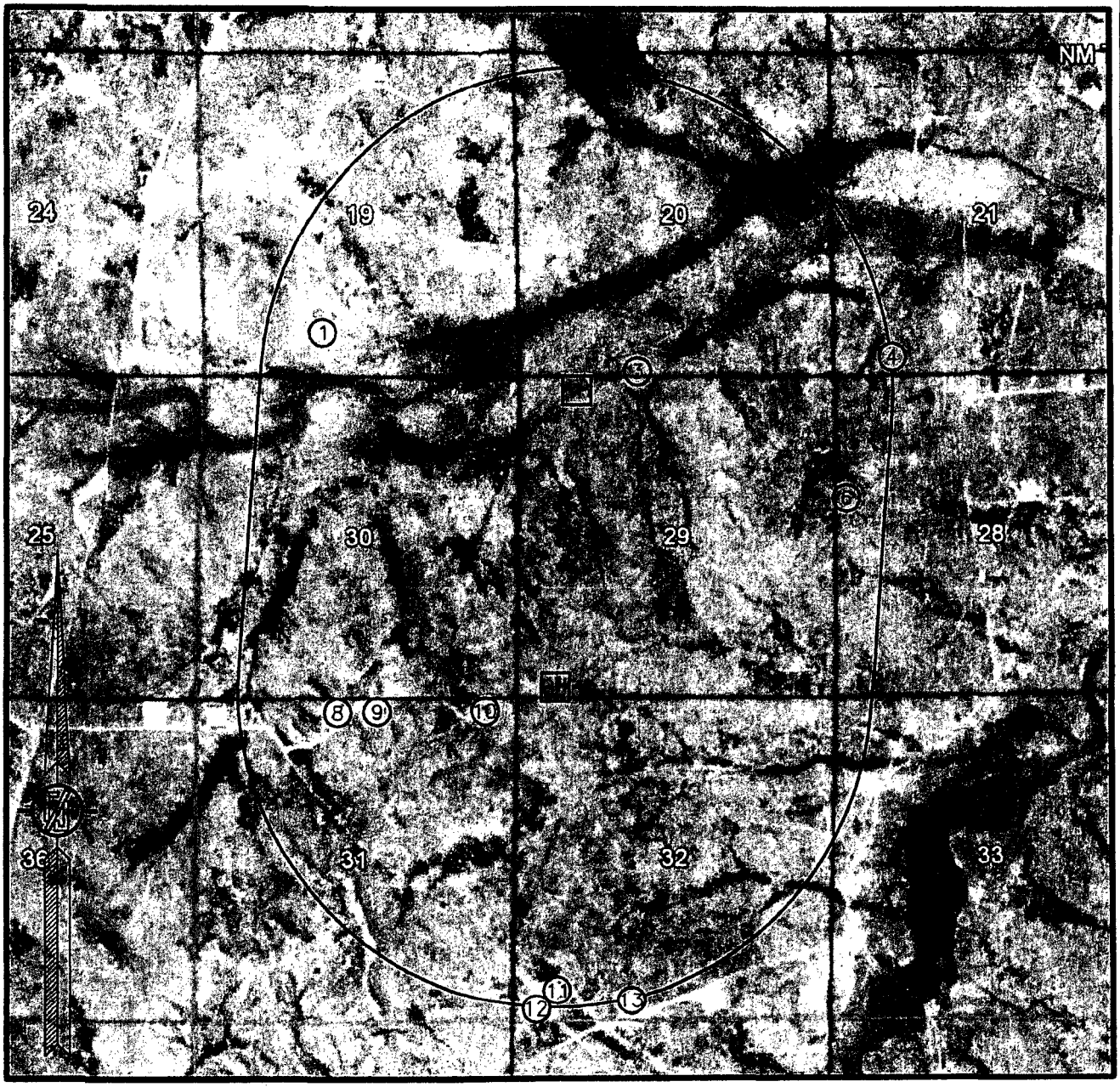
LOCATED 210 FT. FROM THE NORTH LINE
AND 990 FT. FROM THE WEST LINE OF
SECTION 29, TOWNSHIP 25 SOUTH,
RANGE 27 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

DECEMBER 21, 2016

SURVEY NO. 4895A

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

1-MILE MAP



SH SURFACE LOCATION
BH BOTTOM OF HOLE
XX WELLS WITHIN 1 MILE

COG OPERATING, LLC

POPULUS FEDERAL 4H

LOCATED 210 FT. FROM THE NORTH LINE
AND 990 FT. FROM THE WEST LINE OF
SECTION 29, TOWNSHIP 25 SOUTH,
RANGE 27 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

DECEMBER 21, 2016

SURVEY NO. 4895A

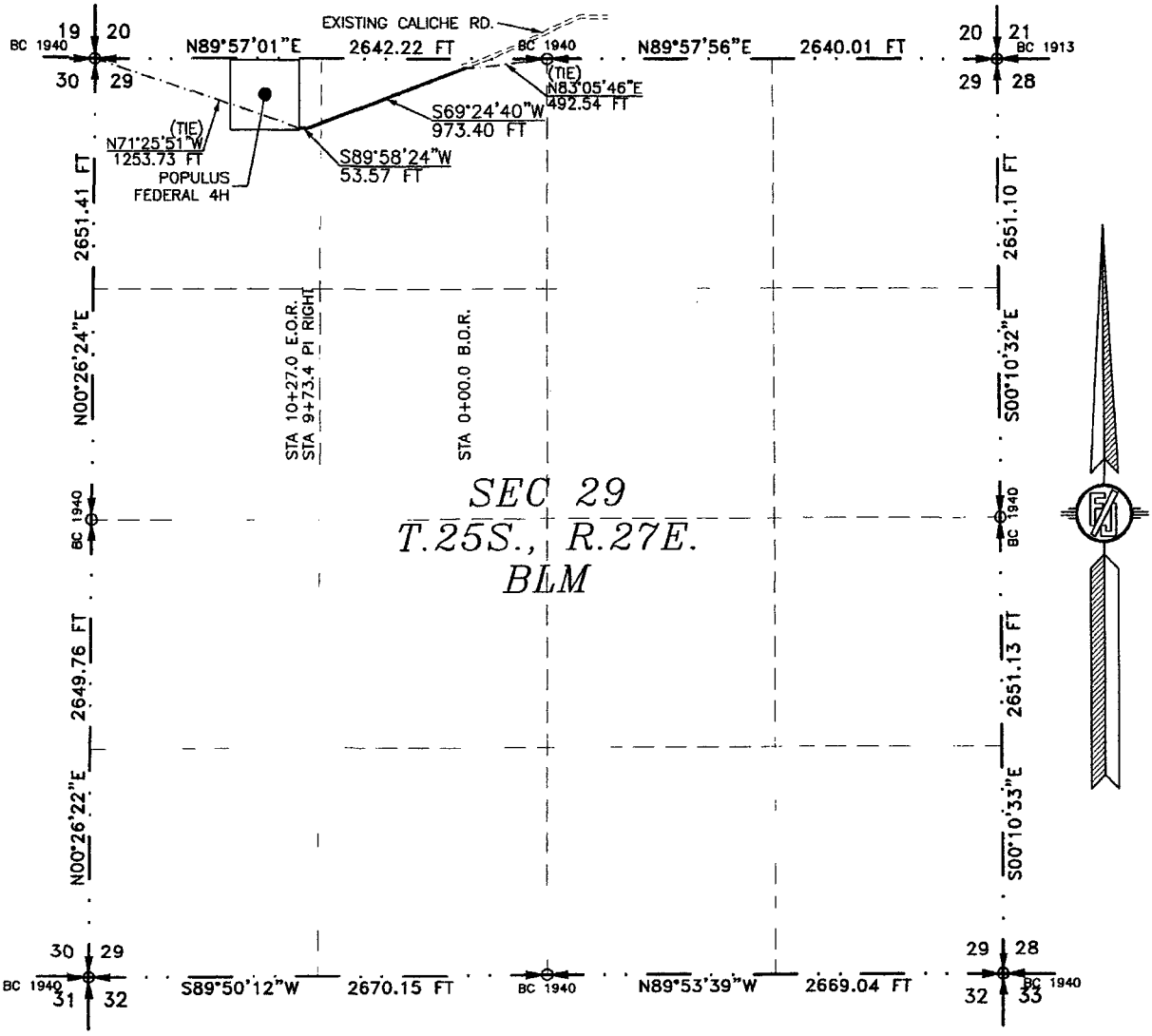
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

ACCESS ROAD PLAT

ACCESS ROAD FROM AN EXISTING CALICHE ROAD TO POPULUS FEDERAL 4H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
NOVEMBER 30, 2016



SEE NEXT SHEET (2-5) FOR DESCRIPTION

1000 0 1000

Scale: 1" = 1000'

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 21 DAY OF NOVEMBER 2016

MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

FILIMON F. JARAMILLO PLS 12797

ACCESS ROAD PLAT

ACCESS ROAD FROM AN EXISTING CALICHE ROAD TO POPULUS FEDERAL 4H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
NOVEMBER 30, 2016

DESCRIPTION

A STRIP OF LAND 20 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 10 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE NE/4 NW/4 OF SAID SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M., WHENCE THE NORTH QUARTER CORNER OF SAID SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M. BEARS N83°05'46"E, A DISTANCE OF 492.54 FEET;
THENCE S69°24'40"W A DISTANCE OF 973.40 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S89°58'24"W A DISTANCE OF 53.57 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTHWEST CORNER OF SAID SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M. BEARS N71°25'51"W, A DISTANCE OF 1253.73 FEET;

SAID STRIP OF LAND BEING 1026.97 FEET OR 62.24 RODS IN LENGTH, CONTAINING 0.472 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NE/4 NW/4	890.92 L.F.	54.00 RODS	0.410 ACRES
NW/4 NW/4	136.05 L.F.	8.24 RODS	0.062 ACRES

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 21 DAY OF NOVEMBER 2016

MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

FILIMON F. JARAMILLO P.L.S. 12797

301 SOUTH CANAL
(575) 234-3341

SURVEY NO. 5069

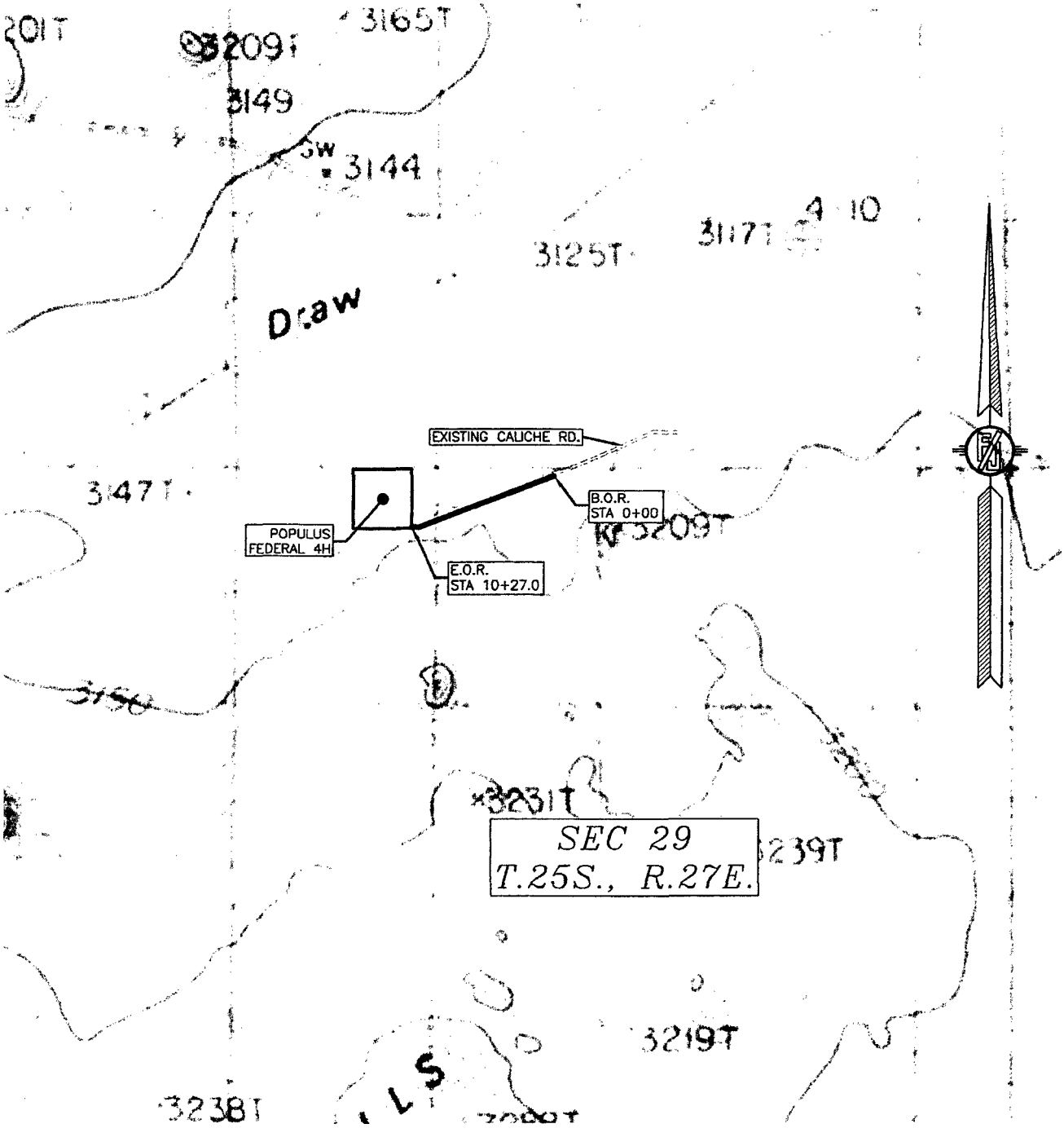
MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD FROM AN EXISTING CALICHE ROAD TO POPULUS FEDERAL 4H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
NOVEMBER 30, 2016



SHEET: 3-5 *SURVEY NO. 5069*

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

ACCESS ROAD PLAT

ACCESS ROAD FROM AN EXISTING CALICHE ROAD TO POPULUS FEDERAL 4H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
NOVEMBER 30, 2016

SHEET: 4-5 *SURVEY NO. 5069*

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

ACCESS ROAD PLAT

ACCESS ROAD FROM AN EXISTING CALICHE ROAD TO POPULUS FEDERAL 4H

COG OPERATING, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
NOVEMBER 30, 2016

CENTER LINE
WELL PAD
STATE LAND
BLM LAND
FEE LAND

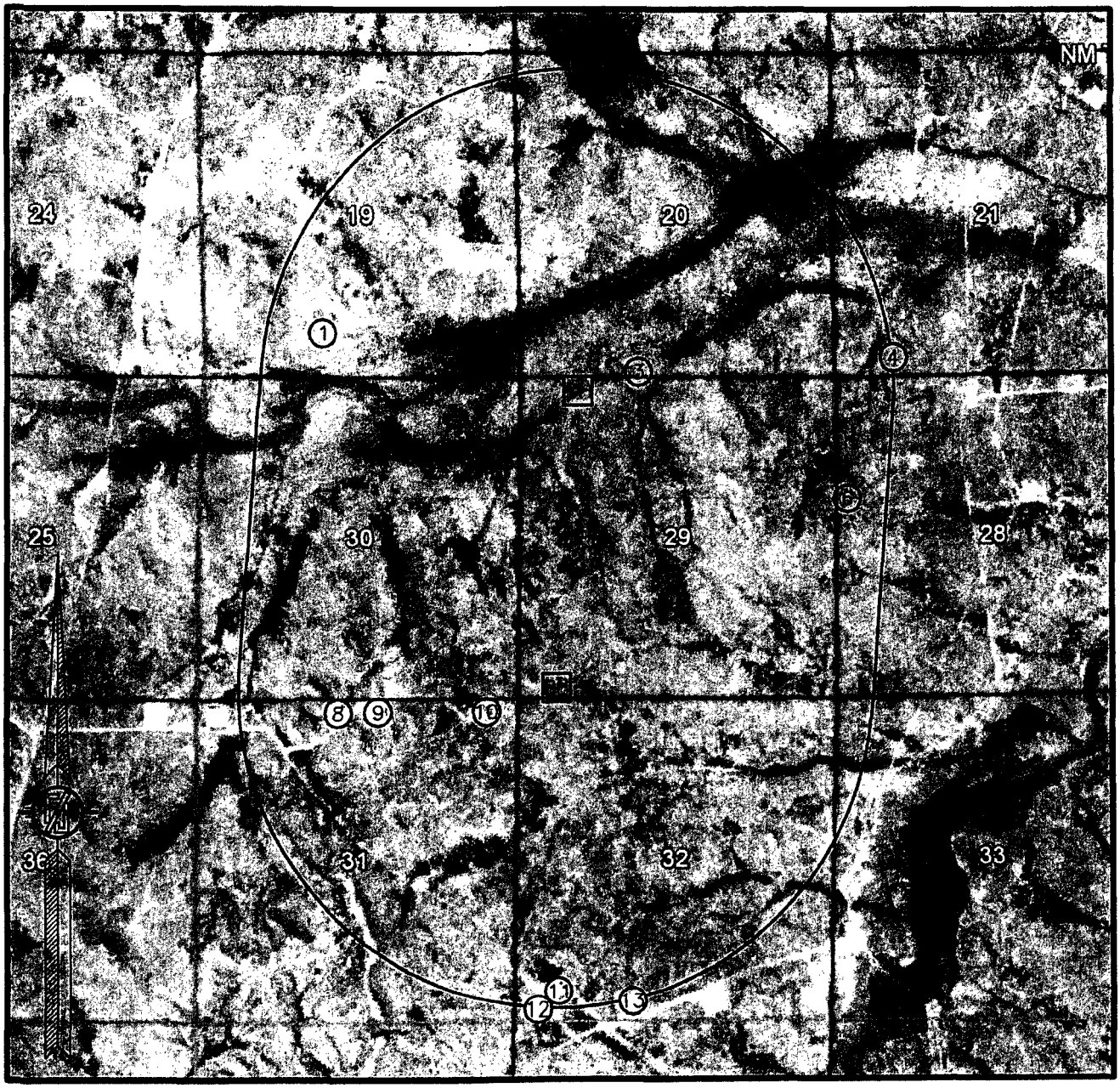
SHEET: 5-5

SURVEY NO. 5069

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

	API	Well	Type	Lease	Status	ULSTR	OCD Unit Letter	Last Production	Spud Date	Plugged On	Current Operator	Location	Lat. Long. (NAD83)
1	30-015-42446	PEACHES 19 FEDERAL #003H	Oil	Federal	Active	N-19-25S-27E	N	Aug-16	8/30/2015		[16696] OXY USA INC	730 FSL 1980 FWL	32.1101379,-104.2312317
3	30-015-43256	POPULUS FEDERAL #003H	Oil	Federal	Active	N-20-25S-27E	N	Sep-16	11/18/2015		[229137] COG OPERATING LLC	100 FSL 1980 FWL	32.10841798,-104.2141763
4	30-015-42975	WHITE CITY 21 25 27 FEDERAL COM #005H	Oil	Federal	Active	M-21-25S-27E	M	Aug-16	5/19/2015		[4323] CHEVRON U S A INC	330 FSL 990 FWL	32.109110922,-104.20029886
6	30-015-43218	LEONARDO BKL FEDERAL #002H	Oil	Federal	New	E-28-25S-27E	E				[25575] YATES PETROLEUM CORPORATION	1980 FNL 200 FWL	32.060984,-104.121028
8	30-015-42133	JACK FEDERAL #003H	Oil	Federal	Active	C-31-25S-27E	C	Sep-16	8/22/2014		[229137] COG OPERATING LLC	206 FNL 2360 FWL	32.0929871,-104.2303391
9	30-015-42134	JACK FEDERAL #004H	Oil	Federal	Active	B-31-25S-27E	B	Sep-16	3/16/2014		[229137] COG OPERATING LLC	190 FNL 2310 FEL	32.0930405,-104.2281723
10	30-015-42135	JACK FEDERAL #005H	Oil	Federal	Active	A-31-25S-27E	A	Sep-16	9/8/2014		[229137] COG OPERATING LLC	190 FNL 500 FEL	32.0930672,-104.2223282
11	30-015-39967	COTTONWOOD HILLS 32 STATE COM #001	Gas	State	Active	M-32-25S-27E	M	Sep-16	2/28/2012		[215099] CIMAREX ENERGY CO.	500 FSL 740 FWL	32.0803833,-104.218544
12	30-015-41084	COTTONWOOD HILLS 32 STATE COM #002H	Oil	State	Active	M-32-25S-27E	M	Sep-16	5/26/2013		[215099] CIMAREX ENERGY CO.	200 FSL 400 FWL	32.0795593,-104.2196503
13	30-015-41603	COTTONWOOD HILLS 32 STATE COM #003	Oil	State	Active	N-32-25S-27E	N	Sep-16	1/10/2014		[215099] CIMAREX ENERGY CO.	330 FSL 1980 FWL	32.0799179,-104.2145462

1 – MILE MAP



SH SURFACE LOCATION
BH BOTTOM OF HOLE
(XX) WELLS WITHIN 1 MILE

COG OPERATING, LLC

POPULUS FEDERAL 4H

LOCATED 210 FT. FROM THE NORTH LINE AND 990 FT. FROM THE WEST LINE OF SECTION 29, TOWNSHIP 25 SOUTH, RANGE 27 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO

DECEMBER 21, 2016

SURVEY NO. 4895A

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

Populus Federal #4H
Water Transfer Route

Date: 12/20/2016
Author: Whytnie McDonald
State: New Mexico
County: Eddy

Disclaimer: This is not a legal survey document

Map Legend

Route

N
W E
S

0 0.475 0.95 1.9 2.85 3.8
Miles

Populus Federal #4H
To Malaga I Brine

Date: 12/21/2016
Author: Whytnie McDonald
State: New Mexico
County: Eddy

Disclaimer: This is not a legal survey document

Map Legend

Route

N
W E
S

0 0.5 1 2 3 4
Miles

Casing Program

Hole Size	Casing From	Casing To	Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17.5"	0	350	13.375"	54.5	J55	STC	7.06	3.19	26.95
12.25"	0	1995	9.625"	40	J55	LTC	2.43	1.37	6.52
8.75"	0	12,113	5.5"	17	P110	LTC	2.07	3.70	3.54
			BLM Minimum Safety Factor				1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Intermediate burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

COG Operating, LLC - Populus Federal 4H

1. Geologic Formations

TVD of target	7,461' EOL	Pilot hole depth	NA
MD at TD:	12,429'	Deepest expected fresh water:	60'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	263	Water	
Top of Salt	467	Salt	
Base of Salt	1861	Salt	
Lamar	2036	Salt Water	
Bell Canyon	2088	Salt Water	
Cherry Canyon	2911	Oil/Gas	
Brushy Canyon	3982	Oil/Gas	
Bone Spring Lime	5604	Oil/Gas	
U. Avalon Shale	5734	Oil/Gas	
L. Avalon Shale	6094	Oil/Gas	
1st Bone Spring Sand	6528	Oil/Gas	
2nd Bone Spring Sand	7284	Oil/Gas	
3rd Bone Spring Sand	8373	Oil/Gas	
Wolfcamp	X	Oil/Gas	

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	425	13.375"	54.5	J55	STC	5.81	3.08	22.19
12.25"	0	2065	9.625"	40	J55	LTC	2.35	1.36	6.30
8.75"	0	12,429	5.5"	17	P110	LTC	2.05	3.67	3.51
			BLM Minimum Safety Factor				1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Intermediate burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface.
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

COG Operating, LLC - Populus Federal 4H

	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?	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?	Y
If yes, are there two strings cemented to surface?	Y
(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	H_20 gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.						
	325	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl2
Inter.	340	13.5	1.7	9.4	10	Lead: 35:65:6 C Blend
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl
5.5 Prod	750	11.9	2.5	19	72	Lead: 50:50:10 H Blend
	1390	14.4	1.24	5.7	19	Tail: 50:50:2 Class H Blend

Volumes Subject to Observed Hole Conditions and/or Fluid Caliper Results
Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
Surface	0'	50%
1st Intermediate	0'	50%
Production	1,565'	25% OH in Lateral (KOP to EOL) – 40% OH in Vertical

4. Pressure Control Equipment

N	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	x	Tested to:
12-1/4"	13-5/8"	2M	Annular	x	2000 psi
			Blind Ram		2M
			Pipe Ram		
			Double Ram		
			Other*		
8-3/4"	13-5/8"	3M	Annular	x	50% testing pressure
			Blind Ram	x	3M
			Pipe Ram	x	
			Double Ram		
			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.
N	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?
N	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.

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	Surf. Shoe	FW Gel	8.6 - 8.8	28-34	N/C
Surf csg	9-5/8" Int shoe	Saturated Brine	10 - 10.2	28-34	N/C
9-5/8" Int shoe	Lateral TD	Cut Brine	8.6 - 9.4	28-34	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.	
Y	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
Y	No Logs are planned based on well control or offset log information.
N	Drill stem test? If yes, explain.
N	Coring? If yes, explain.

Additional logs planned		Interval
N	Resistivity	Pilot Hole TD to ICP
N	Density	Pilot Hole TD to ICP
Y	CBL	Production casing (If cement not circulated to surface)
Y	Mud log	Intermediate shoe to TD
N	PEX	

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	3650 psi at 7461' TVD
Abnormal Temperature	NO 135 Deg. F.

No abnormal pressure or temperature conditions are anticipated. Sufficient mud materials to maintain mud properties and weight increase requirements will be kept on location at all times.

Sufficient supplies of Paper/LCM for periodic sweeps to control seepage and losses will be maintained on location.

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 attached

8. Other Facets of Operation

N	Is it a walking operation?
N	Is casing pre-set?

x	H2S Plan.
x	BOP & Choke Schematics.
x	Directional Plan

COG OPERATING LLC

EDDY COUNTY, NM
ATLAS
POPULUS FEDERAL #4H

OWB

Plan: PWP0

Survey Report - Geographic

22 December, 2016

COG Operating LLC

Survey Report - Geographic

Company:	COG OPERATING LLC	**Local Co-ordinate Reference:**	Well POPULUS FEDERAL #4H
Project:	EDDY COUNTY, NM	**TVD Reference:**	RKB=3137.9+18 @ 3155.9usft (PATRIOT 6)
Site:	ATLAS	**MD Reference:**	RKB=3137.9+18 @ 3155.9usft (PATRIOT 6)
Well:	POPULUS FEDERAL #4H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	EDM_Users

Project	EDDY COUNTY, NM		
Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	ATLAS				
Site Position:		**Northing:**	371,480.80 usft	**Latitude:**	32° 1' 15.933 N
From:	Map	**Easting:**	573,599.60 usft	**Longitude:**	104° 5' 45.086 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.13 °

Well	POPULUS FEDERAL #4H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	402,840.33 usf	**Latitude:**	32° 6' 26.895 N
	+E/-W	0.0 usft	**Easting:**	536,057.65 usf	**Longitude:**	104° 13' 0.769 W
Position Uncertainty		3.0 usft	**Wellhead Elevation:**	usf	**Ground Level:**	3,137.9 usf

Wellbore	OWB			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	WMM2015	12/14/2016	7.31	59.84	47,842.84256986

Design	PWP0				
Audit Notes:					
Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.0	0.0	0.0	184.30	

Survey Tool Program	**Date** 12/22/2016		
From (usft)	**To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
0.0	12,113.2	PWP0 (OWB)	MWD	OWSG MWD - Standard

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
100.0	0.00	0.00	100.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
200.0	0.00	0.00	200.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
300.0	0.00	0.00	300.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
400.0	0.00	0.00	400.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
500.0	0.00	0.00	500.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
600.0	0.00	0.00	600.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
700.0	0.00	0.00	700.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
800.0	0.00	0.00	800.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
900.0	0.00	0.00	900.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
1,000.0	0.00	0.00	1,000.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
1,100.0	0.00	0.00	1,100.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W

COG Operating LLC

Survey Report - Geographic

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Site:	ATLAS	**MD Reference:**	RKB=3137.9+18 @ 3155.9usft (PATRIOT 6)
Well:	POPULUS FEDERAL #4H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,200.0	0.00	0.00	1,200.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
1,300.0	0.00	0.00	1,300.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
1,400.0	0.00	0.00	1,400.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
1,500.0	0.00	0.00	1,500.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
1,600.0	0.00	0.00	1,600.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
1,700.0	0.00	0.00	1,700.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
1,800.0	0.00	0.00	1,800.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
1,900.0	0.00	0.00	1,900.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
2,000.0	0.00	0.00	2,000.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
2,100.0	0.00	0.00	2,100.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
2,200.0	0.00	0.00	2,200.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
2,300.0	0.00	0.00	2,300.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
2,400.0	0.00	0.00	2,400.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
2,500.0	0.00	0.00	2,500.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
2,600.0	0.00	0.00	2,600.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
2,700.0	0.00	0.00	2,700.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
2,800.0	0.00	0.00	2,800.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
2,900.0	0.00	0.00	2,900.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
3,000.0	0.00	0.00	3,000.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
3,100.0	0.00	0.00	3,100.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
3,200.0	0.00	0.00	3,200.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
3,300.0	0.00	0.00	3,300.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
3,400.0	0.00	0.00	3,400.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
3,500.0	0.00	0.00	3,500.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
3,600.0	0.00	0.00	3,600.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
3,700.0	0.00	0.00	3,700.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
3,800.0	0.00	0.00	3,800.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
3,900.0	0.00	0.00	3,900.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
4,000.0	0.00	0.00	4,000.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
4,100.0	0.00	0.00	4,100.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
4,200.0	0.00	0.00	4,200.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
4,300.0	0.00	0.00	4,300.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
4,400.0	0.00	0.00	4,400.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
4,500.0	0.00	0.00	4,500.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
4,600.0	0.00	0.00	4,600.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
4,700.0	0.00	0.00	4,700.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
4,800.0	0.00	0.00	4,800.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
4,900.0	0.00	0.00	4,900.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
5,000.0	0.00	0.00	5,000.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
5,100.0	0.00	0.00	5,100.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
5,200.0	0.00	0.00	5,200.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
5,300.0	0.00	0.00	5,300.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
5,400.0	0.00	0.00	5,400.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
5,500.0	0.00	0.00	5,500.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
5,600.0	0.00	0.00	5,600.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
5,700.0	0.00	0.00	5,700.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
5,800.0	0.00	0.00	5,800.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
5,900.0	0.00	0.00	5,900.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
6,000.0	0.00	0.00	6,000.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
6,100.0	0.00	0.00	6,100.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
6,200.0	0.00	0.00	6,200.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
6,300.0	0.00	0.00	6,300.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
6,400.0	0.00	0.00	6,400.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
6,500.0	0.00	0.00	6,500.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
6,600.0	0.00	0.00	6,600.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W

COG Operating LLC

Survey Report - Geographic

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Site:	ATLAS	**MD Reference:**	RKB=3137.9+18 @ 3155.9usft (PATRIOT 6)
Well:	POPULUS FEDERAL #4H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,700.0	0.00	0.00	6,700.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
6,800.0	0.00	0.00	6,800.0	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
6,886.5	0.00	0.00	6,886.5	0.0	0.0	402,840.33	536,057.65	32° 6' 26.895 N	104° 13' 0.769 W
6,900.0	1.62	205.20	6,900.0	-0.2	-0.1	402,840.16	536,057.57	32° 6' 26.893 N	104° 13' 0.770 W
7,000.0	13.62	205.20	6,998.9	-12.1	-5.7	402,828.18	536,051.94	32° 6' 26.774 N	104° 13' 0.836 W
7,100.0	25.62	205.20	7,093.0	-42.5	-20.0	402,797.86	536,037.67	32° 6' 26.474 N	104° 13' 1.002 W
7,200.0	37.62	205.20	7,178.0	-89.8	-42.3	402,750.51	536,015.39	32° 6' 26.006 N	104° 13' 1.262 W
7,300.0	49.61	205.20	7,250.2	-152.1	-71.6	402,688.21	535,986.07	32° 6' 25.390 N	104° 13' 1.603 W
7,400.0	61.61	205.20	7,306.6	-226.7	-106.7	402,613.67	535,951.00	32° 6' 24.653 N	104° 13' 2.012 W
7,500.0	73.61	205.20	7,344.6	-310.2	-146.0	402,530.16	535,911.70	32° 6' 23.827 N	104° 13' 2.470 W
7,600.0	85.61	205.20	7,362.6	-399.0	-187.8	402,441.33	535,869.90	32° 6' 22.948 N	104° 13' 2.957 W
7,632.9	89.56	205.20	7,364.0	-428.7	-201.8	402,411.58	535,855.90	32° 6' 22.654 N	104° 13' 3.120 W
7,700.0	89.55	202.52	7,364.5	-490.1	-228.9	402,350.23	535,828.76	32° 6' 22.047 N	104° 13' 3.437 W
7,800.0	89.55	198.52	7,365.3	-583.7	-263.9	402,256.59	535,793.73	32° 6' 21.120 N	104° 13' 3.845 W
7,900.0	89.54	194.52	7,366.1	-679.6	-292.3	402,160.74	535,765.30	32° 6' 20.172 N	104° 13' 4.177 W
8,000.0	89.54	190.52	7,366.9	-777.2	-314.0	402,063.14	535,743.64	32° 6' 19.206 N	104° 13' 4.430 W
8,100.0	89.54	186.52	7,367.7	-876.1	-328.8	401,964.27	535,728.83	32° 6' 18.228 N	104° 13' 4.603 W
8,200.0	89.54	182.52	7,368.5	-975.7	-336.7	401,864.60	535,720.96	32° 6' 17.242 N	104° 13' 4.696 W
8,252.0	89.54	180.44	7,368.9	-1,027.7	-338.0	401,812.67	535,719.62	32° 6' 16.728 N	104° 13' 4.712 W
8,300.0	89.54	180.44	7,369.3	-1,075.7	-338.4	401,764.63	535,719.26	32° 6' 16.252 N	104° 13' 4.717 W
8,400.0	89.54	180.44	7,370.1	-1,175.7	-339.2	401,664.63	535,718.49	32° 6' 15.263 N	104° 13' 4.727 W
8,500.0	89.54	180.44	7,370.9	-1,275.7	-339.9	401,564.64	535,717.73	32° 6' 14.273 N	104° 13' 4.737 W
8,600.0	89.54	180.44	7,371.7	-1,375.7	-340.7	401,464.65	535,716.97	32° 6' 13.284 N	104° 13' 4.747 W
8,700.0	89.54	180.44	7,372.5	-1,475.7	-341.5	401,364.65	535,716.20	32° 6' 12.294 N	104° 13' 4.758 W
8,800.0	89.54	180.44	7,373.4	-1,575.7	-342.2	401,264.66	535,715.44	32° 6' 11.305 N	104° 13' 4.768 W
8,900.0	89.54	180.44	7,374.2	-1,675.7	-343.0	401,164.66	535,714.67	32° 6' 10.315 N	104° 13' 4.778 W
9,000.0	89.54	180.44	7,375.0	-1,775.7	-343.7	401,064.67	535,713.91	32° 6' 9.325 N	104° 13' 4.788 W
9,100.0	89.54	180.44	7,375.8	-1,875.7	-344.5	400,964.68	535,713.15	32° 6' 8.336 N	104° 13' 4.798 W
9,200.0	89.54	180.44	7,376.6	-1,975.6	-345.3	400,864.68	535,712.38	32° 6' 7.346 N	104° 13' 4.808 W
9,300.0	89.54	180.44	7,377.4	-2,075.6	-346.0	400,764.69	535,711.62	32° 6' 6.357 N	104° 13' 4.818 W
9,400.0	89.54	180.44	7,378.2	-2,175.6	-346.8	400,664.69	535,710.86	32° 6' 5.367 N	104° 13' 4.828 W
9,500.0	89.54	180.44	7,379.0	-2,275.6	-347.6	400,564.70	535,710.09	32° 6' 4.377 N	104° 13' 4.838 W
9,600.0	89.54	180.44	7,379.8	-2,375.6	-348.3	400,464.71	535,709.33	32° 6' 3.388 N	104° 13' 4.849 W
9,700.0	89.54	180.44	7,380.6	-2,475.6	-349.1	400,364.71	535,708.57	32° 6' 2.398 N	104° 13' 4.859 W
9,800.0	89.54	180.44	7,381.4	-2,575.6	-349.8	400,264.72	535,707.80	32° 6' 1.409 N	104° 13' 4.869 W
9,900.0	89.54	180.44	7,382.2	-2,675.6	-350.6	400,164.73	535,707.04	32° 6' 0.419 N	104° 13' 4.879 W
10,000.0	89.54	180.44	7,383.0	-2,775.6	-351.4	400,064.73	535,706.28	32° 5' 59.429 N	104° 13' 4.889 W
10,100.0	89.54	180.44	7,383.8	-2,875.6	-352.1	399,964.74	535,705.51	32° 5' 58.440 N	104° 13' 4.899 W
10,200.0	89.54	180.44	7,384.6	-2,975.6	-352.9	399,864.74	535,704.75	32° 5' 57.450 N	104° 13' 4.909 W
10,300.0	89.54	180.44	7,385.4	-3,075.6	-353.7	399,764.75	535,703.99	32° 5' 56.461 N	104° 13' 4.919 W
10,400.0	89.54	180.44	7,386.2	-3,175.6	-354.4	399,664.76	535,703.22	32° 5' 55.471 N	104° 13' 4.930 W
10,500.0	89.54	180.44	7,387.0	-3,275.6	-355.2	399,564.76	535,702.46	32° 5' 54.482 N	104° 13' 4.940 W
10,600.0	89.54	180.44	7,387.8	-3,375.6	-356.0	399,464.77	535,701.70	32° 5' 53.492 N	104° 13' 4.950 W
10,700.0	89.54	180.44	7,388.6	-3,475.6	-356.7	399,364.77	535,700.93	32° 5' 52.502 N	104° 13' 4.960 W
10,800.0	89.54	180.44	7,389.4	-3,575.5	-357.5	399,264.78	535,700.17	32° 5' 51.513 N	104° 13' 4.970 W
10,900.0	89.54	180.44	7,390.2	-3,675.5	-358.2	399,164.79	535,699.40	32° 5' 50.523 N	104° 13' 4.980 W
11,000.0	89.54	180.44	7,391.0	-3,775.5	-359.0	399,064.79	535,698.64	32° 5' 49.534 N	104° 13' 4.990 W
11,100.0	89.54	180.44	7,391.9	-3,875.5	-359.8	398,964.80	535,697.88	32° 5' 48.544 N	104° 13' 5.000 W
11,200.0	89.54	180.44	7,392.7	-3,975.5	-360.5	398,864.81	535,697.11	32° 5' 47.554 N	104° 13' 5.010 W
11,300.0	89.54	180.44	7,393.5	-4,075.5	-361.3	398,764.81	535,696.35	32° 5' 46.565 N	104° 13' 5.021 W
11,400.0	89.54	180.44	7,394.3	-4,175.5	-362.1	398,664.82	535,695.59	32° 5' 45.575 N	104° 13' 5.031 W
11,500.0	89.54	180.44	7,395.1	-4,275.5	-362.8	398,564.82	535,694.82	32° 5' 44.586 N	104° 13' 5.041 W
11,600.0	89.54	180.44	7,395.9	-4,375.5	-363.6	398,464.83	535,694.06	32° 5' 43.596 N	104° 13' 5.051 W
11,700.0	89.54	180.44	7,396.7	-4,475.5	-364.4	398,364.84	535,693.30	32° 5' 42.607 N	104° 13' 5.061 W
11,800.0	89.54	180.44	7,397.5	-4,575.5	-365.1	398,264.84	535,692.53	32° 5' 41.617 N	104° 13' 5.071 W

COG Operating LLC

Survey Report - Geographic

Company:	COG OPERATING LLC	**Local Co-ordinate Reference:**	Well POPULUS FEDERAL #4H
Project:	EDDY COUNTY, NM	**TVD Reference:**	RKB=3137.9+18 @ 3155.9usft (PATRIOT 6)
Site:	ATLAS	**MD Reference:**	RKB=3137.9+18 @ 3155.9usft (PATRIOT 6)
Well:	POPULUS FEDERAL #4H	**North Reference:**	Grid
Wellbore:	OWB	**Survey Calculation Method:**	Minimum Curvature
Design:	PWP0	**Database:**	EDM_Users

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
11,900.0	89.54	180.44	7,398.3	-4,675.5	-365.9	398,164.85	535,691.77	32° 5' 40.627 N	104° 13' 5.081 W
12,000.0	89.54	180.44	7,399.1	-4,775.5	-366.6	398,064.85	535,691.01	32° 5' 39.638 N	104° 13' 5.091 W
12,100.0	89.54	180.44	7,399.9	-4,875.5	-367.4	397,964.86	535,690.24	32° 5' 38.648 N	104° 13' 5.102 W
12,113.2	89.54	180.44	7,400.0	-4,888.7	-367.5	397,951.63	535,690.14	32° 5' 38.517 N	104° 13' 5.103 W

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL-Populus Federal - plan hits target center - Point	0.00	0.00	7,400.0	-4,888.7	-367.5	397,951.63	535,690.14	32° 5' 38.517 N	104° 13' 5.103 W

Checked By: _____ Approved By: _____ Date: _____

WELL DETAILS: POPULUS FEDERAL #4H

3137.9

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	402840.33	536057.65	32° 6' 26.895 N	104° 13' 0.769 W	

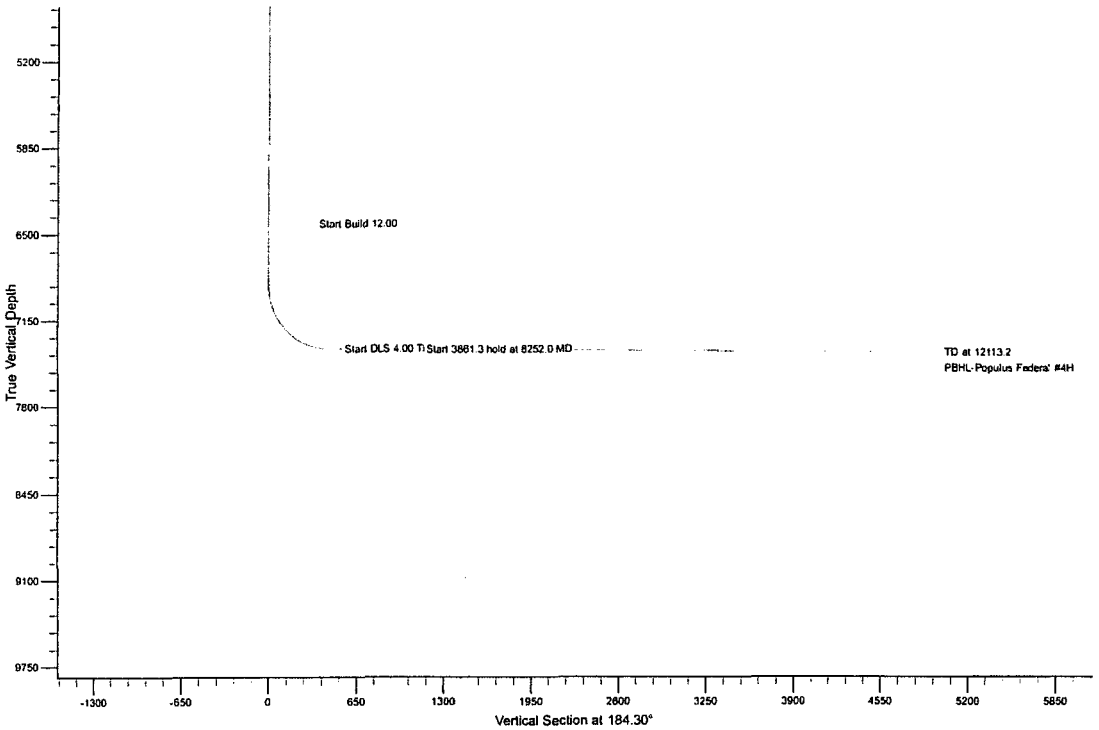
SECTION DETAILS

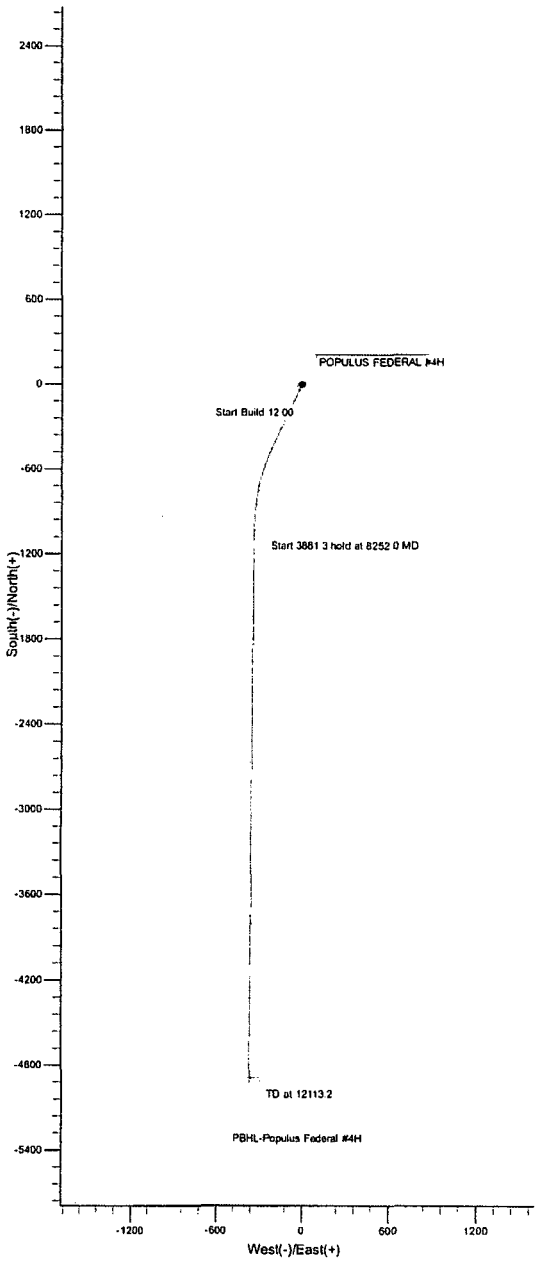
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	6886.5	0.00	0.00	6886.5	0.0	0.0	0.00	0.00	0.0	
3	7632.9	89.56	205.20	7364.0	-428.7	-201.8	12.00	205.20	442.7	
4	8252.0	89.54	180.44	7368.9	-1027.7	-338.0	4.00	-90.15	1050.1	
5	12113.2	89.54	180.44	7400.0	-4888.7	-367.5	0.00	0.00	4902.5	

Project: EDDY COUNTY, NM
Site: ATLAS
Well: POPULUS FEDERAL #4H
Wellbore: OWB
Design: PWP0

LEGEND

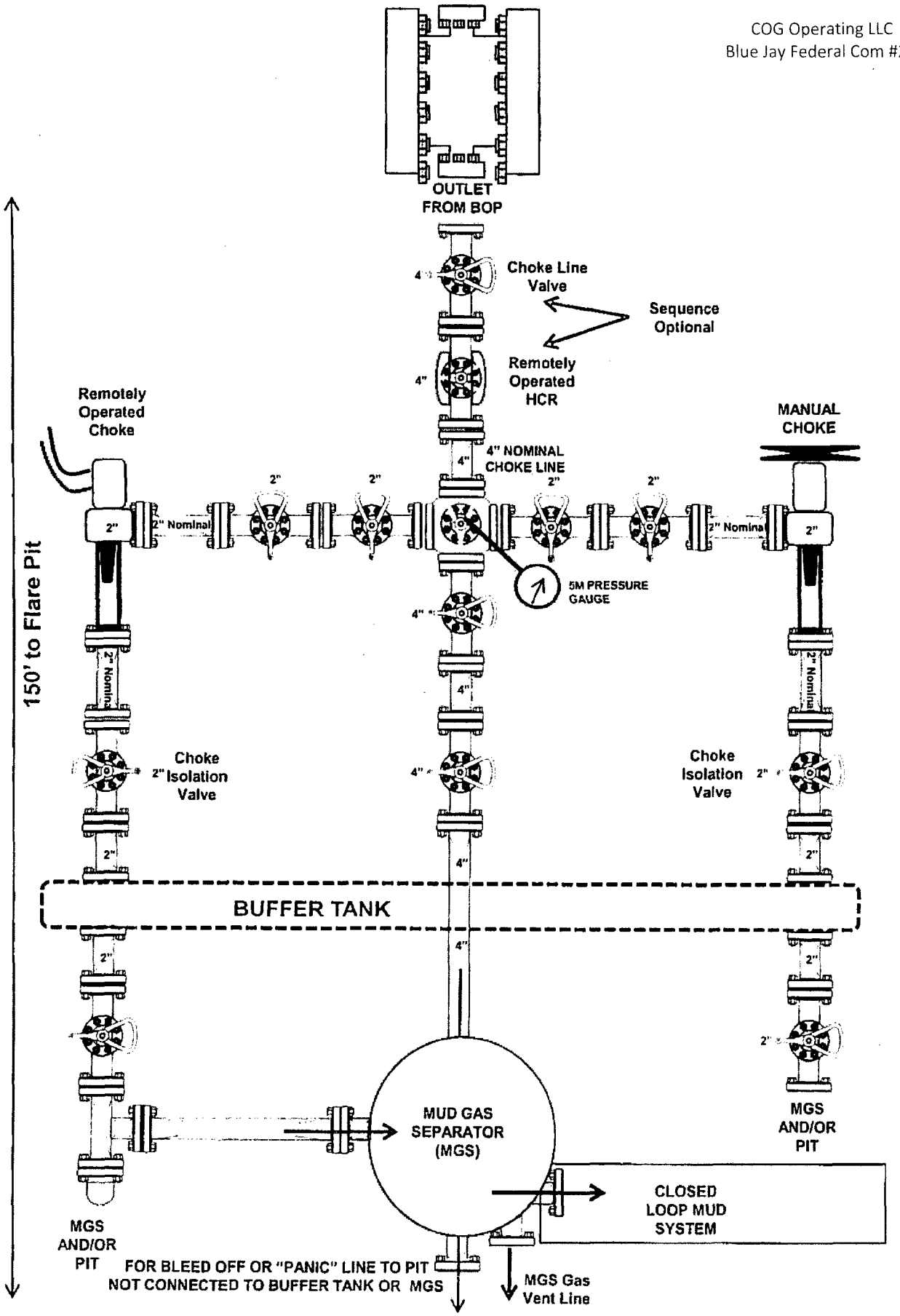
PWP0



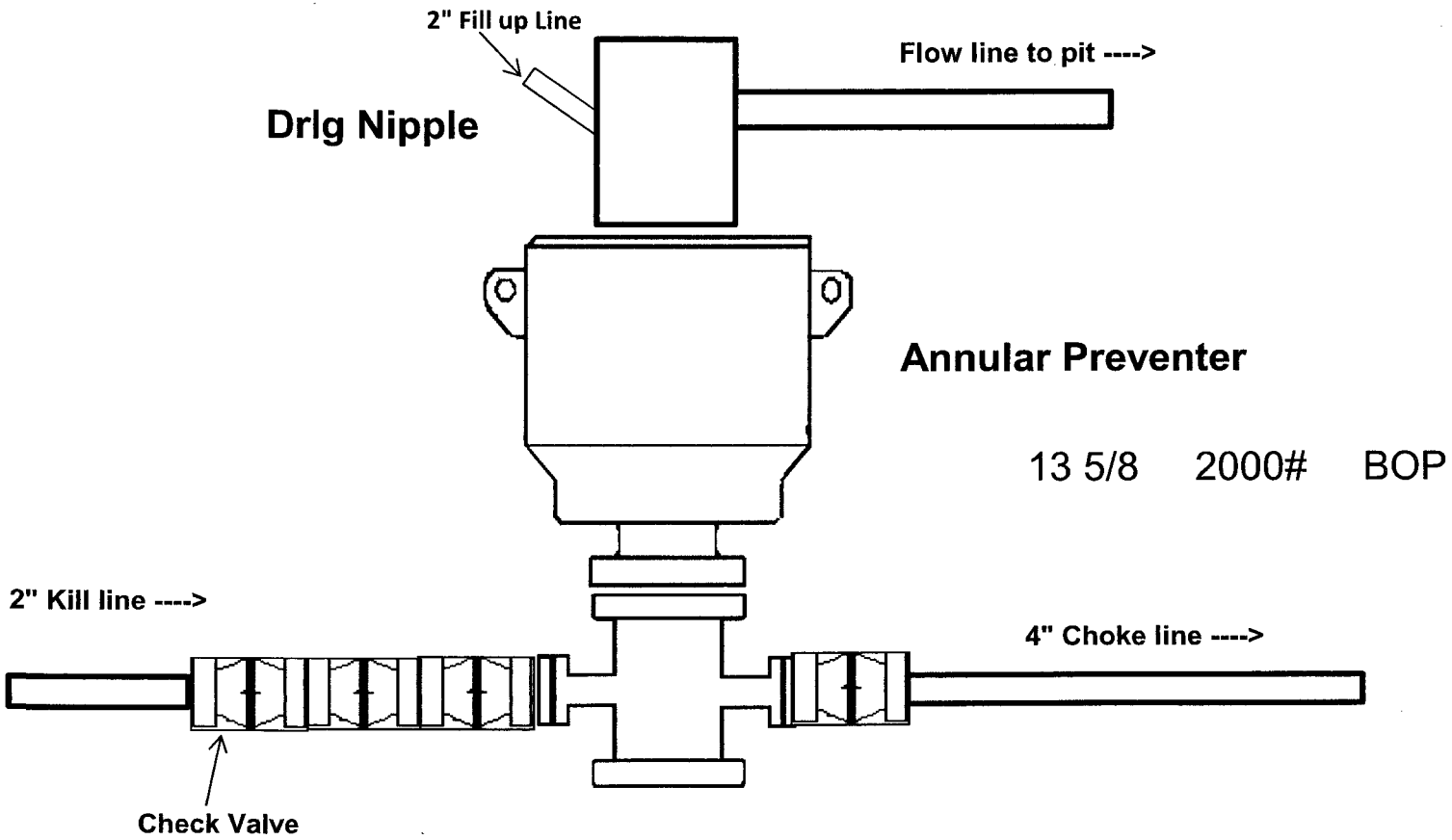


2M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)

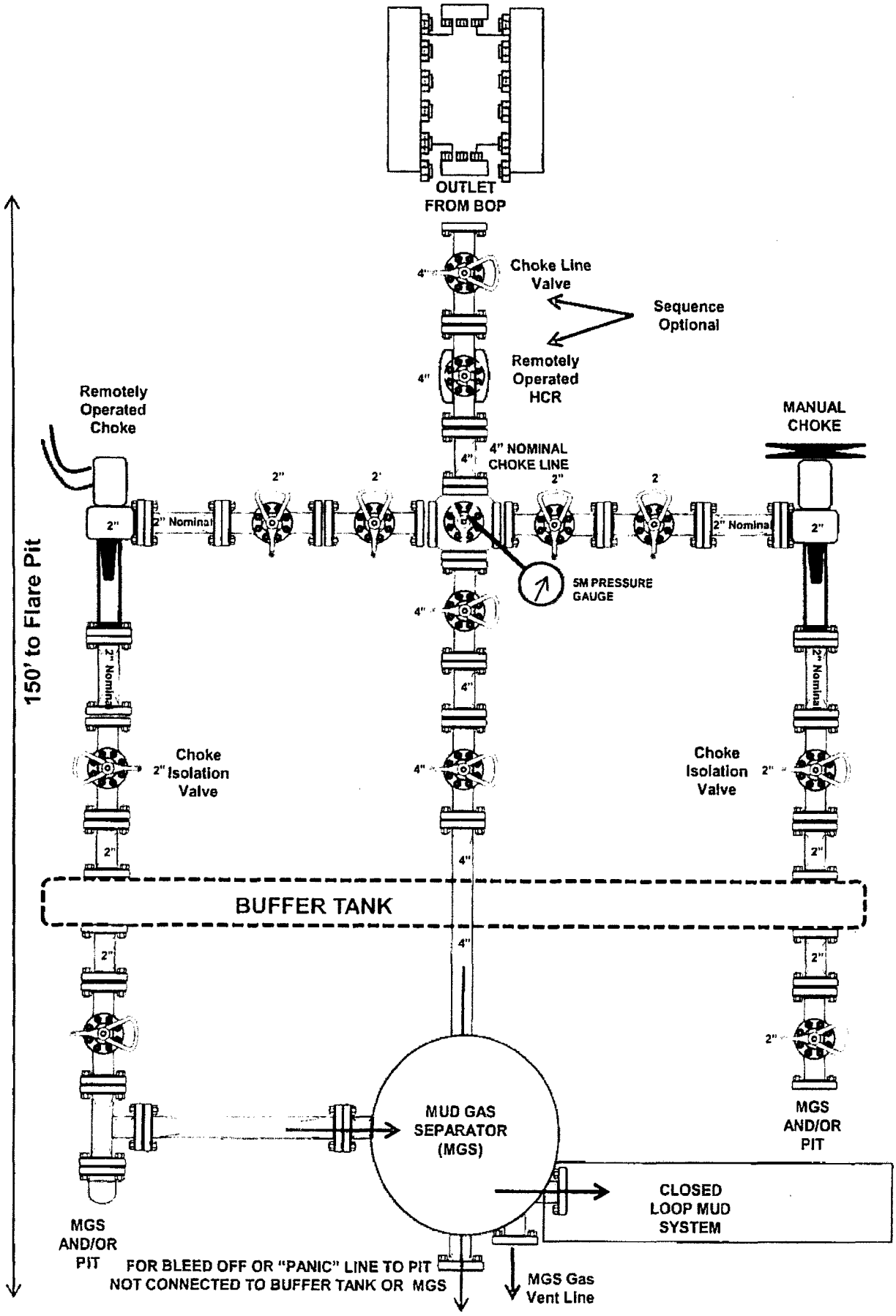
COG Operating LLC
Blue Jay Federal Com #2H



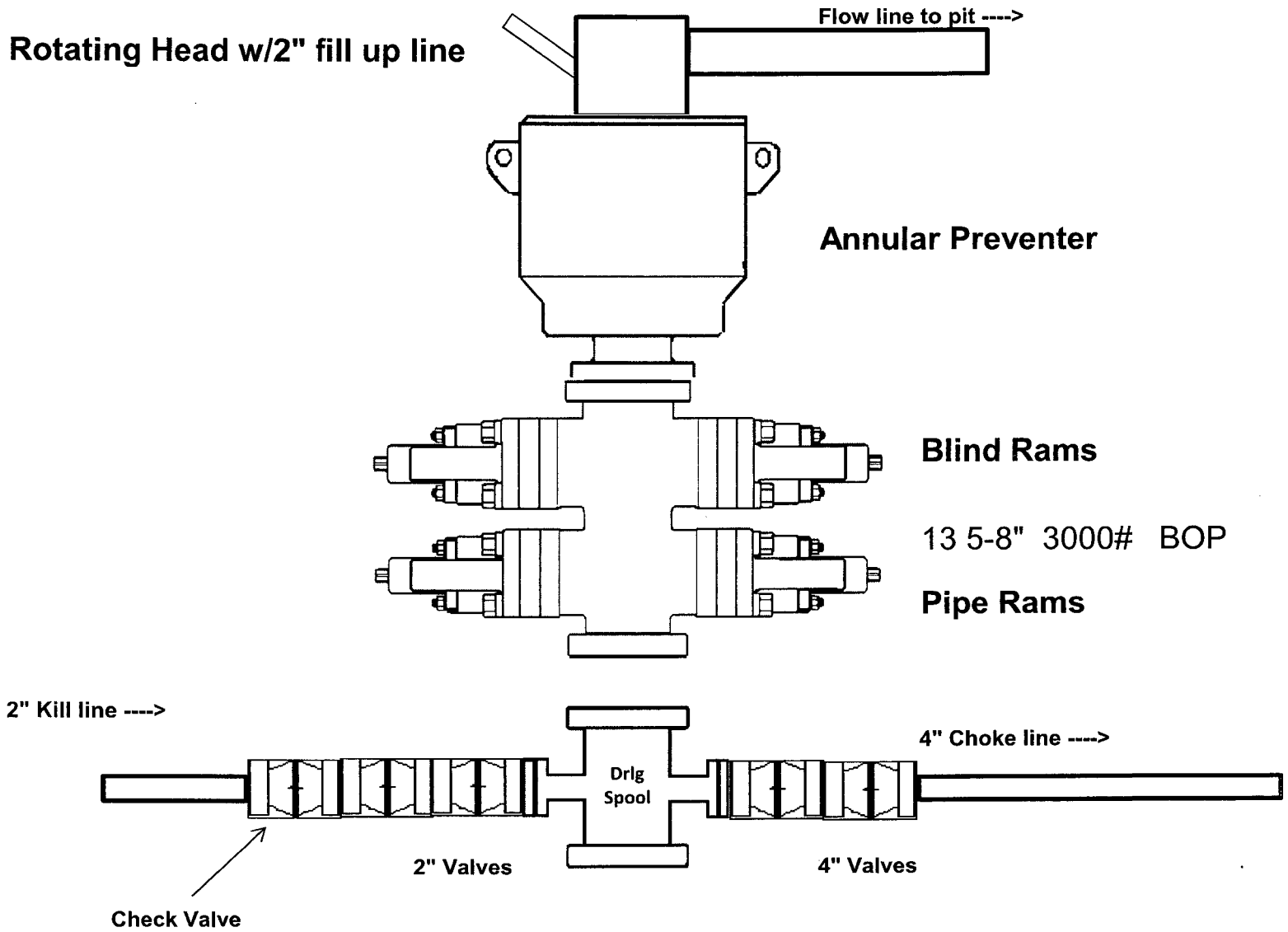
2,000 psi BOP Schematic



3M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)



3,000 psi BOP Schematic



COG OPERATING LLC
HYDROGEN SULFIDE DRILLING OPERATIONS PLAN

1. HYDROGEN SULFIDE TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

a. The hazards and characteristics of hydrogen sulfide (H_2S).
b. The proper use and maintenance of personal protective equipment and life support systems.
c. The proper use of H_2S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
d. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

a. The effects of H2S on metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
b. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
c. The contents and requirements of the H_2S Drilling Operations Plan and the Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H2S zone (within 3 days or 500 feet) and weekly H2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H2S Drilling Operations Plan and the Public Protection Plan. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received the proper training.

2. H_2S SAFETY EQUIPMENT AND SYSTEMS

Note: All H_2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain H2S. If H2S greater than 100 ppm is encountered in the gas stream we will shut in and install H2S equipment.

a. Well Control Equipment:
   Flare line.
   Choke manifold with remotely operated choke.
   Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
   Auxiliary equipment to include: annular preventer, mud-gas separator, rotating head.

b. Protective equipment for essential personnel:
Mark II Surviveair 30-minute units located in the dog house and at briefing areas.

c. H2S detection and monitoring equipment:
2 - portable H2S monitor positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 ppm are reached.

d. Visual warning systems:
Caution/Danger signs shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached.

e. Mud Program:
The mud program has been designed to minimize the volume of H2S circulated to the surface.

f. Metallurgy:
All drill strings, casings, tubing, wellhead, blowout preventers, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.

g. Communication:
Company vehicles equipped with cellular telephone.

COG OPERATING LLC has conducted a review to determine if an H2S contingency plan is required for the above referenced well. We were able to conclude that any potential hazardous volume would be minimal. H2S concentrations of wells in this area from surface to TD are low enough; therefore, we do not believe that an H2S contingency plan is necessary.

WARNING

YOU ARE ENTERING AN H_2S AREA
AUTHORIZED PERSONNEL ONLY

1. ***BEARDS OR CONTACT LENSES NOT ALLOWED***
2. ***HARD HATS REQUIRED***
3. ***SMOKING IN DESIGNATED AREAS ONLY***
4. ***BE WIND CONSCIOUS AT ALL TIMES***
5. ***CK WITH COG OPERATING LLC FOREMAN AT MAIN OFFICE***

COG OPERATING LLC

1-575-748-6940

EMERGENCY CALL LIST

	OFFICE	MOBILE
COG OPERATING LLC OFFICE	575-748-6940	
SETH WILD	432-683-7443	432-528-3633
WALTER ROYE	575-748-6940	432-934-1886

EMERGENCY RESPONSE NUMBERS

	OFFICE
STATE POLICE	575-748-9718
EDDY COUNTY SHERIFF	575-746-2701
EMERGENCY MEDICAL SERVICES (AMBULANCE)	911 or 575-746-2701
EDDY COUNTY EMERGENCY MANAGEMENT (HARRY BURGESS)	575-887-9511
STATE EMERGENCY RESPONSE CENTER (SERC)	575-476-9620
CARLSBAD POLICE DEPARTMENT	575-885-2111
CARLSBAD FIRE DEPARTMENT	575-885-3125
NEW MEXICO OIL CONSERVATION DIVISION	575-748-1283
INDIAN FIRE & SAFETY	800-530-8693
HALLIBURTON SERVICES	800-844-8451

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
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:

☒ Original

Operator & OGRID No.: **COG Operating LLC, OGRID 229137**

☐ 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
Populus Federal #4H	30-015-	B-29-25S-27E	210' FNL 990' FWL	1.0 MMCFD		Gas connect on well pad

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 **Lucid**, and will be connected to **Coyote** low/high pressure gathering system located in **Eddy** County, New Mexico. It will require **0'** of pipeline to connect the facility to low/high pressure gathering system. **COG Operating LLC** provides (periodically) to **Lucid** a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, **COG Operating LLC** and **Lucid** have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at **Palo Duro** Processing Plant located in Sec **35** Twn, **23S** Rng. **27E, Eddy** 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 Gas Transporter system at that time. Based on current information, it is Operator'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

CONCHO

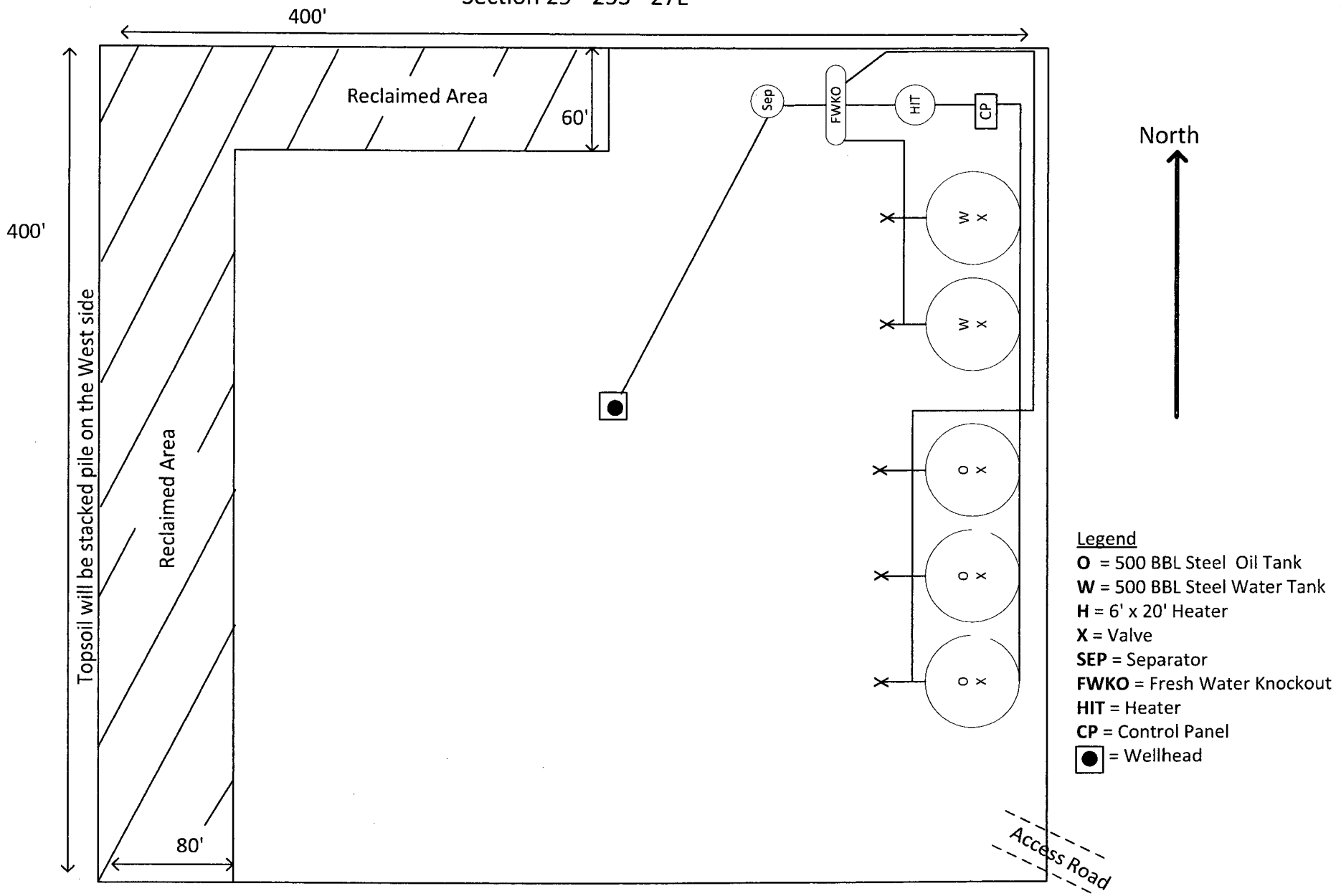
COG Operating LLC.
2208 W Main St.
Artesia, NM 88210

Well Site Layout

Production Facility Layout

Populus Federal #4H
Section 29 - 25S - 27E

Exhibit 3



OPERATOR CERTIFICATION

I hereby certify that I, or persons under my direct supervision, have inspected the drill site and access road proposed herein; that I am familiar with the conditions that presently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or COG Operating LLC, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements. Executed this 23rd day of December, 2016.

Signed: Mayte Reyes

Printed Name: Mayte Reyes
Position: Regulatory Analyst
Address: 2208 W. Main Street, Artesia, NM 88210
Telephone: (575) 748-6945
E-mail: mreyes1@concho.com
Field Representative (if not above signatory): Rand French
Telephone: (575) 748-6940. E-mail: rfrench@concho.com

PECOS DISTRICT
DRILLING OPERATIONS
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating LLC
LEASE NO.:	NM114348
WELL NAME & NO.:	Populus Federal – 4H
SURFACE HOLE FOOTAGE:	210'/FNL & 990'/FWL
BOTTOM HOLE FOOTAGE	200'/FSL & 660'/FWL
LOCATION:	Sec. 29, T. 25 S, R. 27 E
COUNTY:	Eddy County

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. **Although there are no measured amounts of Hydrogen Sulfide reported, it is always a potential hazard. It is recommended that monitoring equipment be onsite for potential Hydrogen Sulfide. 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, report measured amounts and formations to the BLM.**

2. 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. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

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.**

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.

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

High Cave/Karst
Possible water flows in the Rustler and Delaware
Possible lost circulation in the Delaware.

A MINIMUM OF TWO CASING STRINGS CEMENTED TO SURFACE IS REQUIRED IN HIGH CAVE/KARST AREAS. THE CEMENT MUST BE IN A SOLID SHEATH. THEREFORE, ONE INCH OPERATIONS ARE NOT SUFFICIENT TO PROTECT CAVE KARST RESOURCES. A CASING DESIGN THAT HAS A ONE INCH JOB PERFORMED DOES NOT COUNT AS A SOLID SHEATH. IF THE PRIMARY CEMENT JOB ON THE SURFACE CASING DOES NOT CIRCULATE, THEN THE NEXT TWO CASING STRINGS MUST BE CEMENTED TO SURFACE.

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **3000 (3M)** psi.

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**. 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).

    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.

MHH 03022017

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating LLC
LEASE NO.:	NM114348
WELL NAME & NO.:	Populus Federal - 4H
SURFACE HOLE FOOTAGE:	210'/N & 990'/W
BOTTOM HOLE FOOTAGE	200'/S & 660'/W
LOCATION:	Section 29, T. 25 S., R. 27 E., NMPM
COUNTY:	Eddy County, New Mexico

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Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Cave/Karst Surface Mitigation

The following stipulations will be applied to minimize impacts during construction, drilling and production.

Construction:
In the advent that any underground voids are opened up during construction activities, construction activities will be halted and the BLM will be notified immediately.

No Blasting:
No blasting will be utilized for pad construction. The pad will be constructed and leveled by adding the necessary fill and caliche.

Pad Berming:
The pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the pad.

Closed Mud System Using Steel Tanks with All Fluids and Cuttings Hauled Off.
A closed mud system using steel tanks for all cuttings and fluids is required. All fluids and cuttings will be hauled off site for disposal. No pits are allowed.

Tank Battery Liners and Berms:
Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

Leak Detection System:
A method of detecting leaks is required. The method could incorporate gauges to measure loss, situating values and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

Automatic Shut-off Systems:
Automatic shut off, check values, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

Cave/Karst Subsurface Mitigation

The following stipulations will be applied to protect cave/karst and ground water concerns:

Rotary Drilling with Fresh Water:
Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.

Directional Drilling:
Kick off for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

Lost Circulation:
ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported in the drilling report.

Regardless of the type of drilling machinery used, if a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

Abandonment Cementing:
Upon well abandonment in high cave karst areas additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

Pressure Testing:
Annual pressure monitoring will be performed by the operator on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

Range Fence

Allotment fence shall not be damaged during construction of this location. If allotment fence is damaged operation and construction must cease till fence has been repaired and blm contacted.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing
The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

G. ON LEASE ACCESS ROADS

Road Width
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

Surfacing
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Ditching
Ditching shall be required on both sides of the road.

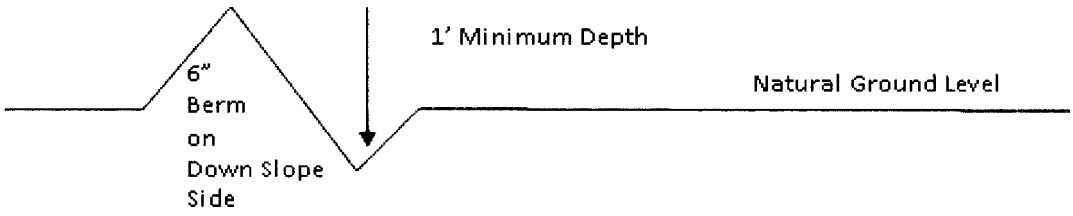
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$\text{400 foot road with 4\% road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

Cattle guards

An appropriately sized cattle guard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattle guards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattle guards that are in place and are utilized during lease operations.

Fence Requirement

Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Public Access

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Construction Steps

1. Salvage topsoil
2. Construct road
3. Redistribute topsoil
4. Revegetate slopes

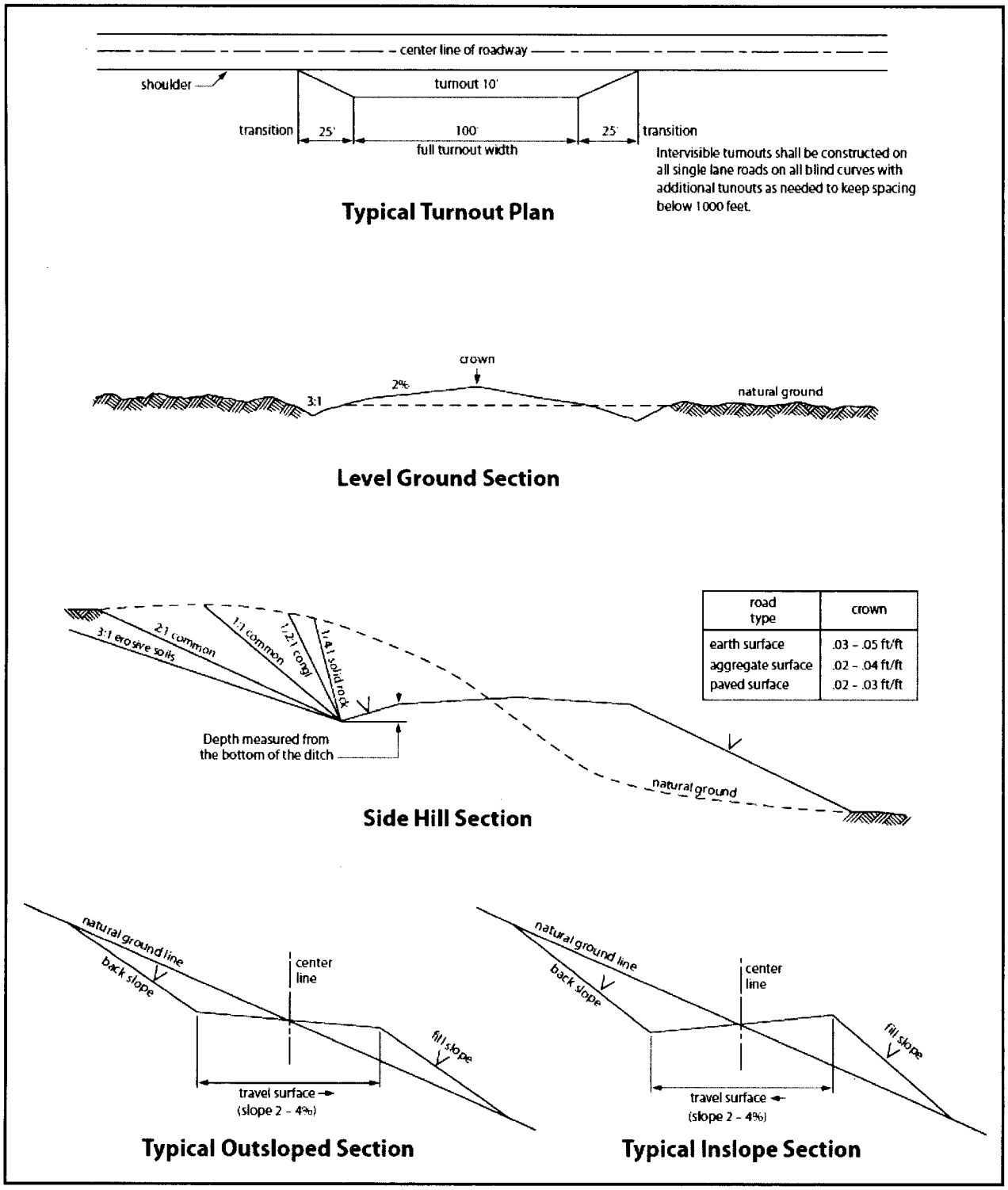


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities
Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Exclosure Netting (Open-top Tanks)
Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

Chemical and Fuel Secondary Containment and Exclosure Screening
The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

Open-Vent Exhaust Stack Exclosures
The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

Containment Structures

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

Painting Requirement
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

VIII. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

IX. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Seed Mixture 1 for Loamy Sites

Holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed shall be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed shall be either certified or registered seed. The seed container shall be tagged in accordance with State law(s) and available for inspection by the Authorized Officer.

Seed shall be planted using a drill equipped with a depth regulator to ensure proper depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture shall be evenly and uniformly planted over the disturbed area (small/heavier seeds have a tendency to drop the bottom of the drill and are planted first). Holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed shall be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre shall be doubled. The seeding shall be repeated until a satisfactory stand is established as determined by the Authorized Officer. Evaluation of growth may not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Plains lovegrass (Eragrostis intermedia)	0.5
Sand dropseed (Sporobolus cryptandrus)	1.0
Sideoats grama (Bouteloua curtipendula)	5.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:

Pounds of seed **x** percent purity **x** percent germination = pounds pure live seed