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Form 3160-3
(June 2015)

HOBBS OCD

AUG 09 2019

RECEIVED

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMLC0054687

6. If Indian, Allotee or Tribe Name

1a. Type of work: [✓] DRILL [ ] REENTER

1b. Type of Well: [✓] Oil Well [ ] Gas Well [ ] Other

1c. Type of Completion: [ ] Hydraulic Fracturing [✓] Single Zone [ ] Multiple Zone

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

8. Lease Name and Well No.
NELSON FEDERAL COM
14H (317447)

2. Name of Operator
COG OPERATING LLC (229137)

9. API Well No.
30-025-46285

3a. Address
600 West Illinois Ave Midland TX 79701

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

10. Field and Pool, or Exploratory
MALJAMAR / YESO, WEST (44500)

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

At surface NESW / 2358 FSL / 2065 FWL / LAT 32.8338319 / LONG -103.7561308

At proposed prod. zone NENW / 10 FNL / 2310 FWL / LAT 32.8563383 / LONG -103.7553355

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 15 / T17S / R32E / NMP

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

12. County or Parish
LEA

13. State
NM

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

16. No of acres in lease
400

17. Spacing Unit dedicated to this well
240

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

19. Proposed Depth
5647 feet / 13428 feet

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

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
4045 feet

22. Approximate date work will start*
02/22/2018

23. Estimated duration
23 days

24. Attachments

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

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

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Robyn Odom / Ph: (432)685-4385	09/27/2017

Title
Regulatory Analyst

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	09/26/2018

Title	Office
Assistant Field Manager Lands & Minerals	CARLSBAD

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

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

GCP Rec 08/09/19

APPROVED WITH CONDITIONS

Approval Date: 09/26/2018

KN 08/09/19

(Continued on page 2)

*(Instructions on page 2)

INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM I: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the wen, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionany drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service wen or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

ROUTINE USE: Information from the record and/or the record win be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

EFFECT OE NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM conects this information to anow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Conection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

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Additional Operator Remarks

Location of Well

1. SHL: NESW / 2358 FSL / 2065 FWL / TWSP: 17S / RANGE: 32E / SECTION: 15 / LAT: 32.8338319 / LONG: -103.7561308 (TVD: 0 feet, MD: 0 feet)
   PPP: NESW / 2358 FSL / 2065 FWL / TWSP: 17S / RANGE: 32E / SECTION: 15 / LAT: 32.8338319 / LONG: -103.7561308 (TVD: 5575 feet, MD: 5600 feet)
   BHL: NENW / 10 FNL / 2310 FWL / TWSP: 17S / RANGE: 32E / SECTION: 10 / LAT: 32.8563383 / LONG: -103.7553355 (TVD: 5647 feet, MD: 13428 feet)

BLM Point of Contact

Name: Judith Yeager
Title: Legal Instruments Examiner
Phone: 5752345936
Email: jyeager@blm.gov

Approval Date: 09/26/2018

Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

PECOS DISTRICT
DRILLING OPERATIONS
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**COG Operating, LLC**
LEASE NO.:	**NMLC-0054687**
WELL NAME & NO.:	**Nelson Federal Com 14H**
SURFACE HOLE FOOTAGE:	**2358' FSL & 2065' FWL**
BOTTOM HOLE FOOTAGE	**0010' FNL & 2310' FWL Sec. 10, T. 17 S., R 32 E.**
LOCATION:	**Section 15, T. 17 S., R 32 E., NMPM**
COUNTY:	**County, New Mexico**

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

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)

☐ **Lea County**
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 3933612

A. **Hydrogen Sulfide**

1. A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **Yates** 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, please 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. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.

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

B. **CASING**

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

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

Wait on cement (WOC) for Water Basin:

After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements.

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

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

Possibility of water flows in the Artesia Group, Salado, and Queen.
Possibility of lost circulation in the Artesia Group, Red Beds, Rustler, Grayburg, and San Andres.

1. The **13-3/8** inch surface casing shall be set at approximately **1010** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt.**

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

    b. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**

    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

    d. If cement falls back, remedial cementing will be done prior to drilling out that string.

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

Option #1 (Single Stage):

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

Option #2 (DV Tool):

DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range. If an ECP is used, it is to be set a minimum of 50' below the shoe to provide cement across the shoe. If it cannot be set below the shoe, a CBL shall be run to verify cement coverage.

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 should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification. **Excess calculates to 24% - Additional cement may be required.**

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 **7 X 5-1/2** inch production casing is:

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 0% - Additional cement may be required.**

Option #2 (DV Tool):

DV tool shall be set a minimum of 50' below previous shoe and 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 approved top of cement on the next stage.

b. Second 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 53.

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 psi.

4. The appropriate BLM office shall be notified a minimum of 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).

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

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

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

    d. 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.**

    e. 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.

JAM 053018

PECOS DISTRICT
DRILLING OPERATIONS
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating, LLC
LEASE NO.:	NMLC054687
WELL NAME & NO.:	24H- Nelson Federal Com
SURFACE HOLE FOOTAGE:	2188'/S & 2065'/W
BOTTOM HOLE FOOTAGE	10'/N & 2310'/W
LOCATION:	Section 15, T.17 S., R.32 E., NMPM
COUNTY:	Lea County, New Mexico

In addition:
Well Name & No: 14H Nelson Federal Com
Surface Hole Footage: NESW, 2358' FSL, 2065' FWL
Bottom Hole Footage: NENW, 10' FNL, 2310' FWL

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, please 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 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 of water flows in the Queen, Salado, and Artesia Group.
Possibility of lost circulation in the Rustler, Grayburg, Red Beds, Artesia Group, and San Andres.

1. The **13-3/8** inch surface casing shall be set at approximately **1040** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.

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

    b. **Wait on cement (WOC) time for a primary cement job 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.

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

☐ 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 53.

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be psi. **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. The appropriate BLM office shall be notified a minimum of 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).

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

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

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

d. 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.**

e. 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.

F. SPECIAL REQUIREMENT(S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will

include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.

- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.

- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

MHH 02242017

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating, LLC
LEASE NO.:	NMLC054687
WELL NAME & NO.:	24H- Nelson Federal Com
SURFACE HOLE FOOTAGE:	2188'/S & 2065'/W
BOTTOM HOLE FOOTAGE	10'/N & 2310'/W
LOCATION:	Section 15, T.17 S., R.32 E., NMPM
COUNTY:	Lea County, New Mexico

In addition:
Well Name & No: 14H Nelson Federal Com
Surface Hole Footage: NESW, 2358' FSL, 2065' FWL
Bottom Hole Footage: NENW, 10' FNL, 2310' FWL

TABLE OF CONTENTS

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

I. GENERAL PROVISIONS

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

II. PERMIT EXPIRATION

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

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

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

IV. NOXIOUS WEEDS

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

V. SPECIAL REQUIREMENT(S)

Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

Below Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

Barrier Fence

A fence must be installed on the North side of the location to protect the sand dunes.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the at least 3 working days prior to commencing construction of the access road and/or well pad.

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

B. TOPSOIL

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

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the .

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

F. EXCLOSURE FENCING (CELLARS & PITS)

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

G. ON LEASE ACCESS ROADS

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

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

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

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

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

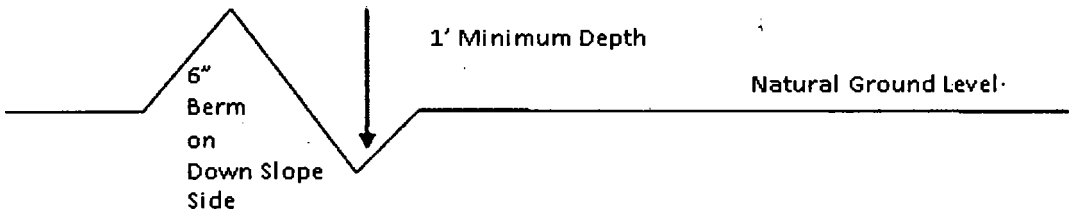
Ditching
Ditching shall be required on both sides of the road.

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

Drainage

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

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



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

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

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

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

Construction Steps

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

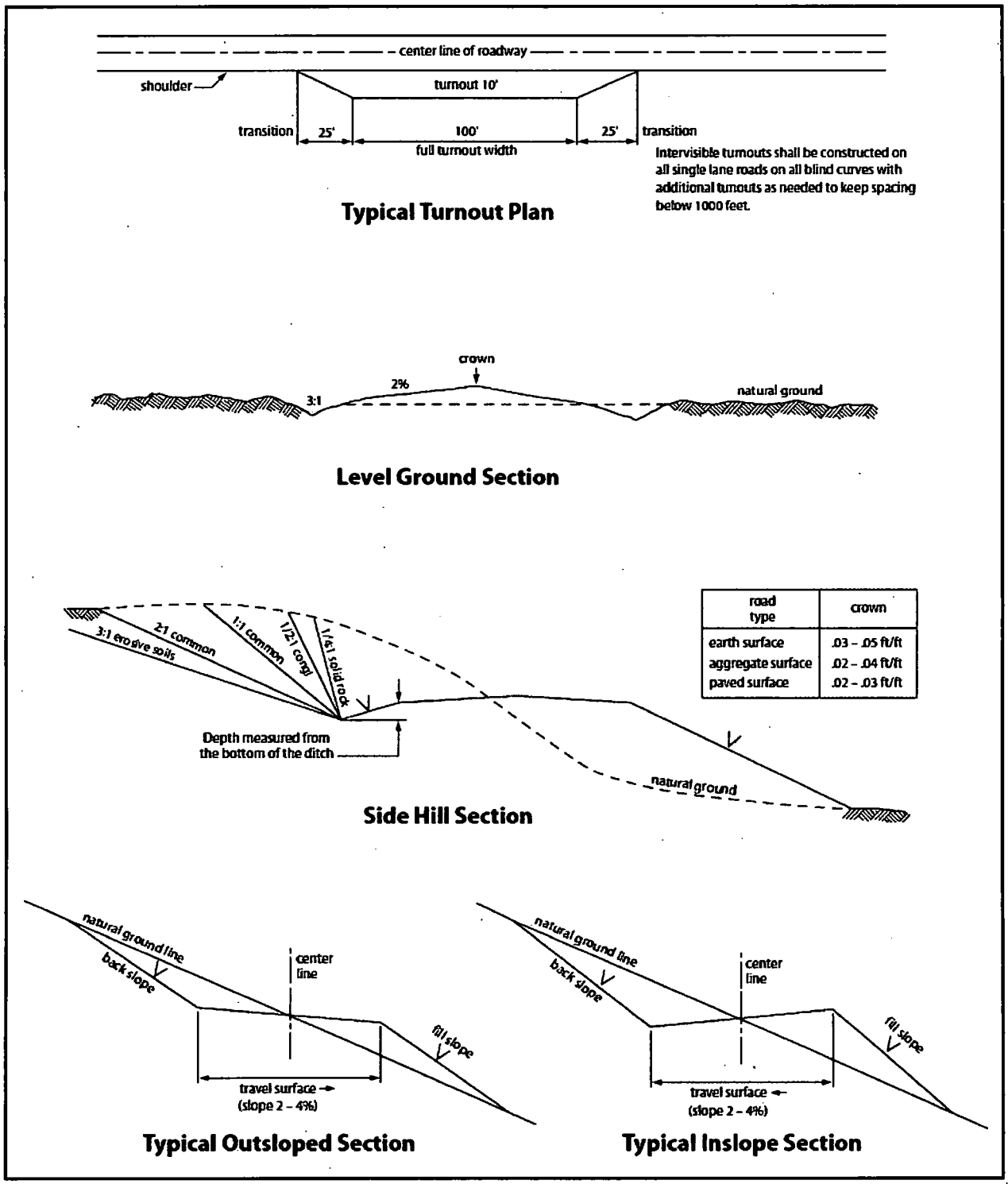


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

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

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

Containment Structures
Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the

largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

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

B. Electric Line

STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES

A copy of the grant and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. There will be no clearing or blading of the right-of-way unless otherwise agreed to in

writing by the Authorized Officer.

5. Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006 . The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

Raptor deterrence will consist of but not limited to the following: triangle perch discouragers shall be placed on each side of the cross arms and a nonconductive perching deterrence shall be placed on all vertical poles that extend past the cross arms.

6. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

7. The BLM serial number assigned to this authorization shall be posted in a permanent, conspicuous manner where the power line crosses roads and at all serviced facilities. Numbers will be at least two inches high and will be affixed to the pole nearest the road crossing and at the facilities served.

8. Upon cancellation, relinquishment, or expiration of this grant, the holder shall comply with those abandonment procedures as prescribed by the Authorized Officer.

9. All surface structures (poles, lines, transformers, etc.) shall be removed within 180 days of abandonment, relinquishment, or termination of use of the serviced facility or facilities or within 180 days of abandonment, relinquishment, cancellation, or expiration of this grant, whichever comes first. This will not apply where the power line extends service to an active, adjoining facility or facilities.

10. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and

any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

11. Special Stipulations:
    - For reclamation remove poles, lines, transformer, etc. and dispose of properly.
    - Fill in any holes from the poles removed.

Timing Limitation Stipulation/Condition of Approval for Lesser Prairie-Chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

VIII. INTERIM RECLAMATION

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

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

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

loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

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

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

IX. FINAL ABANDONMENT & RECLAMATION

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

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

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

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

Below Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

Seed Mixture for LPC Sand/Shinnery Sites

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

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

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

Species	lb/acre
Plains Bristlegrass	5lbs/A
Sand Bluestem	5lbs/A
Little Bluestem	3lbs/A
Big Bluestem	6lbs/A
Plains Coreopsis	2lbs/A
Sand Dropseed	1lbs/A

*Pounds of pure live seed:

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

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Operator Certification Data Report

09/27/2018

Operator Certification

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

NAME: Robyn Odom **Signed on:** 09/27/2017

Title: Regulatory Analyst

Street Address: 600 W Illinois Ave

City: Midland **State:** TX **Zip:** 79701

Phone: (432)685-4385

Email address: rodom@concho.com

Field Representative

Representative Name:

Street Address:

City: **State:** **Zip:**

Phone:

Email address:

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Application Data Report
09/27/2018

APD ID: 10400001893 **Submission Date:** 09/27/2017

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

[redacted]

Show Final Text

Well Type: OIL WELL **Well Work Type:** Drill

Section 1 - General

APD ID: 10400001893 **Tie to previous NOS?** **Submission Date:** 09/27/2017

BLM Office: CARLSBAD **User:** Robyn Odom **Title:** Regulatory Analyst

Federal/Indian APD: FED **Is the first lease penetrated for production Federal or Indian?** FED

Lease number: NMLC0054687 **Lease Acres:** 400

Surface access agreement in place? **Allotted?** **Reservation:**

Agreement in place? NO **Federal or Indian agreement:**

Agreement number:

Agreement name:

Keep application confidential? NO

Permitting Agent? NO **APD Operator:** COG OPERATING LLC

Operator letter of designation:

Operator Info

Operator Organization Name: COG OPERATING LLC

Operator Address: 600 West Illinois Ave

Zip: 79701

Operator PO Box:

Operator City: Midland **State:** TX

Operator Phone: (432)683-7443

Operator Internet Address: RODOM@CONCHO.COM

Section 2 - Well Information

Well in Master Development Plan? NO **Mater Development Plan name:**

Well in Master SUPO? NO **Master SUPO name:**

Well in Master Drilling Plan? NO **Master Drilling Plan name:**

Well Name: NELSON FEDERAL COM **Well Number:** 14H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** MALJAMAR **Pool Name:** YESO, WEST

Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Describe other minerals:

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** NO **New surface disturbance?**

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** NELSON FEDERAL COM **Number:** 1

Well Class: HORIZONTAL **Number of Legs:** 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 1.58 Miles **Distance to nearest well:** 24.3 FT **Distance to lease line:** 10 FT

Reservoir well spacing assigned acres Measurement: 240 Acres

Well plat: Nelson_Federal_Com_14H_C102_20170829085536.pdf

Well work start Date: 02/22/2018 **Duration:** 23 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number:

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	2358	FSL	2065	FWL	17S	32E	15	Aliquot NESW	32.8338319	-103.7561308	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0054687	4045	0	0
KOP Leg #1	2358	FSL	2065	FWL	17S	32E	15	Aliquot NESW	32.8338319	-103.7561308	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0054687	-1209	5254	5254
PPP Leg #1	2358	FSL	2065	FWL	17S	32E	15	Aliquot NESW	32.8338319	-103.7561308	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0054687	-1530	5600	5575

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
EXIT Leg #1	100	FNL	2310	FWL	17S	32E	10	Aliquot NENW	32.8563383	-103.7553355	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0064150	-1602	13428	5647
BHL Leg #1	10	FNL	2310	FWL	17S	32E	10	Aliquot NENW	32.8563383	-103.7553355	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0064150	-1602	13428	5647

APD ID: 10400001893 **Submission Date:** 09/27/2017

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Well Type: OIL WELL **Well Work Type:** Drill

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	UNKNOWN	4045	0	0	ALLUVIUM	USEABLE WATER	No
2	RUSTLER	3060	985	985	ANHYDRITE	OTHER : Brackish Water	No
3	TOP OF SALT	2887	1158	1158	SALT	OTHER : Salt	No
4	TANSILL	1855	2190	2190	DOLOMITE	NONE	No
5	YATES	1745	2300	2300	SANDSTONE,DOLOMITE	NATURAL GAS,OIL	No
6	SEVEN RIVERS	1407	2638	2638	SANDSTONE,DOLOMITE	NATURAL GAS,OIL	No
7	QUEEN	775	3270	3270	SANDSTONE	NATURAL GAS,OIL	No
8	GRAYBURG	324	3721	3721	SANDSTONE,DOLOMITE	NATURAL GAS,OIL	No
9	SAN ANDRES	19	4026	4026	DOLOMITE,ANHYDRITE	NATURAL GAS,OIL	No
10	GLORIETA	-1446	5491	5491	SANDSTONE,SILTSTONE	NATURAL GAS,OIL	No
11	PADDOCK	-1515	5560	5560	DOLOMITE	NATURAL GAS,OIL	Yes
12	BLINEBRY	-2031	6076	6076	DOLOMITE	NATURAL GAS,OIL	No

Section 2 - Blowout Prevention

Pressure Rating (PSI): 2M **Rating Depth:** 9500

Equipment: ALL REQUIRED EQUIPMENT PER FEDERAL AND STATE REGULATIONS TO BE IN PLACE PRIOR TO DRILLING OUT THE SURFACE CASING.

Requesting Variance? NO

Variance request:

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

tested. Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

Choke Diagram Attachment:

2M_Choke_Schematic_03-15-2017.pdf

BOP Diagram Attachment:

2M_ANNULAR_BOP_03-15-2017.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	1010	0	1010			1010	H-40	48	STC	1.79	3.28	DRY	8.4	DRY	14.1
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	2320	0	2320			2320	J-55	40	LTC	2.47	1.44	DRY	6.1	DRY	7.4
3	PRODUCTION	8.75	7.0	NEW	API	N	0	5229	0	5229			5229	L-80	29	LTC	3.17	1.33	DRY	3.77	DRY	4.27
4	PRODUCTION	8.75	5.5	NEW	API	N	5229	6047	5229	5739			818	L-80	17	LTC	2.29	1.26	DRY	4.28	DRY	5.03
5	PRODUCTION	7.875	5.5	NEW	API	N	6047	13714	5739	5739			7667	L-80	17	LTC	2.29	1.26	DRY	4.28	DRY	5.03

Casing Attachments

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Design_Attachement_20170926100545.pdf

Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Design_Attachement_20170926100707.pdf

Casing ID: 3 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Design_Attachement_20170926100741.pdf

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Casing Attachments

Casing ID: 4 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Design_Attachement_20170926100819.pdf

Casing ID: 5 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing_Design_Attachement_20170926100858.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	1010	550	1.75	13.5	962.5	76	Class C	4%Gel+2% CaCl2+0.25pps CF
SURFACE	Tail				200	1.32	14.8	264		Class C	2% CaCl2+0.25pps CF
INTERMEDIATE	Lead		0	2320	425	2.45	11.8	1041.25	125	50:50:10 C; Poz:Gel	5%Salt+5pps LCM+0.25pps CF
INTERMEDIATE	Tail				200	1.32	14.8	264		Class C	2% CaCl2
PRODUCTION	Lead		0	5229	600	2.01	12.5	1206	217	35:65:6 C:Poz:Gel	5%Salt+5pps LCM+0.2%SMS+1%FL-

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
											Ba-58+0.3%FL-52A+0.125pps CF
PRODUCTION	Tail		0	5229	400	1.37	14	548		50:50:2 C:Poz:Gel	5%salt+3pps LCM+0.6%SMS+1%FL-25+1%Ba-58+0.125pps
PRODUCTION	Lead		5229	13714	0	0	0	0		Isolation Packers	See Attached Production Cement Breakdown
PRODUCTION	Tail										none
PRODUCTION	Lead		5229	13714	0	0	0	0		Isolation Packers	See Attached Production Cement Breakdown
PRODUCTION	Tail										none

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: SUFFICIENT MUD MATERIALS TO MAINTAIN MUD PROPERTIES AND MEET MINIMUM LOST CIRCULATION AND WEIGHT INCREASE REQUIREMENTS WILL BE KEPT ON LOCATION AT ALL TIMES.
Describe the mud monitoring system utilized: PVT/PASON/VISUAL MONITORING

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	1010	WATER-BASED MUD	8.6	8.8							

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	5229	SALT SATURATED	10	10.2							
5229	13714	WATER-BASED MUD	8.5	9.2							

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

INTERVAL PERFORATING, FRACTURE STIMULATING, FLOW BACK TESTING.

List of open and cased hole logs run in the well:

CNL,MUDLOG

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 2525 **Anticipated Surface Pressure:** 1282.66

Anticipated Bottom Hole Temperature(F): 113

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

H2S_Plan_07-06-2017.pdf

Nelson_Federal_Com_14H_H2S_Schematic_07-06-2017.pdf

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Nelson_Federal_COM_14H_L1_p1_20170922095356.pdf

Other proposed operations facets description:

7" to be run from surface to kickoff point and changed over to 5 ½" with DV Tool and ECP at kickoff point. 5 ½" casing will be run from kickoff point to td and isolation packers set throughout curve and lateral. 7" to be cemented from kickoff point to surface.

Other proposed operations facets attachment:

Closed_Loop_Schematic_07-03-2017.pdf

Nelson_Federal_Com_14H_GCP_20170911084036.pdf

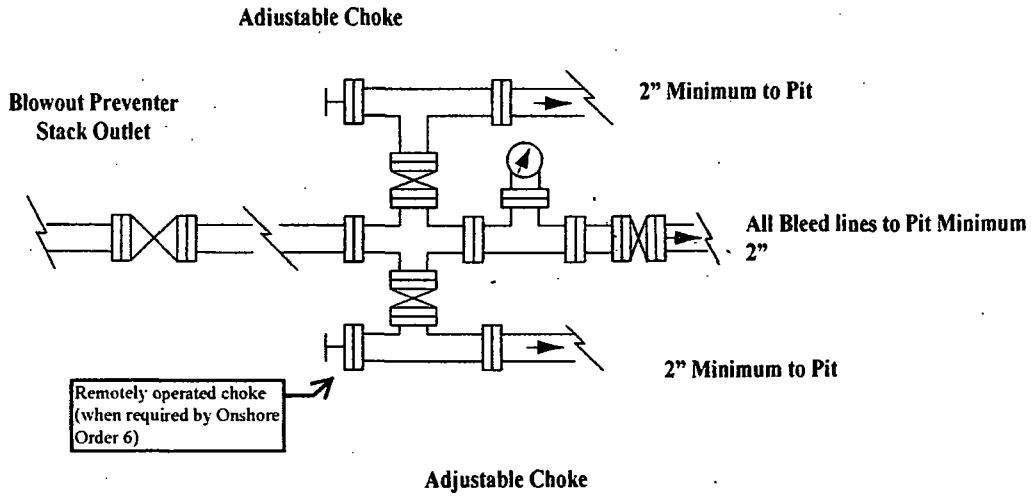
Nelson_Fed_Com_14H_Production_Cement_Breakdown_20170927070214.pdf

Nelson_14H_Contingent_Multi_Stage_Cmt_Plan_20170927070518.pdf

Other Variance attachment:

COG Operating LLC
Exhibit #9
Choke Schematic

Choke Manifold Requirement (2000 psi WP)



NOTES REGARDING THE BLOWOUT PREVENTERS

Master Drilling Plan
Eddy County, New Mexico

1. Drilling nipple to be so constructed that it can be removed without use of a welder through rotary table opening, with minimum I.D. equal to preventer bore.

2. Wear ring to be properly installed in head.

3. Blow out preventer and all fittings must be in good condition, 2000 psi WP minimum.

4. All fittings to be flanged.

5. Safety valve must be available on rig floor at all times with proper connections, valve to be full 2000 psi WP minimum.

6. All choke and fill lines to be securely anchored especially ends of choke lines.

7. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.

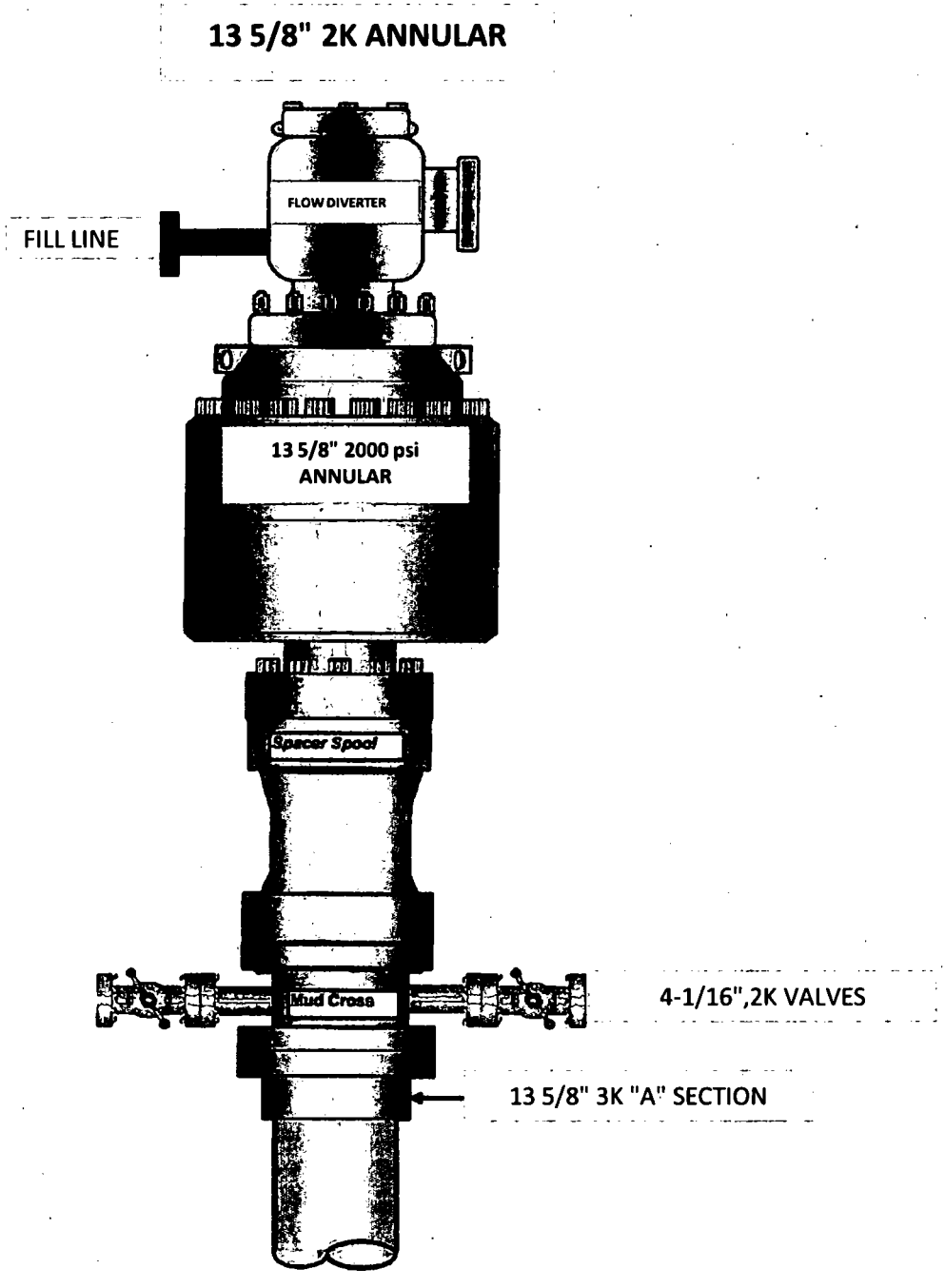
8. Kelly cock on Kelly.

9. Extension wrenches and hands wheels to be properly installed.

10. Blow out preventer control to be located as close to driller's position as feasible.

11. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation all API specifications.

Exhibit #10


13 5/8" 2K ANNULAR
FLOW DIVERTER
FILL LINE
13 5/8" 2000 psi
ANNULAR
Spacer Spool
Mud Cross
4-1/16",2K VALVES
13 5/8" 3K "A" SECTION

Casing Program

	Collapse SF	Burst SF	Tension SF
BLM Minimum Safety Factor	1.125	1	1.6 Dry 1.8 Wet

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Assumed 9.0ppg MW equivalent pore pressure from 9 5/8" shoe to deepest TVD in wellbore.

BLM standard formulas were used on all SF calculations.
Casing design does meet and/or exceed BLM's minimum standards.
The pipe will be kept at a minimum 1/3 fluid fill to avoid approaching the collapse pressure rating of the casing.

This well is not located within the Capitan Reef.
This well is not located in the SOPA or in the R-111-P.

This well is not located in a high or critical Cave/Karst area.

This is not a walking operation.
We will not be pre-setting casing.
All completion intervals are planned to be fracture stimulated.

Casing Program

	Collapse SF	Burst SF	Tension SF
BLM Minimum Safety Factor	1.125	1	1.6 Dry 1.8 Wet

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

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We will not be pre-setting casing.
All completion intervals are planned to be fracture stimulated.

Casing Program

	Collapse SF	Burst SF	Tension SF
BLM Minimum Safety Factor	1.125	1	1.6 Dry 1.8 Wet

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This well is not located in a high or critical Cave/Karst area.

This is not a walking operation.
We will not be pre-setting casing.
All completion intervals are planned to be fracture stimulated.

COG Operating LLC

Hydrogen Sulfide Drilling Operation Plan

I. HYDROGEN SULFIDE TRAINING

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

1. The hazards an characteristics of hydrogen sulfide (H2S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H2S detectors alarms warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

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

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

There will be an initial training session just prior to encountering a known or probable H2S zone (within 3 days or 500 feet) and weekly H2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H2S Drilling Operations Plan and the Public Protection Plan. **The concentrations of H2S of wells in this area from surface to TD are low enough that a contingency plan is not required.**

II. H2S SAFETY EQUIPMENT AND SYSTEMS

Note: All H2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonable expected to contain H2S.

1. **Well Control Equipment:**

   A. Flare line.

   B. Choke manifold with minimum of one remotely operated choke.

   C. Closed Loop Blow Down Tank

   D. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.

   E. Auxiliary equipment may include if applicable: mud-gas separator, annular preventer & rotating head.

2. **Protective equipment for essential personnel:**

   A. SCBA (Self contained breathing apparatus) 30-minute units located in the doghouse and at briefing areas, as indicated on well site diagram.

3. **H2S detection and monitoring equipment:**

   A. Portable H2S monitors positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 PPM are reached.

4. **Visual warning systems:**

   A. Wind direction indicators as shown on well site diagram.

   B. Caution/Danger signs (Exhibit #7) shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached.

5. **Mud program:**

   A. The mud program has been designed to minimize the volume of H2S circulated to surface. Proper mud weight, safe drilling practices, and the use of H2S scavengers will minimize hazards when penetrating H2S bearing zones.

6. **Metallurgy:**

   A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.

   B. All elastomers used for packing and seals shall be H2S trim.

7. **Communication:**

   A. Radio communications in company vehicles including cellular telephone and 2-way radio.

   B. Land line (telephone) communication at Office.

8. **Well testing:**

   A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safely and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H2S environment will use the closed chamber method of testing.

   B. There will be no drill stem testing.

EXHIBIT #7

WARNING

YOU ARE ENTERING AN H2S

AUTHORIZED PERSONNEL ONLY

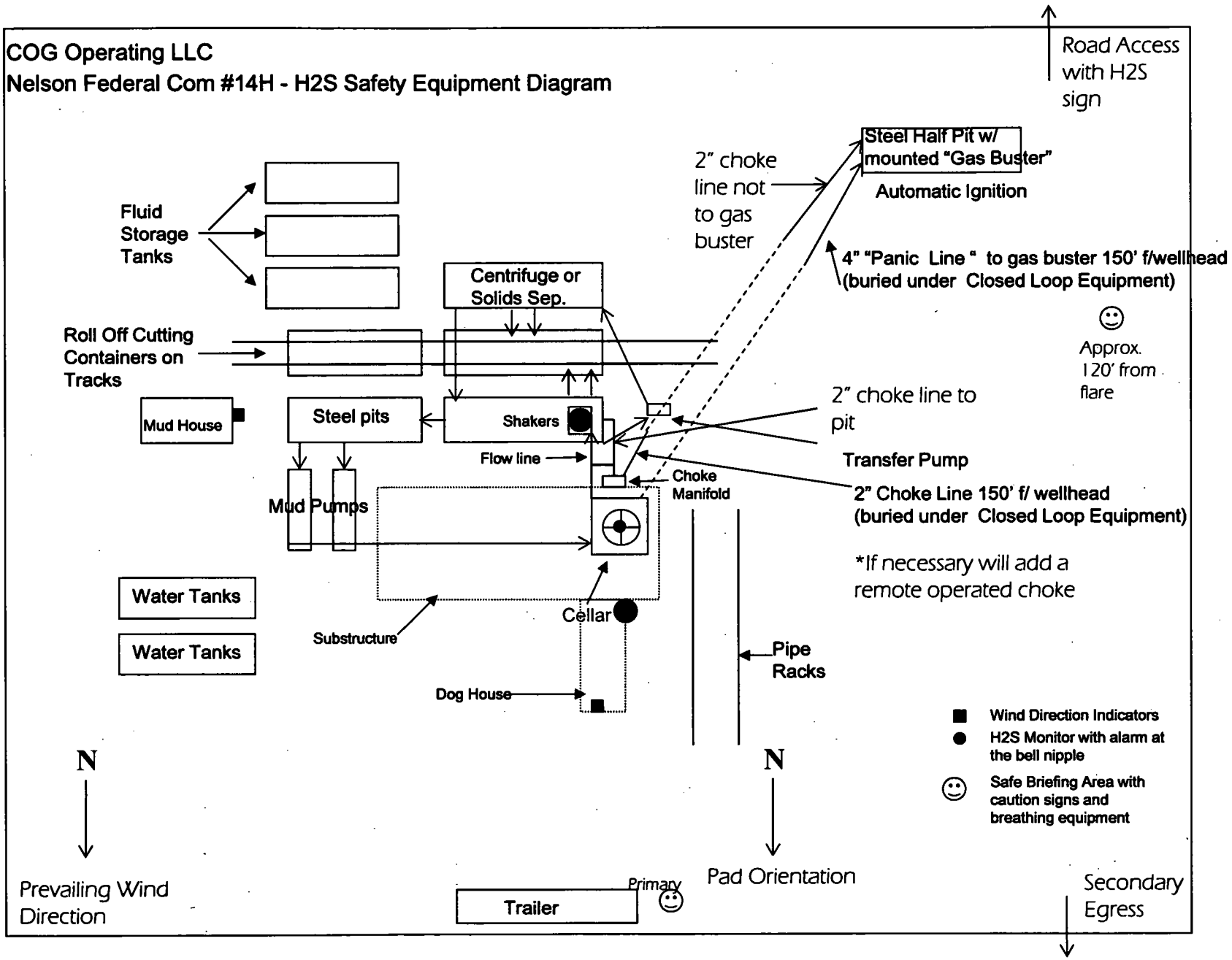
1. **BEARDS OR CONTACT LENSES NOT ALLOWED**
2. **HARD HATS REQUIRED**
3. **SMOKING IN DESIGNATED AREAS ONLY**
4. **BE WIND CONSCIOUS AT ALL TIMES**
5. **CHECK WITH COG OPERATING FOREMAN AT**

COG OPERATING LLC
1-432-683-7443
1-575-746-2010

EDDY COUNTY EMERGENCY NUMBERS
ARTESIA FIRE DEPT. 575-746-5050
ARTESIA POLICE DEPT. 575-746-5000
EDDY CO. SHERIFF DEPT. 575-746-9888

LEA COUNTY EMERGENCY NUMBERS
HOBBS FIRE DEPT. 575-397-9308
HOBBS POLICE DEPT. 575-397-9285
LEA CO. SHERIFF DEPT. 575-396-1196

COG Operating LLC
Nelson Federal Com #14H - H2S Safety Equipment Diagram



COG OPERATING, LLC

Project: Eddy /Lea County, NM (NAD27) NMEZ
Site: Nelson Federal Com 14/24
Well: #14H
Wellbore: Lateral
Design: Plan #1

4045 @ 4063.00ft (Planning)
NAD 1927 (NADCON CONUS)

CONCHO

To convert a Magnetic Direction to a Grid Direction, Add 6.75°

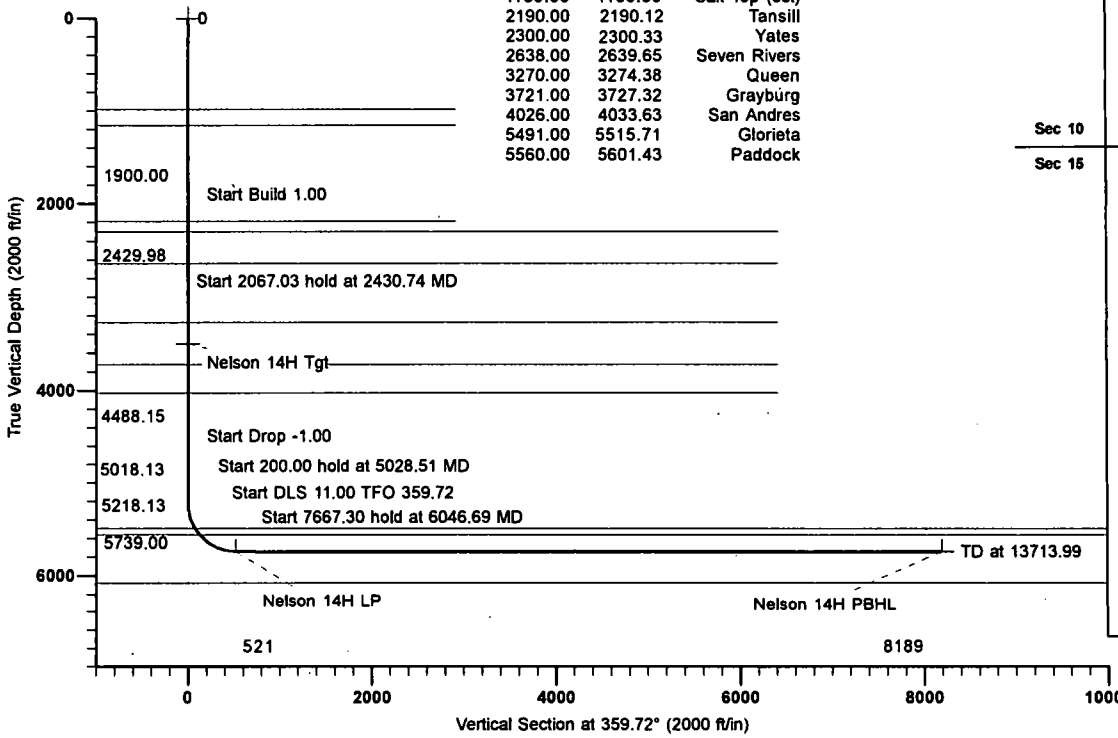
T G M

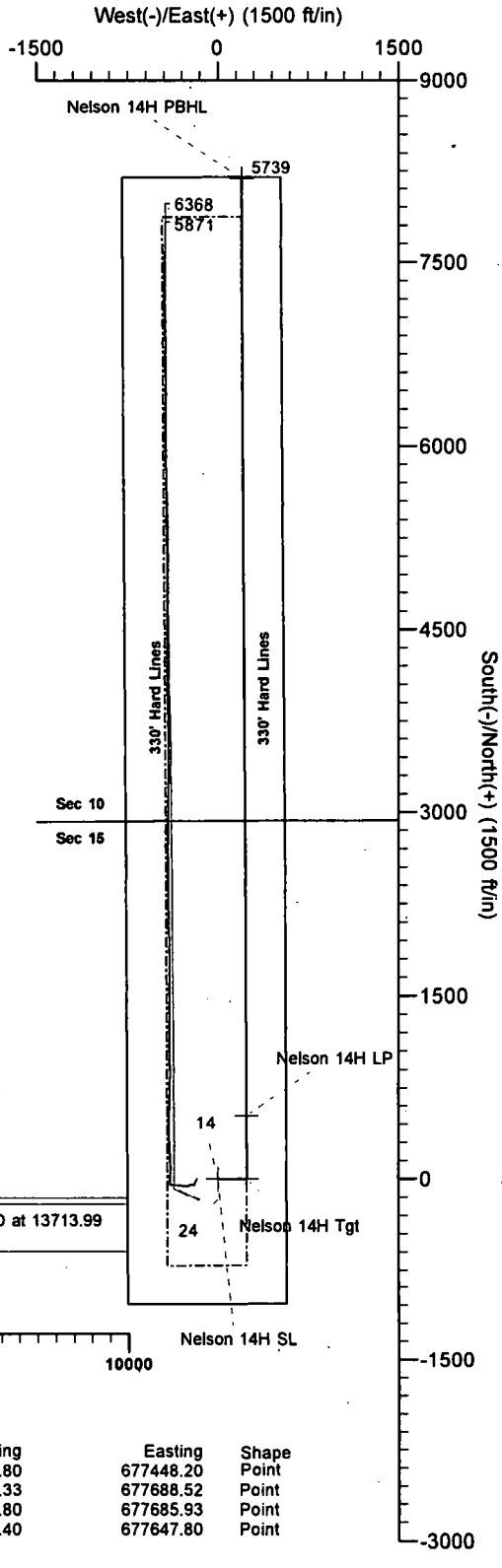
Azimuths to Grid North
True North: -0.31°
Magnetic North: 6.75°

Magnetic Field
Strength: 48251.9snT
Dip Angle: 60.59°
Date: 09/08/2017
Model: IGRF2015

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
985.00	985.00	Rustler
1158.00	1158.00	Salt Top (est)
2190.00	2190.12	Tansill
2300.00	2300.33	Yates
2638.00	2639.65	Seven Rivers
3270.00	3274.38	Queen
3721.00	3727.32	Grayburg
4026.00	4033.63	San Andres
5491.00	5515.71	Glorieta
5560.00	5601.43	Paddock





TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
Nelson 14H SL	0.00	0.00	0.00	667500.80	677448.20	Point
Nelson 14H Tgt	3500.00	1.53	240.32	667502.33	677688.52	Point
Nelson 14H LP	5739.00	522.00	237.73	668022.80	677685.93	Point
Nelson 14H PBHL	5739.00	8189.60	199.60	675690.40	677647.80	Point

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1900.00	0.00	0.00	1900.00	0.00	0.00	0.00	0.00	0.00	
2430.74	5.31	89.64	2429.98	0.16	24.56	1.00	89.64	0.04	
4497.77	5.31	89.64	4488.15	1.37	215.76	0.00	0.00	0.32	
5028.51	0.00	0.00	5018.13	1.53	240.32	1.00	180.00	0.36	
5228.51	0.00	0.00	5218.13	1.53	240.32	0.00	0.00	0.36	
6046.69	90.00	359.72	5739.00	522.39	237.73	11.00	359.72	521.23	
13713.99	90.00	359.72	5739.00	8189.60	199.60	0.00	0.00	8188.53	Nelson 14H PBHL

Plan: Plan #1 (#14H/Lateral)
Created By: Mekka Williams
eSomina Well Design
mekka@esominawelldesign.com
16:05, September 08 2017

VON DIRECTIONAL
12074 FM 3083 Conroe, Texas 77301
936-756-2400

VON DIRECTIONAL SERVICES, LLC.

CONCHO

COG OPERATING, LLC

Eddy /Lea County, NM (NAD27) NMEZ
Nelson Federal Com 14/24
#14H - SL 2358FSL, 2065FWL Sec 15
PP - 2878FSL, 2305FWL Sec 15

Lateral

PBHL - 10FNL, 2310FWL Sec 10

Database:	VON_EDM	**Local Co-ordinate Reference:**	Well #14H - Slot 14
Company:	COG OPERATING, LLC	**TVD Reference:**	4045 @ 4063.00ft (Planning)
Project:	Eddy /Lea County, NM (NAD27) NMEZ	**MD Reference:**	4045 @ 4063.00ft (Planning)
Site:	Nelson Federal Com 14/24	**North Reference:**	Grid
Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Project	Eddy /Lea County, NM (NAD27) NMEZ		
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	Nelson Federal Com 14/24, centered on 14H				
Site Position:		**Northing:**	667,500.80 ft	**Latitude:**	32° 50' 1.352 N
From:	Map	**Easting:**	677,448.20 ft	**Longitude:**	103° 45' 20.269 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.20 in	**Grid Convergence:**	0.31 °

Well	#14H - Slot 14					
Well Position	**+N/-S**	0.00 ft	**Northing:**	667,500.80 ft	**Latitude:**	32° 50' 1.352 N
	+E/-W	0.00 ft	**Easting:**	677,448.20 ft	**Longitude:**	103° 45' 20.269 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**		**Ground Level:**	4,045.00 ft

Wellbore	Lateral				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	09/08/17	7.06	60.59	48,252

Design	Plan #1				
Audit Notes:					
Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**	
	0.00	0.00	0.00	359.72	

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,430.74	5.31	89.64	2,429.98	0.16	24.56	1.00	1.00	0.00	89.64	
4,497.77	5.31	89.64	4,488.15	1.37	215.76	0.00	0.00	0.00	0.00	
5,028.51	0.00	0.00	5,018.13	1.53	240.32	1.00	-1.00	0.00	180.00	
5,228.51	0.00	0.00	5,218.13	1.53	240.32	0.00	0.00	0.00	0.00	
6,046.69	90.00	359.72	5,739.00	522.39	237.73	11.00	11.00	-0.03	359.72	
13,713.99	90.00	359.72	5,739.00	8,189.60	199.60	0.00	0.00	0.00	0.00	Nelson 14H PBHL

Database:	VON_EDM	**Local Co-ordinate Reference:**	Well #14H - Slot 14
Company:	COG OPERATING, LLC	**TVD Reference:**	4045 @ 4063.00ft (Planning)
Project:	Eddy /Lea County, NM (NAD27) NMEZ	**MD Reference:**	4045 @ 4063.00ft (Planning)
Site:	Nelson Federal Com 14/24	**North Reference:**	Grid
Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nelson 14H SL									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
985.00	0.00	0.00	985.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,158.00	0.00	0.00	1,158.00	0.00	0.00	0.00	0.00	0.00	0.00
Salt Top (est)									
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	1.00	89.64	1,999.99	0.01	0.87	0.00	1.00	1.00	0.00
2,100.00	2.00	89.64	2,099.96	0.02	3.49	0.01	1.00	1.00	0.00
2,190.12	2.90	89.64	2,190.00	0.05	7.34	0.01	1.00	1.00	0.00
Tansill									
2,200.00	3.00	89.64	2,199.86	0.05	7.85	0.01	1.00	1.00	0.00
2,300.00	4.00	89.64	2,299.68	0.09	13.96	0.02	1.00	1.00	0.00
2,300.33	4.00	89.64	2,300.00	0.09	13.98	0.02	0.00	0.00	0.00
Yates									
2,400.00	5.00	89.64	2,399.37	0.14	21.80	0.03	1.00	1.00	0.00
2,430.74	5.31	89.64	2,429.98	0.16	24.56	0.04	1.00	1.00	0.00
2,500.00	5.31	89.64	2,498.94	0.20	30.97	0.05	0.00	0.00	0.00
2,600.00	5.31	89.64	2,598.52	0.26	40.22	0.06	0.00	0.00	0.00
2,639.65	5.31	89.64	2,638.00	0.28	43.89	0.06	0.00	0.00	0.00
Seven Rivers									
2,700.00	5.31	89.64	2,698.09	0.31	49.47	0.07	0.00	0.00	0.00
2,800.00	5.31	89.64	2,797.66	0.37	58.72	0.09	0.00	0.00	0.00
2,900.00	5.31	89.64	2,897.23	0.43	67.97	0.10	0.00	0.00	0.00
3,000.00	5.31	89.64	2,996.80	0.49	77.22	0.11	0.00	0.00	0.00
3,100.00	5.31	89.64	3,096.37	0.55	86.47	0.13	0.00	0.00	0.00
3,200.00	5.31	89.64	3,195.94	0.61	95.72	0.14	0.00	0.00	0.00
3,274.38	5.31	89.64	3,270.00	0.65	102.60	0.15	0.00	0.00	0.00
Queen									
3,300.00	5.31	89.64	3,295.51	0.67	104.97	0.16	0.00	0.00	0.00
3,400.00	5.31	89.64	3,395.09	0.73	114.22	0.17	0.00	0.00	0.00
3,500.00	5.31	89.64	3,494.66	0.79	123.47	0.18	0.00	0.00	0.00
3,516.13	5.31	89.64	3,510.72	0.80	124.96	0.18	0.00	0.00	0.00
Nelson 14H Tgt									
3,600.00	5.31	89.64	3,594.23	0.84	132.72	0.20	0.00	0.00	0.00

Database:	VON_EDM	**Local Co-ordinate Reference:**	Well #14H - Slot 14
Company:	COG OPERATING, LLC	**TVD Reference:**	4045 @ 4063.00ft (Planning)
Project:	Eddy /Lea County, NM (NAD27) NMEZ	**MD Reference:**	4045 @ 4063.00ft (Planning)
Site:	Nelson Federal Com 14/24	**North Reference:**	Grid
Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3,700.00	5.31	89.64	3,693.80	0.90	141.97	0.21	0.00	0.00	0.00
3,727.32	5.31	89.64	3,721.00	0.92	144.49	0.21	0.00	0.00	0.00
Grayburg									
3,800.00	5.31	89.64	3,793.37	0.96	151.22	0.22	0.00	0.00	0.00
3,900.00	5.31	89.64	3,892.94	1.02	160.47	0.24	0.00	0.00	0.00
4,000.00	5.31	89.64	3,992.51	1.08	169.72	0.25	0.00	0.00	0.00
4,033.63	5.31	89.64	4,026.00	1.10	172.83	0.26	0.00	0.00	0.00
San Andres									
4,100.00	5.31	89.64	4,092.08	1.14	178.97	0.26	0.00	0.00	0.00
4,200.00	5.31	89.64	4,191.66	1.20	188.21	0.28	0.00	0.00	0.00
4,300.00	5.31	89.64	4,291.23	1.26	197.46	0.29	0.00	0.00	0.00
4,400.00	5.31	89.64	4,390.80	1.32	206.71	0.31	0.00	0.00	0.00
4,497.77	5.31	89.64	4,488.15	1.37	215.76	0.32	0.00	0.00	0.00
4,500.00	5.29	89.64	4,490.37	1.37	215.96	0.32	1.00	-1.00	0.00
4,600.00	4.29	89.64	4,590.02	1.43	224.31	0.33	1.00	-1.00	0.00
4,700.00	3.29	89.64	4,689.80	1.47	230.91	0.34	1.00	-1.00	0.00
4,800.00	2.29	89.64	4,789.68	1.50	235.77	0.35	1.00	-1.00	0.00
4,900.00	1.29	89.64	4,889.63	1.52	238.88	0.35	1.00	-1.00	0.00
5,000.00	0.29	89.64	4,989.62	1.53	240.25	0.36	1.00	-1.00	0.00
5,028.51	0.00	0.00	5,018.13	1.53	240.32	0.36	1.00	-1.00	0.00
5,100.00	0.00	0.00	5,089.62	1.53	240.32	0.36	0.00	0.00	0.00
5,200.00	0.00	0.00	5,189.62	1.53	240.32	0.36	0.00	0.00	0.00
5,228.51	0.00	0.00	5,218.13	1.53	240.32	0.36	0.00	0.00	0.00
5,250.00	2.36	359.72	5,239.61	1.97	240.32	0.80	11.00	11.00	0.00
5,300.00	7.86	359.72	5,289.40	6.43	240.30	5.25	11.00	11.00	0.00
5,350.00	13.36	359.72	5,338.52	15.63	240.25	14.46	11.00	11.00	0.00
5,400.00	18.86	359.72	5,386.54	29.51	240.18	28.33	11.00	11.00	0.00
5,450.00	24.36	359.72	5,433.01	47.92	240.09	46.74	11.00	11.00	0.00
5,500.00	29.86	359.72	5,477.49	70.70	239.98	69.52	11.00	11.00	0.00
5,515.71	31.59	359.72	5,491.00	78.72	239.94	77.55	11.00	11.00	0.00
Glorieta									
5,550.00	35.36	359.72	5,519.59	97.63	239.84	96.46	11.00	11.00	0.00
5,600.00	40.86	359.72	5,558.92	128.48	239.69	127.31	11.00	11.00	0.00
5,601.43	41.02	359.72	5,560.00	129.42	239.69	128.25	11.00	11.00	0.00
Paddock									
5,650.00	46.36	359.72	5,595.10	162.96	239.52	161.79	11.00	11.00	0.00
5,700.00	51.86	359.72	5,627.82	200.74	239.33	199.57	11.00	11.00	0.00
5,750.00	57.36	359.72	5,656.76	241.49	239.13	240.32	11.00	11.00	0.00
5,800.00	62.86	359.72	5,681.67	284.83	238.91	283.65	11.00	11.00	0.00
5,850.00	68.36	359.72	5,702.30	330.35	238.69	329.18	11.00	11.00	0.00
5,900.00	73.86	359.72	5,718.48	377.64	238.45	376.47	11.00	11.00	0.00
5,950.00	79.36	359.72	5,730.05	426.26	238.21	425.09	11.00	11.00	0.00
6,000.00	84.86	359.72	5,736.91	475.77	237.96	474.60	11.00	11.00	0.00
6,046.30	89.96	359.72	5,739.00	522.00	237.73	520.83	11.00	11.00	0.00
Nelson 14H LP									
6,046.69	90.00	359.72	5,739.00	522.39	237.73	521.23	11.00	11.00	0.00
6,100.00	90.00	359.72	5,739.00	575.70	237.47	574.54	0.00	0.00	0.00
6,200.00	90.00	359.72	5,739.00	675.70	236.97	674.54	0.00	0.00	0.00
6,300.00	90.00	359.72	5,739.00	775.70	236.47	774.54	0.00	0.00	0.00
6,400.00	90.00	359.72	5,739.00	875.70	235.97	874.54	0.00	0.00	0.00
6,500.00	90.00	359.72	5,739.00	975.70	235.48	974.54	0.00	0.00	0.00
6,600.00	90.00	359.72	5,739.00	1,075.70	234.98	1,074.54	0.00	0.00	0.00
6,700.00	90.00	359.72	5,739.00	1,175.70	234.48	1,174.54	0.00	0.00	0.00
6,800.00	90.00	359.72	5,739.00	1,275.69	233.98	1,274.54	0.00	0.00	0.00

Database:	VON_EDM	**Local Co-ordinate Reference:**	Well #14H - Slot 14
Company:	COG OPERATING, LLC	**TVD Reference:**	4045 @ 4063.00ft (Planning)
Project:	Eddy /Lea County, NM (NAD27) NMEZ	**MD Reference:**	4045 @ 4063.00ft (Planning)
Site:	Nelson Federal Com 14/24	**North Reference:**	Grid
Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,900.00	90.00	359.72	5,739.00	1,375.69	233.49	1,374.54	0.00	0.00	0.00
7,000.00	90.00	359.72	5,739.00	1,475.69	232.99	1,474.54	0.00	0.00	0.00
7,100.00	90.00	359.72	5,739.00	1,575.69	232.49	1,574.54	0.00	0.00	0.00
7,200.00	90.00	359.72	5,739.00	1,675.69	232.00	1,674.54	0.00	0.00	0.00
7,300.00	90.00	359.72	5,739.00	1,775.69	231.50	1,774.54	0.00	0.00	0.00
7,400.00	90.00	359.72	5,739.00	1,875.69	231.00	1,874.54	0.00	0.00	0.00
7,500.00	90.00	359.72	5,739.00	1,975.69	230.50	1,974.54	0.00	0.00	0.00
7,600.00	90.00	359.72	5,739.00	2,075.68	230.01	2,074.54	0.00	0.00	0.00
7,700.00	90.00	359.72	5,739.00	2,175.68	229.51	2,174.54	0.00	0.00	0.00
7,800.00	90.00	359.72	5,739.00	2,275.68	229.01	2,274.54	0.00	0.00	0.00
7,900.00	90.00	359.72	5,739.00	2,375.68	228.51	2,374.54	0.00	0.00	0.00
8,000.00	90.00	359.72	5,739.00	2,475.68	228.02	2,474.54	0.00	0.00	0.00
8,100.00	90.00	359.72	5,739.00	2,575.68	227.52	2,574.54	0.00	0.00	0.00
8,200.00	90.00	359.72	5,739.00	2,675.68	227.02	2,674.54	0.00	0.00	0.00
8,300.00	90.00	359.72	5,739.00	2,775.68	226.52	2,774.54	0.00	0.00	0.00
8,400.00	90.00	359.72	5,739.00	2,875.67	226.03	2,874.54	0.00	0.00	0.00
8,500.00	90.00	359.72	5,739.00	2,975.67	225.53	2,974.54	0.00	0.00	0.00
8,600.00	90.00	359.72	5,739.00	3,075.67	225.03	3,074.54	0.00	0.00	0.00
8,700.00	90.00	359.72	5,739.00	3,175.67	224.54	3,174.54	0.00	0.00	0.00
8,800.00	90.00	359.72	5,739.00	3,275.67	224.04	3,274.54	0.00	0.00	0.00
8,900.00	90.00	359.72	5,739.00	3,375.67	223.54	3,374.54	0.00	0.00	0.00
9,000.00	90.00	359.72	5,739.00	3,475.67	223.04	3,474.54	0.00	0.00	0.00
9,100.00	90.00	359.72	5,739.00	3,575.67	222.55	3,574.54	0.00	0.00	0.00
9,200.00	90.00	359.72	5,739.00	3,675.66	222.05	3,674.54	0.00	0.00	0.00
9,300.00	90.00	359.72	5,739.00	3,775.66	221.55	3,774.54	0.00	0.00	0.00
9,400.00	90.00	359.72	5,739.00	3,875.66	221.05	3,874.54	0.00	0.00	0.00
9,500.00	90.00	359.72	5,739.00	3,975.66	220.56	3,974.54	0.00	0.00	0.00
9,600.00	90.00	359.72	5,739.00	4,075.66	220.06	4,074.54	0.00	0.00	0.00
9,700.00	90.00	359.72	5,739.00	4,175.66	219.56	4,174.54	0.00	0.00	0.00
9,800.00	90.00	359.72	5,739.00	4,275.66	219.07	4,274.54	0.00	0.00	0.00
9,900.00	90.00	359.72	5,739.00	4,375.66	218.57	4,374.54	0.00	0.00	0.00
10,000.00	90.00	359.72	5,739.00	4,475.65	218.07	4,474.54	0.00	0.00	0.00
10,100.00	90.00	359.72	5,739.00	4,575.65	217.57	4,574.54	0.00	0.00	0.00
10,200.00	90.00	359.72	5,739.00	4,675.65	217.08	4,674.54	0.00	0.00	0.00
10,300.00	90.00	359.72	5,739.00	4,775.65	216.58	4,774.54	0.00	0.00	0.00
10,400.00	90.00	359.72	5,739.00	4,875.65	216.08	4,874.54	0.00	0.00	0.00
10,500.00	90.00	359.72	5,739.00	4,975.65	215.58	4,974.54	0.00	0.00	0.00
10,600.00	90.00	359.72	5,739.00	5,075.65	215.09	5,074.54	0.00	0.00	0.00
10,700.00	90.00	359.72	5,739.00	5,175.65	214.59	5,174.54	0.00	0.00	0.00
10,800.00	90.00	359.72	5,739.00	5,275.64	214.09	5,274.54	0.00	0.00	0.00
10,900.00	90.00	359.72	5,739.00	5,375.64	213.59	5,374.54	0.00	0.00	0.00
11,000.00	90.00	359.72	5,739.00	5,475.64	213.10	5,474.54	0.00	0.00	0.00
11,100.00	90.00	359.72	5,739.00	5,575.64	212.60	5,574.54	0.00	0.00	0.00
11,200.00	90.00	359.72	5,739.00	5,675.64	212.10	5,674.54	0.00	0.00	0.00
11,300.00	90.00	359.72	5,739.00	5,775.64	211.61	5,774.54	0.00	0.00	0.00
11,400.00	90.00	359.72	5,739.00	5,875.64	211.11	5,874.54	0.00	0.00	0.00
11,500.00	90.00	359.72	5,739.00	5,975.64	210.61	5,974.54	0.00	0.00	0.00
11,600.00	90.00	359.72	5,739.00	6,075.63	210.11	6,074.54	0.00	0.00	0.00
11,700.00	90.00	359.72	5,739.00	6,175.63	209.62	6,174.54	0.00	0.00	0.00
11,800.00	90.00	359.72	5,739.00	6,275.63	209.12	6,274.54	0.00	0.00	0.00
11,900.00	90.00	359.72	5,739.00	6,375.63	208.62	6,374.54	0.00	0.00	0.00
12,000.00	90.00	359.72	5,739.00	6,475.63	208.12	6,474.54	0.00	0.00	0.00
12,100.00	90.00	359.72	5,739.00	6,575.63	207.63	6,574.54	0.00	0.00	0.00
12,200.00	90.00	359.72	5,739.00	6,675.63	207.13	6,674.54	0.00	0.00	0.00

Database:	VON_EDM	**Local Co-ordinate Reference:**	Well #14H - Slot 14
Company:	COG OPERATING, LLC	**TVD Reference:**	4045 @ 4063.00ft (Planning)
Project:	Eddy /Lea County, NM (NAD27) NMEZ	**MD Reference:**	4045 @ 4063.00ft (Planning)
Site:	Nelson Federal Com 14/24	**North Reference:**	Grid
Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
12,300.00	90.00	359.72	5,739.00	6,775.63	206.63	6,774.54	0.00	0.00	0.00
12,400.00	90.00	359.72	5,739.00	6,875.62	206.13	6,874.54	0.00	0.00	0.00
12,500.00	90.00	359.72	5,739.00	6,975.62	205.64	6,974.54	0.00	0.00	0.00
12,600.00	90.00	359.72	5,739.00	7,075.62	205.14	7,074.54	0.00	0.00	0.00
12,700.00	90.00	359.72	5,739.00	7,175.62	204.64	7,174.54	0.00	0.00	0.00
12,800.00	90.00	359.72	5,739.00	7,275.62	204.15	7,274.54	0.00	0.00	0.00
12,900.00	90.00	359.72	5,739.00	7,375.62	203.65	7,374.54	0.00	0.00	0.00
13,000.00	90.00	359.72	5,739.00	7,475.62	203.15	7,474.54	0.00	0.00	0.00
13,100.00	90.00	359.72	5,739.00	7,575.62	202.65	7,574.54	0.00	0.00	0.00
13,200.00	90.00	359.72	5,739.00	7,675.61	202.16	7,674.54	0.00	0.00	0.00
13,300.00	90.00	359.72	5,739.00	7,775.61	201.66	7,774.54	0.00	0.00	0.00
13,400.00	90.00	359.72	5,739.00	7,875.61	201.16	7,874.54	0.00	0.00	0.00
13,500.00	90.00	359.72	5,739.00	7,975.61	200.66	7,974.54	0.00	0.00	0.00
13,600.00	90.00	359.72	5,739.00	8,075.61	200.17	8,074.54	0.00	0.00	0.00
13,700.00	90.00	359.72	5,739.00	8,175.61	199.67	8,174.54	0.00	0.00	0.00
13,713.99	90.00	359.72	5,739.00	8,189.60	199.60	8,188.53	0.00	0.00	0.00
Nelson 14H PBHL									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Nelson 14H SL - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	667,500.80	677,448.20	32° 50' 1.352 N	103° 45' 20.269 W
Nelson 14H Tgt - plan misses target center by 115.86ft at 3516.13ft MD (3510.72 TVD, 0.80 N, 124.96 E) - Point	0.00	0.00	3,500.00	1.53	240.32	667,502.33	677,688.52	32° 50' 1.354 N	103° 45' 17.452 W
Nelson 14H LP - plan hits target center - Point	0.00	0.00	5,739.00	522.00	237.73	668,022.80	677,685.93	32° 50' 6.504 N	103° 45' 17.449 W
Nelson 14H PBHL - plan hits target center - Point	0.00	0.00	5,739.00	8,189.60	199.60	675,690.40	677,647.80	32° 51' 22.376 N	103° 45' 17.404 W

Database:	VON_EDM	**Local Co-ordinate Reference:**	Well #14H - Slot 14
Company:	COG OPERATING, LLC	**TVD Reference:**	4045 @ 4063.00ft (Planning)
Project:	Eddy /Lea County, NM (NAD27) NMEZ	**MD Reference:**	4045 @ 4063.00ft (Planning)
Site:	Nelson Federal Com 14/24	**North Reference:**	Grid
Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #1		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
985.00	985.00	Rustler		0.00	
1,158.00	1,158.00	Salt Top (est)		0.00	
2,190.12	2,190.00	Tansill		0.00	
2,300.33	2,300.00	Yates		0.00	
2,639.65	2,638.00	Seven Rivers		0.00	
3,274.38	3,270.00	Queen		0.00	
3,727.32	3,721.00	Grayburg		0.00	
4,033.63	4,026.00	San Andres		0.00	
5,515.71	5,491.00	Glorieta		0.00	
5,601.43	5,560.00	Paddock		0.00	

CONCHO

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #14H - Slot 14
Project:	Eddy /Lea County, NM (NAD27) NMEZ	**TVD Reference:**	4045 @ 4063.00ft (Planning)
Reference Site:	Nelson Federal Com 14/24	**MD Reference:**	4045 @ 4063.00ft (Planning)
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	VON_EDM
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00ft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.00 ft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	**Casing Method:**	Not applied

Survey Tool Program Date 09/08/17

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	13,713.86	Plan #1 (Lateral)	MWD	MWD v3:standard declination

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Nelson Federal COM 23H						
13H (Offset) - Lateral - Lateral	0.00	0.98	169.90			
13H (Offset) - Lateral - Lateral	13,353.68	13,455.95	650.57	363.74	2.268 SF	
23H - Lateral - Lateral PLANNED BHL 352'FWL, 220'FN	2,078.07	2,085.20	235.01	229.61	43.508 CC	
23H - Lateral - Lateral PLANNED BHL 352'FWL, 220'FN	2,100.00	2,107.12	235.04	229.59	43.112 ES	
23H - Lateral - Lateral PLANNED BHL 352'FWL, 220'FN	13,505.78	14,145.00	892.13	664.47	3.919 SF	

Offset Design Nelson Federal COM 23H - 13H (Offset) - Lateral - Lateral — Offset Site Error: 0.00 ft

Survey Program: 100-MWD — Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.98	0.98	0.00	0.00	-90.20	-0.60	-169.90	169.90				
100.00	100.00	99.40	99.40	0.09	0.11	-90.34	-1.00	-170.36	170.37	170.19	0.18	923.903	
200.00	200.00	199.81	199.90	0.32	0.32	-90.66	-1.98	-171.15	171.17	170.53	0.63	270.377	
300.00	300.00	298.88	298.86	0.54	0.54	-90.89	-2.68	-172.08	172.11	171.03	1.08	159.620	
400.00	400.00	398.92	398.89	0.77	0.76	-90.91	-2.76	-173.31	173.34	171.82	1.52	113.864	
500.00	500.00	499.04	499.01	0.99	0.98	-90.83	-2.52	-174.49	174.52	172.56	1.97	88.786	
600.00	600.00	599.42	599.38	1.22	1.20	-90.75	-2.30	-175.53	175.55	173.14	2.41	72.790	
700.00	700.00	698.59	698.55	1.44	1.42	-90.77	-2.39	-176.67	176.71	173.85	2.86	61.809	
800.00	800.00	800.95	800.90	1.67	1.65	-90.86	-2.67	-177.42	177.44	174.13	3.31	53.665	
900.00	900.00	899.79	899.74	1.89	1.86	-91.16	-3.60	-177.79	177.83	174.09	3.74	47.504	
1,000.00	1,000.00	999.31	999.23	2.12	2.08	-91.93	-6.03	-178.57	178.68	174.49	4.19	42.681	
1,100.00	1,100.00	1,099.21	1,099.06	2.34	2.30	-93.02	-9.48	-179.45	179.71	175.08	4.63	38.797	
1,200.00	1,200.00	1,197.71	1,197.47	2.56	2.52	-94.21	-13.30	-180.70	181.22	176.14	5.08	35.682	
1,300.00	1,300.00	1,297.44	1,297.09	2.79	2.75	-95.54	-17.70	-182.37	183.26	177.73	5.53	33.132	
1,400.00	1,400.00	1,395.53	1,395.04	3.01	2.99	-97.02	-22.73	-184.43	185.92	179.93	5.98	31.072	
1,500.00	1,500.00	1,495.21	1,494.52	3.24	3.23	-98.67	-28.52	-186.98	189.25	182.81	6.44	29.378	
1,600.00	1,600.00	1,593.52	1,592.61	3.46	3.47	-100.23	-34.26	-189.88	193.13	186.23	6.90	27.996	
1,700.00	1,700.00	1,696.66	1,695.57	3.69	3.72	-101.60	-39.56	-192.67	196.77	189.40	7.37	26.715	
1,800.00	1,800.00	1,798.51	1,797.34	3.91	3.96	-102.58	-43.34	-194.25	199.06	191.23	7.82	25.440	
1,900.00	1,900.00	1,900.02	1,898.82	4.14	4.19	-103.16	-45.65	-195.25	200.52	192.25	8.28	24.221	
2,000.00	1,999.99	1,999.72	1,998.50	4.35	4.42	166.80	-47.47	-196.00	202.54	193.82	8.71	23.242	
2,100.00	2,099.96	2,103.15	2,101.91	4.55	4.64	166.53	-49.09	-196.02	205.47	196.33	9.14	22.488	

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 #14H - Slot 14
Project:	Eddy /Lea County, NM (NAD27) NMEZ	**TVD Reference:**	4045 @ 4063.00ft (Planning)
Reference Site:	Nelson Federal Com 14/24	**MD Reference:**	4045 @ 4063.00ft (Planning)
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	VON_EDM
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design Nelson Federal COM 23H - 13H (Offset) - Lateral - Lateral — **Offset Site Error:** 0.00 ft

Survey Program: 100-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
2,200.00	2,199.86	2,200.58	2,199.34	4.75	4.85	166.46	-50.31	-195.90	209.89	200.34	9.55	21.975	
2,300.00	2,299.68	2,301.75	2,300.50	4.96	5.07	166.60	-51.33	-196.39	216.54	206.57	9.97	21.715	
2,400.00	2,399.37	2,401.83	2,400.58	5.18	5.27	166.91	-51.71	-195.77	223.67	213.29	10.38	21.546	
2,500.00	2,498.94	2,492.63	2,491.36	5.40	5.46	167.49	-51.58	-197.25	234.18	223.40	10.78	21.725	
2,600.00	2,598.52	2,578.55	2,577.04	5.63	5.64	168.45	-50.53	-203.45	249.92	238.78	11.14	22.426	
2,700.00	2,698.09	2,673.17	2,671.11	5.86	5.85	169.63	-48.84	-213.44	268.92	257.38	11.54	23.306	
2,800.00	2,797.66	2,775.27	2,772.67	6.10	6.09	170.50	-48.17	-223.87	287.90	275.92	11.98	24.038	
2,900.00	2,897.23	2,879.28	2,876.34	6.34	6.34	170.54	-50.91	-231.72	304.84	292.41	12.43	24.517	
3,000.00	2,996.80	2,980.74	2,977.54	6.58	6.59	170.32	-54.78	-237.99	320.66	307.77	12.89	24.882	
3,100.00	3,096.37	3,081.32	3,077.90	6.83	6.84	170.17	-58.25	-243.51	335.74	322.40	13.34	25.174	
3,200.00	3,195.94	3,178.90	3,175.31	7.08	7.07	170.35	-59.66	-249.07	350.68	336.91	13.77	25.468	
3,300.00	3,295.51	3,272.26	3,268.43	7.33	7.29	170.85	-59.06	-255.60	366.56	352.38	14.18	25.851	
3,400.00	3,395.09	3,370.18	3,366.01	7.58	7.52	171.44	-57.98	-263.74	383.67	369.06	14.61	26.266	
3,500.00	3,494.66	3,473.75	3,469.29	7.84	7.76	171.89	-57.45	-271.45	400.06	385.00	15.06	26.564	
3,600.00	3,594.23	3,566.46	3,561.76	8.09	7.98	172.25	-57.05	-278.12	416.25	400.77	15.47	26.903	
3,700.00	3,693.80	3,657.53	3,652.44	8.35	8.21	172.67	-56.24	-286.44	434.27	418.40	15.88	27.354	
3,800.00	3,793.37	3,752.79	3,747.17	8.61	8.45	173.12	-55.15	-296.39	453.57	437.27	16.30	27.829	
3,900.00	3,892.94	3,855.49	3,849.32	8.87	8.71	173.56	-54.09	-306.92	472.73	455.97	16.76	28.210	
4,000.00	3,992.51	3,954.22	3,947.62	9.13	8.96	173.84	-53.78	-316.21	491.16	473.96	17.20	28.555	
4,100.00	4,092.08	4,051.48	4,044.44	9.40	9.21	174.06	-53.89	-325.44	509.72	492.08	17.64	28.896	
4,200.00	4,191.66	4,160.09	4,152.64	9.66	9.49	174.30	-53.79	-334.86	527.48	509.35	18.13	29.099	
4,300.00	4,291.23	4,257.91	4,250.14	9.93	9.73	174.55	-53.14	-342.70	544.53	525.96	18.57	29.327	
4,400.00	4,390.80	4,369.09	4,361.08	10.19	10.00	174.86	-51.84	-349.96	560.05	541.00	19.05	29.392	
4,500.00	4,490.37	4,465.54	4,457.36	10.46	10.23	175.15	-50.30	-355.33	574.64	555.15	19.49	29.489	
4,600.00	4,590.02	4,552.60	4,544.18	10.72	10.44	175.46	-48.44	-361.56	589.85	569.97	19.88	29.666	
4,700.00	4,689.80	4,641.41	4,632.62	10.97	10.67	175.68	-47.45	-369.56	605.26	584.98	20.28	29.841	
4,800.00	4,789.68	4,738.39	4,729.10	11.20	10.93	175.86	-46.79	-379.26	619.99	599.27	20.72	29.925	
4,900.00	4,889.63	4,852.38	4,842.62	11.43	11.23	175.97	-46.73	-389.65	632.21	610.98	21.23	29.786	
5,000.00	4,989.62	4,989.32	4,979.38	11.64	11.55	175.98	-47.29	-396.25	638.47	616.68	21.79	29.307	
5,100.00	5,089.62	5,103.30	5,093.35	11.84	11.78	-94.35	-46.94	-396.86	639.02	616.80	22.23	28.751	
5,200.00	5,189.62	5,203.77	5,193.82	12.04	11.95	-94.24	-45.73	-396.43	638.51	615.89	22.62	28.230	
5,223.87	5,213.49	5,225.89	5,215.92	12.09	11.99	-93.93	-44.94	-396.41	638.45	615.74	22.71	28.114	
5,300.00	5,289.40	5,303.29	5,292.73	12.24	12.13	-93.51	-35.93	-396.98	638.69	615.67	23.01	27.755	
5,400.00	5,386.54	5,448.04	5,429.65	12.45	12.36	-92.65	9.70	-394.58	636.46	613.02	23.44	27.151	
5,500.00	5,477.49	5,535.25	5,504.70	12.68	12.50	-92.26	53.81	-391.51	632.25	608.34	23.91	26.444	
5,540.66	5,511.93	5,562.03	5,526.08	12.77	12.55	-92.11	69.91	-391.33	631.73	607.61	24.13	26.183	
5,600.00	5,558.92	5,602.00	5,556.64	12.93	12.65	-91.84	95.66	-392.25	632.80	608.35	24.45	25.885	
5,700.00	5,627.82	5,698.29	5,625.78	13.28	12.98	-91.73	162.53	-396.35	636.84	611.56	25.28	25.194	
5,800.00	5,681.67	5,795.84	5,693.16	13.80	13.44	-92.82	232.90	-400.93	642.03	615.64	26.39	24.329	
5,900.00	5,718.48	5,915.82	5,766.36	14.54	14.26	-95.15	327.57	-405.70	647.80	619.84	27.95	23.174	
6,000.00	5,736.91	6,054.17	5,828.36	15.48	15.50	-98.11	451.05	-407.28	652.02	621.99	30.03	21.714	
6,100.00	5,739.00	6,166.72	5,862.12	16.57	16.71	-100.76	558.24	-404.94	654.14	621.99	32.15	20.345	
6,200.00	5,739.00	6,315.12	5,875.58	17.79	18.55	-102.02	705.53	-400.07	651.99	616.92	35.07	18.592	
6,300.00	5,739.00	6,396.06	5,874.36	19.12	19.65	-101.96	786.42	-397.60	648.24	610.73	37.51	17.282	
6,377.86	5,739.00	6,460.06	5,872.85	20.21	20.56	-101.84	850.41	-397.59	647.46	607.94	39.52	16.383	
6,400.00	5,739.00	6,478.67	5,872.58	20.52	20.83	-101.82	869.01	-397.79	647.52	607.42	40.10	16.147	
6,500.00	5,739.00	6,570.67	5,871.60	22.00	22.19	-101.70	960.98	-399.79	648.92	605.99	42.93	15.116	
6,600.00	5,739.00	6,675.46	5,869.29	23.53	23.81	-101.46	1,065.71	-402.52	650.56	604.48	46.07	14.120	
6,700.00	5,739.00	6,782.17	5,870.15	25.10	25.49	-101.53	1,172.41	-403.41	651.04	601.75	49.29	13.208	
6,800.00	5,739.00	6,888.67	5,871.84	26.71	27.21	-101.69	1,278.88	-403.08	650.57	598.01	52.56	12.378	
6,900.00	5,739.00	6,982.27	5,872.98	28.35	28.75	-101.80	1,372.48	-402.82	650.06	594.38	55.68	11.674	
6,949.72	5,739.00	7,037.83	5,873.98	29.18	29.67	-101.90	1,428.02	-402.66	649.87	592.47	57.40	11.322	

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 #14H - Slot 14
Project:	Eddy /Lea County, NM (NAD27) NMEZ	**TVD Reference:**	4045 @ 4063.00ft (Planning)
Reference Site:	Nelson Federal Com 14/24	**MD Reference:**	4045 @ 4063.00ft (Planning)
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	VON_EDM
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design Nelson Federal COM 23H - 13H (Offset) - Lateral - Lateral — **Offset Site Error:** 0.00 ft

Survey Program: 100-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,000.00	5,739.00	7,095.03	5,873.89	30.01	30.62	-101.91	1,485.22	-402.14	649.16	590.00	59.16	10.973	
7,100.00	5,739.00	7,199.59	5,870.55	31.70	32.39	-101.66	1,589.71	-400.37	646.34	583.73	62.61	10.324	
7,200.00	5,739.00	7,283.49	5,868.80	33.40	33.81	-101.52	1,673.58	-399.92	644.91	579.16	65.74	9.809	
7,216.97	5,739.00	7,299.42	5,868.74	33.70	34.09	-101.52	1,689.52	-400.00	644.90	578.59	66.30	9.726	
7,300.00	5,739.00	7,379.41	5,869.58	35.12	35.46	-101.59	1,769.50	-400.42	645.09	576.04	69.06	9.341	
7,400.00	5,739.00	7,468.90	5,871.68	36.86	37.02	-101.76	1,858.95	-401.60	646.37	574.12	72.25	8.946	
7,500.00	5,739.00	7,566.40	5,873.53	38.60	38.73	-101.88	1,956.41	-404.03	648.72	573.10	75.62	8.579	
7,600.00	5,739.00	7,670.10	5,874.34	40.36	40.55	-101.91	2,060.06	-406.74	650.95	571.80	79.14	8.225	
7,700.00	5,739.00	7,774.69	5,873.70	42.12	42.41	-101.83	2,164.63	-408.96	652.41	569.68	82.73	7.886	
7,800.00	5,739.00	7,874.84	5,873.08	43.89	44.19	-101.75	2,264.76	-410.96	653.76	567.50	86.25	7.580	
7,900.00	5,739.00	7,981.48	5,872.54	45.67	46.09	-101.69	2,371.39	-412.21	654.30	564.41	89.89	7.279	
8,000.00	5,739.00	8,083.29	5,871.75	47.46	47.90	-101.62	2,473.19	-412.91	654.34	560.87	93.46	7.001	
8,100.00	5,739.00	8,185.84	5,871.22	49.25	49.74	-101.57	2,575.74	-413.24	654.06	557.01	97.05	6.740	
8,200.00	5,739.00	8,286.42	5,871.17	51.04	51.54	-101.58	2,676.32	-413.11	653.44	552.85	100.59	6.496	
8,300.00	5,739.00	8,387.73	5,871.58	52.84	53.36	-101.63	2,777.63	-412.90	652.82	548.69	104.14	6.269	
8,400.00	5,739.00	8,491.75	5,871.09	54.64	55.23	-101.60	2,881.65	-412.38	651.75	543.99	107.76	6.048	
8,500.00	5,739.00	8,596.22	5,870.33	56.45	57.11	-101.57	2,986.11	-411.19	650.00	538.61	111.39	5.835	
8,600.00	5,739.00	8,694.70	5,870.05	58.26	58.89	-101.58	3,084.58	-409.72	648.00	533.08	114.92	5.639	
8,700.00	5,739.00	8,791.94	5,870.63	60.07	60.64	-101.66	3,181.81	-408.45	646.35	527.93	118.42	5.458	
8,800.00	5,739.00	8,895.04	5,872.09	61.89	62.51	-101.83	3,284.88	-406.89	644.67	522.71	121.97	5.286	
8,881.61	5,739.00	8,964.32	5,873.51	63.37	63.76	-101.97	3,354.15	-406.36	643.99	519.36	124.63	5.167	
8,900.00	5,739.00	8,980.26	5,873.91	63.71	64.05	-102.00	3,370.08	-406.39	644.03	518.80	125.23	5.143	
9,000.00	5,739.00	9,082.67	5,875.64	65.53	65.92	-102.15	3,472.48	-406.74	644.24	515.45	128.79	5.002	
9,100.00	5,739.00	9,179.37	5,876.19	67.35	67.68	-102.20	3,569.17	-407.38	644.52	512.23	132.29	4.872	
9,200.00	5,739.00	9,273.90	5,876.91	69.17	69.40	-102.25	3,663.68	-408.60	645.45	509.71	135.74	4.755	
9,300.00	5,739.00	9,367.83	5,877.50	71.00	71.12	-102.27	3,757.59	-410.75	647.34	508.15	139.19	4.651	
9,400.00	5,739.00	9,468.34	5,877.54	72.83	72.97	-102.23	3,858.06	-413.56	649.59	506.77	142.81	4.548	
9,500.00	5,739.00	9,570.07	5,877.66	74.66	74.84	-102.19	3,959.75	-416.37	651.83	505.36	146.46	4.450	
9,600.00	5,739.00	9,680.47	5,876.34	76.49	76.86	-102.05	4,070.13	-418.49	652.96	502.62	150.35	4.343	
9,700.00	5,739.00	9,791.36	5,873.41	78.32	78.89	-101.80	4,180.97	-419.18	652.54	498.29	154.25	4.230	
9,800.00	5,739.00	9,890.76	5,871.09	80.15	80.71	-101.62	4,280.34	-418.53	650.95	493.02	157.93	4.122	
9,900.00	5,739.00	9,987.16	5,871.28	81.99	82.48	-101.65	4,376.74	-418.17	650.13	488.66	161.46	4.026	
10,000.00	5,739.00	10,085.57	5,872.50	83.82	84.28	-101.77	4,475.14	-417.86	649.59	484.61	164.98	3.937	
10,100.00	5,739.00	10,184.79	5,873.91	85.66	86.10	-101.90	4,574.35	-417.73	649.26	480.75	168.51	3.853	
10,200.00	5,739.00	10,284.88	5,874.91	87.49	87.94	-102.00	4,674.43	-417.73	648.98	476.91	172.07	3.772	
10,300.00	5,739.00	10,383.71	5,876.14	89.33	89.75	-102.11	4,773.25	-417.73	648.75	473.16	175.59	3.695	
10,323.06	5,739.00	10,406.42	5,876.57	89.76	90.17	-102.15	4,795.96	-417.73	648.73	472.34	176.40	3.678	
10,400.00	5,739.00	10,475.79	5,877.51	91.17	91.44	-102.23	4,865.32	-418.28	649.18	470.19	178.98	3.627	
10,500.00	5,739.00	10,593.55	5,877.23	93.01	93.61	-102.20	4,983.07	-419.01	649.30	466.38	182.92	3.550	
10,568.33	5,739.00	10,651.26	5,876.61	94.27	94.67	-102.15	5,040.78	-419.05	648.84	463.60	185.25	3.503	
10,600.00	5,739.00	10,678.77	5,876.42	94.85	95.18	-102.14	5,068.29	-419.32	648.95	462.62	186.32	3.483	
10,700.00	5,739.00	10,775.74	5,876.30	96.69	96.96	-102.11	5,165.24	-420.75	649.88	459.98	189.90	3.422	
10,800.00	5,739.00	10,880.99	5,875.70	98.53	98.91	-102.04	5,270.49	-422.20	650.62	456.96	193.66	3.360	
10,900.00	5,739.00	10,987.85	5,874.34	100.38	100.87	-101.92	5,377.33	-422.59	650.22	452.75	197.47	3.293	
10,987.26	5,739.00	11,070.43	5,873.70	101.98	102.39	-101.87	5,459.91	-422.81	649.88	449.30	200.58	3.240	
11,000.00	5,739.00	11,081.71	5,873.64	102.22	102.60	-101.87	5,471.19	-422.89	649.90	448.88	201.02	3.233	
11,100.00	5,739.00	11,174.18	5,873.49	104.06	104.31	-101.84	5,563.65	-424.24	650.79	446.28	204.51	3.182	
11,200.00	5,739.00	11,275.73	5,873.99	105.91	106.19	-101.86	5,665.18	-425.93	652.04	443.88	208.16	3.132	
11,300.00	5,739.00	11,377.90	5,874.80	107.75	108.07	-101.91	5,767.34	-427.26	652.99	441.20	211.79	3.083	
11,400.00	5,739.00	11,480.53	5,875.14	109.59	109.97	-101.93	5,869.97	-428.34	653.59	438.13	215.46	3.034	
11,500.00	5,739.00	11,583.13	5,875.53	111.44	111.86	-101.96	5,972.56	-428.92	653.74	434.63	219.11	2.984	
11,600.00	5,739.00	11,683.37	5,876.08	113.29	113.71	-102.02	6,072.80	-429.21	653.66	430.95	222.70	2.935	

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 #14H - Slot 14
Project:	Eddy /Lea County, NM (NAD27) NMEZ	**TVD Reference:**	4045 @ 4063.00ft (Planning)
Reference Site:	Nelson Federal Com 14/24	**MD Reference:**	4045 @ 4063.00ft (Planning)
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	VON_EDM
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design Nelson Federal COM 23H - 13H (Offset) - Lateral - Lateral — **Offset Site Error:** 0.00 ft

Survey Program: 100-MWD — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
11,700.00	5,739.00	11,784.30	5,875.37	115.13	115.57	-101.95	6,173.72	-429.81	653.60	427.21	226.39	2.887	
11,760.09	5,739.00	11,843.12	5,874.88	116.24	116.66	-101.91	6,232.54	-430.07	653.46	424.89	228.58	2.859	
11,800.00	5,739.00	11,879.53	5,874.73	116.98	117.33	-101.90	6,268.95	-430.38	653.57	423.60	229.97	2.842	
11,900.00	5,739.00	11,980.62	5,874.79	118.82	119.20	-101.89	6,370.04	-431.65	654.33	420.71	233.63	2.801	
12,000.00	5,739.00	12,086.02	5,874.90	120.67	121.15	-101.90	6,475.44	-432.05	654.23	416.89	237.34	2.756	
12,051.47	5,739.00	12,134.51	5,875.08	121.62	122.04	-101.92	6,523.92	-432.06	654.04	414.89	239.14	2.735	
12,100.00	5,739.00	12,177.29	5,875.31	122.52	122.83	-101.94	6,566.70	-432.42	654.25	413.47	240.78	2.717	
12,200.00	5,739.00	12,278.41	5,876.06	124.37	124.70	-101.98	6,667.81	-433.86	655.31	410.91	244.40	2.681	
12,300.00	5,739.00	12,378.41	5,877.23	126.21	126.55	-102.08	6,767.79	-434.74	655.94	407.98	247.96	2.645	
12,400.00	5,739.00	12,488.86	5,879.06	128.06	128.59	-102.24	6,878.23	-434.92	655.97	404.33	251.64	2.607	
12,500.00	5,739.00	12,584.37	5,879.59	129.91	130.35	-102.30	6,973.73	-434.78	655.46	400.31	255.15	2.569	
12,509.83	5,739.00	12,592.91	5,879.55	130.09	130.51	-102.29	6,982.27	-434.83	655.45	399.97	255.49	2.566	
12,600.00	5,739.00	12,673.35	5,878.65	131.76	132.00	-102.20	7,062.69	-436.03	656.12	397.49	258.63	2.537	
12,700.00	5,739.00	12,779.01	5,876.81	133.61	133.96	-102.01	7,168.32	-438.13	657.21	394.67	262.54	2.503	
12,800.00	5,739.00	12,879.72	5,875.37	135.46	135.83	-101.87	7,269.01	-439.60	657.86	391.55	266.31	2.470	
12,900.00	5,739.00	12,985.70	5,874.20	137.31	137.79	-101.77	7,374.98	-440.44	657.92	387.78	270.14	2.435	
13,000.00	5,739.00	13,095.00	5,873.20	139.16	139.81	-101.70	7,484.27	-440.15	657.00	383.04	273.96	2.398	
13,100.00	5,739.00	13,198.17	5,872.34	141.01	141.71	-101.67	7,587.42	-438.17	654.45	376.80	277.64	2.357	
13,200.00	5,739.00	13,290.43	5,871.92	142.86	143.41	-101.66	7,679.67	-437.21	652.84	371.64	281.20	2.322	
13,300.00	5,739.00	13,394.32	5,872.35	144.71	145.33	-101.72	7,783.56	-436.52	651.81	366.98	284.83	2.288	
13,353.68	5,739.00	13,455.95	5,872.31	145.70	146.46	-101.74	7,845.18	-435.38	650.57	363.74	286.82	2.268 SF	
13,400.00	5,739.00	13,438.00	5,872.36	146.56	146.13	-101.74	7,827.23	-435.79	652.35	365.57	286.78	2.275	
13,500.00	5,739.00	13,438.00	5,872.36	148.41	146.13	-101.74	7,827.23	-435.79	666.79	384.36	282.43	2.361	
13,600.00	5,739.00	13,438.00	5,872.36	150.26	146.13	-101.74	7,827.23	-435.79	695.45	422.79	272.66	2.551	
13,700.00	5,739.00	13,438.00	5,872.36	152.11	146.13	-101.74	7,827.23	-435.79	736.67	477.42	259.25	2.842	
13,714.86	5,739.00	13,438.00	5,872.36	152.39	146.13	-101.74	7,827.23	-435.79	743.75	486.69	257.06	2.893	

CONCHO

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #14H - Slot 14
Project:	Eddy /Lea County, NM (NAD27) NMEZ	**TVD Reference:**	4045 @ 4063.00ft (Planning)
Reference Site:	Nelson Federal Com 14/24	**MD Reference:**	4045 @ 4063.00ft (Planning)
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	VON_EDM
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design Nelson Federal COM 23H - 23H - Lateral - Lateral PLANNED BHL 352'FWL, 220'FNL — **Offset Site Error:** 0.00 ft

Survey Program: 100-GYD_DP_MS, 2387-MWD, 14145-Projection — **Offset Well Error:** 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	2.01	2.01	0.00	0.00	-135.29	-170.60	-168.90	240.07				
100.00	100.00	102.35	102.35	0.09	0.09	-135.41	-170.90	-168.50	240.00	239.82	0.18	1,347.018	
200.00	200.00	203.46	203.45	0.32	0.23	-135.59	-171.18	-167.67	239.62	239.08	0.54	445.044	
300.00	300.00	302.73	302.73	0.54	0.31	-135.70	-171.18	-167.04	239.18	238.34	0.85	282.426	
400.00	400.00	402.65	402.64	0.77	0.38	-135.80	-171.26	-166.56	238.90	237.76	1.14	209.887	
500.00	500.00	502.79	502.78	0.99	0.44	-135.88	-171.30	-166.09	238.60	237.18	1.42	168.058	
600.00	600.00	603.22	603.21	1.22	0.50	-135.94	-171.17	-165.62	238.18	236.48	1.70	140.267	
700.00	700.00	703.06	703.05	1.44	0.55	-135.98	-170.95	-165.17	237.71	235.74	1.97	120.489	
800.00	800.00	802.28	802.27	1.67	0.60	-136.01	-170.84	-164.90	237.44	235.20	2.24	106.010	
819.98	819.98	821.99	821.98	1.71	0.60	-136.02	-170.85	-164.87	237.43	235.14	2.29	103.779	
900.00	900.00	900.99	900.98	1.89	0.62	-136.08	-171.14	-164.82	237.60	235.12	2.48	95.684	
1,000.00	1,000.00	1,000.66	1,000.65	2.12	0.66	-136.17	-171.77	-164.88	238.10	235.36	2.74	86.979	
1,100.00	1,100.00	1,099.91	1,099.89	2.34	0.69	-136.26	-172.54	-165.11	238.82	235.83	2.99	79.867	
1,200.00	1,200.00	1,199.98	1,199.96	2.56	0.72	-136.31	-173.31	-165.56	239.69	236.45	3.24	73.908	
1,300.00	1,300.00	1,300.05	1,300.03	2.79	0.74	-136.32	-173.94	-166.12	240.53	237.03	3.50	68.788	
1,400.00	1,400.00	1,400.61	1,400.58	3.01	0.77	-136.31	-174.43	-166.63	241.23	237.48	3.75	64.317	
1,500.00	1,500.00	1,502.59	1,502.56	3.24	0.77	-136.32	-174.59	-166.73	241.41	237.43	3.98	60.710	
1,600.00	1,600.00	1,602.49	1,602.46	3.46	0.80	-136.40	-174.68	-166.36	241.23	237.00	4.23	57.085	
1,700.00	1,700.00	1,705.80	1,705.77	3.69	0.83	-136.50	-174.32	-165.43	240.35	235.88	4.47	53.734	
1,800.00	1,800.00	1,806.18	1,806.13	3.91	0.86	-136.66	-173.59	-163.84	238.74	234.01	4.73	50.500	
1,900.00	1,900.00	1,906.82	1,906.75	4.14	0.90	-136.84	-172.75	-162.00	236.87	231.89	4.98	47.546	
2,000.00	1,999.99	2,007.21	2,007.12	4.35	0.93	133.50	-171.76	-159.98	235.38	230.16	5.22	45.071	
2,078.07	2,078.04	2,085.20	2,085.08	4.50	0.96	133.66	-171.02	-158.33	235.01	229.61	5.40	43.508	CC
2,100.00	2,099.96	2,107.12	2,106.99	4.55	0.96	133.75	-170.80	-157.87	235.04	229.59	5.45	43.112	ES
2,200.00	2,199.86	2,206.57	2,206.42	4.75	1.00	134.23	-170.10	-155.68	236.04	230.36	5.68	41.523	
2,300.00	2,299.68	2,306.28	2,306.11	4.96	1.02	134.94	-169.69	-153.43	238.46	232.55	5.91	40.342	
2,400.00	2,399.37	2,405.93	2,405.72	5.18	1.05	135.83	-169.56	-150.94	242.19	236.04	6.15	39.372	
2,500.00	2,498.94	2,504.23	2,504.00	5.40	1.11	137.08	-169.08	-149.28	247.29	240.86	6.43	38.433	
2,600.00	2,598.52	2,601.75	2,601.48	5.63	1.20	139.06	-166.65	-150.44	253.40	246.65	6.75	37.543	
2,700.00	2,698.09	2,698.90	2,698.57	5.86	1.32	141.14	-163.89	-152.73	260.48	253.39	7.09	36.726	
2,800.00	2,797.66	2,793.22	2,792.78	6.10	1.45	143.22	-161.43	-156.45	269.31	261.85	7.46	36.103	
2,900.00	2,897.23	2,888.45	2,887.79	6.34	1.61	145.43	-159.08	-162.40	280.44	272.59	7.85	35.738	
3,000.00	2,996.80	2,987.62	2,986.74	6.58	1.78	147.53	-156.73	-168.61	292.05	283.80	8.25	35.403	
3,100.00	3,096.37	3,083.65	3,082.51	6.83	1.96	149.46	-154.55	-175.23	304.62	295.96	8.66	35.166	
3,200.00	3,195.94	3,182.07	3,180.62	7.08	2.17	151.37	-152.23	-182.82	318.19	309.11	9.09	35.019	
3,300.00	3,295.51	3,282.01	3,280.29	7.33	2.40	153.02	-150.26	-189.69	331.51	321.99	9.52	34.830	
3,400.00	3,395.09	3,377.16	3,375.16	7.58	2.62	154.57	-147.95	-196.78	345.40	335.46	9.94	34.735	
3,500.00	3,494.66	3,472.04	3,469.67	7.84	2.86	155.98	-146.30	-204.92	360.84	350.47	10.37	34.786	
3,600.00	3,594.23	3,571.75	3,568.90	8.09	3.12	157.55	-143.50	-214.32	376.85	366.04	10.82	34.837	
3,700.00	3,693.80	3,670.34	3,667.07	8.35	3.37	158.93	-140.71	-222.94	392.47	381.21	11.26	34.843	
3,800.00	3,793.37	3,767.99	3,764.19	8.61	3.64	160.39	-136.79	-232.28	408.68	396.97	11.71	34.898	
3,900.00	3,892.94	3,867.19	3,862.89	8.87	3.91	161.73	-132.99	-241.55	424.98	412.81	12.16	34.937	
4,000.00	3,992.51	3,966.19	3,961.41	9.13	4.18	162.94	-129.31	-250.54	441.26	428.64	12.62	34.976	
4,100.00	4,092.08	4,065.35	4,060.14	9.40	4.45	164.00	-126.13	-259.21	457.54	444.47	13.07	35.013	
4,200.00	4,191.66	4,166.32	4,160.69	9.66	4.72	164.99	-122.80	-267.71	473.64	460.11	13.52	35.021	
4,300.00	4,291.23	4,264.56	4,258.56	9.93	4.98	165.88	-119.61	-275.63	489.52	475.55	13.97	35.032	
4,400.00	4,390.80	4,365.02	4,358.64	10.19	5.25	166.75	-116.24	-283.65	505.41	490.98	14.43	35.026	
4,500.00	4,490.37	4,464.43	4,457.70	10.46	5.51	167.56	-112.73	-291.29	521.09	506.20	14.88	35.012	
4,600.00	4,590.02	4,563.96	4,556.88	10.72	5.78	168.34	-109.18	-298.79	535.82	520.48	15.34	34.939	
4,700.00	4,689.80	4,663.91	4,656.51	10.97	6.04	169.00	-105.87	-306.07	548.74	532.95	15.79	34.759	
4,800.00	4,789.68	4,762.51	4,754.78	11.20	6.30	169.62	-102.38	-313.31	560.03	543.80	16.23	34.499	
4,900.00	4,889.63	4,863.38	4,855.36	11.43	6.56	170.09	-99.70	-320.45	569.57	552.89	16.68	34.142	

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 #14H - Slot 14
Project:	Eddy /Lea County, NM (NAD27) NMEZ	**TVD Reference:**	4045 @ 4063.00ft (Planning)
Reference Site:	Nelson Federal Com 14/24	**MD Reference:**	4045 @ 4063.00ft (Planning)
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	VON_EDM
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design Nelson Federal COM 23H - 23H - Lateral - Lateral PLANNED BHL 352'FWL, 220'FNL — Offset Site Error: 0.00 ft

Survey Program: 100-GYD_DP_MS, 2387-MWD, 14145-Projection — Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,989.62	4,964.50	4,956.23	11.64	6.82	170.46	-97.50	-327.25	577.16	560.03	17.13	33.694	
5,100.00	5,089.62	5,064.98	5,056.46	11.84	7.08	-99.55	-95.09	-333.84	583.29	565.72	17.57	33.203	
5,200.00	5,189.62	5,165.17	5,156.41	12.04	7.33	-99.20	-92.54	-340.36	589.31	571.30	18.01	32.730	
5,300.00	5,289.40	5,265.27	5,256.27	12.24	7.59	-98.50	-89.97	-346.78	595.97	577.52	18.45	32.306	
5,400.00	5,386.54	5,365.31	5,356.07	12.45	7.84	-99.29	-87.24	-353.09	605.52	586.61	18.91	32.021	
5,500.00	5,477.49	5,466.85	5,457.46	12.68	8.08	-101.50	-85.46	-358.31	618.72	599.31	19.41	31.878	
5,600.00	5,558.92	5,562.23	5,552.79	12.93	8.29	-104.32	-84.67	-360.96	637.40	617.46	19.93	31.974	
5,700.00	5,627.82	5,638.07	5,628.63	13.28	8.44	-106.07	-84.61	-361.45	665.11	644.65	20.46	32.510	
5,800.00	5,681.67	5,695.88	5,686.44	13.80	8.55	-105.72	-84.41	-361.53	704.89	683.92	20.97	33.612	
5,900.00	5,718.48	5,900.00	5,831.11	14.54	9.00	-110.90	-68.70	-360.23	754.90	733.03	21.86	34.532	
6,000.00	5,736.91	6,184.02	6,120.52	15.48	10.37	-124.45	103.89	-362.43	802.74	779.64	23.10	34.748	
6,100.00	5,739.00	6,265.94	6,177.49	16.57	10.97	-125.96	162.76	-362.04	848.79	824.88	23.91	35.498	
6,200.00	5,739.00	6,826.57	6,377.28	17.79	17.82	-136.61	661.23	-364.52	875.70	847.59	28.11	31.153	
6,300.00	5,739.00	6,930.37	6,378.25	19.12	19.47	-136.62	765.01	-365.65	876.78	846.63	30.15	29.081	
6,400.00	5,739.00	7,028.70	6,379.86	20.52	21.08	-136.71	863.33	-365.83	877.76	845.53	32.23	27.238	
6,500.00	5,739.00	7,138.82	6,380.83	22.00	22.91	-136.76	973.44	-366.13	878.25	843.73	34.52	25.440	
6,600.00	5,739.00	7,243.23	6,379.55	23.53	24.69	-136.68	1,077.84	-367.15	877.68	840.79	36.89	23.792	
6,648.95	5,739.00	7,287.05	6,378.77	24.30	25.44	-136.62	1,121.65	-368.01	877.53	839.52	38.01	23.086	
6,700.00	5,739.00	7,337.29	6,377.89	25.10	26.31	-136.53	1,171.86	-369.34	877.63	838.38	39.25	22.361	
6,800.00	5,739.00	7,446.71	6,375.86	26.71	28.22	-136.37	1,281.24	-371.33	877.20	835.36	41.84	20.965	
6,900.00	5,739.00	7,549.24	6,374.01	28.35	30.02	-136.28	1,383.75	-371.81	875.87	831.50	44.37	19.740	
7,000.00	5,739.00	7,646.04	6,371.89	30.01	31.73	-136.15	1,480.52	-373.06	874.84	827.93	46.91	18.651	
7,100.00	5,739.00	7,739.17	6,369.57	31.70	33.38	-135.97	1,573.60	-375.05	874.19	824.73	49.46	17.673	
7,107.97	5,739.00	7,746.21	6,369.44	31.84	33.51	-135.96	1,580.64	-375.21	874.19	824.52	49.67	17.602	
7,200.00	5,739.00	7,833.26	6,368.65	33.40	35.07	-135.86	1,667.66	-377.04	874.60	822.57	52.03	16.809	
7,300.00	5,739.00	7,941.28	6,369.78	35.12	37.00	-135.95	1,775.68	-376.86	874.91	820.25	54.66	16.007	
7,366.37	5,739.00	8,004.64	6,370.18	36.27	38.13	-136.01	1,839.03	-376.29	874.57	818.26	56.31	15.532	
7,400.00	5,739.00	8,031.02	6,370.44	36.86	38.60	-136.02	1,865.41	-376.30	874.71	817.63	57.08	15.324	
7,500.00	5,739.00	8,126.60	6,371.96	38.60	40.32	-136.06	1,960.97	-377.44	876.32	816.70	59.61	14.700	
7,600.00	5,739.00	8,234.82	6,373.20	40.36	42.28	-136.12	2,069.18	-377.84	877.04	814.74	62.30	14.077	
7,700.00	5,739.00	8,343.75	6,373.18	42.12	44.25	-136.13	2,178.11	-378.33	877.00	811.94	65.06	13.481	
7,800.00	5,739.00	8,439.28	6,373.06	43.89	45.98	-136.15	2,273.64	-378.26	876.52	808.88	67.64	12.959	
7,814.65	5,739.00	8,452.95	6,373.09	44.15	46.23	-136.15	2,287.31	-378.29	876.51	808.50	68.01	12.888	
7,900.00	5,739.00	8,530.45	6,373.63	45.67	47.64	-136.18	2,364.81	-378.61	876.89	806.73	70.16	12.498	
8,000.00	5,739.00	8,622.92	6,374.76	47.46	49.32	-136.20	2,457.26	-379.70	878.24	805.53	72.71	12.079	
8,100.00	5,739.00	8,718.00	6,375.60	49.25	51.06	-136.14	2,552.30	-382.12	880.30	804.92	75.37	11.679	
8,200.00	5,739.00	8,824.65	6,376.18	51.04	53.02	-136.05	2,658.91	-385.20	882.36	804.10	78.26	11.275	
8,300.00	5,739.00	8,941.76	6,375.99	52.84	55.18	-135.98	2,776.00	-387.02	882.98	801.73	81.25	10.867	
8,400.00	5,739.00	9,043.98	6,375.32	54.64	57.03	-135.95	2,878.22	-387.55	882.52	798.50	84.02	10.504	
8,500.00	5,739.00	9,147.48	6,374.02	56.45	58.93	-135.88	2,981.71	-388.41	881.86	795.00	86.86	10.153	
8,600.00	5,739.00	9,250.54	6,372.47	58.26	60.82	-135.84	3,084.76	-388.15	880.24	790.59	89.65	9.818	
8,700.00	5,739.00	9,342.51	6,371.61	60.07	62.50	-135.81	3,176.72	-388.59	879.54	787.22	92.33	9.526	
8,800.00	5,739.00	9,440.39	6,370.37	61.89	64.30	-135.73	3,274.59	-389.54	878.97	783.84	95.13	9.240	
8,815.37	5,739.00	9,453.79	6,370.27	62.17	64.55	-135.72	3,287.99	-389.69	878.96	783.42	95.54	9.200	
8,900.00	5,739.00	9,536.66	6,370.41	63.71	66.07	-135.71	3,370.85	-390.50	879.33	781.48	97.85	8.987	
8,985.70	5,739.00	9,624.14	6,371.27	65.27	67.67	-135.81	3,458.32	-389.60	879.01	778.93	100.09	8.783	
9,000.00	5,739.00	9,635.36	6,371.45	65.53	67.88	-135.82	3,469.53	-389.50	879.04	778.62	100.42	8.754	
9,100.00	5,739.00	9,717.88	6,373.36	67.35	69.40	-135.92	3,552.03	-389.76	880.55	777.77	102.78	8.567	
9,200.00	5,739.00	9,821.62	6,376.05	69.17	71.31	-135.99	3,655.72	-391.32	883.13	777.65	105.48	8.372	
9,300.00	5,739.00	9,931.68	6,376.61	71.00	73.34	-135.96	3,765.77	-392.96	884.15	775.75	108.40	8.156	
9,400.00	5,739.00	10,023.73	6,375.97	72.83	75.04	-135.82	3,857.77	-395.89	885.50	774.26	111.25	7.960	
9,500.00	5,739.00	10,132.80	6,374.42	74.66	77.06	-135.58	3,966.75	-400.23	886.95	772.45	114.50	7.746	

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 #14H - Slot 14
Project:	Eddy /Lea County, NM (NAD27) NMEZ	**TVD Reference:**	4045 @ 4063.00ft (Planning)
Reference Site:	Nelson Federal Com 14/24	**MD Reference:**	4045 @ 4063.00ft (Planning)
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	#14H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	VON_EDM
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design Nelson Federal COM 23H - 23H - Lateral - Lateral PLANNED BHL 352'FWL, 220'FNL — Offset Site Error: 0.00 ft

Survey Program: 100-GYD_DP_MS, 2387-MWD, 14145-Projection — Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,600.00	5,739.00	10,252.93	6,373.27	76.49	79.28	-135.52	4,086.85	-400.98	886.33	768.73	117.60	7.537	
9,700.00	5,739.00	10,361.56	6,371.64	78.32	81.27	-135.52	4,195.47	-399.79	884.13	763.69	120.44	7.341	
9,779.82	5,739.00	10,418.51	6,371.28	79.78	82.32	-135.55	4,252.41	-399.03	882.85	760.51	122.34	7.216	
9,800.00	5,739.00	10,431.22	6,371.32	80.15	82.56	-135.55	4,265.11	-399.13	882.94	760.14	122.80	7.190	
9,900.00	5,739.00	10,512.49	6,372.34	81.99	84.06	-135.50	4,346.34	-401.67	885.51	760.15	125.36	7.064	
10,000.00	5,739.00	10,624.64	6,373.12	83.82	86.14	-135.41	4,458.44	-404.95	887.71	759.23	128.49	6.909	
10,100.00	5,739.00	10,737.14	6,372.84	85.66	88.22	-135.32	4,570.91	-407.30	888.65	757.05	131.60	6.752	
10,200.00	5,739.00	10,846.95	6,371.72	87.49	90.25	-135.24	4,680.71	-408.35	888.25	753.61	134.64	6.597	
10,249.89	5,739.00	10,888.68	6,371.41	88.41	91.02	-135.23	4,722.44	-408.57	888.00	752.05	135.95	6.532	
10,300.00	5,739.00	10,929.83	6,371.65	89.33	91.78	-135.24	4,763.58	-408.83	888.25	751.04	137.21	6.474	
10,400.00	5,739.00	11,038.14	6,373.03	91.17	93.78	-135.31	4,871.89	-409.16	889.05	749.07	139.98	6.351	
10,500.00	5,739.00	11,139.69	6,373.65	93.01	95.66	-135.36	4,973.44	-409.07	889.07	748.38	142.69	6.231	
10,600.00	5,739.00	11,250.97	6,373.49	94.85	97.71	-135.41	5,084.71	-408.52	888.26	742.74	145.52	6.104	
10,700.00	5,739.00	11,349.98	6,372.87	96.69	99.54	-135.45	5,183.71	-407.42	886.69	738.49	148.20	5.983	
10,775.92	5,739.00	11,414.74	6,372.74	98.09	100.73	-135.47	5,248.47	-407.30	888.22	736.06	150.16	5.902	
10,800.00	5,739.00	11,433.74	6,372.78	98.53	101.08	-135.47	5,267.47	-407.42	886.28	735.53	150.76	5.879	
10,900.00	5,739.00	11,512.00	6,373.68	100.38	102.53	-135.46	5,345.71	-408.92	888.09	734.88	153.22	5.796	
11,000.00	5,739.00	11,612.97	6,375.61	102.22	104.41	-135.44	5,446.62	-411.75	891.07	735.01	156.06	5.710	
11,100.00	5,739.00	11,714.11	6,377.40	104.06	106.29	-135.41	5,547.71	-414.53	893.91	734.99	158.92	5.625	
11,200.00	5,739.00	11,816.11	6,378.77	105.91	108.18	-135.36	5,649.65	-417.63	896.65	734.78	161.87	5.539	
11,300.00	5,739.00	11,923.08	6,379.56	107.75	110.17	-135.29	5,756.58	-420.45	898.68	733.75	164.93	5.449	
11,400.00	5,739.00	12,025.50	6,380.08	109.59	112.07	-135.22	5,858.97	-422.94	900.40	732.50	167.91	5.363	
11,500.00	5,739.00	12,140.88	6,379.76	111.44	114.21	-135.13	5,974.32	-425.25	901.30	730.17	171.13	5.267	
11,600.00	5,739.00	12,254.23	6,377.76	113.29	116.31	-135.03	6,087.65	-426.08	900.20	725.89	174.31	5.164	
11,700.00	5,739.00	12,349.73	6,376.32	115.13	118.08	-134.99	6,183.14	-425.92	898.66	721.51	177.15	5.073	
11,800.00	5,739.00	12,450.65	6,375.40	116.98	119.94	-134.99	6,284.05	-425.65	897.48	717.50	179.98	4.987	
11,900.00	5,739.00	12,556.10	6,373.61	118.82	121.89	-134.93	6,389.49	-425.60	895.89	712.92	182.97	4.896	
11,968.60	5,739.00	12,607.69	6,373.14	120.09	122.85	-134.91	6,441.07	-425.74	895.32	710.57	184.75	4.846	
12,000.00	5,739.00	12,632.16	6,373.18	120.67	123.30	-134.91	6,465.55	-425.95	895.44	709.90	185.54	4.826	
12,100.00	5,739.00	12,739.67	6,373.98	122.52	125.29	-134.95	6,573.05	-426.56	896.02	707.65	188.37	4.757	
12,109.74	5,739.00	12,750.61	6,374.05	122.70	125.49	-134.95	6,583.99	-426.52	896.01	707.37	188.65	4.750	
12,200.00	5,739.00	12,828.98	6,374.62	124.37	126.95	-134.97	6,662.36	-427.08	896.59	705.61	190.97	4.695	
12,300.00	5,739.00	12,929.07	6,375.34	126.21	128.80	-134.96	6,762.43	-428.48	897.74	703.93	193.81	4.632	
12,400.00	5,739.00	13,035.02	6,375.72	128.06	130.77	-134.95	6,868.38	-429.76	898.48	701.73	196.75	4.567	
12,500.00	5,739.00	13,136.38	6,375.85	129.91	132.65	-134.93	6,969.73	-430.68	898.87	699.25	199.62	4.503	
12,600.00	5,739.00	13,238.44	6,375.80	131.76	134.54	-134.92	7,071.79	-431.52	899.07	696.56	202.51	4.440	
12,700.00	5,739.00	13,339.44	6,375.67	133.61	136.41	-134.91	7,172.79	-432.10	899.03	693.68	205.36	4.378	
12,800.00	5,739.00	13,443.02	6,375.47	135.46	138.33	-134.89	7,276.37	-432.69	898.95	690.70	208.25	4.317	
12,900.00	5,739.00	13,552.23	6,374.41	137.31	140.35	-134.87	7,385.57	-432.81	897.99	686.74	211.24	4.251	
13,000.00	5,739.00	13,640.56	6,373.45	139.16	141.99	-134.85	7,473.89	-432.72	896.85	682.86	213.98	4.191	
13,007.16	5,739.00	13,646.28	6,373.45	139.29	142.10	-134.85	7,479.61	-432.75	896.84	682.67	214.17	4.188	
13,100.00	5,739.00	13,733.91	6,373.93	141.01	143.72	-134.86	7,567.23	-433.45	897.39	680.70	216.69	4.141	
13,200.00	5,739.00	13,836.56	6,374.31	142.86	145.62	-134.86	7,669.88	-434.17	897.80	678.27	219.52	4.090	
13,300.00	5,739.00	13,947.83	6,374.08	144.71	147.69	-134.86	7,781.15	-434.62	897.59	675.10	222.49	4.034	
13,400.00	5,739.00	14,070.33	6,372.27	146.56	149.95	-134.85	7,903.62	-433.58	895.65	670.15	225.50	3.972	
13,500.00	5,739.00	14,145.00	6,369.53	148.41	150.32	-134.79	7,978.24	-432.49	892.15	664.59	227.56	3.921	
13,505.78	5,739.00	14,145.00	6,369.53	148.52	150.32	-134.79	7,978.24	-432.49	892.13	664.47	227.66	3.919	SF
13,600.00	5,739.00	14,145.00	6,369.53	150.26	150.32	-134.79	7,978.24	-432.49	897.10	669.11	227.98	3.935	
13,700.00	5,739.00	14,145.00	6,369.53	152.11	150.32	-134.79	7,978.24	-432.49	913.03	687.33	225.70	4.045	
13,714.86	5,739.00	14,145.00	6,369.53	152.39	150.32	-134.79	7,978.24	-432.49	916.31	691.16	225.15	4.070	

Closed Loop Operation & Maintenance Procedure

All drilling fluid circulated over shaker(s) with cuttings discharged into roll off container.

Fluid and fines below shaker(s) are circulated with transfer pump through centrifuge(s) or solids separator with cuttings and fines discharged into roll off container.

Fluid is continuously re-circulated through equipment with polymer added to aid separation of cutting fines.

Roll off containers are lined and de-watered with fluids re-circulated into system.

Additional tank is used to capture unused drilling fluid or cement returns from casing jobs.

This equipment will be maintained 24 hrs./day by solids control personnel and or rig crews that stay on location.

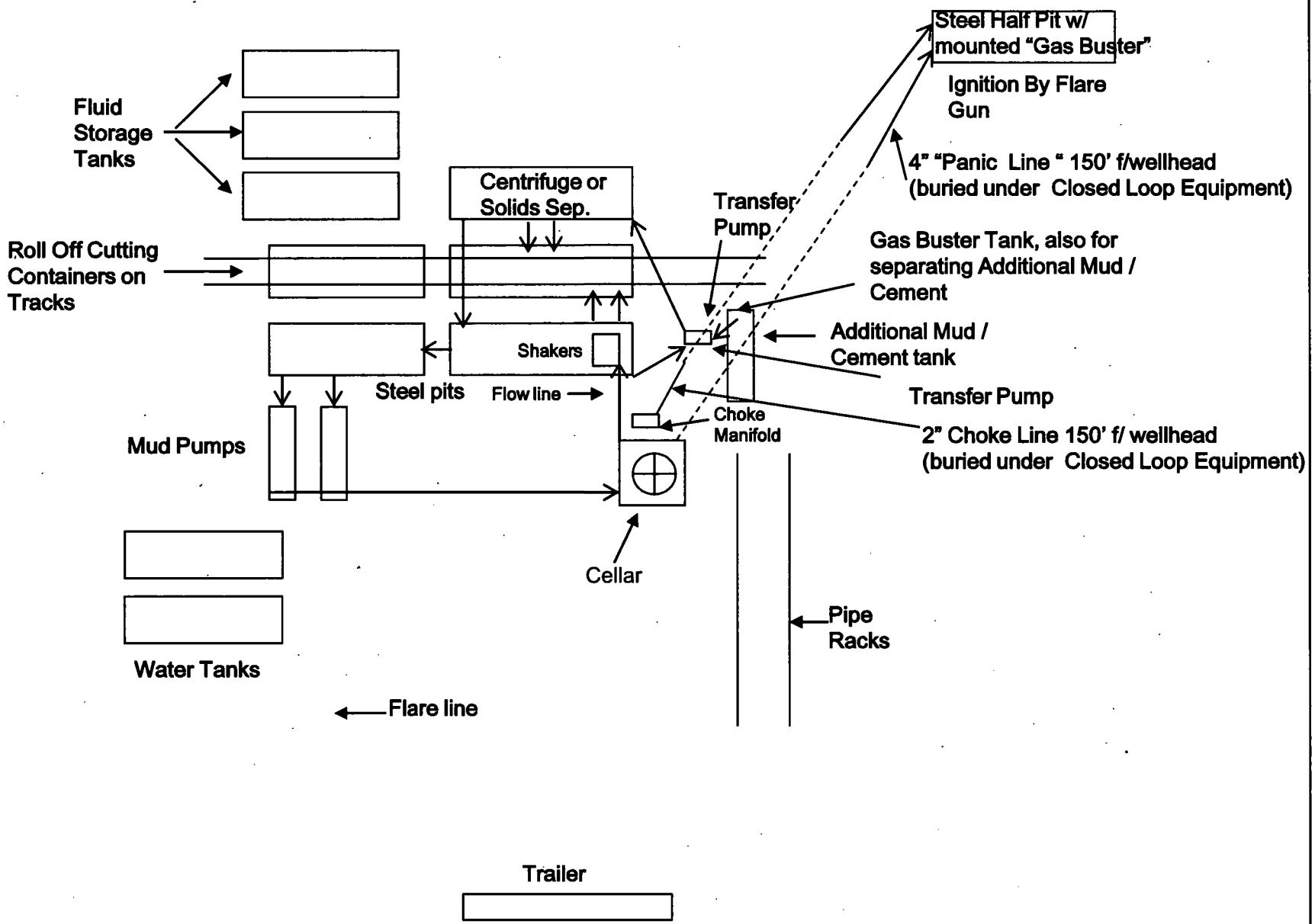
Cuttings will be hauled to either:

CRI (permit number R9166)
or
GMI (permit number 711-019-001)

dependent upon which rig is available to drill this well.

COG Operating LLC

Closed Loop Equipment Diagram



Production Cement Breakdown

Well: Nelson Fed Com #14H

Hole Volumes						
Hole	**Hole Section (Length)**	**Casing**	**Capacity (ft3/Lin.ft)**	**Cu.Ft**	**Total Cu.Ft**	**% Excess**
Prod	0-2320 (2320)	7"	0.1585	367.6	367.7	0
Prod	2320-5229 (2909)	7"	0.1503	437.2	437.2	217
Prod						
Prod						

Cement Volumes					
Blend	**Cement Sacks**	**Yield**	**Weight**	**Volume**	**Total Volume**
35:65:6	600	2.01	12.5	1206	1754
50:50:02	400	1.37	14	548	

% Excess Calculation			
Total Volume	1754		1386.3
Cu.Ft	-367.7		/437.2
	1386.3		**217% Excess**

7" to be run from surface to kickoff point and changed over to 5 ½" with DV Tool and ECP at kickoff point. 5 ½" casing will be run from kickoff point to td and isolation packers set throughout curve and lateral. 7" to be cemented from kickoff point to surface.

Nelson Federal Com #14H

Contingent Multi-Stage Cement Discussion:

COG does not anticipate losing circulation or encountering water flows while drilling this well. If these situations arise, COG requests approval in this APD to set DV tools where necessary immediately without having to shut down the rig and wait for sundry approval.

Lost Circulation or Water flow Contingent DV Tool Cement Plans are as follows:

1. If lost circulation occurs while drilling the 12 ¼" intermediate hole, it may become necessary to set a DV tool in the 9 5/8" casing. The DV tool depth will be based on hole conditions and cement volumes will be adjusted proportionally. If the DV Tool is needed, it will be set a minimum of 50 feet below the previous casing and a minimum of 200 feet above the current shoe.

2. If water flows in the San Andres are encountered, it may become necessary to set a DV tool in the 7" casing. These water flows normally occur in areas where produced water disposal is happening. This dense cement is used to combat water flows. This cement recipe also has a right angle set time and is mixed a little under saturated so the water flow will be absorbed by cement. The DV tool depth will be based on hole conditions and cement volumes will be adjusted proportionally. If the DV tool is needed, it will be set a minimum of 50 feet below the previous casing and a minimum of 200 feet above the current shoe.

Casing	Bottom MD of Segment	Lead or Tail	Cement Type	Additives	Quantity (Sks)	Yield (cu.ft./sk)	Density (lbs./gal)
Inter. Multi-Stage	+/- 1060'	1st Lead	50:50:10 C: Poz:Gel	5% Salt + 5 pps LCM + 0.25 pps CF	150	2.45	11.8
		1st Tail	Class C	2% Cacl2	200	1.32	14.8
		2nd Lead	50:50:10 C: Poz:Gel	5% Salt + 5 pps LCM + 0.25 pps CF	200	2.45	11.8
Prod. Multi-Stage	+/- 4000'	1st Lead	35:65:6 C:Poz Gel	5% salt+5 pps LCM+0.2% SMS + 1% FL-25+1% BA-58+0.3% FL-52A+ 0.125 pps CF	400	2.01	12.5
		1st Tail	Class C	0.3% R-3 + 1.5% CD-32	1850	1.37	14
		2nd Lead	35:65:6 C:Poz Gel	5% salt + 5 pp LCM + 0.2% SMS + 1% FL-25+ 1% BA-58 + 0.3% FL-52A + 0.125 pps CF	650	2.01	12.5
		2nd Tail	50:50:2 C: PozGel	5% salt + 3 pps LCM + 0.6% SMS + 1% FL-25 + 1% BA-58 + 0.125 pps CF	150	0.99	16.8

APD ID: 10400001893 **Submission Date:** 09/27/2017

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Well Type: OIL WELL **Well Work Type:** Drill

[redacted]

Show Final Text

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

Nelson_Federal_Com_14H_Vicinity_plat_07-03-2017.pdf

Existing Road Purpose: ACCESS,FLUID TRANSPORT **Row(s) Exist?** NO

ROW ID(s)

ID:

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? NO

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

Nelson_Federal_Com_14H_1mileRadius_Map_20170829094826.pdf

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Existing Wells description:

Section 4 - Location of Existing and/or Proposed Production Facilities

Submit or defer a Proposed Production Facilities plan? SUBMIT

Production Facilities description: Production will be sent to the Nelson Federal Com Tank Battery located in Section 15 of T17S R32E. Proposed flowlines will follow an archaeologically approved route to the Nelson Federal Com Tank Battery. The flowlines will be SDR 7 3" poly line laid on the surface and will be approx. 1060' in length. Normal working pressure of the flowlines will be below 70 psi and carry a mixture of produced oil, water, and gas. Flowlines will follow existing well-traveled or proposed roads.

Production Facilities map:

Nelson_Federal_Com_14H_Flowline_Map_07-06-2017.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

Water source use type: DUST CONTROL, INTERMEDIATE/PRODUCTION CASING, SURFACE CASING

Water source type: GW WELL

Describe type:

Source latitude:

Source longitude:

Source datum:

Water source permit type: PRIVATE CONTRACT

Source land ownership: COMMERCIAL

Water source transport method: PIPELINE,TRUCKING

Source transportation land ownership: COMMERCIAL

Water source volume (barrels): 8000

Source volume (acre-feet): 1.0311447

Source volume (gal): 336000

Water source and transportation map:

Caswell_Ranch_Water_Supply_07-03-2017.pdf

Loco_Hills_Water_Disposal_Co_Water_Supply_07-03-2017.pdf

Water source comments: The well will be drilled with combination brine and fresh water mud system as outlined in the drilling program. Water will be obtained from commercial water stations in the area and hauled to location by transport truck over the existing and proposed access roads shown in Vicinity Map. A fresh water source is nearby and fast line may be laid along existing road ROW's and fresh water pumped to the well. Water will originate from 1 and/or all of the 3 private wells location described on the attached "Caswell Ranch Water Supply" Map. No water well will be drilled on the location. A secondary water source will be from private wells location depicted on the attached "Loco Hills Water Disposal Co" map attached to this APD. James R. Maloney, 575-677-2118.

New water well? NO

New Water Well Info

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Well latitude: **Well Longitude:** **Well datum:**

Well target aquifer:

Est. depth to top of aquifer(ft): **Est thickness of aquifer:**

Aquifer comments:

Aquifer documentation:

Well depth (ft): **Well casing type:**

Well casing outside diameter (in.): **Well casing inside diameter (in.):**

New water well casing? **Used casing source:**

Drilling method: **Drill material:**

Grout material: **Grout depth:**

Casing length (ft.): **Casing top depth (ft.):**

Well Production type: **Completion Method:**

Water well additional information:

State appropriation permit:

Additional information attachment:

Section 6 - Construction Materials

Construction Materials description: Surfacing material will consist of native caliche. Caliche will be obtained from the actual well site if available. Secondary candidate source will be Caswell Ranch owned Caliche Pit located in NESE of Sec 9, T17S, R32E. A third candidate source will be NMSLO Caliche Pit located in S2/SW4 of Sec 32, T16S, R30E.
Construction Materials source location attachment:

Construction_Turn_Over_Procedure_07-03-2017.pdf

Caswell_Ranch_Caliche_Pit_07-03-2017.pdf

NMSLO_Caliche_Pit_07-03-2017.pdf

Section 7 - Methods for Handling Waste

Waste type: DRILLING

Waste content description: DRILL CUTTINGS AND DRILLING FLUIDS

Amount of waste: 100 barrels

Waste disposal frequency : Daily

Safe containment description: CLOSED LOOP SYSTEM

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** FEDERAL
Disposal type description:

Disposal location description: R360'S DISPOSAL SITE LOCATED AT 4507 WEST CARLSBAD HIGHWAY, HOBBS, NM 88240.

Waste type: PRODUCED WATER

Waste content description: PRODUCED WATER

Amount of waste: 100 barrels

Waste disposal frequency : Daily

Safe containment description: STEEL TANKS

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** STATE

Disposal type description:

Disposal location description: NMOCD APPROVED COMMERCIAL DISPOSAL FACILITY. R360'S DISPOSAL SITE LOCATED AT 4507 WEST CARLSBAD HIGHWAY, HOBBS, NM 88240.

Waste type: GARBAGE

Waste content description: GARBAGE AND TRASH PRODUCED DURING DRILLING AND COMPLETION OPERATIONS.

Amount of waste: 100 pounds

Waste disposal frequency : Weekly

Safe containment description: TRASH BIN

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** STATE

Disposal type description:

Disposal location description: GARBAGE AND TRASH TO BE COLLECTED IN TRASH BIN AND HAULED TO LEA LANDFILL LLC. LOCATED AT MILE MARKER 64, HIGHWAY 62-180 EAST, PO BOX 3247, CARLSBAD, NM 88221. NO TOXIC WASTE OR HAZARDOUS CHEMICALS WILL BE PRODUCED BY THIS OPERATION.

Waste type: SEWAGE

Waste content description: HUMAN WASTE AND GREY WATER.

Amount of waste: 100 gallons

Waste disposal frequency : Weekly

Safe containment description: PORTABLE SEPTIC SYSTEM AND/OR PORTABLE WASTE GATHERING SYSTEM.

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: HAULED TO NMOCD APPROVED WASTE DISPOSAL FACILTY.

Reserve Pit

Reserve Pit being used? NO

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Temporary disposal of produced water into reserve pit?

Reserve pit length (ft.) **Reserve pit width (ft.)**

Reserve pit depth (ft.) **Reserve pit volume (cu. yd.)**

Is at least 50% of the reserve pit in cut?

Reserve pit liner

Reserve pit liner specifications and installation description

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? YES

Description of cuttings location CLOSED LOOP MUD SYSTEM: ROLL-OFF STYLE MUD BOX.

Cuttings area length (ft.) **Cuttings area width (ft.)**

Cuttings area depth (ft.) **Cuttings area volume (cu. yd.)**

Is at least 50% of the cuttings area in cut?

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments:

Section 9 - Well Site Layout

Well Site Layout Diagram:

Nelson_Federal_Com_14H_Well_Site_plat_07-03-2017.pdf

Nelson_Federal_Com_14H_Interim_Reclamation_plat_07-03-2017.pdf

Comments:

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance **Multiple Well Pad Name:** NELSON FEDERAL COM

Multiple Well Pad Number: 1

Recontouring attachment:

Drainage/Erosion control construction: NO SEDIMENTATION OR EROSION CONTROL WILL BE NECESSARY ON THIS LOCATION AS IT IS GENERALLY FLAT WITH LITTLE TO NO SLOPE OR CUT AND FILL.
Drainage/Erosion control reclamation: NO SEDIMENTATION OR EROSION CONTROL WILL BE NECESSARY ON THIS LOCATION AS IT IS GENERALLY FLAT WITH LITTLE TO NO SLOPE OR CUT AND FILL.

Wellpad long term disturbance (acres): 1.99 **Wellpad short term disturbance (acres):** 2.206

Access road long term disturbance (acres): 0 **Access road short term disturbance (acres):** 0

Pipeline long term disturbance (acres): 0.008273645 **Pipeline short term disturbance (acres):** 0.008273645

Other long term disturbance (acres): 0 **Other short term disturbance (acres):** 0

Total long term disturbance: 1.9982736 **Total short term disturbance:** 2.2142737

Disturbance Comments: IN THE EVENT THAT THE WELL MUST BE WORKED OVER OR MAINTAINED, IT MAY BE NECESSARY TO DRIVE, PARK, AND/OR OPERATE MACHINERY ON RECLAIMED LAND. THIS AREA WILL BE REPAIRED OR RECLAIMED AFTER WORK IS COMPLETE.
Reconstruction method: AFTER WELL IS COMPLETED, THE PAD WILL BE DOWNSIZED BY RECLAIMING THE AREAS NOT NEEDED FOR PRODUCTION OPERATIONS. THE PORTIONS OF THE PAD THAT ARE NOT NEEDED FOR PRODUCTION OPERATIONS WILL BE RE-CONTOURED TO ITS ORIGINAL STATE AS MUSH AS POSSIBLE. THE CALICHE THAT IS REMOVED WILL BE REUSED TO EITHER BUILD ANOTHER PAD SITE OR FOR ROAD REPAIRS WITHIN THE LEASE.
Topsoil redistribution: THE STOCKPILED TOPSOIL WILL BE SPREAD OUT ON RECLAIMED AREA AND RESEEDED WITH A BLM APPROVED SEED MIXTURE.
Soil treatment: INTERIM RECLAMATION AS IDENTIFIED DURING ONSITE.

Existing Vegetation at the well pad: GRASSLAND AREA WITH SANDY TOPSOIL. VEGETATION IS MODERATELY SPARSE WITH NATIVE PRAIRIE GRASSES, SOME MESQUITE AND SHINNERY OAK.
Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road: GRASSLAND AREA WITH SANDY TOPSOIL. VEGETATION IS MODERATELY SPARSE WITH NATIVE PRAIRIE GRASSES, SOME MESQUITE AND SHINNERY OAK.
Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline: GRASSLAND AREA WITH SANDY TOPSOIL. VEGETATION IS MODERATELY SPARSE WITH NATIVE PRAIRIE GRASSES, SOME MESQUITE AND SHINNERY OAK.
Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances: GRASSLAND AREA WITH SANDY TOPSOIL. VEGETATION IS MODERATELY SPARSE WITH NATIVE PRAIRIE GRASSES, SOME MESQUITE AND SHINNERY OAK.
Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

Seed Management

Seed Table

Seed type:

Seed source:

Seed name:

Source name:

Source address:

Source phone:

Seed cultivar:

Seed use location:

PLS pounds per acre:

Proposed seeding season:

Seed Summary

Total pounds/Acre:

Seed Type	Pounds/Acre

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name:

Last Name:

Phone:

Email:

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Weed treatment plan description: APPROVED EPA AND BLM REQUIREMENTS AND POLICIES FOR WEED CONTROL METHODS WILL BE FOLLOWED.
Weed treatment plan attachment:

Monitoring plan description: EVALUATION OF GROWTH WILL BE MADE AFTER THE COMPLETION OF ONE FULL GROWING SEASON AFTER SEEDING. -OR- BLM REPRESENTATIVE WILL BE CONTACTED PRIOR TO COMMENCING CONSTRUCTION OF WELL PAD AND ROAD. BLM REPERSENTATIVE WILL ALSO BE CONTACTED PRIOR TO COMMENCING RECLAMATION WORK.
Monitoring plan attachment:

Success standards: 80% COVERAGE BY 2ND GROWING SEASON OF NATIVE SPECIES WITH LESS THAN 5% INVASIVE SPECIES.
Pit closure description: N/A

Pit closure attachment:

Section 11 - Surface Ownership

Disturbance type: EXISTING ACCESS ROAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Disturbance type: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Disturbance type: PIPELINE

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Operator Name: COG OPERATING LLC

Well Name: NELSON FEDERAL COM **Well Number:** 14H

Section 12 - Other Information

Right of Way needed? NO **Use APD as ROW?**

ROW Type(s):

ROW Applications

SUPO Additional Information: 1. It will be necessary to run electric power if this well is productive. Power will be provided by CVE. There will be necessary electric line construction for this well. A Proposed Electric Line Plat has been attached to this APD. 2. There is no permanent or live water in the immediate area. 3. There are no dwellings within 2 miles of this location. 4. A Cultural Resources Examination is being prepared by Boone Arch Services of New Mexico, LLC. Carlsbad, NM, 88220. 506 E Chapman Rd., phone # 575.887.7667 and the results will be forwarded to your office in the near future.
Use a previously conducted onsite? YES

Previous Onsite information: Previous On-site performed on 3/31/2016 by Bob Ballard(BLM), Caden Jameson(COG), Gary Box(RRC)

Other SUPO Attachment

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

PWD Data Report
09/27/2018

Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number: **Injection well name:**

Assigned injection well API number? **Injection well API number:**

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

AFMSS

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Bond Info Data Report

09/27/2018

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB000215

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment: