OCD Artesia

Form 3160-5
(August 2007)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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.
NMLC031844

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.
SHINER BOCK 1 FEDERAL COM 7H

2. Name of Operator
COG OPERATING LLC
Contact: KELLY J HOLLY
E-Mail: kholly@concho.com

9. API Well No.
30-015-42022-00-X1

3a. Address
ONE CONCHO CENTER 600 W ILLINOIS AVENUE
MIDLAND, TX 79701

3b. Phone No. (include area code)
Ph: 432.685.4384

10. Field and Pool, or Exploratory
FREN

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 1 T17S R31E SWSW 1160FSL 0170FWL
32.859032 N Lat, 103.820728 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 APD
	☐ 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.)

COG Operating LLC respectfully requests permission to change the Well # and TVD of this well as follows:

FROM: Shiner Bock 1 Federal Com #7H
TO: Shiner Bock 1 Federal Com #27H

FROM: 6406' TVD; 11042' MD
TO: 6025' TVD; 10699' MD

3/4/15

SEE ATTACHED FOR CONDITIONS OF APPROVAL

NM OIL CONSERVATION
ARTESIA DISTRICT
MAR 16 2015

A revised C-102, 1 mile map and directional plan are attached.

RECEIVED

14. I hereby certify that the foregoing is true and correct.
Electronic Submission #291840 verified by the BLM Well Information System
For COG OPERATING LLC, sent to the Carlsbad
Committed to AFMSS for processing by JENNIFER MASON on 03/11/2015 (15JAM0234SE)

Name *(Printed/Typed)* KELLY J HOLLY — Title PERMITTING TECH

Signature (Electronic Submission) — Date 02/16/2015

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

ACCEPTED FOR RECORD
MAR 11 2015
BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD OFFICE

Approved By — Title — Date

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

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.

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

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
30-015-42022	97213	Fren; Glorieta Yeso East

[4] Property Code	[5] Property Name	[6] Well Number
40368	SHINER BOCK 1 FEDERAL COM	27H

[7] OGRID No.	[8] Operator Name	[9] Elevation
229137	COG OPERATING, LLC	3998'

[10] Surface Location

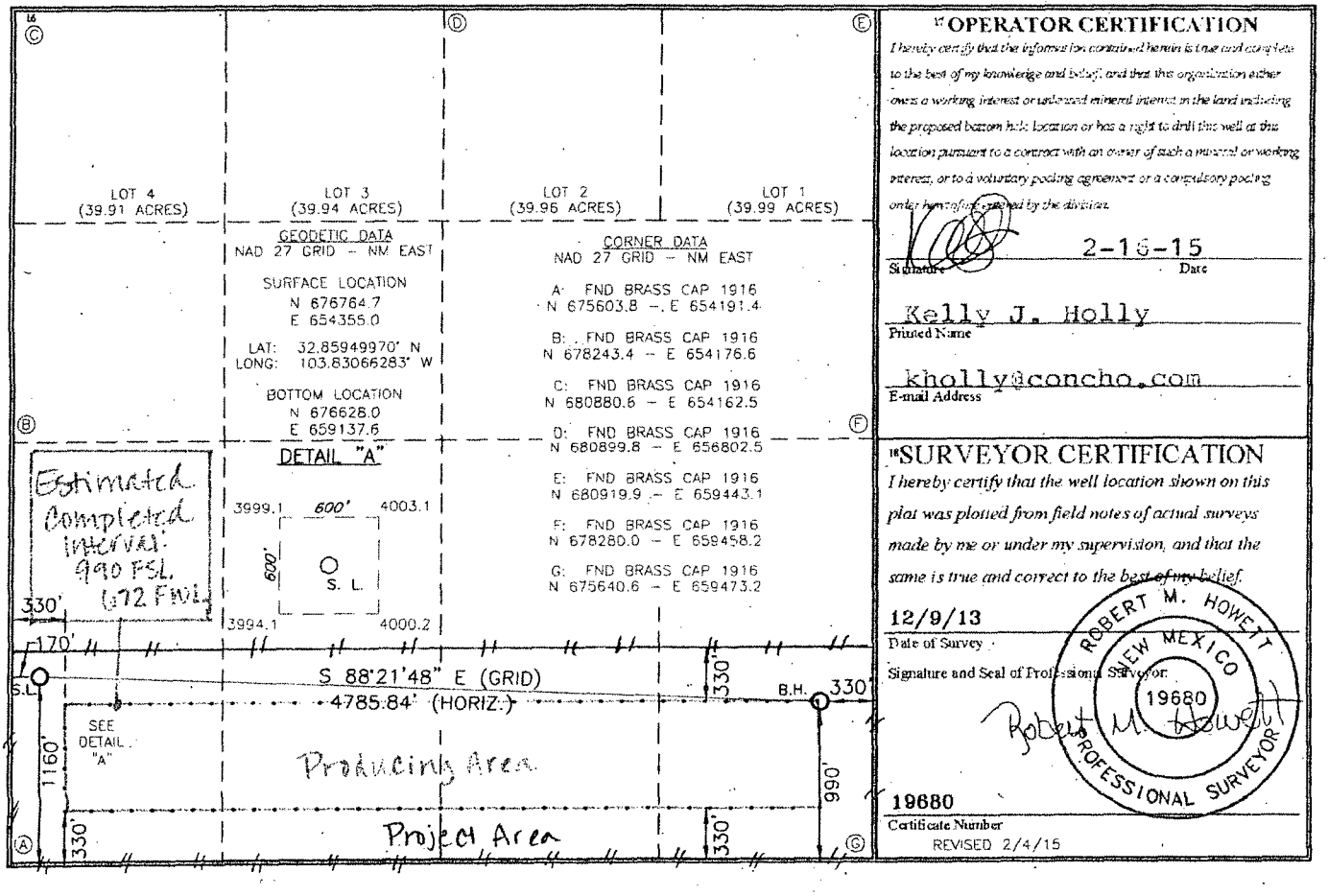
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	1	17-S	31-E		1160	SOUTH	170	WEST	EDDY

[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
P	1	17-S	31-E		990	SOUTH	330	EAST	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 order heretofore entered by the division.

Signature — 2-16-15 Date

Kelly J. Holly
Printed Name

kholly@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.

12/9/13
Date of Survey

Signature and Seal of Professional Surveyor: Robert M. Howett

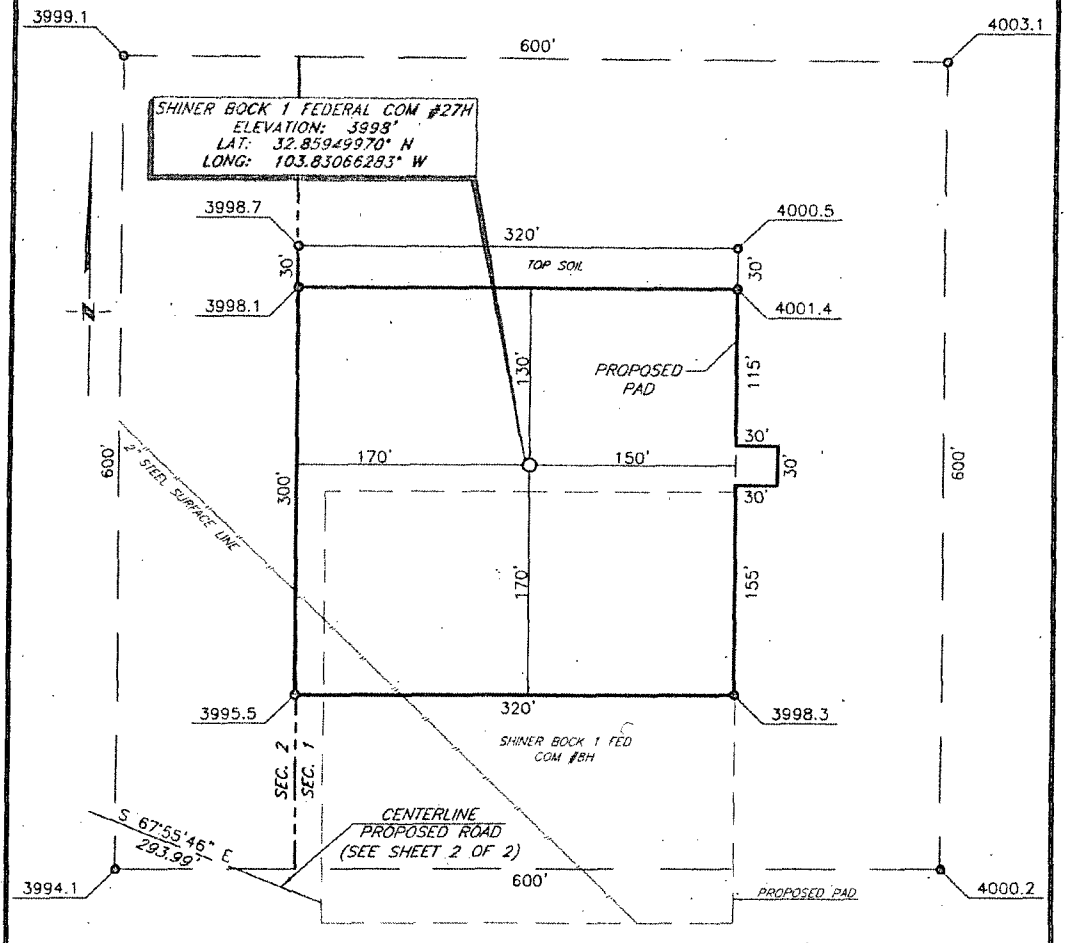
ROBERT M. HOWETT
NEW MEXICO
19680
PROFESSIONAL SURVEYOR

19680
Certificate Number

REVISED 2/4/15

COG OPERATING, LLC

Shiner Bock 1 Federal Com #27H
(1160' FSL & 170' FWL)
Section 1, T-17-S, R-31-E,
N. M. P. M., Eddy Co., New Mexico



DIRECTIONS TO LOCATION

From the intersection of U.S. Hwy. #82 and CR-223 (Sweet Gum).

Go Northeast on U.S. Hwy. #82 approx. 1.5 miles.

Turn left on a lease road and go Northwest approx. 0.3 mile.

Turn right and go North approx. 0.2 mile.

Turn right and go Northeast approx. 0.5 mile.

Turn left and go North approx. 2.0 miles.

Turn right and go East approx. 0.4 mile.

Turn right and go South approx. 0.1 mile.

Turn left on a two tract road go Southwest 0.1 mile to the Alamo State BGK #4;

The location is 530' Northeast of the existing Alamo Resources Pumping Unit.

NO.	REVISION	DATE
1	- WELL NAME	2/4/15

JOB NO.: LS130524

DWG. NO.: 130524PAD

PROSPERITY CONSULTANTS, LLC

2251 Double Creek Drive, Suite 602, Round Rock, Texas 78664 o (512) 992-2087 f (512) 251-2518

SCALE: 1" = 100'

DATE: 12/9/13

SURVEYED BY: GB/JW

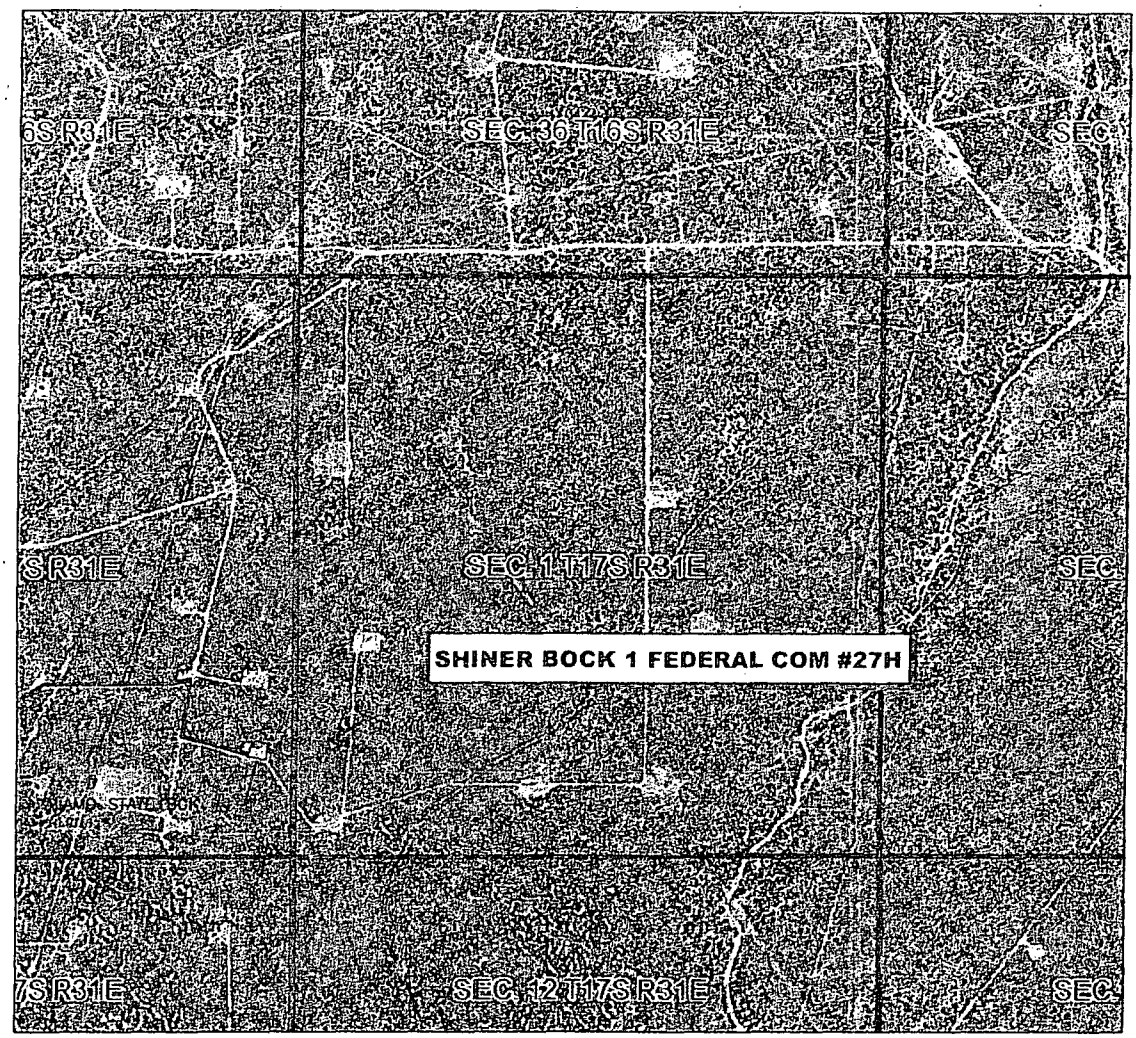
DRAWN BY: JC

APPROVED BY: LWB

SHEET : 1 OF 2

VICINITY MAP

NOT TO SCALE



SECTION 1, TWP. 17 SOUTH, RGE. 31 EAST,
N. M. P. M., EDDY COUNTY, NEW MEXICO

OPERATOR: COG Operating, LLC
LEASE: Shiner Bock 1 Federal Com
WELL NO.: 27H

LOCATION: 1160' FSL & 170' FWL
ELEVATION: 3998'

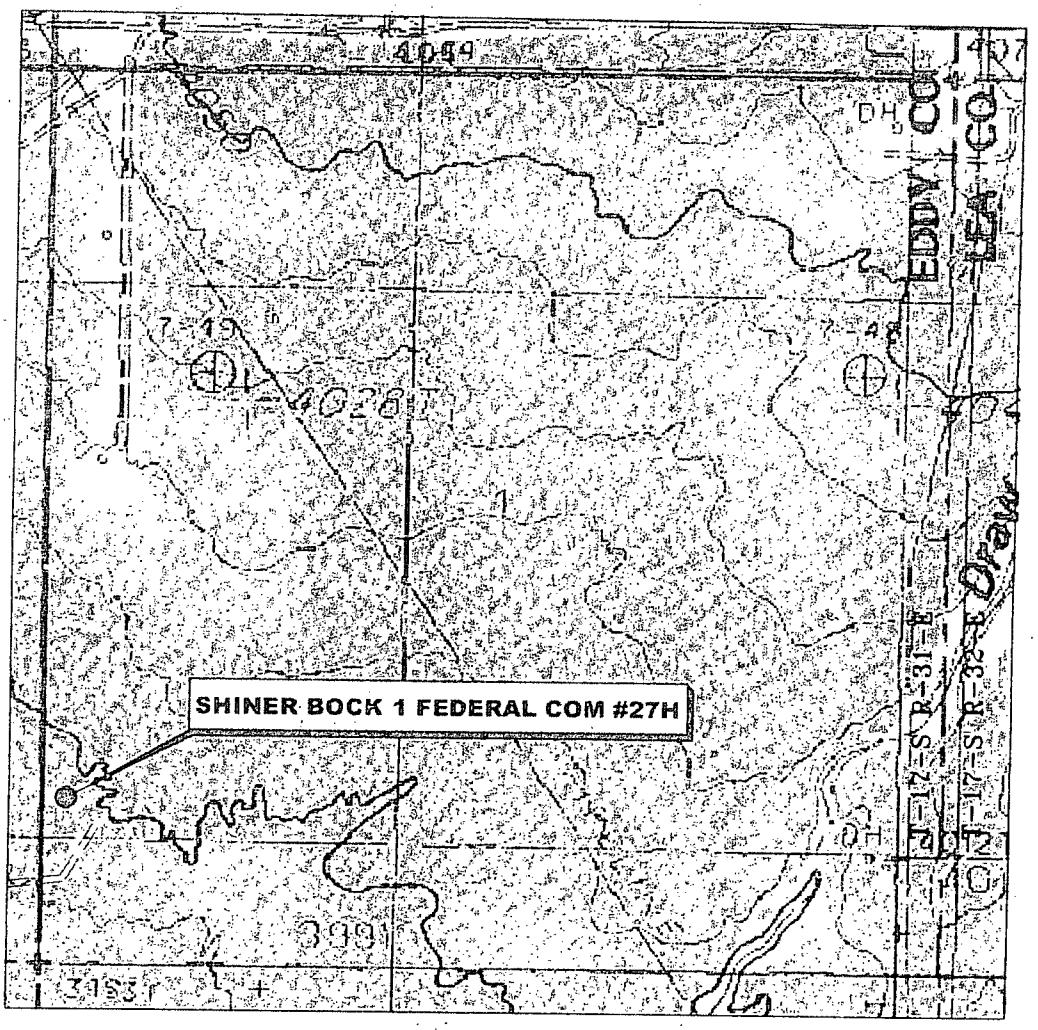
NO.	REVISION	DATE
1	WELL NAME	2/4/15
JOB NO.: LS130524		
DWG. NO.: 130524VM		

PROSPERITY CONSULTANTS, LLC

2251 Double Creek Drive, Suite 602, Round Rock, Texas 78664 o (512) 992-2087 f (512) 251-2518

SCALE:	NONE
DATE:	12/9/13
SURVEYED BY:	GB/JW
DRAWN BY:	JC
APPROVED BY:	LWB
SHEET :	1 OF 1

LOCATION VERIFICATION MAP



SECTION 1, TWP. 17 SOUTH, RGE. 31 EAST,
N. M. P. M., EDDY COUNTY, NEW MEXICO

OPERATOR: COG Operating, LLC
LEASE: Shiner Bock 1 Federal Com
WELL NO.: 27H
ELEVATION: 3998'

LOCATION: 1160' FSL & 170' FWL
CONTOUR INTERVAL: 10'
USGS TOPO. SOURCE MAP:
Maljamar, NM (Prov. Ed. 1985)

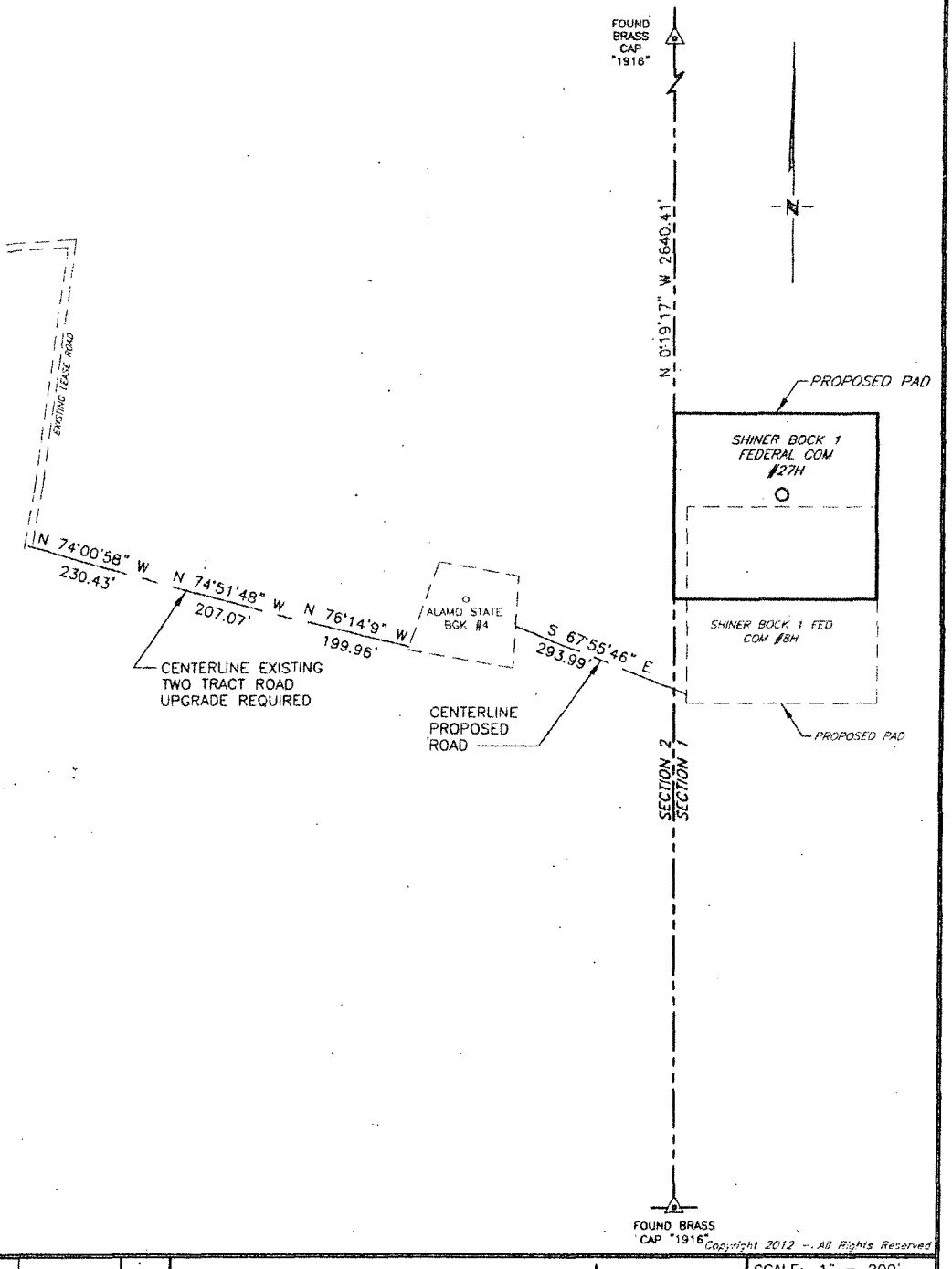
1	WELL NAME	2/4/15
NO.	REVISION	DATE
JOB NO.: LS130524		
DWG. NO.: 130524LVM		

PROSPERITY CONSULTANTS, LLC

2251 Double Creek Drive, Suite 602, Round Rock, Texas 78664 o (512) 992-2087 f (512) 251-2518

SCALE: 1" = 1000'
DATE: 12/9/13
SURVEYED BY: GB/JW
DRAWN BY: JC
APPROVED BY: LWB
SHEET : 1 OF 1

COG OPERATING, LLC
Access Road
Shiner Bock 1 Federal Com #27H
(1160' FSL & 170' FEL)
Section 1, T-17-S, R-31-E,
N. M. P. M., Eddy Co., New Mexico

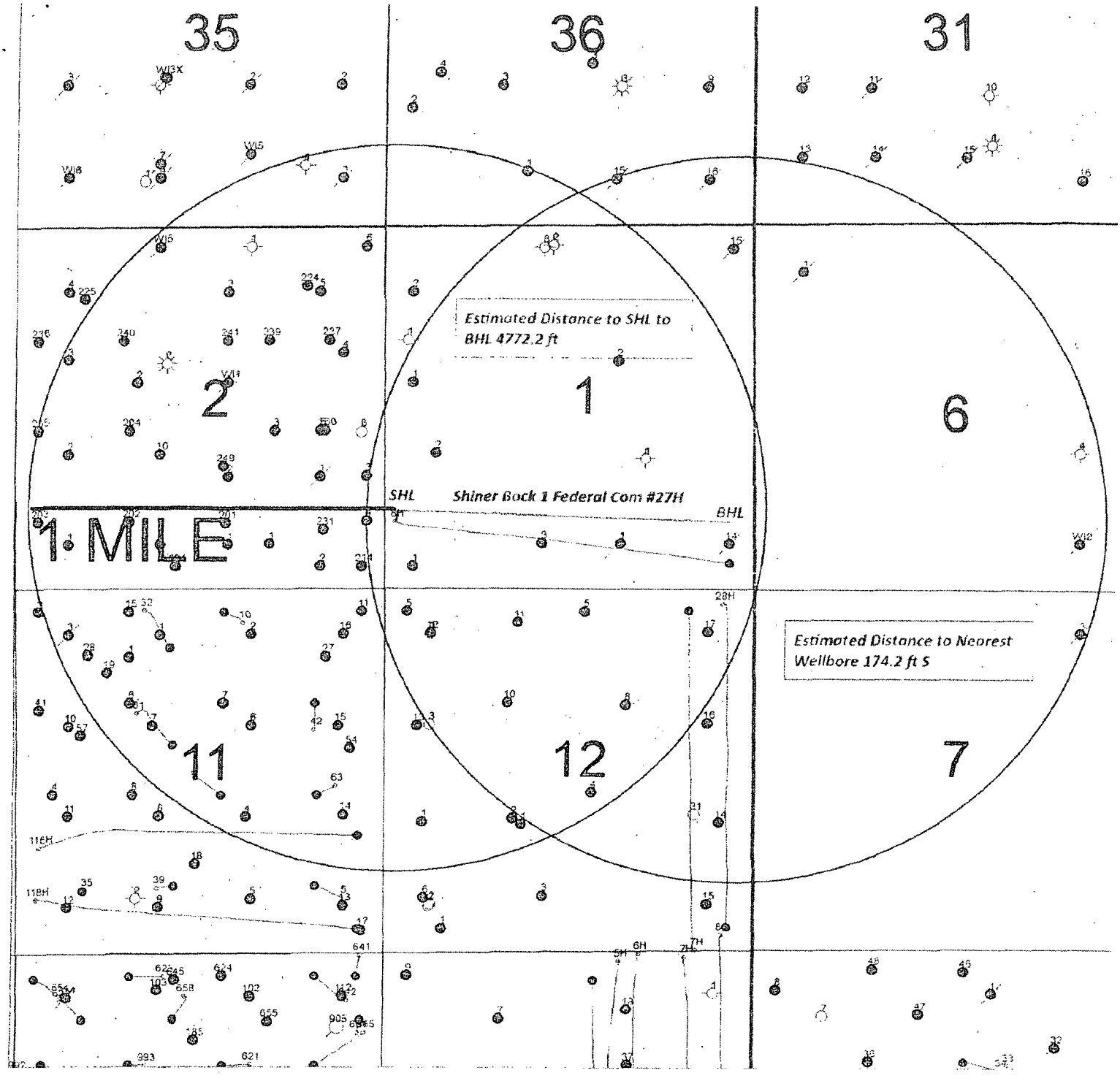


NO.	REVISION	DATE
1	WELL NAME	2/4/15

JOB NO.: LS130524
DWG. NO.: 130524RD

PROSPERITY CONSULTANTS, LLC
2251 Double Creek Drive, Suite 602, Round Rock, Texas 78664 o·(512) 992-2087 f (512) 251-2518

SCALE: 1" = 200'
DATE: 12/9/13
SURVEYED BY: GB/JW
DRAWN BY: JC
APPROVED BY: LWB
SHEET : 2 OF 2



CONCHO

SENM Shelf Area

Shiner Bock 1 Federal Com #27H

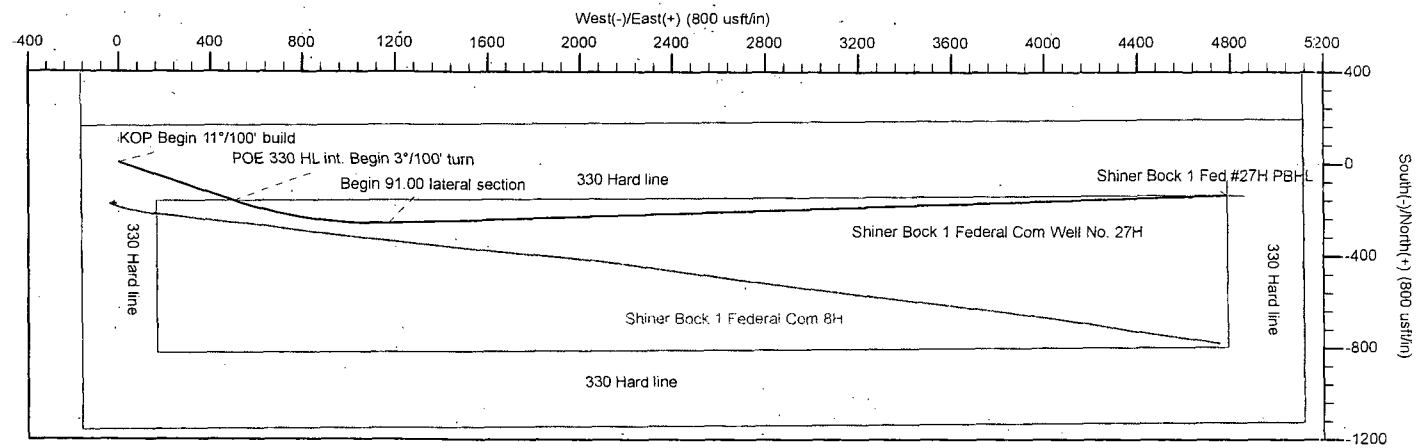
SEC. 1, T17S – R31E SHL 1160 FSL 170 FWL, UNIT M
SEC. 1, T17S – R31E SHL 990 FSL 330 FEL, UNIT P

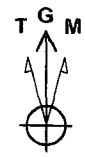
Author: | Date:

CONCHO

COG Operating LLC

Well: Shiner Bock 1 Federal Com Well No. 27H
Site: Shiner Bock 1 Federal Com
Project: Eddy County, New Mexico
Design: rev0
Rig: United #43





Azimuths to Grid North
True North: -0.27°
Magnetic North: 7.03°

Magnetic Field
Strength: 48598.7snT
Dip Angle: 60.64°
Date: 2/12/2015
Model: IGRF2010

PRODIRECTIONAL

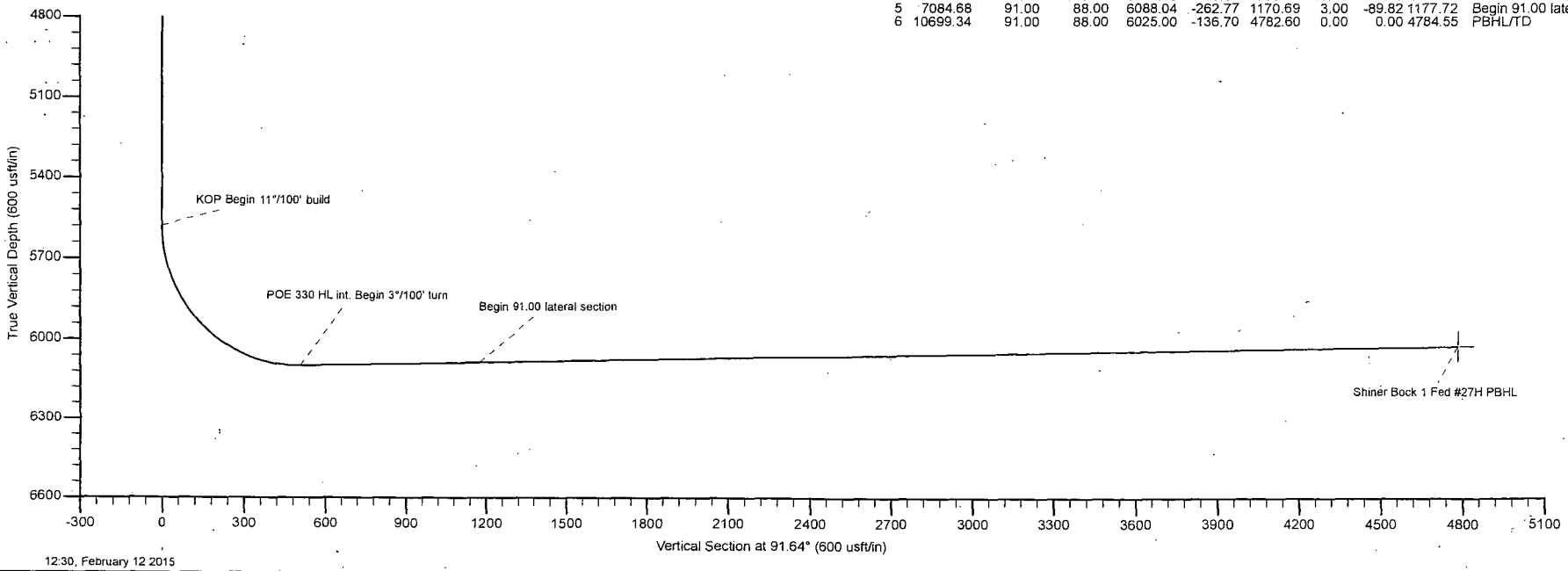
Surface Location: RKB=3998+12 @ 4010.00usft (United #43)
US State Plane 1927 (Exact solution)
New Mexico East 3001

Northing	Easting	Latitude	Longitude
676764.70	654355.00	32° 51' 34.199203 N	103° 49' 50.385820 W

Total Correction (M => G) To convert a Magnetic Direction to a Grid Direction, Add 7.03°

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	5579.21	0.00	0.00	5579.21	0.00	0.00	0.00	0.00	0.00	KOP Begin 11°/100' build
3	5624.66	5.00	108.35	5624.61	-0.62	1.88	11.00	108.35	1.90	
4	6406.48	91.00	108.35	6100.00	-166.84	503.01	11.00	0.00	507.57	POE 330 HL int. Begin 3°/100' turn
5	7084.68	91.00	88.00	6088.04	-262.77	1170.69	3.00	-89.82	1177.72	Begin 91.00 lateral section
6	10699.34	91.00	88.00	6025.00	-136.70	4782.60	0.00	0.00	4784.55	PBHL/TD



12:30, February 12 2015

CONCHO

COG Operating LLC

Eddy County, New Mexico
Shiner Bock 1 Federal Com
Shiner Bock 1 Federal Com Well No. 27H
Original Hole

SHL: 1160 FSL 170 FWL Sect 1-T17S-R31E Unit M
POE: 990 FSL 672 FWL Sect 1-T17S-R31E Unit M
BHL: 990 FSL 330 FEL Sect 1-T17S-R31E Unit P

Plan: rev0

Standard_report

12 February, 2015

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Shiner Bock 1 Federal Com Well No. 27H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3998+12 @ 4010.00usft (United #43)
Site:	Shiner Bock 1 Federal Com	MD Reference:	RKB=3998+12 @ 4010.00usft (United #43)
Well:	Shiner Bock 1 Federal Com Well No. 27H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	Dbase Nov0914

Project Eddy County, New Mexico

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 Shiner Bock 1 Federal Com

Site Position:		Northing:	676,006.70 usft	Latitude:	32° 51' 26.707546 N
From:	Map	Easting:	654,169.20 usft	Longitude:	103° 49' 52.606262 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.27 °

Well Shiner Bock 1 Federal Com Well No. 27H, Surf Loc: 1160 FSL 170 FWL Sect 1-T17S-R31E Unit M

Well Position	+N/-S	0.00 usft	Northing:	676,764.70 usft	Latitude:	32° 51' 34.199203 N
	+E/-W	0.00 usft	Easting:	654,355.00 usft	Longitude:	103° 49' 50.385820 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,998.00 usft

Wellbore Original Hole

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/12/2015	7.30	60.64	48,599

Design rev0

Audit Notes:

Version:		Phase:	PLAN	Tie On Depth:	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	91.64

Survey Tool Program Date 2/12/2015

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	10,699.07	rev0 (Original Hole)	MWD	MWD - Standard

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Shiner Bock 1 Federal Com Well No. 27H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3998+12 @ 4010.00usft (United #43)
Site:	Shiner Bock 1 Federal Com	MD Reference:	RKB=3998+12 @ 4010.00usft (United #43)
Well:	Shiner Bock 1 Federal Com Well No. 27H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	Dbase Nov0914

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Shiner Bock 1 Federal Com Well No. 27H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3998+12 @ 4010.00usft (United #43)
Site:	Shiner Bock 1 Federal Com	MD Reference:	RKB=3998+12 @ 4010.00usft (United #43)
Well:	Shiner Bock 1 Federal Com Well No. 27H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	Dbase Nov0914

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Shiner Bock 1 Federal Com Well No. 27H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3998+12 @ 4010.00usft (United #43)
Site:	Shiner Bock 1 Federal Com	MD Reference:	RKB=3998+12 @ 4010.00usft (United #43)
Well:	Shiner Bock 1 Federal Com Well No. 27H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	Dbase Nov0914

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	676,764.70	654,355.00
5,579.21	0.00	0.00	5,579.21	0.00	0.00	0.00	0.00	676,764.70	654,355.00
KOP Begin 11°/100' build									
5,600.00	2.29	108.35	5,599.99	-0.13	0.39	11.00	0.40	676,764.57	654,355.39
5,624.66	5.00	108.35	5,624.61	-0.62	1.88	11.00	1.90	676,764.08	654,356.88
5,700.00	13.29	108.35	5,698.92	-4.39	13.23	11.00	13.35	676,760.31	654,368.23
5,800.00	24.29	108.35	5,793.45	-14.51	43.75	11.00	44.15	676,750.19	654,398.75
5,900.00	35.29	108.35	5,880.10	-30.13	90.83	11.00	91.66	676,734.57	654,445.83
6,000.00	46.29	108.35	5,955.70	-50.66	152.74	11.00	154.13	676,714.04	654,507.74
6,100.00	57.29	108.35	6,017.46	-75.36	227.20	11.00	229.26	676,689.34	654,582.20
6,200.00	68.29	108.35	6,063.12	-103.31	311.48	11.00	314.31	676,661.39	654,666.48
6,300.00	79.29	108.35	6,091.00	-133.50	402.48	11.00	406.13	676,631.20	654,757.48
6,400.00	90.29	108.35	6,100.07	-164.80	496.86	11.00	501.37	676,599.90	654,851.86
6,406.48	91.00	108.35	6,100.00	-166.84	503.01	11.00	507.57	676,597.86	654,858.01
POE 330 HL int. Begin 3°/100' turn									
6,500.00	91.01	105.54	6,098.36	-194.10	592.45	3.00	597.75	676,570.60	654,947.45
6,600.00	91.01	102.54	6,096.60	-218.35	689.43	3.00	695.39	676,546.35	655,044.43
6,700.00	91.02	99.54	6,094.83	-237.50	787.55	3.00	794.02	676,527.20	655,142.55
6,800.00	91.02	96.54	6,093.06	-251.49	886.54	3.00	893.37	676,513.21	655,241.54
6,900.00	91.01	93.54	6,091.29	-260.28	986.13	3.00	993.16	676,504.42	655,341.13
7,000.00	91.01	90.54	6,089.53	-263.84	1,086.04	3.00	1,093.13	676,500.86	655,441.04
7,084.68	91.00	88.00	6,088.04	-262.77	1,170.69	3.00	1,177.72	676,501.93	655,525.69
Begin 91.00 lateral section									
7,100.00	91.00	88.00	6,087.78	-262.23	1,186.00	0.00	1,193.01	676,502.47	655,541.00
7,200.00	91.00	88.00	6,086.03	-258.74	1,285.92	0.00	1,292.79	676,505.96	655,640.92
7,300.00	91.00	88.00	6,084.29	-255.26	1,385.85	0.00	1,392.58	676,509.44	655,740.85

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Shiner Bock 1 Federal Com Well No. 27H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3998+12 @ 4010.00usft (United #43)
Site:	Shiner Bock 1 Federal Com	MD Reference:	RKB=3998+12 @ 4010.00usft (United #43)
Well:	Shiner Bock 1 Federal Com Well No. 27H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	Dbase Nov0914

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
7,400.00	91.00	88.00	6,082.54	-251.77	1,485.77	0.00	1,492.36	676,512.93	655,840.77
7,500.00	91.00	88.00	6,080.80	-248.28	1,585.70	0.00	1,592.14	676,516.42	655,940.70
7,600.00	91.00	88.00	6,079.06	-244.79	1,685.62	0.00	1,691.93	676,519.91	656,040.62
7,700.00	91.00	88.00	6,077.31	-241.31	1,785.54	0.00	1,791.71	676,523.39	656,140.54
7,800.00	91.00	88.00	6,075.57	-237.82	1,885.47	0.00	1,891.49	676,526.88	656,240.47
7,900.00	91.00	88.00	6,073.82	-234.33	1,985.39	0.00	1,991.28	676,530.37	656,340.39
8,000.00	91.00	88.00	6,072.08	-230.84	2,085.32	0.00	2,091.06	676,533.86	656,440.32
8,100.00	91.00	88.00	6,070.33	-227.35	2,185.24	0.00	2,190.84	676,537.35	656,540.24
8,200.00	91.00	88.00	6,068.59	-223.87	2,285.16	0.00	2,290.63	676,540.83	656,640.16
8,300.00	91.00	88.00	6,066.85	-220.38	2,385.09	0.00	2,390.41	676,544.32	656,740.09
8,400.00	91.00	88.00	6,065.10	-216.89	2,485.01	0.00	2,490.19	676,547.81	656,840.01
8,500.00	91.00	88.00	6,063.36	-213.40	2,584.94	0.00	2,589.98	676,551.30	656,939.94
8,600.00	91.00	88.00	6,061.61	-209.92	2,684.86	0.00	2,689.76	676,554.78	657,039.86
8,700.00	91.00	88.00	6,059.87	-206.43	2,784.78	0.00	2,789.54	676,558.27	657,139.78
8,800.00	91.00	88.00	6,058.13	-202.94	2,884.71	0.00	2,889.33	676,561.76	657,239.71
8,900.00	91.00	88.00	6,056.38	-199.45	2,984.63	0.00	2,989.11	676,565.25	657,339.63
9,000.00	91.00	88.00	6,054.64	-195.97	3,084.55	0.00	3,088.89	676,568.73	657,439.55
9,100.00	91.00	88.00	6,052.89	-192.48	3,184.48	0.00	3,188.68	676,572.22	657,539.48
9,200.00	91.00	88.00	6,051.15	-188.99	3,284.40	0.00	3,288.46	676,575.71	657,639.40
9,300.00	91.00	88.00	6,049.41	-185.50	3,384.33	0.00	3,388.25	676,579.20	657,739.33
9,400.00	91.00	88.00	6,047.66	-182.02	3,484.25	0.00	3,488.03	676,582.68	657,839.25
9,500.00	91.00	88.00	6,045.92	-178.53	3,584.17	0.00	3,587.81	676,586.17	657,939.17
9,600.00	91.00	88.00	6,044.17	-175.04	3,684.10	0.00	3,687.60	676,589.66	658,039.10
9,700.00	91.00	88.00	6,042.43	-171.55	3,784.02	0.00	3,787.38	676,593.15	658,139.02
9,800.00	91.00	88.00	6,040.69	-168.07	3,883.95	0.00	3,887.16	676,596.63	658,238.95
9,900.00	91.00	88.00	6,038.94	-164.58	3,983.87	0.00	3,986.95	676,600.12	658,338.87
10,000.00	91.00	88.00	6,037.20	-161.09	4,083.79	0.00	4,086.73	676,603.61	658,438.79

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Shiner Bock 1 Federal Com Well No. 27H
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3998+12 @ 4010.00usft (United #43)
Site:	Shiner Bock 1 Federal Com	MD Reference:	RKB=3998+12 @ 4010.00usft (United #43)
Well:	Shiner Bock 1 Federal Com Well No. 27H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	rev0	Database:	Dbase Nov0914

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
10,100.00	91.00	88.00	6,035.45	-157.60	4,183.72	0.00	4,186.51	676,607.10	658,538.72
10,200.00	91.00	88.00	6,033.71	-154.11	4,283.64	0.00	4,286.30	676,610.59	658,638.64
10,300.00	91.00	88.00	6,031.96	-150.63	4,383.57	0.00	4,386.08	676,614.07	658,738.57
10,400.00	91.00	88.00	6,030.22	-147.14	4,483.49	0.00	4,485.86	676,617.56	658,838.49
10,500.00	91.00	88.00	6,028.48	-143.65	4,583.41	0.00	4,585.65	676,621.05	658,938.41
10,600.00	91.00	88.00	6,026.73	-140.16	4,683.34	0.00	4,685.43	676,624.54	659,038.34
10,699.33	91.00	88.00	6,025.00	-136.70	4,782.59	0.00	4,784.55	676,628.00	659,137.59
PBHL/TD									
10,699.34	91.00	88.00	6,025.00	-136.70	4,782.60	0.00	4,784.55	676,628.00	659,137.60

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
5,579.21	5,579.21	0.00	0.00	KOP Begin 11°/100' build
6,406.48	6,100.00	-166.84	503.01	POE 330 HL int. Begin 3°/100' turn
7,084.68	6,088.04	-262.77	1,170.69	Begin 91.00 lateral section
10,699.33	6,025.00	-136.70	4,782.59	PBHL/TD

CONCHO

Anticollision Report

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Shiner Bock 1 Federal Com Well No. 27H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3998+12 @ 4010.00usft (United #43)
Reference Site:	Shiner Bock 1 Federal Com	**MD Reference:**	RKB=3998+12 @ 4010.00usft (United #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Shiner Bock 1 Federal Com Well No. 27H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Reference rev0

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 11,000.00 usft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	3.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 2/12/2015

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	10,699.07	rev0 (Original Hole)	MWD	MWD - Standard

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Shiner Bock 1 Federal Com						
Shiner Bock 1 Federal Com 8H - Original hole - Surveys	0.00	0.00	171.44			
Shiner Bock 1 Federal Com 8H - Original hole - Surveys	4,500.00	4,491.32	182.30	154.48	6.554	ES
Shiner Bock 1 Federal Com 8H - Original hole - Surveys	10,699.34	9,979.63	868.24	576.14	2.972	SF

Offset Design Shiner Bock 1 Federal Com - Shiner Bock 1 Federal Com 8H - Original hole - Surveys Original hole — Offset Site Error: 0.00 usft

Survey Program: 100-NS-GYRO-MS / 4861-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	7.50	0.00	0.00	-173.56	-170.20	-19.20	171.44				
100.00	100.00	91.59	99.08	0.15	0.16	-173.62	-170.46	-19.07	171.53	171.22	0.31	560.303	
200.00	200.00	191.25	198.75	0.49	0.54	-173.78	-171.15	-18.67	172.17	171.15	1.02	168.661	
300.00	300.00	291.41	298.90	0.82	0.93	-173.98	-171.91	-18.14	172.87	171.11	1.76	98.449	
400.00	400.00	391.40	398.89	1.16	1.33	-174.17	-172.60	-17.61	173.50	171.01	2.49	69.662	
500.00	500.00	491.31	498.79	1.50	1.71	-174.29	-173.30	-17.34	174.17	170.96	3.21	54.295	
600.00	600.00	591.62	599.11	1.83	2.09	-174.36	-173.93	-17.17	174.78	170.85	3.93	44.517	
700.00	700.00	692.51	699.99	2.17	2.31	-174.44	-174.23	-16.95	175.05	170.57	4.48	39.089	
800.00	800.00	791.51	798.99	2.51	2.52	-174.46	-174.47	-16.93	175.30	170.27	5.03	34.884	
900.00	900.00	892.01	899.49	2.85	2.81	-174.41	-174.93	-17.13	175.77	170.12	5.65	31.103	
1,000.00	1,000.00	991.48	998.96	3.18	3.07	-174.23	-175.29	-17.73	176.19	169.93	6.26	28.156	
1,100.00	1,100.00	1,092.30	1,099.77	3.52	3.36	-174.09	-175.64	-18.19	176.58	169.71	6.88	25.683	
1,200.00	1,200.00	1,192.22	1,199.70	3.86	3.64	-174.00	-175.74	-18.47	176.71	169.21	7.50	23.558	
1,300.00	1,300.00	1,291.82	1,299.29	4.19	4.00	-173.98	-176.01	-18.56	176.99	168.80	8.19	21.612	
1,400.00	1,400.00	1,392.22	1,399.69	4.53	4.32	-174.08	-176.35	-18.28	177.30	168.45	8.85	20.037	
1,500.00	1,500.00	1,492.16	1,499.63	4.87	4.60	-174.27	-176.59	-17.73	177.48	168.01	9.47	18.749	
1,600.00	1,600.00	1,592.42	1,599.89	5.21	4.88	-174.45	-176.79	-17.17	177.62	167.54	10.08	17.614	
1,700.00	1,700.00	1,692.03	1,699.50	5.54	5.17	-174.70	-177.02	-16.42	177.78	167.07	10.71	16.600	
1,800.00	1,800.00	1,792.43	1,799.89	5.88	5.47	-175.00	-177.29	-15.51	177.97	166.62	11.35	15.685	
1,900.00	1,900.00	1,892.58	1,900.04	6.22	5.76	-175.28	-177.38	-14.63	177.98	166.01	11.98	14.862	
1,912.02	1,912.02	1,904.57	1,912.03	6.26	5.79	-175.33	-177.39	-14.50	177.98	165.93	12.05	14.767	
2,000.00	2,000.00	1,991.88	1,999.33	6.55	6.07	-175.67	-177.63	-13.46	178.14	165.52	12.63	14.109	
2,100.00	2,100.00	2,092.10	2,099.54	6.89	6.42	-175.97	-178.04	-12.53	178.48	165.17	13.31	13.405	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Shiner Bock 1 Federal Com Well No. 27H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3998+12 @ 4010.00usft (United #43)
Reference Site:	Shiner Bock 1 Federal Com	**MD Reference:**	RKB=3998+12 @ 4010.00usft (United #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Shiner Bock 1 Federal Com Well No. 27H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Shiner Bock 1 Federal Com - Shiner Bock 1 Federal Com 8H - Original hole - Surveys Original hole — Offset Site Error: 0.00 usft

Survey Program: 100-NS-GYRO-MS, 4861-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,200.00	2,200.00	2,191.31	2,198.76	7.23	6.79	-176.21	-178.54	-11.83	178.93	164.92	14.02	12.766	
2,300.00	2,300.00	2,291.38	2,298.81	7.57	7.17	-176.51	-179.30	-10.95	179.63	164.90	14.73	12.193	
2,400.00	2,400.00	2,392.35	2,399.78	7.90	7.56	-176.63	-179.73	-10.57	180.04	164.58	15.46	11.646	
2,500.00	2,500.00	2,492.30	2,499.74	8.24	7.94	-176.65	-179.84	-10.54	180.15	163.97	16.18	11.135	
2,600.00	2,600.00	2,591.83	2,599.26	8.58	8.32	-176.67	-180.12	-10.47	180.42	163.53	16.89	10.679	
2,700.00	2,700.00	2,692.08	2,699.51	8.91	8.65	-176.68	-180.48	-10.49	180.78	163.21	17.57	10.291	
2,800.00	2,800.00	2,792.42	2,799.85	9.25	8.88	-176.60	-180.64	-10.73	180.96	162.83	18.13	9.979	
2,900.00	2,900.00	2,892.31	2,899.74	9.59	9.07	-176.50	-180.73	-11.05	181.06	162.40	18.66	9.703	
3,000.00	3,000.00	2,992.27	2,999.70	9.93	9.28	-176.37	-180.86	-11.47	181.22	162.02	19.20	9.436	
3,100.00	3,100.00	3,091.92	3,099.35	10.26	9.52	-176.22	-181.08	-11.96	181.48	161.70	19.78	9.174	
3,200.00	3,200.00	3,192.71	3,200.14	10.60	9.74	-176.07	-181.22	-12.46	181.64	161.31	20.34	8.931	
3,297.97	3,297.97	3,290.55	3,297.97	10.93	9.91	-175.83	-181.11	-13.20	181.59	160.75	20.84	8.715	
3,300.00	3,300.00	3,292.57	3,300.00	10.94	9.91	-175.83	-181.10	-13.22	181.59	160.74	20.85	8.711	
3,400.00	3,400.00	3,392.55	3,399.96	11.27	10.10	-175.40	-181.02	-14.56	181.60	160.23	21.37	8.496	
3,500.00	3,500.00	3,491.82	3,499.23	11.61	10.33	-174.96	-181.11	-15.97	181.81	159.87	21.95	8.284	
3,600.00	3,600.00	3,593.33	3,600.72	11.95	10.57	-174.56	-181.06	-17.24	181.88	159.36	22.52	8.077	
3,700.00	3,700.00	3,692.85	3,700.23	12.29	10.77	-174.07	-180.60	-18.76	181.57	158.52	23.05	7.877	
3,780.83	3,780.83	3,773.45	3,780.83	12.56	10.95	-173.74	-180.45	-19.78	181.53	158.03	23.50	7.724	
3,800.00	3,800.00	3,792.58	3,799.95	12.62	10.99	-173.66	-180.42	-20.03	181.53	157.92	23.61	7.688	
3,900.00	3,900.00	3,892.85	3,900.21	12.96	11.22	-173.12	-180.19	-21.74	181.50	157.31	24.18	7.505	
3,931.78	3,931.78	3,924.43	3,931.78	13.07	11.30	-172.90	-180.08	-22.43	181.47	157.10	24.37	7.447	
4,000.00	4,000.00	3,992.03	3,999.37	13.30	11.47	-172.47	-180.02	-23.80	181.59	156.82	24.77	7.331	
4,100.00	4,100.00	4,092.06	4,099.38	13.63	11.75	-171.86	-180.12	-25.75	181.95	156.57	25.38	7.169	
4,200.00	4,200.00	4,193.29	4,200.59	13.97	12.01	-171.28	-179.88	-27.60	181.99	156.01	25.98	7.006	
4,274.89	4,274.89	4,267.60	4,274.89	14.22	12.20	-170.88	-179.54	-28.81	181.84	155.42	26.42	6.883	
4,300.00	4,300.00	4,292.47	4,299.75	14.31	12.26	-170.74	-179.49	-29.25	181.86	155.29	26.57	6.845	
4,400.00	4,400.00	4,392.74	4,400.01	14.65	12.53	-170.27	-179.33	-30.75	181.95	154.77	27.18	6.695	
4,406.18	4,406.18	4,398.94	4,406.22	14.67	12.55	-170.25	-179.32	-30.82	181.95	154.73	27.22	6.685	
4,500.00	4,500.00	4,491.32	4,498.58	14.98	12.83	-169.92	-179.48	-31.92	182.30	154.48	27.81	6.554 ES	
4,600.00	4,600.00	4,591.62	4,598.88	15.32	13.16	-169.51	-179.97	-33.32	183.04	154.55	28.48	6.427	
4,700.00	4,700.00	4,691.44	4,698.69	15.66	13.50	-169.15	-180.40	-34.58	183.69	154.53	29.16	6.300	
4,800.00	4,800.00	4,790.73	4,797.97	15.99	13.86	-168.90	-181.12	-35.53	184.58	154.73	29.85	6.184	
4,900.00	4,900.00	4,891.49	4,898.73	16.33	14.00	-168.64	-181.87	-36.54	185.51	155.18	30.33	6.116	
5,000.00	5,000.00	4,987.00	4,993.76	16.67	14.02	-171.11	-184.85	-28.93	187.20	156.52	30.69	6.100	
5,100.00	5,100.00	5,075.67	5,079.31	17.01	14.07	-177.80	-192.59	-7.40	193.84	162.77	31.07	6.238	
5,200.00	5,200.00	5,161.86	5,157.22	17.34	14.18	172.22	-202.81	27.73	209.12	177.60	31.52	6.634	
5,300.00	5,300.00	5,236.63	5,219.56	17.68	14.44	162.18	-211.58	68.02	236.36	204.30	32.06	7.373	
5,400.00	5,400.00	5,308.47	5,276.01	18.02	14.87	153.10	-219.96	111.60	276.06	243.30	32.76	8.426	
5,500.00	5,500.00	5,365.00	5,316.99	18.35	15.36	146.25	-224.80	150.20	326.48	292.91	33.57	9.725	
5,579.21	5,579.21	5,402.87	5,342.20	18.62	15.81	141.91	-227.54	178.33	373.83	339.57	34.27	10.909	
5,600.00	5,599.99	5,411.60	5,347.76	18.69	15.92	141.01	-228.19	185.01	386.93	353.24	33.69	11.485	
5,624.66	5,624.61	5,422.08	5,354.32	18.76	16.06	140.05	-229.00	193.15	402.23	368.52	33.71	11.932	
5,650.00	5,649.78	5,429.00	5,358.57	18.83	16.15	139.61	-229.55	198.58	417.67	384.01	33.66	12.409	
5,700.00	5,698.92	5,460.00	5,377.04	18.98	16.63	137.31	-232.13	223.35	446.79	413.32	33.47	13.348	
5,750.00	5,746.96	5,484.71	5,391.14	19.13	17.05	136.09	-234.34	243.51	473.99	440.95	33.04	14.346	
5,800.00	5,793.45	5,509.33	5,404.64	19.31	17.50	135.26	-236.71	263.96	499.04	466.65	32.39	15.407	
5,850.00	5,837.97	5,533.05	5,416.93	19.50	17.97	134.84	-239.23	284.09	521.98	490.45	31.54	16.552	
5,900.00	5,880.10	5,555.00	5,427.62	19.74	18.43	134.91	-241.70	303.10	542.74	512.24	30.49	17.799	
5,950.00	5,919.47	5,587.00	5,441.90	20.04	19.17	134.19	-245.36	331.50	561.27	531.93	29.34	19.130	
6,000.00	5,955.70	5,605.77	5,449.57	20.42	19.63	135.16	-247.51	348.49	577.26	549.25	28.01	20.609	
6,050.00	5,988.47	5,631.44	5,459.32	20.91	20.30	135.68	-250.47	372.06	590.75	564.11	26.64	22.178	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

CONCHO

Anticollision Report

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Shiner Bock 1 Federal Com Well No. 27H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3998+12 @ 4010.00usft (United #43)
Reference Site:	Shiner Bock 1 Federal Com	**MD Reference:**	RKB=3998+12 @ 4010.00usft (United #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Shiner Bock 1 Federal Com Well No. 27H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Shiner Bock 1 Federal Com:- Shiner Bock 1 Federal Com 8H - Original hole - Surveys Original hole — Offset Site Error: 0.00 usft

Survey Program: 100-NS-GYRO-MS, 4861-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
6,100.00	6,017.46	5,649.00	5,465.44	21.50	20.76	137.69	-252.45	388.40	601.73	576.53	25.19	23.883	
6,150.00	6,042.43	5,681.00	5,475.38	22.24	21.67	138.02	-256.05	418.60	609.95	586.12	23.83	25.591	
6,200.00	6,063.12	5,712.00	5,483.69	23.11	22.59	138.77	-259.40	448.27	615.48	592.92	22.56	27.283	
6,250.00	6,079.37	5,744.00	5,491.24	24.12	23.58	139.55	-262.33	479.23	617.87	596.43	21.44	28.816	
6,300.00	6,091.00	5,775.00	5,497.45	25.25	24.57	140.76	-264.53	509.52	617.20	596.65	20.55	30.033	
6,350.00	6,097.93	5,796.96	5,501.01	26.50	25.29	145.01	-265.80	531.15	613.68	593.73	19.95	30.761	
6,400.00	6,100.07	5,820.95	5,504.06	27.84	26.10	150.43	-267.09	554.90	607.51	587.79	19.72	30.803	
6,406.48	6,100.00	5,823.93	5,504.37	28.02	26.20	151.36	-267.28	557.86	606.53	586.81	19.72	30.753	
6,500.00	6,098.36	5,867.00	5,507.05	30.76	27.68	173.93	-271.23	600.65	596.37	575.86	20.52	29.069	
6,600.00	6,096.60	5,943.01	5,507.50	33.94	30.40	-167.95	-281.52	675.95	592.64	570.98	21.65	27.373	
6,700.00	6,094.83	6,038.15	5,506.11	37.30	33.89	-163.06	-294.53	770.19	591.73	568.65	23.08	25.641	
6,794.16	6,093.16	6,132.41	5,504.48	40.59	37.44	-162.90	-306.16	863.72	591.53	566.89	24.64	24.007	
6,800.00	6,093.06	6,138.28	5,504.37	40.79	37.66	-162.93	-306.86	869.54	591.53	566.78	24.74	23.908	
6,900.00	6,091.29	6,235.77	5,502.47	44.36	41.40	-161.15	-318.20	966.35	591.99	565.36	26.63	22.226	
7,000.00	6,089.53	6,333.71	5,500.10	47.98	45.22	-161.04	-329.00	1,063.66	593.43	564.60	28.84	20.580	
7,084.68	6,088.04	6,416.00	5,497.84	51.07	48.45	-161.40	-337.74	1,145.46	595.48	564.48	31.00	19.211	
7,100.00	6,087.78	6,430.85	5,497.41	51.63	49.04	-161.50	-339.32	1,160.21	595.94	564.50	31.43	18.959	
7,200.00	6,086.03	6,547.41	5,495.79	55.32	53.67	-173.96	-350.90	1,276.18	597.47	562.62	34.86	17.141	
7,300.00	6,084.29	6,645.82	5,495.61	59.07	57.60	-173.64	-360.17	1,374.16	598.07	559.86	38.21	15.652	
7,400.00	6,082.54	6,744.66	5,495.10	62.87	61.57	-173.59	-369.47	1,472.55	599.26	557.38	41.88	14.310	
7,500.00	6,080.80	6,847.46	5,495.30	66.70	65.72	-175.28	-379.14	1,574.90	600.04	554.06	45.98	13.049	
7,600.00	6,079.06	6,942.14	5,495.21	70.57	69.56	-173.45	-388.05	1,669.16	601.39	551.24	50.15	11.991	
7,700.00	6,077.31	7,044.47	5,494.53	74.47	73.71	-174.70	-397.68	1,771.03	603.57	548.73	54.84	11.006	
7,800.00	6,075.57	7,161.04	5,496.26	78.39	78.46	179.45	-408.39	1,887.09	603.90	543.48	60.43	9.994	
7,900.00	6,073.82	7,258.34	5,499.26	82.33	82.43	-179.56	-416.70	1,983.98	602.81	537.19	65.62	9.186	
7,921.29	6,073.45	7,277.54	5,499.74	83.17	83.21	-178.90	-418.46	2,003.10	602.77	536.05	66.73	9.034	
8,000.00	6,072.08	7,351.03	5,501.30	86.28	86.21	-177.33	-425.64	2,076.22	603.18	532.11	71.07	8.487	
8,100.00	6,070.34	7,436.98	5,502.42	90.26	89.73	-173.52	-435.12	2,161.63	605.19	528.53	76.67	7.894	
8,200.00	6,068.59	7,525.61	5,501.98	94.24	93.36	-170.91	-446.76	2,249.50	609.92	527.02	82.90	7.357	
8,300.00	6,066.85	7,614.89	5,501.03	98.24	97.02	-168.83	-459.79	2,337.81	616.20	526.55	89.65	6.874	
8,400.00	6,065.10	7,718.40	5,497.94	102.25	101.27	-170.13	-473.88	2,440.32	624.27	527.20	97.07	6.431	
8,500.00	6,063.36	7,819.60	5,496.66	106.26	105.43	-170.80	-486.26	2,540.74	630.52	526.04	104.48	6.035	
8,600.00	6,061.61	7,902.98	5,494.51	110.29	108.85	-167.92	-497.20	2,623.38	638.69	527.53	111.15	5.746	
8,700.00	6,059.87	7,992.09	5,490.10	114.32	112.51	-166.41	-509.70	2,711.49	649.60	531.37	118.23	5.494	
8,800.00	6,058.13	8,092.59	5,484.88	118.36	116.64	-167.03	-523.43	2,810.91	660.88	534.91	125.98	5.246	
8,900.00	6,056.38	8,190.88	5,479.24	122.40	120.68	-167.21	-535.78	2,908.26	672.34	538.94	133.40	5.040	
9,000.00	6,054.64	8,293.71	5,473.06	126.45	124.90	-168.07	-548.01	3,010.16	683.89	542.91	140.98	4.851	
9,100.00	6,052.89	8,398.83	5,467.78	130.51	129.23	-169.22	-560.31	3,114.44	694.66	545.80	148.87	4.666	
9,200.00	6,051.15	8,498.58	5,463.44	134.56	133.34	-169.50	-571.96	3,213.41	705.06	548.40	156.66	4.501	
9,300.00	6,049.41	8,598.87	5,459.69	138.63	137.48	-169.84	-584.49	3,312.84	715.59	550.75	164.84	4.341	
9,400.00	6,047.66	8,700.60	5,456.14	142.69	141.68	-170.36	-596.96	3,413.74	725.98	552.81	173.18	4.192	
9,500.00	6,045.92	8,791.44	5,452.39	146.76	145.42	-169.40	-607.71	3,503.86	736.83	556.05	180.78	4.076	
9,600.00	6,044.17	8,896.24	5,447.66	150.84	149.75	-170.27	-620.10	3,607.81	748.15	559.00	189.15	3.955	
9,700.00	6,042.43	9,023.69	5,445.54	154.91	155.02	-173.89	-634.78	3,734.40	757.18	557.79	199.39	3.797	
9,800.00	6,040.69	9,128.38	5,447.48	158.99	159.34	-174.56	-646.74	3,838.38	763.61	554.64	208.97	3.654	
9,900.00	6,038.94	9,214.63	5,448.57	163.07	162.91	-173.07	-657.43	3,923.96	771.38	553.87	217.52	3.546	
10,000.00	6,037.20	9,299.65	5,448.82	167.15	166.43	-171.53	-668.92	4,008.19	780.89	554.80	226.10	3.454	
10,100.00	6,035.45	9,378.58	5,447.51	171.24	169.69	-169.44	-680.66	4,086.23	792.95	558.71	234.24	3.385	
10,200.00	6,033.71	9,477.44	5,444.93	175.32	173.77	-169.57	-695.95	4,183.87	806.35	562.66	243.69	3.309	
10,300.00	6,031.96	9,582.28	5,442.81	179.41	178.11	-170.28	-712.15	4,287.42	819.54	565.87	253.67	3.231	
10,400.00	6,030.22	9,689.06	5,441.78	183.50	182.53	-171.15	-728.22	4,392.99	831.92	568.01	263.91	3.152	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Shiner Bock 1 Federal Com Well No. 27H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3998+12 @ 4010.00usft (United #43)
Reference Site:	Shiner Bock 1 Federal Com	**MD Reference:**	RKB=3998+12 @ 4010.00usft (United #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Shiner Bock 1 Federal Com Well No. 27H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Shiner Bock 1 Federal Com - Shiner Bock 1 Federal Com 8H - Original hole - Surveys Original hole — Offset Site Error: 0.00 usft

Survey Program: 100-NS-GYRO-MS, 4861-MWD — Offset Well Error: 0.00 usft

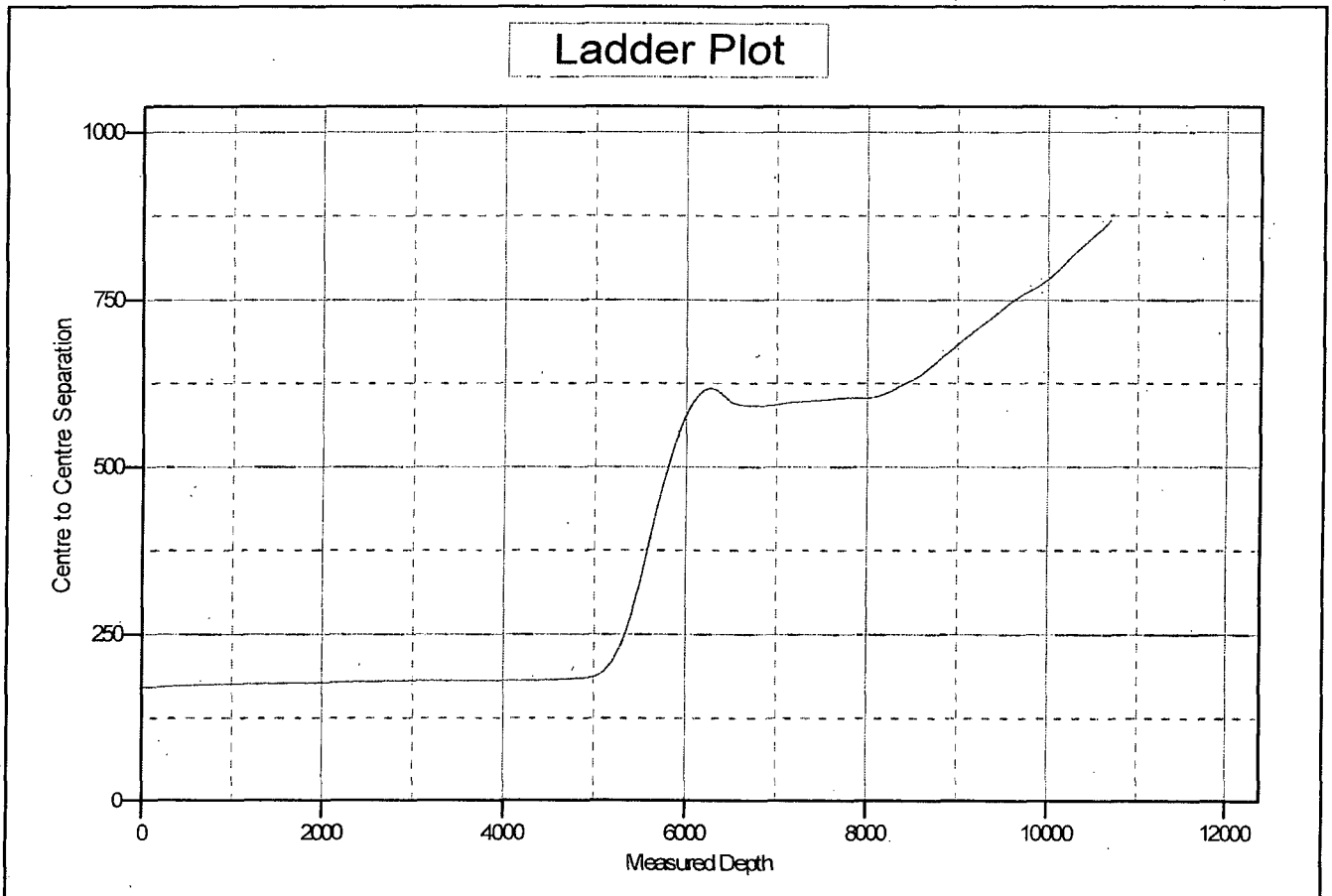
Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
10,500.00	6,028.48	9,791.49	5,441.07	187.60	186.77	-171.55	-742.90	4,494.35	843.85	570.07	273.78	3.082	
10,600.00	6,026.73	9,888.50	5,440.31	191.69	190.78	-171.43	-756.35	4,590.43	855.69	572.51	283.19	3.022	
10,699.34	6,025.00	9,979.63	5,438.97	195.76	194.56	-170.84	-769.17	4,680.64	868.24	576.14	292.11	2.972 SF	

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Shiner Bock 1 Federal Com Well No. 27H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3998+12 @ 4010.00usft (United #43)
Reference Site:	Shiner Bock 1 Federal Com	**MD Reference:**	RKB=3998+12 @ 4010.00usft (United #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Shiner Bock 1 Federal Com Well No. 27H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to RKB=3998+12 @ 4010.00usft (United
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.000000 W

Coordinates are relative to: Shiner Bock 1 Federal Com Well No. 27H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.27°

Ladder Plot



LEGEND

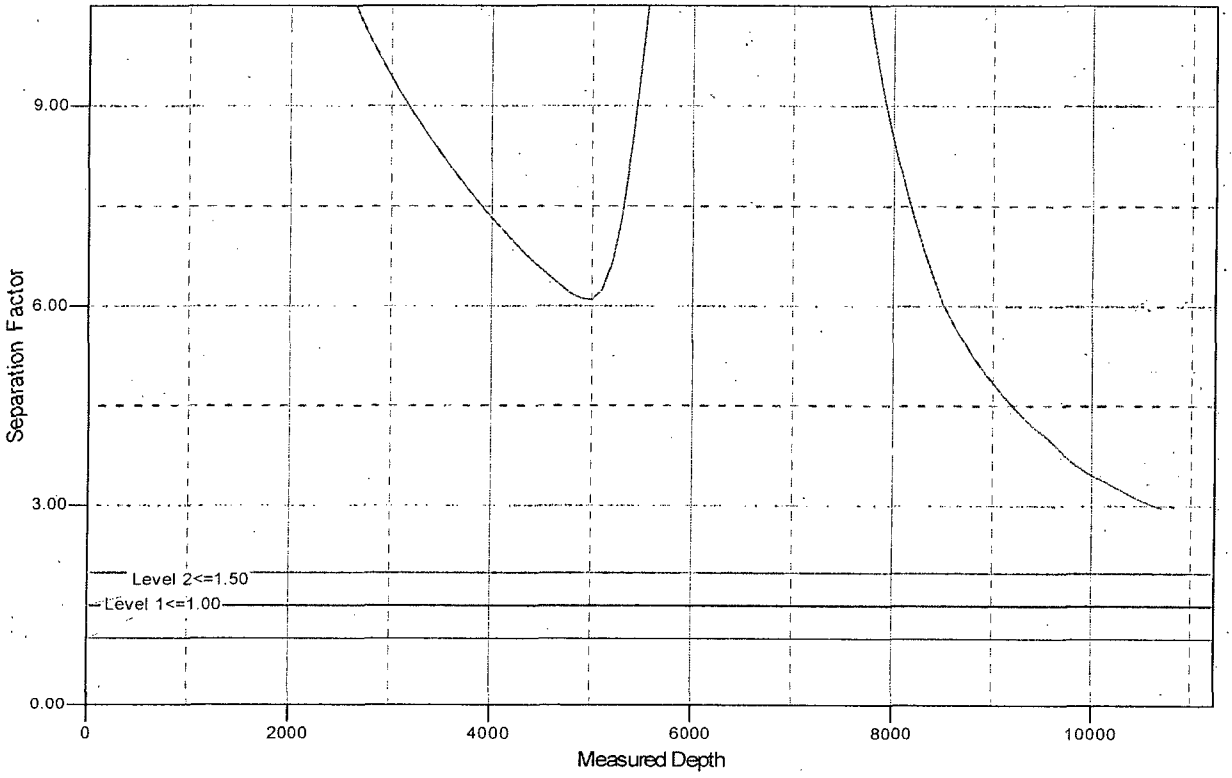
1 8H, Original hole, Surveys Original hole V0

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Shiner Bock 1 Federal Com Well No. 27H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3998+12 @ 4010.00usft (United #43)
Reference Site:	Shiner Bock 1 Federal Com	**MD Reference:**	RKB=3998+12 @ 4010.00usft (United #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Shiner Bock 1 Federal Com Well No. 27H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to RKB=3998+12 @ 4010.00usft (United
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.000000 W

Coordinates are relative to: Shiner Bock 1 Federal Com Well No. 27H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.27°

Separation Factor Plot



LEGEND

18H, Original hole, Surveys Original hole V0

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating, LLC
LEASE NO.:	NMLC-031844
WELL NAME & NO.:	Shiner Bock 1 Federal Com 27H
SURFACE HOLE FOOTAGE:	1160' FSL & 0170' FWL
BOTTOM HOLE FOOTAGE	0990' FSL & 0330' FEL
LOCATION:	Section 01, T. 17 S., R 31 E., NMPM
COUNTY:	Eddy County, New Mexico
API:	30-015-42022

The following drilling modifications apply:

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. A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **Grayburg** formation. **As a result, the Hydrogen Sulfide area must 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. 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. **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.

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

Possibility for water flows in the Red Beds, Artesia Group, and Salado.
Possible lost circulation in the Red beds, Rustler, Artesia Group, San Andres, and Grayburg.

1. The **13-3/8** inch surface casing shall be set at approximately **775** feet (**in a competent bed below the Magenta Dolomite, which is a Member of the Rustler, and if salt is encountered, set casing at least 25 feet above the salt**) and cemented to the surface. **Fresh water mud to be used to setting depth.**

    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.

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

Cement Option #1 (Single Stage):

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

Cement Option #2:

Operator has proposed DV tool at depth of 765', but with the change in casing depth this is no longer acceptable. DV tool shall be at least 50' below previous casing shoe. Operator shall adjust cement proportionately according to the depth change.

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.

b. Second stage above DV tool:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

Centralizers required through the curve and a minimum of one every other joint.

3. The minimum required fill of cement behind the **7 X 5-1/2** inch production casing is:

Cement Option #1 (Single Stage):

☒ Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification. **Excess calculates to 18% - Additional cement may be required.**

Cement Option #2:

Operator has proposed two DV tools at depths of 2125' and 5959', but will adjust cement proportionately if moved. DV tool at 2125' shall be set a minimum of 50' below previous shoe and DV tool at 5959' a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range.

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.

b. Second stage above DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with third stage cement job. Operator should have plans as to how they will achieve circulation on the next stage. **Excess calculates to 8% - Additional cement may be required.**

c. Third stage above DV tool:

☒ Cement should tie-back at least 200 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. **In the case where the only BOP installed is an annular preventer, it shall be tested to a minimum of 2000 psi (which may require upgrading to 3M or 5M annular).**

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.

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.

   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.

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