NM OIL CONSERVATION
ARTESIA DISTRICT
MAY 18 2015
RECEIVED

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.
NMNM93205

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.
ICE DANCER 30 FEDERAL COM 2H

2. Name of Operator
COG OPERATING LLC
Contact: MAYTE X REYES
E-Mail: mreyes1@concho.com

9. API Well No.
30-015-39473-00-X1

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

3b. Phone No. (include area code)
Ph: 575.748.6945

10. Field and Pool, or Exploratory
UNDESIGNATED

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 30 T23S R30E SWSE 475FSL 1890FEL

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

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

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

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

COG Operating LLC, respectfully requests approval for the following drilling changes to the original approved APD.

See attached.

BHL change

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

Accepted for record
NMOCD
RD 5/28/15

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

Electronic Submission #301767 verified by the BLM Well Information System
For COG OPERATING LLC, sent to the Carlsbad
Committed to AFMSS for processing by JENNIFER SANCHEZ on 05/14/2015 (15JAS0350SE)

Name *(Printed/Typed)* MAYTE X REYES — Title REGULATORY ANALYST

Signature (Electronic Submission) — Date 05/14/2015

APPROVED
MAY 14 2015
BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD OFFICE

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

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 RD., AZTEC, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-015-39473	96526	Forty Niner Ridge; Bone Spring, West

Property Code	Property Name	Well Number
38857	ICE DANCER 30 FEDERAL COM	2H

OGRID No.	Operator Name	Elevation
229137	COG OPERATING, LLC	3071.4

Surface Location

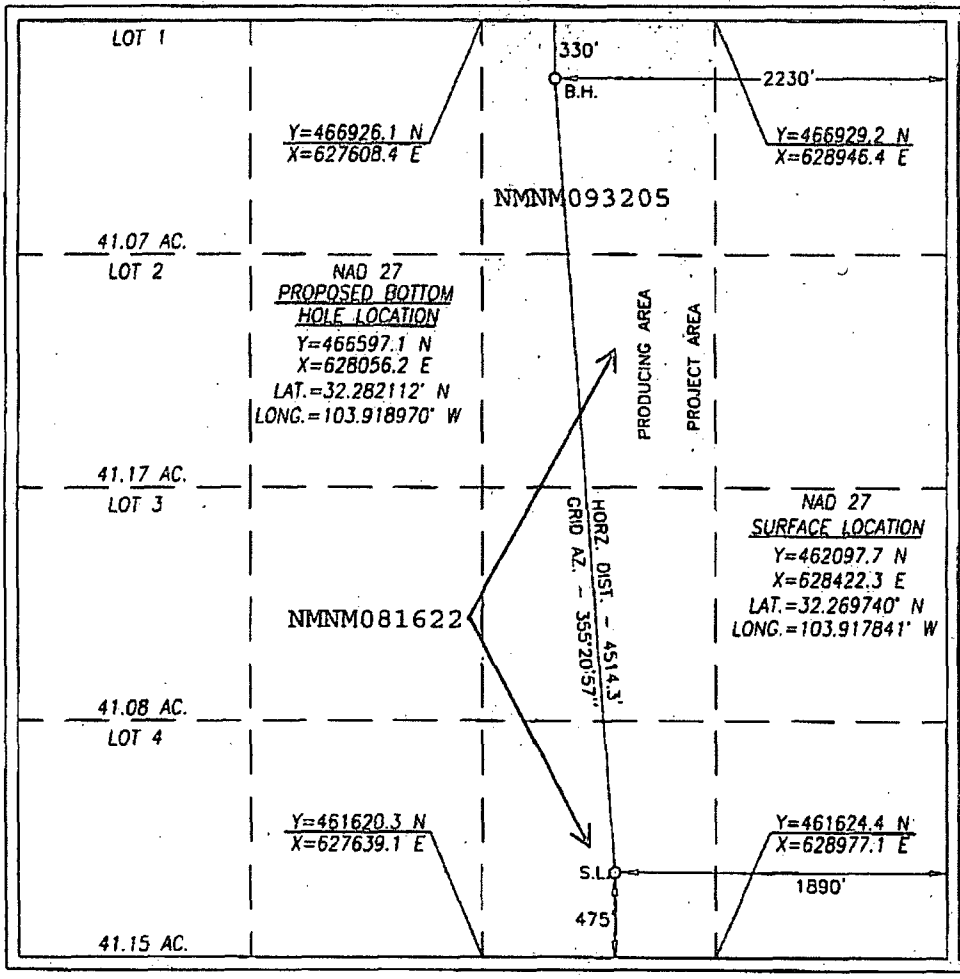
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	30	23-S	30-E		475	SOUTH	1890	EAST	EDDY

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
B	30	23-S	30-E		330	NORTH	2230	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	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



OPERATOR CERTIFICATION

I hereby certify that the information 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 mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature — Date: 5-14-15

Mayte Reyes
Printed Name

mreyes1@concho.com
E-mail Address

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.

MARCH 9, 2015
Date of Survey

Signature & Seal of Professional Surveyor

CHAD L. HARCROW
NEW MEXICO
17777
LICENSED PROFESSIONAL SURVEYOR

5/13/15

Certificate No. CHAD HARCROW 17777

W.O. # 15-307 DRAWN BY: AF

5.14.15

Need to Sundry the following for the Ice Dancer 30 Federal Com 2H:

- Request the Total Depth of the previously approved Pilot Hole TD of 10,380' be extended to 10,750' MD/TVD or about 320' into the Upper Wolfcamp to capture log top in the upper part of the Wolfcamp and verify 3rd Bone Spring Sand target.
- Geological Target and Depths have been revised as follows:
  - Was Avalon Shale at 7875' TVD Now 3rd Bone Spring Sand at 10,422' TVD
- As result of the request to drill a deeper pilot hole and adjustments to the projected geologic tops, the following tops of the geological markers and anticipated depths are submitted as follows:

Top of Salt	Was 415'	Now 599'
Base of Salt	Was 3163'	Now 3159'
Delaware	Was 3335'	Now 3379'
Bone Spring Lime	Was 7063'	Now 7126'
Avalon Shale	Was 7393'	Now 7477'
1st Bone Spring Sand	Was 8115'	Now 8153'
2nd Bone Spring Sand	Was 8949'	Now 8966'
3rd Bone Spring Sand	Was 9989'	Now 10,038'
Wolfcamp	Was Not Submitted	Now 10,433'
Strawn	Was Not Submitted	Now 12,378'

- The End of Lateral Bottom Hole Location is changed as follows:
  - Was 375' FNL X 1980' FEL Sec 30 23S – 30E Unit O
  - Now **330' FNL** X **2230' FEL** Sec 30 23S – 30E Unit B
  - Note: Surface Location as approved unchanged.
  - Revised Plat Attached – Note: No change to previously approved surface location.
- The Third Bone Spring target is submitted as follows:
  - End of Curve Target 10,686' MD / 10,422' TVD
  - End of Lateral Target 14,744' MD / 10412' TVD
- As result of change in End of Lateral Bottom Hole Location and adjustment of the geological target, a revised Directional Drilling Plan is submitted to include a well path plan to avoid collision with the Gold Rush 30 Federal 1 (API 30-015-28032). All other wells along the well path are too shallow for anti-collision mitigation.
- Proposed Casing and Cementing Program as follows:
- 13-3/8" Casing – No Change
- 9-5/8" Casing – Depth No Change – SF Burst 1.3 (as result of deeper PH)
- 5-1/2" Casing – New
  - Setting Depth: Was 0 to 12,127' Now 0 to 14,744'
  - Weight: 17# Unchanged
  - Grade: P-110 Unchanged
  - Joint: LTC Unchanged
  - Design Factor Burst: 2.7
  - Design Factor Tension: 2.7
  - Design Factor Collapse: 1.5
- Cementing Program
  - Surface Casing – No Change
  - Intermediate Casing – No Change

- Production Casing
  - Lead: **725 sx** of Halliburton Tune Light at 10.3 ppg – / 21.6 gal/sx / 3.63 cf/sk)
  - Tail: **1150 sx** of Versacem H + 0.3% CFR-3 + 1% Salt + 1% HR-601 (14.4 ppg – 5.7 gal/sk 1.24 cf/sk)
  - Volume Factors – Lead – 45% OH from KOP to Intermediate Casing Point. Cement calculated to tie back 500' into intermediate casing.
  - Volume Factors Tail – 17% hole excess from TD (14,744') to KOP (9945').
- Pilot Hole Plug Back Cement
  - Plug 1 10,750' – 9750' 450 sx Class H @ 17.2 ppg / 0.98 cf/sx

*** Plug Back Cement volumes based on 8-3/4" bit size + 5% - may be adjusted based on Open Hole Caliper Logs and hole conditions.

- Pressure Control Equipment – No Change. No abnormal pressure anticipated. Estimated BHP at PHTD: 4655 psi. Estimated BHT: 162 deg. No anticipated H2S.
- Mud Program
  - 8-3/4" Pilot Hole Section – 8.6 ppg to 9.2 ppg controlled brine as in the previously approved 8-3/4" Lateral Section. Will use lime for pH control in range of 10 to 11. Will sweep hole with salt gel slugs and polymer as previously approved.
- Testing and Coring Program
  - Pilot Hole TD (10,750') to surface: Gamma Ray/Compensated Neutron
  - Pilot Hole TD (10,750') to Intermediate Casing: Dual Laterolog, Gamma Ray, Compensated Neutron, Density
  - Request Contingency for Sidewall Cores if hole conditions allow.
  - Gyro from KOP (9945') to Surface.
  - 20' Samples from intermediate casing point to PH TD and Lateral TD.

Thanks,

Alex

Alex R. Korzenewski
Sr. Drilling Engineer
COG Operating, LLC
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701
432.683.7443 (main)
432.818.2355 (direct)
325.627.6925 (cell)

Attachments:
Nexus Revised Directional Program with 5.13.15
AC Report Gold Rush 30 Federal Com 1
Revised Plat

CONCHO

COG Operating LLC
Project: Eddy County, NM
Site: Ice Dancer 30 Federal Com
Well: #2H
Wellbore: OH
Plan: Design #1 (#2H/OH)

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	9944.5	0.00	0.00	9944.5	0.0	0.0	0.00	0.00	0.0	
3	10695.7	90.14	350.00	10422.0	471.4	-83.1	12.00	350.00	476.6	
4	11824.1	90.14	350.00	10419.2	1582.6	-279.1	0.00	0.00	1600.0	
5	12273.1	90.14	358.98	10418.1	2029.1	-322.1	2.00	89.97	2048.5	
6	14743.8	90.14	358.98	10412.0	4499.4	-366.1	0.00	0.00	4514.3	PBHL(ID30#2H)

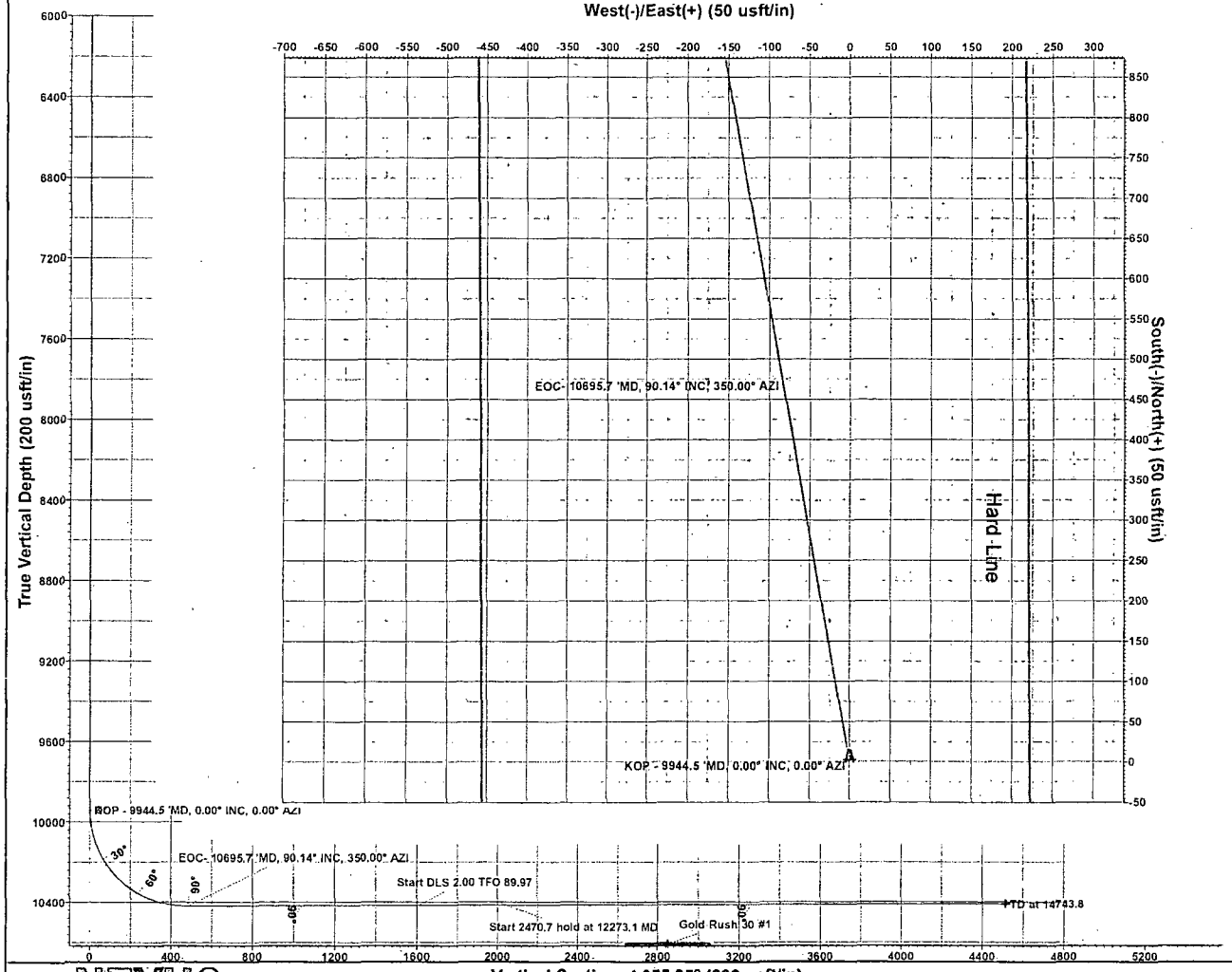
WELL DETAILS: #2H

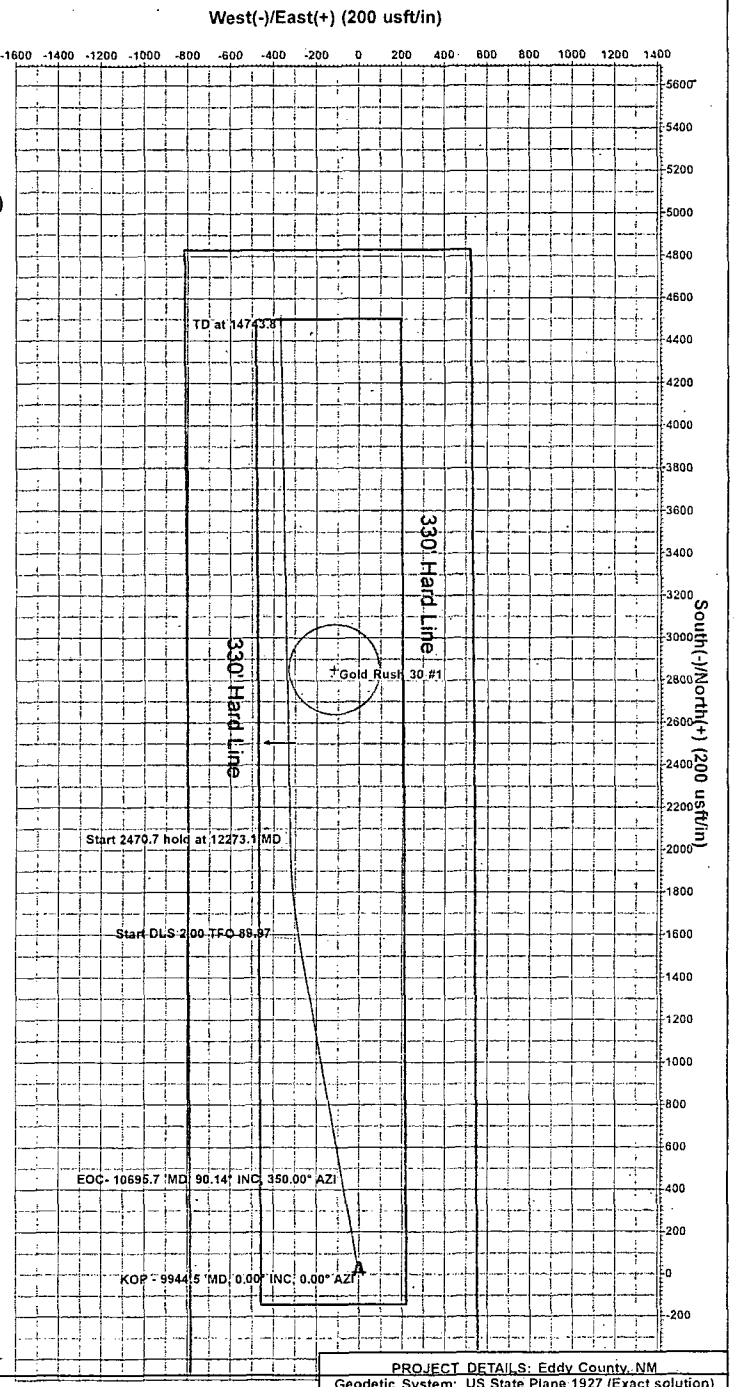
Ground Elevation:: 3071.4
RKB Elevation: WELL @ 3089.4usft (Original Well Elev)
Rig Name: Original Well Elev

Northing	Easting	Latitude	Longitude
462097.70	628422.30	32° 16' 11.064 N	103° 55' 4.229 W

Azimuths to Grid North
True North: -0.22°
Magnetic North: 7.05°

Magnetic Field
Strength: 48222.2snT
Dip Angle: 60.07°
Date: 4/29/2015





NEXUS DIRECTIONAL SOLUTIONS, L.P.

Nexus Directional Solutions

PROJECT DETAILS: Eddy County, NM
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid

CONCHO

COG Operating LLC

Eddy County, NM
Ice Dancer 30 Federal Com
#2H

OH

Plan: Design #1

Standard Planning Report

29 April, 2015

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well #2H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3089.4usft (Original Well Elev)
Project:	Eddy County, NM	**MD Reference:**	WELL @ 3089.4usft (Original Well Elev)
Site:	Ice Dancer 30 Federal Com	**North Reference:**	Grid
Well:	#2H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

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 Ice Dancer 30 Federal Com

Site Position:		**Northing:**	462,097.70 usft	**Latitude:**	32° 16' 11.064 N
From:	Map	**Easting:**	628,422.30 usft	**Longitude:**	103° 55' 4.229 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.22 °

Well #2H

Well Position	**+N/-S**	0.0 usft	**Northing:**	462,097.70 usft	**Latitude:**	32° 16' 11.064 N
	+E/-W	0.0 usft	**Easting:**	628,422.30 usft	**Longitude:**	103° 55' 4.229 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**		**Ground Level:**	3,071.4 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/29/2015	7.27	60.07	48,222

Design Design #1

Audit Notes:

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

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	355.35

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
9,944.5	0.00	0.00	9,944.5	0.0	0.0	0.00	0.00	0.00	0.00	
10,695.7	90.14	350.00	10,422.0	471.4	-83.1	12.00	12.00	0.00	350.00	
11,824.1	90.14	350.00	10,419.2	1,582.6	-279.1	0.00	0.00	0.00	0.00	
12,273.1	90.14	358.98	10,418.1	2,029.1	-322.1	2.00	0.00	2.00	89.97	
14,743.8	90.14	358.98	10,412.0	4,499.4	-366.1	0.00	0.00	0.00	0.00	PBHL(ID30#2H)

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well #2H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3089.4usft (Original Well Elev)
Project:	Eddy County, NM	**MD Reference:**	WELL @ 3089.4usft (Original Well Elev)
Site:	Ice Dancer 30 Federal Com	**North Reference:**	Grid
Well:	#2H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well #2H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3089.4usft (Original Well Elev)
Project:	Eddy County, NM	**MD Reference:**	WELL @ 3089.4usft (Original Well Elev)
Site:	Ice Dancer 30 Federal Com	**North Reference:**	Grid
Well:	#2H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	0.00	0.00	0.00
7,800.0	0.00	0.00	7,800.0	0.0	0.0	0.0	0.00	0.00	0.00
7,900.0	0.00	0.00	7,900.0	0.0	0.0	0.0	0.00	0.00	0.00
8,000.0	0.00	0.00	8,000.0	0.0	0.0	0.0	0.00	0.00	0.00
8,100.0	0.00	0.00	8,100.0	0.0	0.0	0.0	0.00	0.00	0.00
8,200.0	0.00	0.00	8,200.0	0.0	0.0	0.0	0.00	0.00	0.00
8,300.0	0.00	0.00	8,300.0	0.0	0.0	0.0	0.00	0.00	0.00
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00
8,600.0	0.00	0.00	8,600.0	0.0	0.0	0.0	0.00	0.00	0.00
8,700.0	0.00	0.00	8,700.0	0.0	0.0	0.0	0.00	0.00	0.00
8,800.0	0.00	0.00	8,800.0	0.0	0.0	0.0	0.00	0.00	0.00
8,900.0	0.00	0.00	8,900.0	0.0	0.0	0.0	0.00	0.00	0.00
9,000.0	0.00	0.00	9,000.0	0.0	0.0	0.0	0.00	0.00	0.00
9,100.0	0.00	0.00	9,100.0	0.0	0.0	0.0	0.00	0.00	0.00
9,200.0	0.00	0.00	9,200.0	0.0	0.0	0.0	0.00	0.00	0.00
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	0.00	0.00	0.00
9,400.0	0.00	0.00	9,400.0	0.0	0.0	0.0	0.00	0.00	0.00
9,500.0	0.00	0.00	9,500.0	0.0	0.0	0.0	0.00	0.00	0.00
9,600.0	0.00	0.00	9,600.0	0.0	0.0	0.0	0.00	0.00	0.00
9,700.0	0.00	0.00	9,700.0	0.0	0.0	0.0	0.00	0.00	0.00
9,800.0	0.00	0.00	9,800.0	0.0	0.0	0.0	0.00	0.00	0.00
9,900.0	0.00	0.00	9,900.0	0.0	0.0	0.0	0.00	0.00	0.00
9,944.5	0.00	0.00	9,944.5	0.0	0.0	0.0	0.00	0.00	0.00
KOP - 9944.5 MD, 0.00° INC, 0.00° AZI									
9,950.0	0.66	350.00	9,950.0	0.0	0.0	0.0	12.00	12.00	0.00
9,975.0	3.66	350.00	9,975.0	1.0	-0.2	1.0	12.00	12.00	0.00
10,000.0	6.66	350.00	9,999.9	3.2	-0.6	3.2	12.00	12.00	0.00
10,025.0	9.66	350.00	10,024.6	6.7	-1.2	6.7	12.00	12.00	0.00
10,050.0	12.66	350.00	10,049.1	11.4	-2.0	11.6	12.00	12.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well #2H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3089.4usft (Original Well Elev)
Project:	Eddy County, NM	**MD Reference:**	WELL @ 3089.4usft (Original Well Elev)
Site:	Ice Dancer 30 Federal Com	**North Reference:**	Grid
Well:	#2H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,075.0	15.66	350.00	10,073.4	17.5	-3.1	17.6	12.00	12.00	0.00
10,100.0	18.66	350.00	10,097.3	24.7	-4.4	25.0	12.00	12.00	0.00
10,125.0	21.66	350.00	10,120.7	33.2	-5.9	33.6	12.00	12.00	0.00
10,150.0	24.66	350.00	10,143.7	42.9	-7.6	43.4	12.00	12.00	0.00
10,175.0	27.66	350.00	10,166.2	53.7	-9.5	54.3	12.00	12.00	0.00
10,200.0	30.66	350.00	10,188.0	65.7	-11.6	66.5	12.00	12.00	0.00
10,225.0	33.66	350.00	10,209.1	78.8	-13.9	79.7	12.00	12.00	0.00
10,250.0	36.66	350.00	10,229.6	93.0	-16.4	94.0	12.00	12.00	0.00
10,275.0	39.66	350.00	10,249.2	108.2	-19.1	109.4	12.00	12.00	0.00
10,300.0	42.66	350.00	10,268.1	124.4	-21.9	125.8	12.00	12.00	0.00
10,325.0	45.66	350.00	10,286.0	141.6	-25.0	143.1	12.00	12.00	0.00
10,350.0	48.66	350.00	10,303.0	159.6	-28.1	161.4	12.00	12.00	0.00
10,375.0	51.66	350.00	10,319.0	178.5	-31.5	180.5	12.00	12.00	0.00
10,400.0	54.66	350.00	10,334.0	198.2	-35.0	200.4	12.00	12.00	0.00
10,425.0	57.66	350.00	10,347.9	218.7	-38.6	221.1	12.00	12.00	0.00
10,450.0	60.66	350.00	10,360.7	239.8	-42.3	242.4	12.00	12.00	0.00
10,475.0	63.66	350.00	10,372.4	261.6	-46.1	264.4	12.00	12.00	0.00
10,500.0	66.65	350.00	10,382.9	283.9	-50.1	287.0	12.00	12.00	0.00
10,525.0	69.65	350.00	10,392.2	306.8	-54.1	310.1	12.00	12.00	0.00
10,550.0	72.65	350.00	10,400.3	330.1	-58.2	333.7	12.00	12.00	0.00
10,575.0	75.65	350.00	10,407.1	353.7	-62.4	357.6	12.00	12.00	0.00
10,600.0	78.65	350.00	10,412.7	377.7	-66.6	381.9	12.00	12.00	0.00
10,625.0	81.65	350.00	10,416.9	402.0	-70.9	406.4	12.00	12.00	0.00
10,650.0	84.65	350.00	10,419.9	426.4	-75.2	431.1	12.00	12.00	0.00
10,675.0	87.65	350.00	10,421.6	451.0	-79.5	456.0	12.00	12.00	0.00
10,695.7	90.14	350.00	10,422.0	471.4	-83.1	476.6	12.00	12.00	0.00
EOC- 10695.7 MD, 90.14° INC, 350.00° AZI									
10,700.0	90.14	350.00	10,422.0	475.6	-83.9	480.8	0.00	0.00	0.00
10,800.0	90.14	350.00	10,421.7	574.1	-101.2	580.4	0.00	0.00	0.00
10,900.0	90.14	350.00	10,421.5	672.6	-118.6	680.0	0.00	0.00	0.00
11,000.0	90.14	350.00	10,421.3	771.0	-136.0	779.5	0.00	0.00	0.00
11,100.0	90.14	350.00	10,421.0	869.5	-153.3	879.1	0.00	0.00	0.00
11,200.0	90.14	350.00	10,420.8	968.0	-170.7	978.7	0.00	0.00	0.00
11,300.0	90.14	350.00	10,420.5	1,066.5	-188.1	1,078.2	0.00	0.00	0.00
11,400.0	90.14	350.00	10,420.3	1,165.0	-205.4	1,177.8	0.00	0.00	0.00
11,500.0	90.14	350.00	10,420.0	1,263.5	-222.8	1,277.4	0.00	0.00	0.00
11,600.0	90.14	350.00	10,419.8	1,361.9	-240.1	1,376.9	0.00	0.00	0.00
11,700.0	90.14	350.00	10,419.5	1,460.4	-257.5	1,476.5	0.00	0.00	0.00
11,800.0	90.14	350.00	10,419.3	1,558.9	-274.9	1,576.0	0.00	0.00	0.00
11,824.1	90.14	350.00	10,419.2	1,582.6	-279.1	1,600.0	0.00	0.00	0.00
Start DLS 2.00 TFO 89.97									
11,900.0	90.14	351.52	10,419.1	1,657.5	-291.2	1,675.7	2.00	0.00	2.00
12,000.0	90.14	353.52	10,418.8	1,756.7	-304.3	1,775.6	2.00	0.00	2.00
12,100.0	90.14	355.52	10,418.6	1,856.2	-313.8	1,875.6	2.00	0.00	2.00
12,200.0	90.14	357.52	10,418.3	1,956.0	-319.9	1,975.5	2.00	0.00	2.00
12,273.1	90.14	358.98	10,418.1	2,029.1	-322.1	2,048.5	2.00	0.00	2.00
Start 2470.7 hold at 12273.1 MD									
12,300.0	90.14	358.98	10,418.1	2,056.0	-322.6	2,075.4	0.00	0.00	0.00
12,400.0	90.14	358.98	10,417.8	2,156.0	-324.4	2,175.2	0.00	0.00	0.00
12,500.0	90.14	358.98	10,417.6	2,256.0	-326.2	2,275.0	0.00	0.00	0.00
12,600.0	90.14	358.98	10,417.3	2,355.9	-327.9	2,374.8	0.00	0.00	0.00
12,700.0	90.14	358.98	10,417.1	2,455.9	-329.7	2,474.6	0.00	0.00	0.00
12,800.0	90.14	358.98	10,416.8	2,555.9	-331.5	2,574.4	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well #2H
Company:	COG Operating LLC	**TVD Reference:**	WELL @ 3089.4usft (Original Well Elev)
Project:	Eddy County, NM	**MD Reference:**	WELL @ 3089.4usft (Original Well Elev)
Site:	Ice Dancer 30 Federal Com	**North Reference:**	Grid
Well:	#2H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,900.0	90.14	358.98	10,416.6	2,655.9	-333.3	2,674.2	0.00	0.00	0.00
13,000.0	90.14	358.98	10,416.3	2,755.9	-335.1	2,774.0	0.00	0.00	0.00
13,089.1	90.14	358.98	10,416.1	2,845.0	-336.6	2,862.9	0.00	0.00	0.00
Gold Rush 30 #1									
13,100.0	90.14	358.98	10,416.1	2,855.9	-336.8	2,873.8	0.00	0.00	0.00
13,200.0	90.14	358.98	10,415.8	2,955.8	-338.6	2,973.6	0.00	0.00	0.00
13,300.0	90.14	358.98	10,415.6	3,055.8	-340.4	3,073.4	0.00	0.00	0.00
13,400.0	90.14	358.98	10,415.3	3,155.8	-342.2	3,173.2	0.00	0.00	0.00
13,500.0	90.14	358.98	10,415.1	3,255.8	-344.0	3,273.0	0.00	0.00	0.00
13,600.0	90.14	358.98	10,414.8	3,355.8	-345.7	3,372.8	0.00	0.00	0.00
13,700.0	90.14	358.98	10,414.6	3,455.8	-347.5	3,472.6	0.00	0.00	0.00
13,800.0	90.14	358.98	10,414.3	3,555.7	-349.3	3,572.4	0.00	0.00	0.00
13,900.0	90.14	358.98	10,414.1	3,655.7	-351.1	3,672.2	0.00	0.00	0.00
14,000.0	90.14	358.98	10,413.8	3,755.7	-352.9	3,772.0	0.00	0.00	0.00
14,100.0	90.14	358.98	10,413.6	3,855.7	-354.6	3,871.8	0.00	0.00	0.00
14,200.0	90.14	358.98	10,413.4	3,955.7	-356.4	3,971.6	0.00	0.00	0.00
14,300.0	90.14	358.98	10,413.1	4,055.7	-358.2	4,071.4	0.00	0.00	0.00
14,400.0	90.14	358.98	10,412.9	4,155.6	-360.0	4,171.2	0.00	0.00	0.00
14,500.0	90.14	358.98	10,412.6	4,255.6	-361.8	4,271.0	0.00	0.00	0.00
14,600.0	90.14	358.98	10,412.4	4,355.6	-363.5	4,370.8	0.00	0.00	0.00
14,700.0	90.14	358.98	10,412.1	4,455.6	-365.3	4,470.6	0.00	0.00	0.00
14,743.8	90.14	358.98	10,412.0	4,499.4	-366.1	4,514.3	0.00	0.00	0.00
TD at 14743.8 - PBHL(ID30#2H)									

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(ID30#2H) - plan hits target center - Point	0.00	0.00	10,412.0	4,499.4	-366.1	466,597.10	628,056.20	32° 16' 55.604 N	103° 55' 8.291 W
Gold Rush 30 #1 - plan misses target center by 293.7usft at 13089.1usft MD (10416.1 TVD, 2845.0 N, -336.6 E) - Circle (radius 212.0)	0.00	0.00	10,610.0	2,849.4	-116.1	464,947.10	628,306.20	32° 16' 39.266 N	103° 55' 5.453 W

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
9,944.5	9,944.5	0.0	0.0	KOP - 9944.5 'MD, 0.00° INC, 0.00° AZI
10,695.7	10,422.0	471.4	-83.1	EOC- 10695.7 'MD, 90.14° INC, 350.00° AZI
11,824.1	10,419.2	1,582.6	-279.1	Start DLS 2.00 TFO 89.97
12,273.1	10,418.1	2,029.1	-322.1	Start 2470.7 hold at 12273.1 MD
14,743.8	10,412.0	4,499.4	-366.1	TD at 14743.8

COG Operating LLC

Eddy County, NM
Ice Dancer 30 Federal Com
#2H

OH
Design #1

Anticollision Report

13 May, 2015

Anticollision Report

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #2H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3089.4usft (Original Well Elev)
Reference Site:	Ice Dancer 30 Federal Com	**MD Reference:**	WELL @ 3089.4usft (Original Well Elev)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#2H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #1	**Offset TVD Reference:**	Offset Datum

Reference Design #1

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 separation factor of 20.00	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	**Casing Method:**	Not applied

Survey Tool Program **Date** 4/29/2015

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	14,743.8	Design #1 (OH)	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
Gold Rush 30						
#2 - OH - OH	13,091.5	10,432.5	12.7	-65.4	0.163	Level 1, CC, ES, SF

Offset Design Gold Rush 30 - #2 - OH - OH — Offset Site Error: 0.0 usft

Survey Program: 1146-MWD — Offset Well Error: 0.0 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)	Highside Toolface (°)	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
11,900.0	10,419.1	10,434.4	10,431.9	39.1	21.2	90.87	2,849.4	-324.2	1,192.3	1,132.3	59.98	19.877	
12,000.0	10,418.8	10,434.5	10,432.0	40.5	21.2	91.24	2,849.4	-324.2	1,092.9	1,031.6	61.35	17.815	
12,100.0	10,418.6	10,434.4	10,431.9	41.9	21.2	91.90	2,849.4	-324.2	993.2	930.5	62.69	15.843	
12,200.0	10,418.3	10,434.3	10,431.8	43.3	21.2	93.53	2,849.4	-324.2	893.4	829.4	63.97	13.966	
12,273.1	10,418.1	10,434.2	10,431.7	44.4	21.2	99.02	2,849.4	-324.2	820.4	755.9	64.48	12.722	
12,300.0	10,418.1	10,434.1	10,431.6	44.8	21.2	98.77	2,849.4	-324.2	793.4	728.5	64.91	12.223	
12,400.0	10,417.8	10,433.9	10,431.4	46.3	21.2	97.83	2,849.4	-324.2	693.4	626.9	66.54	10.421	
12,500.0	10,417.6	10,433.7	10,431.2	47.9	21.2	96.89	2,849.4	-324.2	593.4	525.3	68.19	8.703	
12,600.0	10,417.3	10,433.5	10,431.0	49.4	21.2	95.94	2,849.4	-324.2	493.5	423.6	69.84	7.065	
12,700.0	10,417.1	10,433.3	10,430.8	51.0	21.2	95.00	2,849.4	-324.2	393.5	322.0	71.51	5.503	
12,800.0	10,416.8	10,433.1	10,430.6	52.6	21.2	94.05	2,849.4	-324.2	293.6	220.4	73.18	4.012	
12,900.0	10,416.6	10,432.9	10,430.4	54.2	21.2	93.09	2,849.4	-324.2	193.7	118.9	74.86	2.588	
13,000.0	10,416.3	10,432.7	10,430.2	55.9	21.2	92.14	2,849.4	-324.2	94.2	17.6	76.54	1.230	Level 2
13,091.5	10,416.1	10,432.5	10,430.0	57.4	21.2	91.27	2,849.4	-324.1	12.7	-65.4	78.07	0.163	Level 1, CC, ES, SF
13,100.0	10,416.1	10,432.5	10,430.0	57.5	21.2	91.19	2,849.4	-324.1	14.2	-64.0	78.21	0.182	Level 1
13,200.0	10,415.8	10,432.3	10,429.7	59.2	21.2	90.23	2,849.4	-324.1	107.4	27.5	79.88	1.345	Level 3
13,300.0	10,415.6	10,432.0	10,429.5	60.9	21.2	89.28	2,849.4	-324.1	207.1	125.5	81.55	2.539	
13,400.0	10,415.3	10,431.8	10,429.3	62.5	21.2	88.33	2,849.4	-324.1	306.9	223.7	83.21	3.689	
13,500.0	10,415.1	10,431.6	10,429.1	64.2	21.2	87.38	2,849.4	-324.1	406.9	322.0	84.86	4.795	
13,600.0	10,414.8	10,431.4	10,428.9	65.9	21.2	86.43	2,849.4	-324.1	506.8	420.3	86.49	5.860	
13,700.0	10,414.6	10,431.2	10,428.7	67.6	21.2	85.48	2,849.4	-324.1	606.8	518.7	88.12	6.886	
13,800.0	10,414.3	10,431.0	10,428.5	69.3	21.2	84.54	2,849.4	-324.1	706.8	617.1	89.73	7.877	
13,900.0	10,414.1	10,430.8	10,428.3	71.0	21.2	83.60	2,849.4	-324.1	806.8	715.5	91.32	8.834	
14,000.0	10,413.8	10,430.6	10,428.1	72.7	21.2	82.67	2,849.4	-324.1	906.8	813.9	92.90	9.761	
14,100.0	10,413.6	10,430.4	10,427.9	74.5	21.2	81.74	2,849.4	-324.1	1,006.8	912.3	94.46	10.658	
14,200.0	10,413.4	10,430.2	10,427.7	76.2	21.2	80.81	2,849.4	-324.1	1,106.8	1,010.8	96.00	11.529	

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

Anticollision Report

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well #2H
Project:	Eddy County, NM	**TVD Reference:**	WELL @ 3089.4usft (Original Well Elev)
Reference Site:	Ice Dancer 30 Federal Com	**MD Reference:**	WELL @ 3089.4usft (Original Well Elev)
Site Error:	0.0 usft	**North Reference:**	Grid
Reference Well:	#2H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.1 Single User Db
Reference Design:	Design #1	**Offset TVD Reference:**	Offset Datum

Offset Design Gold Rush 30 - #2 - OH - OH — Offset Site Error: 0.0 usft

Survey Program: 1146-MWD — Offset Well Error: 0.0 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)	Highside Toolface (°)	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
14,300.0	10,413.1	10,430.0	10,427.4	77.9	21.2	79.89	2,849.4	-324.1	1,206.7	1,109.2	97.52	12.375	
14,400.0	10,412.9	10,429.7	10,427.2	79.7	21.2	78.93	2,849.4	-324.1	1,306.7	1,207.7	99.02	13.197	
14,500.0	10,412.6	10,429.5	10,427.0	81.4	21.2	78.07	2,849.4	-324.1	1,406.7	1,306.2	100.49	13.998	
14,600.0	10,412.4	10,429.3	10,426.8	83.2	21.2	77.17	2,849.4	-324.1	1,506.7	1,404.8	101.95	14.780	
14,700.0	10,412.1	10,429.1	10,426.6	84.9	21.2	76.28	2,849.4	-324.1	1,606.7	1,503.4	103.38	15.542	
14,743.8	10,412.0	10,429.0	10,426.5	85.7	21.2	75.89	2,849.4	-324.1	1,650.5	1,546.5	104.00	15.871	

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG OPERATING
LEASE NO.:	NM93205
WELL NAME & NO.:	Ice Dancer 30 Federal 2H
SURFACE HOLE FOOTAGE:	475' FSL & 1890' FEL
BOTTOM HOLE FOOTAGE	375' FNL & 1980' FEL
LOCATION:	Section 30, T.23S., R.30E., NMPM
COUNTY:	Eddy County, New Mexico
API:	30-015-39473

A. DRILLING OPERATIONS REQUIREMENTS

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

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

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

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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

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

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

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 Potash Areas:
After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log.

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

Secretary's Potash
High Cave/Karst.
Possible water flows in the Salado, Castile, Delaware and Bone Spring
Possible lost circulation in the Delaware and Bone Spring.

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.

1. The **13-3/8** inch surface casing shall be set at approximately **225** feet (in a competent bed and above the salt) and cemented to the surface.

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

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

The pilot hole plugging procedure is approved as written. Note plug top on Subsequent Report sundry of drilling activities.

Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.

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

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

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

C. PRESSURE CONTROL

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

2. 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.

    a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.

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

    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 (18 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.

    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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