PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG OPERATING
LEASE NO.:	NMNM121958
WELL NAME & NO.:	DOMINATOR 25 FED COM 104H
SURFACE HOLE FOOTAGE:	310'/S & 2010'/E
BOTTOM HOLE FOOTAGE	200'/N & 2310'/E
LOCATION:	SECTION 25, T25S, R33E, NMPM
COUNTY:	LEA

Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	◉ Low	○ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	◉ Conventional	○ Multibowl	
Other	☐4 String Area	☐Capitan Reef	☐WIPP

A. Hydrogen Sulfide

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

B. CASING

1. The **13 3/8** inch surface casing shall be set at approximately **1150** 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 will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

    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 **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. **Excess calculates to 16% - additional cement might be required.**

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **13 3/8** inch surface casing shoe shall be **2000 (2M)** psi **Annular. 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 **9 5/8** inch intermediate casing shoe shall be **3000 (3M)** psi.

D. 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.

Waste Minimization Plan (WMP)

In the interest of resource development, submission of additional well gas capture development plan information is deferred but may be required by the BLM Authorized Officer at a later date.

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GENERAL 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)

☒ Chaves and Roosevelt Counties
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
During office hours call (575) 627-0272.
After office hours call (575)

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

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 393-3612

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

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

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

A. CASING

1. 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.

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

3. 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.

4. 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.

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

6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. 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.

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

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

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.
    e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the

plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

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

c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

d. 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.

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

f. 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.

g. 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.

h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

D. 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.

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

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WELL NAME & NO.:	DOMINATOR 25 FED COM 104H
SURFACE HOLE FOOTAGE:	310'/S & 2010'/E
BOTTOM HOLE FOOTAGE	200'/N & 2310'/E
LOCATION:	SECTION 25, T25S, R33E, NMPM
COUNTY:	LEA

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

I. GENERAL PROVISIONS

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

II. PERMIT EXPIRATION

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

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

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

IV. NOXIOUS WEEDS

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

V. SPECIAL REQUIREMENT(S)

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.

Range

The operator must contact the allotment holder prior to construction to identify the location of the pipeline. The operator must take measures to protect the pipeline from compression or other damages. If the pipeline is damaged or compromised in any way near the proposed project as a result of oil and gas activity, the operator is responsible for repairing the pipeline immediately. The operator must notify the BLM office (575-234-5972) and the private surface landowner or the grazing allotment holder if any damage occurs to structures that provide water to livestock.

Watershed

Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank or 24 hour production, whichever is greater. Automatic shut off, check valves, or similar systems will be installed for tanks to minimize the effects of catastrophic line failures used in production or drilling.

VI. CONSTRUCTION

A. NOTIFICATION

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

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

B. TOPSOIL

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

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

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

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

F. EXCLOSURE FENCING (CELLARS & PITS)

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

G. ON LEASE ACCESS ROADS

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

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

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

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

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

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

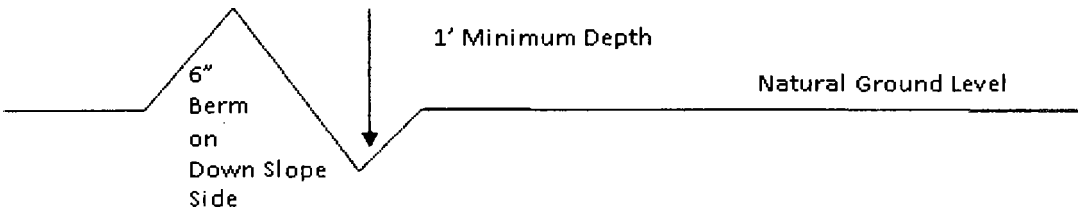
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

Cattle guards

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

Fence Requirement

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

Public Access

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

Construction Steps

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

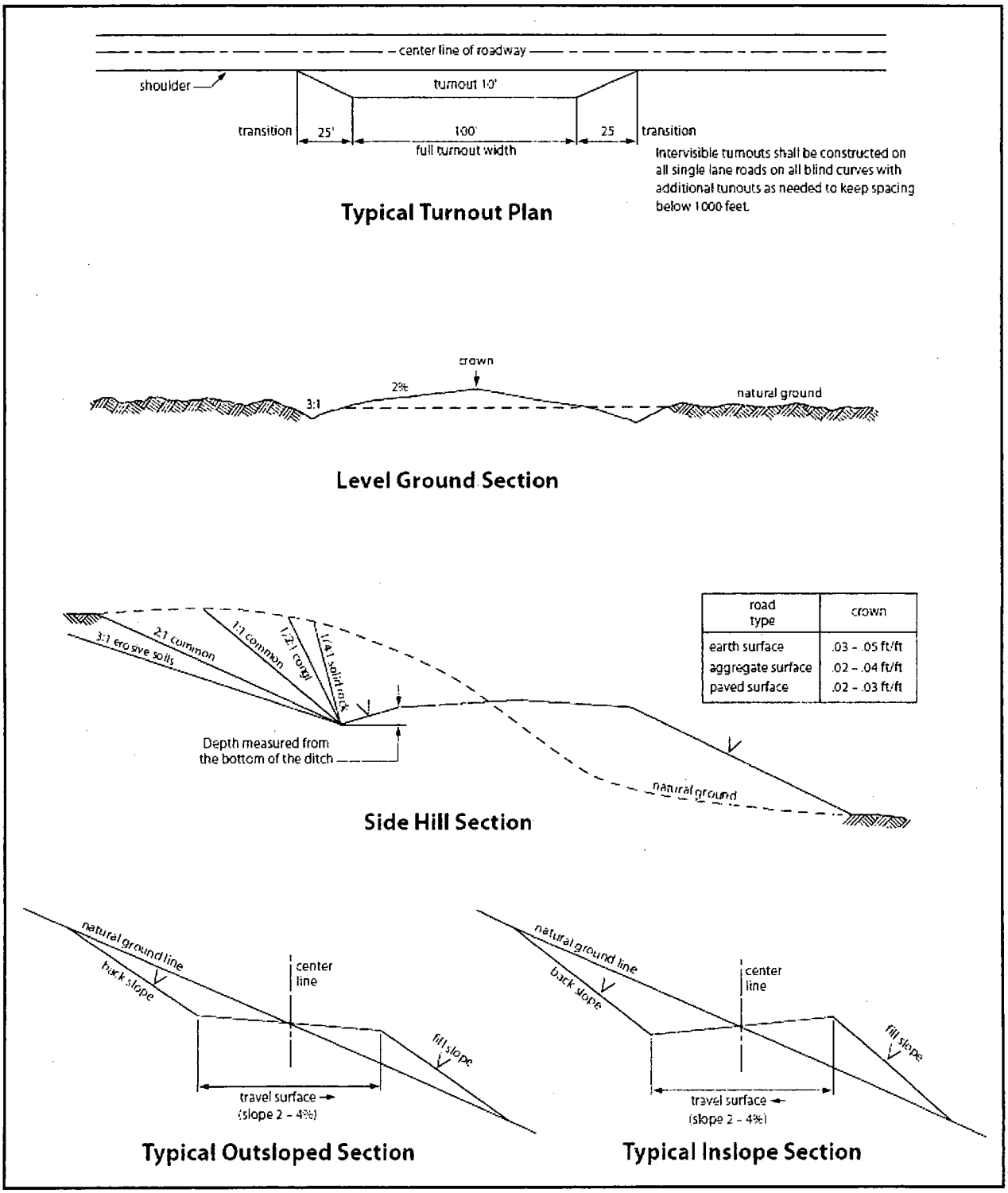


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

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

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

Containment Structures

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

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

B. PIPELINES
STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

A copy of the Grant and attachments, including stipulations, survey plat(s) and/or map(s), shall be on location during construction. BLM personnel may request to review 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. 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. Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, Holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC § 2601 *et seq.* (1982) with regard 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 in particular, 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. 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 activity of 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 provision applies without regard to whether a release is caused by Holder, its agent, or unrelated third parties.

4. Holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. Holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

a. Activities of Holder including, but not limited to: construction, operation, maintenance, and termination of the facility;

b. Activities of other parties including, but not limited to:
   (1) Land clearing
   (2) Earth-disturbing and earth-moving work
   (3) Blasting
   (4) Vandalism and sabotage;

c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars ($1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of Holder, regardless of fault. Upon failure of Holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he/she deems necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of Holder. Such action by the Authorized Officer shall not relieve Holder of any responsibility as provided herein.

6. All construction and maintenance activity shall be confined to the authorized right-of-way width of **20** feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline shall be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline shall be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity shall be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation shall be allowed unless approved in writing by the Authorized Officer.

8. Holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky of duney areas, the pipeline shall be "snaked" around hummocks and dunes rather than suspended across these features.

9. The pipeline shall be buried with a minimum of **24** inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. 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 of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. Signs will be maintained in a legible condition for the life of the pipeline.

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. 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 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.

16. 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, powerline 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.

17. Surface pipelines shall be less than or equal to 4 inches and a working pressure below 125 psi.

18. Special Stipulations:

a. **Lesser Prairie-Chicken:** Oil and gas activities 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 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. Normal vehicle use on existing roads will not be restricted.

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

COG OPERATING LLC
HYDROGEN SULFIDE DRILLING OPERATIONS PLAN

1. HYDROGEN SULFIDE TRAINING

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

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

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

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

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

2. H_2S SAFETY EQUIPMENT AND SYSTEMS

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

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

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

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

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

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

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

g. Communication:
Company vehicles equipped with cellular telephone.

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

WARNING

YOU ARE ENTERING AN H_2S AREA
AUTHORIZED PERSONNEL ONLY

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

COG OPERATING LLC

1-575-748-6940

EMERGENCY CALL LIST

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

EMERGENCY RESPONSE NUMBERS

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

COG OPERATING, LLC

Lea County, NM (NAD27) NMEZ
Dominator 25 Fed COM
#104H

OH
Plan #1 - IP

Anticollision Report

28 November, 2017

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Reference Plan #1 - IP

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	**Error Surface:**	Pedal Curve
Warning Levels Evaluated at:	2.000 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 11/28/17

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	14,455.02	Plan #1 - IP (OH)	MWD	MWD v3:standard declination

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Dominator 25 Fed COM						
#304H - OH - Plan #1 - IP	3,000.00	3,000.10	29.90	16.70	2.264	CC, ES
#304H - OH - Plan #1 - IP	9,225.00	9,221.21	87.70	47.19	2.165	SF
#403H - OH - Plan #1 - IP	3,000.00	3,000.50	89.90	76.70	6.808	CC, ES
#403H - OH - Plan #1 - IP	3,100.00	3,099.32	91.50	77.90	6.728	SF
#404H - OH - Plan #1 - IP	3,000.00	3,000.50	59.90	46.70	4.536	CC, ES
#404H - OH - Plan #1 - IP	9,275.00	9,267.15	180.79	140.25	4.459	SF
#502H - OH - Plan #1 - IP	3,000.00	3,000.60	94.81	81.60	7.179	CC, ES
#502H - OH - Plan #1 - IP	3,200.00	3,200.05	97.91	83.96	7.021	SF
#605H - OH - Plan #1 - IP	3,000.00	3,000.00	66.95	53.74	5.070	CC, ES
#605H - OH - Plan #1 - IP	3,100.00	3,099.65	67.65	54.05	4.974	SF
#705H - OH - Plan #1 - IP	2,000.00	1,999.30	42.29	33.58	4.856	CC, ES
#705H - OH - Plan #1 - IP	2,200.00	2,198.24	44.61	35.09	4.684	SF
#706H - OH - Plan #1 - IP	1,500.00	1,498.90	30.00	23.54	4.644	CC, ES
#706H - OH - Plan #1 - IP	7,000.00	7,002.61	94.40	62.82	2.989	SF

Offset Design Dominator 25 Fed COM - #304H - OH - Plan #1 - IP — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.10	0.10	0.00	0.00	89.43	0.30	29.90	29.90				
100.00	100.00	100.10	100.10	0.08	0.08	89.43	0.30	29.90	29.90	29.73	.169	177.142	
200.00	200.00	200.10	200.10	0.31	0.31	89.43	0.30	29.90	29.90	29.28	.618	48.358	
300.00	300.00	300.10	300.10	0.53	0.53	89.43	0.30	29.90	29.90	28.83	1.068	28.001	
400.00	400.00	400.10	400.10	0.76	0.76	89.43	0.30	29.90	29.90	28.38	1.517	19.706	
500.00	500.00	500.10	500.10	0.98	0.98	89.43	0.30	29.90	29.90	27.93	1.967	15.202	
600.00	600.00	600.10	600.10	1.21	1.21	89.43	0.30	29.90	29.90	27.49	2.416	12.374	
700.00	700.00	700.10	700.10	1.43	1.43	89.43	0.30	29.90	29.90	27.04	2.866	10.433	
800.00	800.00	800.10	800.10	1.66	1.66	89.43	0.30	29.90	29.90	26.59	3.316	9.019	
900.00	900.00	900.10	900.10	1.88	1.88	89.43	0.30	29.90	29.90	26.14	3.765	7.942	
1,000.00	1,000.00	1,000.10	1,000.10	2.11	2.11	89.43	0.30	29.90	29.90	25.69	4.215	7.095	
1,100.00	1,100.00	1,100.10	1,100.10	2.33	2.33	89.43	0.30	29.90	29.90	25.24	4.664	6.411	
1,200.00	1,200.00	1,200.10	1,200.10	2.56	2.56	89.43	0.30	29.90	29.90	24.79	5.114	5.847	
1,300.00	1,300.00	1,300.10	1,300.10	2.78	2.78	89.43	0.30	29.90	29.90	24.34	5.563	5.375	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #304H - OH - Plan #1 - IP — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
1,400.00	1,400.00	1,400.10	1,400.10	3.01	3.01	89.43	0.30	29.90	29.90	23.89	6.013	4.973	
1,500.00	1,500.00	1,500.10	1,500.10	3.23	3.23	89.43	0.30	29.90	29.90	23.44	6.462	4.627	
1,600.00	1,600.00	1,600.10	1,600.10	3.46	3.46	89.43	0.30	29.90	29.90	22.99	6.912	4.326	
1,700.00	1,700.00	1,700.10	1,700.10	3.68	3.68	89.43	0.30	29.90	29.90	22.54	7.361	4.062	
1,800.00	1,800.00	1,800.10	1,800.10	3.91	3.91	89.43	0.30	29.90	29.90	22.09	7.811	3.828	
1,900.00	1,900.00	1,900.10	1,900.10	4.13	4.13	89.43	0.30	29.90	29.90	21.64	8.260	3.620	
2,000.00	2,000.00	2,000.10	2,000.10	4.35	4.36	89.43	0.30	29.90	29.90	21.19	8.710	3.433	
2,100.00	2,100.00	2,100.10	2,100.10	4.58	4.58	89.43	0.30	29.90	29.90	20.74	9.159	3.265	
2,200.00	2,200.00	2,200.10	2,200.10	4.80	4.80	89.43	0.30	29.90	29.90	20.29	9.609	3.112	
2,300.00	2,300.00	2,300.10	2,300.10	5.03	5.03	89.43	0.30	29.90	29.90	19.84	10.059	2.973	
2,400.00	2,400.00	2,400.10	2,400.10	5.25	5.25	89.43	0.30	29.90	29.90	19.39	10.508	2.846	
2,500.00	2,500.00	2,500.10	2,500.10	5.48	5.48	89.43	0.30	29.90	29.90	18.94	10.958	2.729	
2,600.00	2,600.00	2,600.10	2,600.10	5.70	5.70	89.43	0.30	29.90	29.90	18.49	11.407	2.621	
2,700.00	2,700.00	2,700.10	2,700.10	5.93	5.93	89.43	0.30	29.90	29.90	18.04	11.857	2.522	
2,800.00	2,800.00	2,800.10	2,800.10	6.15	6.15	89.43	0.30	29.90	29.90	17.60	12.306	2.430	
2,900.00	2,900.00	2,900.10	2,900.10	6.38	6.38	89.43	0.30	29.90	29.90	17.15	12.756	2.344	
3,000.00	3,000.00	3,000.10	3,000.10	6.60	6.60	89.43	0.30	29.90	29.90	16.70	13.205	2.264	CC, ES
3,100.00	3,099.99	3,100.09	3,100.09	6.80	6.83	-138.24	0.30	29.90	30.87	17.24	13.630	2.265	
3,200.00	3,199.91	3,200.01	3,200.01	6.98	7.05	-142.63	0.30	29.90	33.89	19.86	14.031	2.416	
3,300.00	3,299.69	3,300.21	3,299.79	7.16	7.28	-148.38	0.30	29.90	39.30	24.86	14.437	2.722	
3,333.33	3,332.91	3,333.01	3,333.01	7.23	7.35	-150.35	0.30	29.90	41.67	27.10	14.572	2.860	
3,400.00	3,399.32	3,400.58	3,399.42	7.35	7.50	-153.87	0.30	29.90	46.82	31.97	14.846	3.154	
3,500.00	3,498.94	3,499.04	3,499.04	7.55	7.72	-157.89	0.30	29.90	54.78	39.53	15.252	3.592	
3,600.00	3,598.56	3,600.13	3,600.12	7.75	7.93	-160.40	-0.71	29.06	61.77	46.14	15.638	3.950	
3,700.00	3,698.18	3,701.56	3,701.47	7.95	8.10	-161.46	-3.77	26.48	66.44	50.45	15.997	4.154	
3,800.00	3,797.80	3,803.18	3,802.86	8.16	8.29	-161.49	-8.91	22.17	68.71	52.35	16.355	4.201	
3,900.00	3,897.42	3,903.12	3,902.49	8.37	8.47	-161.09	-14.92	17.13	69.84	53.11	16.732	4.174	
4,000.00	3,997.04	4,003.11	4,002.18	8.58	8.66	-160.70	-20.93	12.09	70.97	53.86	17.112	4.147	
4,100.00	4,096.66	4,103.10	4,101.86	8.80	8.85	-160.33	-26.94	7.05	72.11	54.61	17.498	4.121	
4,200.00	4,196.28	4,203.09	4,201.54	9.03	9.05	-159.97	-32.95	2.00	73.25	55.36	17.889	4.095	
4,300.00	4,295.90	4,303.09	4,301.23	9.25	9.25	-159.61	-38.96	-3.04	74.39	56.11	18.284	4.069	
4,400.00	4,395.52	4,403.08	4,400.91	9.48	9.45	-159.27	-44.97	-8.08	75.54	56.85	18.683	4.043	
4,500.00	4,495.14	4,503.07	4,500.60	9.71	9.65	-158.94	-50.98	-13.13	76.68	57.60	19.087	4.018	
4,600.00	4,594.76	4,603.06	4,600.28	9.94	9.86	-158.62	-56.99	-18.17	77.83	58.34	19.494	3.993	
4,700.00	4,694.38	4,703.06	4,699.97	10.18	10.08	-158.31	-63.00	-23.21	78.99	59.08	19.905	3.968	
4,800.00	4,794.00	4,803.05	4,799.65	10.41	10.29	-158.01	-69.01	-28.26	80.14	59.82	20.319	3.944	
4,900.00	4,893.62	4,903.04	4,899.33	10.65	10.51	-157.71	-75.02	-33.30	81.30	60.56	20.737	3.921	
5,000.00	4,993.24	5,003.03	4,999.02	10.89	10.73	-157.43	-81.03	-38.34	82.46	61.30	21.157	3.897	
5,100.00	5,092.85	5,103.03	5,098.70	11.14	10.95	-157.15	-87.04	-43.38	83.62	62.04	21.581	3.875	
5,200.00	5,192.47	5,203.02	5,198.39	11.38	11.17	-156.88	-93.05	-48.43	84.78	62.77	22.008	3.852	
5,300.00	5,292.09	5,303.01	5,298.07	11.63	11.40	-156.61	-99.06	-53.47	85.95	63.51	22.437	3.831	
5,400.00	5,391.71	5,403.00	5,397.75	11.87	11.62	-156.36	-105.07	-58.51	87.11	64.24	22.869	3.809	
5,500.00	5,491.33	5,503.00	5,497.44	12.12	11.85	-156.11	-111.08	-63.56	88.28	64.98	23.304	3.788	
5,600.00	5,590.95	5,602.99	5,597.12	12.37	12.08	-155.87	-117.09	-68.60	89.45	65.71	23.740	3.768	
5,700.00	5,690.57	5,702.98	5,696.81	12.62	12.32	-155.63	-123.10	-73.64	90.62	66.44	24.180	3.748	
5,800.00	5,790.19	5,802.97	5,796.49	12.88	12.55	-155.40	-129.11	-78.68	91.80	67.18	24.621	3.728	
5,900.00	5,889.81	5,902.97	5,896.18	13.13	12.79	-155.17	-135.12	-83.73	92.97	67.91	25.064	3.709	
6,000.00	5,989.43	6,002.96	5,995.86	13.38	13.02	-154.96	-141.12	-88.77	94.15	68.64	25.509	3.691	
6,100.00	6,089.05	6,102.95	6,095.54	13.64	13.26	-154.74	-147.13	-93.81	95.32	69.37	25.956	3.672	
6,200.00	6,188.67	6,202.94	6,195.23	13.89	13.50	-154.53	-153.14	-98.86	96.50	70.10	26.405	3.655	
6,300.00	6,288.29	6,302.94	6,294.91	14.15	13.74	-154.33	-159.15	-103.90	97.68	70.83	26.856	3.637	
6,400.00	6,387.91	6,402.93	6,394.60	14.41	13.98	-154.13	-165.16	-108.94	98.86	71.56	27.308	3.620	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #304H - OH - Plan #1 - IP — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
6,500.00	6,487.53	6,502.92	6,494.28	14.67	14.22	-153.94	-171.17	-113.98	100.05	72.28	27.762	3.604	
6,600.00	6,587.15	6,602.91	6,593.96	14.92	14.46	-153.75	-177.18	-119.03	101.23	73.01	28.218	3.587	
6,700.00	6,686.77	6,702.91	6,693.65	15.18	14.71	-153.56	-183.19	-124.07	102.41	73.74	28.675	3.572	
6,800.00	6,786.39	6,802.90	6,793.33	15.44	14.95	-153.38	-189.20	-129.11	103.60	74.47	29.133	3.556	
6,900.00	6,886.00	6,902.89	6,893.02	15.70	15.20	-153.21	-195.21	-134.16	104.79	75.19	29.593	3.541	
7,000.00	6,985.62	7,002.88	6,992.70	15.97	15.44	-153.03	-201.22	-139.20	105.97	75.92	30.054	3.526	
7,100.00	7,085.24	7,102.88	7,092.39	16.23	15.69	-152.86	-207.23	-144.24	107.16	76.64	30.516	3.512	
7,200.00	7,184.86	7,202.87	7,192.07	16.49	15.94	-152.70	-213.24	-149.28	108.35	77.37	30.980	3.497	
7,300.00	7,284.48	7,302.86	7,291.75	16.75	16.19	-152.54	-219.25	-154.33	109.54	78.10	31.444	3.484	
7,400.00	7,384.10	7,402.85	7,391.44	17.02	16.44	-152.38	-225.26	-159.37	110.73	78.82	31.910	3.470	
7,500.00	7,483.72	7,502.85	7,491.12	17.28	16.69	-152.22	-231.27	-164.41	111.92	79.55	32.377	3.457	
7,600.00	7,583.34	7,602.84	7,590.81	17.54	16.94	-152.07	-237.28	-169.46	113.12	80.27	32.845	3.444	
7,700.00	7,682.96	7,702.83	7,690.49	17.81	17.19	-151.92	-243.29	-174.50	114.31	81.00	33.314	3.431	
7,747.22	7,730.00	7,750.05	7,737.56	17.93	17.31	-151.86	-246.13	-176.88	114.87	81.34	33.536	3.425	
7,800.00	7,782.61	7,802.82	7,790.18	18.07	17.44	-151.70	-249.30	-179.54	115.18	81.40	33.786	3.409	
7,900.00	7,882.43	7,902.80	7,889.85	18.32	17.69	-150.90	-255.31	-184.58	114.02	79.74	34.274	3.327	
8,000.00	7,982.36	8,002.70	7,989.44	18.54	17.94	-149.40	-261.32	-189.62	110.62	75.83	34.783	3.180	
8,080.55	8,062.91	8,083.06	8,069.55	18.70	18.15	78.43	-266.15	-193.67	106.32	71.11	35.208	3.020	
8,100.00	8,082.36	8,102.45	8,088.88	18.74	18.19	78.95	-267.31	-194.65	105.13	69.82	35.313	2.977	
8,200.00	8,182.36	8,202.14	8,188.27	18.92	18.45	81.80	-273.30	-199.68	99.14	63.28	35.860	2.765	
8,300.00	8,282.36	8,301.19	8,287.02	19.11	18.70	84.90	-279.12	-204.56	93.56	57.14	36.425	2.569	
8,400.00	8,382.36	8,399.40	8,385.08	19.30	18.93	87.38	-283.33	-208.09	89.68	52.72	36.956	2.427	
8,500.00	8,482.36	8,497.83	8,483.46	19.49	19.15	88.81	-285.60	-210.00	87.66	50.23	37.429	2.342	
8,600.00	8,582.36	8,603.16	8,582.46	19.68	19.36	89.09	-286.04	-210.37	87.28	49.43	37.846	2.306	
8,700.00	8,682.36	8,703.16	8,682.46	19.87	19.55	89.09	-286.04	-210.37	87.28	49.04	38.238	2.282	
8,800.00	8,782.36	8,803.16	8,782.46	20.06	19.74	89.09	-286.04	-210.37	87.28	48.65	38.632	2.259	
8,900.00	8,882.36	8,903.16	8,882.46	20.25	19.94	89.09	-286.04	-210.37	87.28	48.25	39.026	2.236	
9,000.00	8,982.36	9,003.16	8,982.46	20.44	20.13	89.09	-286.04	-210.37	87.28	47.86	39.422	2.214	
9,100.00	9,082.36	9,103.16	9,082.46	20.64	20.33	89.09	-286.04	-210.37	87.28	47.46	39.819	2.192	
9,130.18	9,112.54	9,127.02	9,112.64	20.70	20.37	89.09	-286.04	-210.37	87.28	47.35	39.926	2.186	
9,150.00	9,132.35	9,146.83	9,132.45	20.73	20.41	89.78	-286.04	-210.37	87.27	47.26	40.014	2.181	
9,156.75	9,139.10	9,153.57	9,139.20	20.74	20.43	90.00	-286.04	-210.37	87.27	47.23	40.048	2.179	
9,175.00	9,157.29	9,171.77	9,157.39	20.78	20.46	90.89	-286.04	-210.37	87.28	47.13	40.152	2.174	
9,200.00	9,182.11	9,203.41	9,182.21	20.81	20.52	92.83	-286.04	-210.37	87.38	47.05	40.331	2.167	
9,225.00	9,206.74	9,221.21	9,206.84	20.85	20.56	95.55	-286.04	-210.37	87.70	47.19	40.508	2.165 SF	
9,250.00	9,231.10	9,245.58	9,231.20	20.88	20.61	98.97	-286.04	-210.37	88.42	47.71	40.719	2.172	
9,275.00	9,255.15	9,269.63	9,255.25	20.90	20.65	102.97	-286.04	-210.37	89.78	48.84	40.941	2.193	
9,300.00	9,278.80	9,306.72	9,278.90	20.92	20.73	107.38	-286.04	-210.37	92.01	50.82	41.190	2.234	
9,325.00	9,302.00	9,316.48	9,302.10	20.94	20.74	112.02	-286.04	-210.37	95.37	54.00	41.370	2.305	
9,350.00	9,324.67	9,339.15	9,324.77	20.95	20.79	116.69	-286.04	-210.37	100.08	58.53	41.549	2.409	
9,375.00	9,346.77	9,361.25	9,346.87	20.96	20.83	121.20	-286.04	-210.37	106.29	64.59	41.691	2.549	
9,400.00	9,368.22	9,382.70	9,368.32	20.97	20.87	125.42	-286.04	-210.37	114.10	72.30	41.795	2.730	
9,425.00	9,388.98	9,403.46	9,389.08	20.98	20.92	129.24	-286.04	-210.37	123.53	81.67	41.863	2.951	
9,450.00	9,408.97	9,423.45	9,409.07	20.98	20.95	132.62	-286.04	-210.37	134.57	92.66	41.903	3.211	
9,475.00	9,428.16	9,442.63	9,428.26	20.98	20.99	135.52	-286.04	-210.37	147.13	105.21	41.922	3.510	
9,500.00	9,446.47	9,460.95	9,446.57	20.97	21.03	137.97	-286.04	-210.37	161.14	119.21	41.928	3.843	
9,525.00	9,463.88	9,478.36	9,463.98	20.97	21.06	139.97	-286.04	-210.37	176.50	134.57	41.926	4.210	
9,550.00	9,480.32	9,505.21	9,480.42	20.96	21.12	141.53	-286.04	-210.37	193.09	151.15	41.941	4.604	
9,575.00	9,495.75	9,510.23	9,495.85	20.96	21.13	142.68	-286.04	-210.37	210.82	168.90	41.912	5.030	
9,600.00	9,510.13	9,524.61	9,510.23	20.95	21.15	143.42	-286.04	-210.37	229.58	187.68	41.904	5.479	
9,625.00	9,523.42	9,537.90	9,523.52	20.94	21.18	143.73	-286.04	-210.37	249.30	207.40	41.895	5.951	
9,650.00	9,535.59	9,550.06	9,535.69	20.93	21.20	143.60	-286.04	-210.37	269.86	227.97	41.886	6.443	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #304H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,675.00	9,546.59	9,561.07	9,546.69	20.92	21.23	142.98	-286.04	-210.37	291.19	249.31	41.878	6.953	
9,700.00	9,556.41	9,570.89	9,556.51	20.91	21.25	141.78	-286.04	-210.37	313.20	271.33	41.869	7.480	
9,725.00	9,565.01	9,579.49	9,565.11	20.90	21.26	139.87	-286.04	-210.37	335.80	293.94	41.859	8.022	
9,750.00	9,572.37	9,586.85	9,572.47	20.89	21.28	137.05	-286.04	-210.37	358.92	317.07	41.849	8.577	
9,775.00	9,578.47	9,607.06	9,578.57	20.88	21.32	133.00	-286.04	-210.37	382.48	340.62	41.866	9.136	
9,800.00	9,583.29	9,602.23	9,583.39	20.88	21.31	127.24	-286.04	-210.37	406.40	364.57	41.834	9.715	
9,825.00	9,586.82	9,601.30	9,586.92	20.91	21.31	119.12	-286.04	-210.37	430.60	388.79	41.811	10.299	
9,850.00	9,589.05	9,603.53	9,589.15	20.99	21.31	107.91	-286.04	-210.37	455.01	413.22	41.796	10.886	
9,875.00	9,589.98	9,604.45	9,590.08	21.09	21.31	93.36	-286.04	-210.37	479.55	437.77	41.779	11.478	
9,882.27	9,590.00	9,604.48	9,590.10	21.13	21.31	88.63	-286.04	-210.37	486.70	444.93	41.774	11.651	
9,900.00	9,589.92	9,604.40	9,590.02	21.21	21.31	88.57	-286.04	-210.37	504.16	462.39	41.762	12.072	
10,000.00	9,589.49	9,603.96	9,589.59	21.75	21.31	88.29	-286.04	-210.37	602.89	561.19	41.707	14.456	
10,100.00	9,589.05	10,724.06	10,209.02	22.43	23.83	179.65	412.78	-299.04	619.89	581.70	38.188	16.232	
10,200.00	9,588.61	10,823.93	10,208.58	23.23	24.63	179.98	512.55	-303.31	619.87	581.31	38.562	16.075	
10,210.27	9,588.57	10,834.19	10,208.53	23.32	24.71	180.00	522.81	-303.55	619.87	581.27	38.605	16.057	
10,300.00	9,588.17	10,923.92	10,208.14	24.14	25.51	-179.98	612.54	-304.51	619.88	580.88	38.995	15.896	
10,400.00	9,587.74	11,023.92	10,207.71	25.15	26.49	-179.98	712.53	-305.24	619.88	580.40	39.479	15.701	
10,500.00	9,587.30	11,123.92	10,207.27	26.24	27.55	-179.98	812.53	-305.97	619.88	579.87	40.011	15.493	
10,600.00	9,586.86	11,223.92	10,206.83	27.42	28.70	-179.98	912.52	-306.70	619.88	579.29	40.589	15.272	
10,700.00	9,586.42	11,323.92	10,206.39	28.67	29.91	-179.98	1,012.52	-307.42	619.88	578.67	41.211	15.042	
10,800.00	9,585.99	11,423.92	10,205.96	29.98	31.18	-179.98	1,112.52	-308.15	619.88	578.00	41.875	14.803	
10,900.00	9,585.55	11,523.92	10,205.52	31.34	32.51	-179.98	1,212.51	-308.88	619.88	577.30	42.580	14.558	
11,000.00	9,585.11	11,623.92	10,205.08	32.75	33.89	-179.98	1,312.51	-309.61	619.88	576.56	43.322	14.309	
11,100.00	9,584.67	11,723.92	10,204.65	34.20	35.31	-179.98	1,412.51	-310.34	619.88	575.78	44.101	14.056	
11,200.00	9,584.24	11,823.92	10,204.21	35.69	36.76	-179.98	1,512.50	-311.07	619.88	574.96	44.914	13.801	
11,300.00	9,583.80	11,923.92	10,203.77	37.21	38.26	-179.98	1,612.50	-311.80	619.88	574.12	45.760	13.546	
11,400.00	9,583.36	12,023.92	10,203.34	38.76	39.78	-179.98	1,712.50	-312.53	619.88	573.24	46.637	13.292	
11,500.00	9,582.92	12,123.92	10,202.90	40.34	41.33	-179.98	1,812.49	-313.26	619.88	572.34	47.543	13.038	
11,600.00	9,582.49	12,223.92	10,202.46	41.93	42.90	-179.98	1,912.49	-313.99	619.88	571.40	48.476	12.787	
11,700.00	9,582.05	12,323.92	10,202.03	43.55	44.49	-179.98	2,012.48	-314.72	619.88	570.45	49.435	12.539	
11,800.00	9,581.61	12,423.92	10,201.59	45.18	46.10	-179.99	2,112.48	-315.45	619.88	569.46	50.419	12.295	
11,900.00	9,581.18	12,523.92	10,201.15	46.83	47.73	-179.99	2,212.48	-316.18	619.88	568.46	51.425	12.054	
12,000.00	9,580.74	12,623.92	10,200.71	48.50	49.38	-179.99	2,312.47	-316.91	619.88	567.43	52.454	11.818	
12,100.00	9,580.30	12,723.92	10,200.28	50.18	51.04	-179.99	2,412.47	-317.64	619.88	566.38	53.502	11.586	
12,200.00	9,579.86	12,823.92	10,199.84	51.87	52.71	-179.99	2,512.47	-318.37	619.88	565.31	54.570	11.359	
12,300.00	9,579.43	12,923.92	10,199.40	53.57	54.39	-179.99	2,612.46	-319.10	619.88	564.23	55.656	11.138	
12,400.00	9,578.99	13,023.92	10,198.97	55.28	56.09	-179.99	2,712.46	-319.83	619.88	563.13	56.759	10.921	
12,500.00	9,578.55	13,123.92	10,198.53	56.99	57.79	-179.99	2,812.46	-320.56	619.89	562.01	57.879	10.710	
12,600.00	9,578.11	13,223.92	10,198.09	58.72	59.50	-179.99	2,912.45	-321.29	619.89	560.87	59.013	10.504	
12,700.00	9,577.68	13,323.92	10,197.66	60.46	61.22	-179.99	3,012.45	-322.02	619.89	559.72	60.162	10.304	
12,800.00	9,577.24	13,423.92	10,197.22	62.20	62.95	-179.99	3,112.44	-322.75	619.89	558.56	61.325	10.108	
12,900.00	9,576.80	13,523.92	10,196.78	63.94	64.69	-179.99	3,212.44	-323.47	619.89	557.39	62.500	9.918	
13,000.00	9,576.36	13,623.92	10,196.35	65.70	66.43	-179.99	3,312.44	-324.20	619.89	556.20	63.687	9.733	
13,100.00	9,575.93	13,723.92	10,195.91	67.45	68.17	-179.99	3,412.43	-324.93	619.89	555.00	64.886	9.554	
13,200.00	9,575.49	13,823.92	10,195.47	69.22	69.93	-179.99	3,512.43	-325.66	619.89	553.79	66.095	9.379	
13,300.00	9,575.05	13,923.92	10,195.03	70.98	71.68	-179.99	3,612.43	-326.39	619.89	552.57	67.315	9.209	
13,400.00	9,574.61	14,023.92	10,194.60	72.75	73.45	-179.99	3,712.42	-327.12	619.89	551.34	68.544	9.044	
13,500.00	9,574.18	14,123.92	10,194.16	74.53	75.21	-179.99	3,812.42	-327.85	619.89	550.11	69.783	8.883	
13,600.00	9,573.74	14,223.92	10,193.72	76.31	76.98	-180.00	3,912.42	-328.58	619.89	548.86	71.030	8.727	
13,700.00	9,573.30	14,323.92	10,193.29	78.09	78.75	-180.00	4,012.41	-329.31	619.89	547.60	72.286	8.576	
13,800.00	9,572.87	14,423.92	10,192.85	79.87	80.53	-180.00	4,112.41	-330.04	619.89	546.34	73.549	8.428	
13,900.00	9,572.43	14,523.92	10,192.41	81.66	82.31	-180.00	4,212.41	-330.77	619.89	545.07	74.820	8.285	

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 #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #304H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
14,000.00	9,571.99	14,623.92	10,191.98	83.45	84.09	-180.00	4,312.40	-331.50	619.89	543.79	76.098	8.146	
14,100.00	9,571.55	14,723.92	10,191.54	85.25	85.88	-180.00	4,412.40	-332.23	619.89	542.51	77.382	8.011	
14,200.00	9,571.12	14,823.92	10,191.10	87.04	87.67	-180.00	4,512.39	-332.96	619.89	541.22	78.673	7.879	
14,300.00	9,570.68	14,923.92	10,190.67	88.84	89.46	-180.00	4,612.39	-333.69	619.89	539.92	79.970	7.752	
14,400.00	9,570.24	15,023.92	10,190.23	90.64	91.25	-180.00	4,712.39	-334.42	619.89	538.62	81.272	7.627	
14,455.02	9,570.00	15,078.95	10,189.99	91.63	92.24	180.00	4,767.41	-334.82	619.89	537.90	81.991	7.560	

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #403H - OH - Plan #1 - IP — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.50	0.50	0.00	0.00	89.49	0.80	89.90	89.90				
100.00	100.00	100.50	100.50	0.08	0.09	89.49	0.80	89.90	89.90	89.73	.170	529.784	
200.00	200.00	200.50	200.50	0.31	0.31	89.49	0.80	89.90	89.90	89.28	.619	145.186	
300.00	300.00	300.50	300.50	0.53	0.53	89.49	0.80	89.90	89.90	88.83	1.069	84.119	
400.00	400.00	400.50	400.50	0.76	0.76	89.49	0.80	89.90	89.90	88.39	1.518	59.214	
500.00	500.00	500.50	500.50	0.98	0.98	89.49	0.80	89.90	89.90	87.94	1.968	45.687	
600.00	600.00	600.50	600.50	1.21	1.21	89.49	0.80	89.90	89.90	87.49	2.417	37.191	
700.00	700.00	700.50	700.50	1.43	1.43	89.49	0.80	89.90	89.90	87.04	2.867	31.359	
800.00	800.00	800.50	800.50	1.66	1.66	89.49	0.80	89.90	89.90	86.59	3.316	27.109	
900.00	900.00	900.50	900.50	1.88	1.88	89.49	0.80	89.90	89.90	86.14	3.766	23.873	
1,000.00	1,000.00	1,000.50	1,000.50	2.11	2.11	89.49	0.80	89.90	89.90	85.69	4.215	21.327	
1,100.00	1,100.00	1,100.50	1,100.50	2.33	2.33	89.49	0.80	89.90	89.90	85.24	4.665	19.272	
1,200.00	1,200.00	1,200.50	1,200.50	2.56	2.56	89.49	0.80	89.90	89.90	84.79	5.115	17.578	
1,300.00	1,300.00	1,300.50	1,300.50	2.78	2.78	89.49	0.80	89.90	89.90	84.34	5.564	16.158	
1,400.00	1,400.00	1,400.50	1,400.50	3.01	3.01	89.49	0.80	89.90	89.90	83.89	6.014	14.950	
1,500.00	1,500.00	1,500.50	1,500.50	3.23	3.23	89.49	0.80	89.90	89.90	83.44	6.463	13.910	
1,600.00	1,600.00	1,600.50	1,600.50	3.46	3.46	89.49	0.80	89.90	89.90	82.99	6.913	13.006	
1,700.00	1,700.00	1,700.50	1,700.50	3.68	3.68	89.49	0.80	89.90	89.90	82.54	7.362	12.211	
1,800.00	1,800.00	1,800.50	1,800.50	3.91	3.91	89.49	0.80	89.90	89.90	82.09	7.812	11.509	
1,900.00	1,900.00	1,900.50	1,900.50	4.13	4.13	89.49	0.80	89.90	89.90	81.64	8.261	10.883	
2,000.00	2,000.00	2,000.50	2,000.50	4.35	4.36	89.49	0.80	89.90	89.90	81.19	8.711	10.321	
2,100.00	2,100.00	2,100.50	2,100.50	4.58	4.58	89.49	0.80	89.90	89.90	80.74	9.160	9.814	
2,200.00	2,200.00	2,200.50	2,200.50	4.80	4.81	89.49	0.80	89.90	89.90	80.29	9.610	9.355	
2,300.00	2,300.00	2,300.50	2,300.50	5.03	5.03	89.49	0.80	89.90	89.90	79.84	10.059	8.937	
2,400.00	2,400.00	2,400.50	2,400.50	5.25	5.26	89.49	0.80	89.90	89.90	79.39	10.509	8.555	
2,500.00	2,500.00	2,500.50	2,500.50	5.48	5.48	89.49	0.80	89.90	89.90	78.95	10.958	8.204	
2,600.00	2,600.00	2,600.50	2,600.50	5.70	5.70	89.49	0.80	89.90	89.90	78.50	11.408	7.881	
2,700.00	2,700.00	2,700.50	2,700.50	5.93	5.93	89.49	0.80	89.90	89.90	78.05	11.858	7.582	
2,800.00	2,800.00	2,800.50	2,800.50	6.15	6.15	89.49	0.80	89.90	89.90	77.60	12.307	7.305	
2,900.00	2,900.00	2,900.50	2,900.50	6.38	6.38	89.49	0.80	89.90	89.90	77.15	12.757	7.048	
3,000.00	3,000.00	3,000.50	3,000.50	6.60	6.60	89.49	0.80	89.90	89.90	76.70	13.206	6.808	CC, ES
3,100.00	3,099.99	3,099.32	3,099.31	6.80	6.80	-136.35	-0.32	90.55	91.50	77.90	13.600	6.728	SF
3,200.00	3,199.91	3,198.00	3,197.91	6.98	6.97	-135.90	-3.64	92.47	96.26	82.32	13.945	6.903	
3,300.00	3,299.69	3,303.21	3,296.50	7.16	7.16	-135.30	-9.08	95.60	104.14	89.84	14.307	7.279	
3,333.33	3,332.91	3,329.97	3,329.60	7.23	7.21	-135.24	-11.08	96.76	107.29	92.87	14.417	7.442	
3,400.00	3,399.32	3,403.68	3,395.79	7.35	7.34	-135.28	-15.09	99.07	113.79	99.11	14.672	7.755	
3,500.00	3,498.94	3,504.15	3,495.07	7.55	7.53	-135.34	-21.10	102.55	123.53	108.49	15.044	8.211	
3,600.00	3,598.56	3,604.63	3,594.35	7.75	7.72	-135.39	-27.12	106.02	133.28	117.85	15.425	8.640	
3,700.00	3,698.18	3,705.11	3,693.63	7.95	7.91	-135.43	-33.13	109.49	143.02	127.21	15.812	9.045	
3,800.00	3,797.80	3,805.58	3,792.92	8.16	8.11	-135.47	-39.14	112.96	152.77	136.56	16.207	9.426	
3,900.00	3,897.42	3,906.06	3,892.20	8.37	8.32	-135.50	-45.15	116.43	162.52	145.91	16.608	9.785	
4,000.00	3,997.04	4,006.53	3,991.48	8.58	8.52	-135.53	-51.16	119.90	172.26	155.25	17.015	10.124	
4,100.00	4,096.66	4,107.01	4,090.76	8.80	8.73	-135.56	-57.18	123.37	182.01	164.58	17.427	10.444	
4,200.00	4,196.28	4,192.51	4,190.04	9.03	8.91	-135.58	-63.19	126.84	191.75	173.94	17.813	10.765	
4,300.00	4,295.90	4,307.96	4,289.32	9.25	9.16	-135.60	-69.20	130.32	201.50	183.23	18.267	11.031	
4,400.00	4,395.52	4,408.44	4,388.60	9.48	9.37	-135.62	-75.21	133.79	211.25	192.55	18.694	11.301	
4,500.00	4,495.14	4,508.92	4,487.89	9.71	9.59	-135.64	-81.23	137.26	220.99	201.87	19.124	11.556	
4,600.00	4,594.76	4,609.39	4,587.17	9.94	9.81	-135.66	-87.24	140.73	230.74	211.18	19.559	11.797	
4,700.00	4,694.38	4,709.87	4,686.45	10.18	10.04	-135.67	-93.25	144.20	240.49	220.49	19.997	12.026	
4,800.00	4,794.00	4,789.66	4,785.73	10.41	10.21	-135.68	-99.26	147.67	250.23	229.84	20.394	12.270	
4,900.00	4,893.62	4,889.18	4,885.01	10.65	10.44	-135.70	-105.28	151.14	259.98	239.14	20.836	12.477	
5,000.00	4,993.24	4,988.70	4,984.29	10.89	10.66	-135.71	-111.29	154.61	269.73	248.44	21.282	12.674	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #403H - OH - Plan #1 - IP — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,092.85	5,088.23	5,083.57	11.14	10.89	-135.72	-117.30	158.09	279.47	257.74	21.730	12.861	
5,200.00	5,192.47	5,187.75	5,182.86	11.38	11.12	-135.73	-123.31	161.56	289.22	267.04	22.181	13.039	
5,300.00	5,292.09	5,287.28	5,282.14	11.63	11.35	-135.74	-129.32	165.03	298.97	276.33	22.634	13.209	
5,400.00	5,391.71	5,386.80	5,381.42	11.87	11.58	-135.75	-135.34	168.50	308.71	285.62	23.090	13.370	
5,500.00	5,491.33	5,486.32	5,480.70	12.12	11.81	-135.76	-141.35	171.97	318.46	294.91	23.548	13.524	
5,600.00	5,590.95	5,585.85	5,579.98	12.37	12.04	-135.76	-147.36	175.44	328.21	304.20	24.008	13.671	
5,700.00	5,690.57	5,685.37	5,679.26	12.62	12.28	-135.77	-153.37	178.91	337.95	313.48	24.470	13.811	
5,800.00	5,790.19	5,784.90	5,778.54	12.88	12.51	-135.78	-159.39	182.38	347.70	322.77	24.933	13.945	
5,900.00	5,889.81	5,884.42	5,877.83	13.13	12.75	-135.78	-165.40	185.85	357.44	332.05	25.399	14.073	
6,000.00	5,989.43	5,983.94	5,977.11	13.38	12.99	-135.79	-171.41	189.33	367.19	341.33	25.866	14.196	
6,100.00	6,089.05	6,083.47	6,076.39	13.64	13.23	-135.80	-177.42	192.80	376.94	350.60	26.335	14.313	
6,200.00	6,188.67	6,182.99	6,175.67	13.89	13.46	-135.80	-183.44	196.27	386.68	359.88	26.805	14.426	
6,300.00	6,288.29	6,282.51	6,274.95	14.15	13.70	-135.81	-189.45	199.74	396.43	369.15	27.276	14.534	
6,400.00	6,387.91	6,382.04	6,374.23	14.41	13.94	-135.81	-195.46	203.21	406.18	378.43	27.749	14.637	
6,500.00	6,487.53	6,481.56	6,473.51	14.67	14.18	-135.82	-201.47	206.68	415.92	387.70	28.223	14.737	
6,600.00	6,587.15	6,581.09	6,572.80	14.92	14.43	-135.82	-207.49	210.15	425.67	396.97	28.699	14.832	
6,700.00	6,686.77	6,680.61	6,672.08	15.18	14.67	-135.83	-213.50	213.62	435.42	406.24	29.175	14.924	
6,800.00	6,786.39	6,780.13	6,771.36	15.44	14.91	-135.83	-219.51	217.10	445.16	415.51	29.653	15.012	
6,900.00	6,886.00	6,879.66	6,870.64	15.70	15.15	-135.83	-225.52	220.57	454.91	424.78	30.132	15.097	
7,000.00	6,985.62	6,979.18	6,969.92	15.97	15.40	-135.84	-231.53	224.04	464.66	434.05	30.611	15.179	
7,100.00	7,085.24	7,078.71	7,069.20	16.23	15.64	-135.84	-237.55	227.51	474.40	443.31	31.092	15.258	
7,200.00	7,184.86	7,178.23	7,168.48	16.49	15.89	-135.84	-243.56	230.98	484.15	452.58	31.574	15.334	
7,300.00	7,284.48	7,277.75	7,267.77	16.75	16.13	-135.85	-249.57	234.45	493.90	461.84	32.056	15.407	
7,400.00	7,384.10	7,377.28	7,367.05	17.02	16.38	-135.85	-255.58	237.92	503.64	471.10	32.539	15.478	
7,500.00	7,483.72	7,476.80	7,466.33	17.28	16.62	-135.85	-261.60	241.39	513.39	480.37	33.023	15.546	
7,600.00	7,583.34	7,576.33	7,565.61	17.54	16.87	-135.86	-267.61	244.87	523.14	489.63	33.508	15.612	
7,700.00	7,682.96	7,675.85	7,664.89	17.81	17.11	-135.86	-273.62	248.34	532.88	498.89	33.994	15.676	
7,747.22	7,730.00	7,722.84	7,711.77	17.93	17.23	-135.86	-276.46	249.98	537.49	503.26	34.223	15.705	
7,800.00	7,782.61	7,776.48	7,765.28	18.07	17.36	-135.89	-279.67	251.83	542.36	507.87	34.482	15.729	
7,900.00	7,882.43	7,883.92	7,872.57	18.32	17.62	-135.93	-284.49	254.61	549.28	514.30	34.974	15.705	
8,000.00	7,982.36	7,991.63	7,980.24	18.54	17.85	-136.01	-286.68	255.88	552.91	517.48	35.437	15.603	
8,080.55	8,062.91	8,074.79	8,063.41	18.70	18.02	89.94	-286.83	255.96	553.60	517.84	35.765	15.479	
8,100.00	8,082.36	8,105.76	8,082.86	18.74	18.08	89.94	-286.83	255.96	553.60	517.74	35.862	15.437	
8,200.00	8,182.36	8,205.76	8,182.86	18.92	18.27	89.94	-286.83	255.96	553.60	517.36	36.246	15.274	
8,300.00	8,282.36	8,305.76	8,282.86	19.11	18.46	89.94	-286.83	255.96	553.60	516.97	36.632	15.113	
8,400.00	8,382.36	8,405.76	8,382.86	19.30	18.65	89.94	-286.83	255.96	553.60	516.58	37.019	14.955	
8,500.00	8,482.36	8,505.76	8,482.86	19.49	18.84	89.94	-286.83	255.96	553.60	516.20	37.407	14.799	
8,600.00	8,582.36	8,605.76	8,582.86	19.68	19.03	89.94	-286.83	255.96	553.60	515.81	37.797	14.647	
8,700.00	8,682.36	8,705.76	8,682.86	19.87	19.23	89.94	-286.83	255.96	553.60	515.41	38.188	14.497	
8,800.00	8,782.36	8,805.76	8,782.86	20.06	19.42	89.94	-286.83	255.96	553.60	515.02	38.581	14.349	
8,900.00	8,882.36	8,905.76	8,882.86	20.25	19.62	89.94	-286.83	255.96	553.60	514.63	38.975	14.204	
9,000.00	8,982.36	9,005.76	8,982.86	20.44	19.81	89.94	-286.83	255.96	553.60	514.23	39.370	14.062	
9,100.00	9,082.36	9,105.76	9,082.86	20.64	20.01	89.94	-286.83	255.96	553.60	513.84	39.766	13.922	
9,130.18	9,112.54	9,124.42	9,113.04	20.70	20.05	89.94	-286.83	255.96	553.60	513.74	39.863	13.888	
9,150.00	9,132.35	9,144.23	9,132.85	20.73	20.08	90.40	-286.83	255.96	553.61	513.67	39.940	13.861	
9,175.00	9,157.29	9,169.17	9,157.79	20.78	20.13	90.58	-286.83	255.96	553.62	513.59	40.034	13.829	
9,200.00	9,182.11	9,206.01	9,182.61	20.81	20.21	90.88	-286.83	255.96	553.66	513.51	40.148	13.790	
9,225.00	9,206.74	9,218.62	9,207.24	20.85	20.23	91.30	-286.83	255.96	553.74	513.53	40.211	13.771	
9,250.00	9,231.10	9,242.99	9,231.60	20.88	20.28	91.85	-286.83	255.96	553.90	513.61	40.292	13.747	
9,275.00	9,255.15	9,267.03	9,255.65	20.90	20.33	92.49	-286.83	255.96	554.17	513.80	40.369	13.728	
9,300.00	9,278.80	9,309.32	9,279.30	20.92	20.41	93.23	-286.83	255.96	554.60	514.12	40.478	13.701	
9,325.00	9,302.00	9,313.88	9,302.50	20.94	20.42	94.05	-286.83	255.96	555.23	514.73	40.509	13.706	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #403H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,350.00	9,324.67	9,336.56	9,325.17	20.95	20.46	94.92	-286.83	255.96	556.14	515.57	40.572	13.708	
9,375.00	9,346.77	9,358.65	9,347.27	20.96	20.51	95.83	-286.83	255.96	557.38	516.75	40.631	13.718	
9,400.00	9,368.22	9,380.11	9,368.72	20.97	20.55	96.76	-286.83	255.96	559.02	518.34	40.684	13.740	
9,425.00	9,388.98	9,400.86	9,389.48	20.98	20.59	97.69	-286.83	255.96	561.13	520.39	40.734	13.775	
9,450.00	9,408.97	9,420.86	9,409.47	20.98	20.63	98.59	-286.83	255.96	563.77	522.99	40.780	13.825	
9,475.00	9,428.16	9,440.04	9,428.66	20.98	20.67	99.44	-286.83	255.96	567.02	526.20	40.821	13.890	
9,500.00	9,446.47	9,458.36	9,446.97	20.97	20.71	100.22	-286.83	255.96	570.94	530.08	40.859	13.974	
9,525.00	9,463.88	9,475.76	9,464.38	20.97	20.74	100.91	-286.83	255.96	575.60	534.70	40.893	14.076	
9,550.00	9,480.32	9,507.80	9,480.82	20.96	20.80	101.49	-286.83	255.96	581.03	540.08	40.956	14.187	
9,575.00	9,495.75	9,507.63	9,496.25	20.96	20.80	101.93	-286.83	255.96	587.31	546.35	40.953	14.341	
9,600.00	9,510.13	9,522.01	9,510.63	20.95	20.83	102.22	-286.83	255.96	594.45	553.47	40.978	14.506	
9,625.00	9,523.42	9,535.30	9,523.92	20.94	20.86	102.34	-286.83	255.96	602.48	561.48	41.001	14.694	
9,650.00	9,535.59	9,547.47	9,536.09	20.93	20.88	102.26	-286.83	255.96	611.43	570.41	41.022	14.905	
9,675.00	9,546.59	9,558.47	9,547.09	20.92	20.90	101.98	-286.83	255.96	621.29	580.25	41.040	15.139	
9,700.00	9,556.41	9,568.29	9,556.91	20.91	20.92	101.48	-286.83	255.96	632.06	591.00	41.056	15.395	
9,725.00	9,565.01	9,576.89	9,565.51	20.90	20.94	100.73	-286.83	255.96	643.71	602.64	41.069	15.674	
9,750.00	9,572.37	9,584.25	9,572.87	20.89	20.96	99.73	-286.83	255.96	656.22	615.14	41.081	15.974	
9,775.00	9,578.47	9,609.65	9,578.97	20.88	21.01	98.46	-286.83	255.96	669.55	628.42	41.129	16.279	
9,800.00	9,583.29	9,604.83	9,583.79	20.88	21.00	96.91	-286.83	255.96	683.65	642.53	41.116	16.627	
9,825.00	9,586.82	9,601.30	9,587.32	20.91	20.99	95.07	-286.83	255.96	698.46	657.35	41.105	16.992	
9,850.00	9,589.05	9,600.93	9,589.55	20.99	20.99	92.94	-286.83	255.96	713.91	672.81	41.101	17.370	
9,875.00	9,589.98	9,601.86	9,590.48	21.09	20.99	90.53	-286.83	255.96	729.94	688.84	41.100	17.760	
9,882.27	9,590.00	9,601.88	9,590.50	21.13	20.99	89.78	-286.83	255.96	734.70	693.60	41.099	17.876	
9,900.00	9,589.92	9,601.80	9,590.42	21.21	20.99	89.77	-286.83	255.96	746.48	705.38	41.098	18.163	
10,000.00	9,589.49	9,601.37	9,589.99	21.75	20.99	89.73	-286.83	255.96	816.93	775.83	41.104	19.875	
10,100.00	9,589.05	9,600.93	9,589.55	22.43	20.99	89.68	-286.83	255.96	893.04	851.91	41.130	21.713	
10,200.00	9,588.61	9,600.49	9,589.11	23.23	20.99	89.64	-286.83	255.96	973.49	932.32	41.167	23.648	
10,300.00	9,588.17	9,600.05	9,588.67	24.14	20.99	89.59	-286.83	255.96	1,057.27	1,016.07	41.208	25.657	
10,400.00	9,587.74	9,600.38	9,588.24	25.15	20.99	89.55	-286.83	255.96	1,143.67	1,102.41	41.254	27.722	
10,500.00	9,587.30	9,600.82	9,587.80	26.24	20.99	89.50	-286.83	255.96	1,232.12	1,190.82	41.301	29.833	
10,600.00	9,586.86	11,724.32	10,701.80	27.42	29.09	149.37	919.51	353.26	1,295.10	1,248.72	46.374	27.927	
10,700.00	9,586.42	11,824.32	10,701.36	28.67	30.26	149.37	1,019.50	352.53	1,295.10	1,247.54	47.556	27.233	
10,800.00	9,585.99	11,924.32	10,700.92	29.98	31.50	149.37	1,119.50	351.80	1,295.10	1,246.29	48.813	26.532	
10,900.00	9,585.55	12,024.32	10,700.49	31.34	32.79	149.37	1,219.49	351.07	1,295.11	1,244.96	50.142	25.829	
11,000.00	9,585.11	12,124.32	10,700.05	32.75	34.13	149.37	1,319.49	350.34	1,295.11	1,243.57	51.536	25.130	
11,100.00	9,584.67	12,224.32	10,699.62	34.20	35.52	149.37	1,419.49	349.60	1,295.11	1,242.12	52.990	24.441	
11,200.00	9,584.24	12,324.32	10,699.18	35.69	36.95	149.37	1,519.48	348.87	1,295.11	1,240.61	54.500	23.764	
11,300.00	9,583.80	12,424.32	10,698.74	37.21	38.42	149.37	1,619.48	348.14	1,295.12	1,239.06	56.060	23.102	
11,400.00	9,583.36	12,524.32	10,698.31	38.76	39.91	149.37	1,719.48	347.41	1,295.12	1,237.45	57.668	22.458	
11,500.00	9,582.92	12,624.32	10,697.87	40.34	41.44	149.37	1,819.47	346.68	1,295.12	1,235.81	59.318	21.834	
11,600.00	9,582.49	12,724.32	10,697.43	41.93	42.99	149.37	1,919.47	345.95	1,295.13	1,234.12	61.008	21.229	
11,700.00	9,582.05	12,824.32	10,697.00	43.55	44.57	149.37	2,019.47	345.22	1,295.13	1,232.40	62.734	20.645	
11,800.00	9,581.61	12,924.32	10,696.56	45.18	46.16	149.37	2,119.46	344.48	1,295.13	1,230.64	64.494	20.081	
11,900.00	9,581.18	13,024.32	10,696.13	46.83	47.77	149.37	2,219.46	343.75	1,295.14	1,228.85	66.285	19.539	
12,000.00	9,580.74	13,124.32	10,695.69	48.50	49.40	149.37	2,319.45	343.02	1,295.14	1,227.04	68.104	19.017	
12,100.00	9,580.30	13,224.32	10,695.25	50.18	51.05	149.37	2,419.45	342.29	1,295.14	1,225.19	69.949	18.516	
12,200.00	9,579.86	13,324.32	10,694.82	51.87	52.71	149.37	2,519.45	341.56	1,295.14	1,223.33	71.818	18.034	
12,300.00	9,579.43	13,424.32	10,694.38	53.57	54.38	149.37	2,619.44	340.83	1,295.15	1,221.44	73.710	17.571	
12,400.00	9,578.99	13,524.32	10,693.94	55.28	56.06	149.37	2,719.44	340.10	1,295.15	1,219.53	75.622	17.127	
12,500.00	9,578.55	13,624.32	10,693.51	56.99	57.75	149.37	2,819.44	339.36	1,295.15	1,217.60	77.553	16.700	
12,600.00	9,578.11	13,724.32	10,693.07	58.72	59.45	149.37	2,919.43	338.63	1,295.16	1,215.65	79.503	16.291	
12,700.00	9,577.68	13,824.32	10,692.64	60.46	61.16	149.37	3,019.43	337.90	1,295.16	1,213.69	81.468	15.898	

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 #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #403H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
12,800.00	9,577.24	13,924.32	10,692.20	62.20	62.88	149.37	3,119.43	337.17	1,295.16	1,211.71	83.449	15.520	
12,900.00	9,576.80	14,024.32	10,691.76	63.94	64.61	149.37	3,219.42	336.44	1,295.17	1,209.72	85.445	15.158	
13,000.00	9,576.36	14,124.32	10,691.33	65.70	66.34	149.37	3,319.42	335.71	1,295.17	1,207.72	87.453	14.810	
13,100.00	9,575.93	14,224.32	10,690.89	67.45	68.08	149.37	3,419.41	334.98	1,295.17	1,205.70	89.474	14.475	
13,200.00	9,575.49	14,324.32	10,690.45	69.22	69.82	149.37	3,519.41	334.24	1,295.18	1,203.67	91.507	14.154	
13,300.00	9,575.05	14,424.32	10,690.02	70.98	71.57	149.37	3,619.41	333.51	1,295.18	1,201.63	93.550	13.845	
13,400.00	9,574.61	14,524.32	10,689.58	72.75	73.33	149.37	3,719.40	332.78	1,295.18	1,199.58	95.604	13.547	
13,500.00	9,574.18	14,624.32	10,689.15	74.53	75.09	149.37	3,819.40	332.05	1,295.18	1,197.52	97.667	13.261	
13,600.00	9,573.74	14,724.32	10,688.71	76.31	76.85	149.37	3,919.40	331.32	1,295.19	1,195.45	99.739	12.986	
13,700.00	9,573.30	14,824.32	10,688.27	78.09	78.62	149.37	4,019.39	330.59	1,295.19	1,193.37	101.820	12.720	
13,800.00	9,572.87	14,924.32	10,687.84	79.87	80.39	149.37	4,119.39	329.86	1,295.19	1,191.29	103.908	12.465	
13,900.00	9,572.43	15,024.32	10,687.40	81.66	82.16	149.37	4,219.39	329.12	1,295.20	1,189.19	106.003	12.218	
14,000.00	9,571.99	15,124.32	10,686.96	83.45	83.94	149.37	4,319.38	328.39	1,295.20	1,187.09	108.106	11.981	
14,100.00	9,571.55	15,224.32	10,686.53	85.25	85.72	149.37	4,419.38	327.66	1,295.20	1,184.99	110.215	11.752	
14,200.00	9,571.12	15,324.32	10,686.09	87.04	87.51	149.37	4,519.38	326.93	1,295.21	1,182.87	112.331	11.530	
14,300.00	9,570.68	15,424.32	10,685.66	88.84	89.29	149.37	4,619.37	326.20	1,295.21	1,180.76	114.452	11.317	
14,400.00	9,570.24	15,524.32	10,685.22	90.64	91.08	149.37	4,719.37	325.47	1,295.21	1,178.63	116.579	11.110	
14,455.02	9,570.00	15,579.34	10,684.98	91.63	92.07	149.37	4,774.39	325.06	1,295.21	1,177.46	117.751	11.000	

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #404H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.50	0.50	0.00	0.00	89.52	0.50	59.90	59.90				
100.00	100.00	100.50	100.50	0.08	0.09	89.52	0.50	59.90	59.90	59.73	.170	352.991	
200.00	200.00	200.50	200.50	0.31	0.31	89.52	0.50	59.90	59.90	59.28	.619	96.736	
300.00	300.00	300.50	300.50	0.53	0.53	89.52	0.50	59.90	59.90	58.83	1.069	56.048	
400.00	400.00	400.50	400.50	0.76	0.76	89.52	0.50	59.90	59.90	58.38	1.518	39.454	
500.00	500.00	500.50	500.50	0.98	0.98	89.52	0.50	59.90	59.90	57.93	1.968	30.441	
600.00	600.00	600.50	600.50	1.21	1.21	89.52	0.50	59.90	59.90	57.48	2.417	24.780	
700.00	700.00	700.50	700.50	1.43	1.43	89.52	0.50	59.90	59.90	57.04	2.867	20.894	
800.00	800.00	800.50	800.50	1.66	1.66	89.52	0.50	59.90	59.90	56.59	3.316	18.062	
900.00	900.00	900.50	900.50	1.88	1.88	89.52	0.50	59.90	59.90	56.14	3.766	15.906	
1,000.00	1,000.00	1,000.50	1,000.50	2.11	2.11	89.52	0.50	59.90	59.90	55.69	4.215	14.210	
1,100.00	1,100.00	1,100.50	1,100.50	2.33	2.33	89.52	0.50	59.90	59.90	55.24	4.665	12.841	
1,200.00	1,200.00	1,200.50	1,200.50	2.56	2.56	89.52	0.50	59.90	59.90	54.79	5.115	11.712	
1,300.00	1,300.00	1,300.50	1,300.50	2.78	2.78	89.52	0.50	59.90	59.90	54.34	5.564	10.766	
1,400.00	1,400.00	1,400.50	1,400.50	3.01	3.01	89.52	0.50	59.90	59.90	53.89	6.014	9.961	
1,500.00	1,500.00	1,500.50	1,500.50	3.23	3.23	89.52	0.50	59.90	59.90	53.44	6.463	9.268	
1,600.00	1,600.00	1,600.50	1,600.50	3.46	3.46	89.52	0.50	59.90	59.90	52.99	6.913	8.666	
1,700.00	1,700.00	1,700.50	1,700.50	3.68	3.68	89.52	0.50	59.90	59.90	52.54	7.362	8.136	
1,800.00	1,800.00	1,800.50	1,800.50	3.91	3.91	89.52	0.50	59.90	59.90	52.09	7.812	7.668	
1,900.00	1,900.00	1,900.50	1,900.50	4.13	4.13	89.52	0.50	59.90	59.90	51.64	8.261	7.251	
2,000.00	2,000.00	2,000.50	2,000.50	4.35	4.36	89.52	0.50	59.90	59.90	51.19	8.711	6.877	
2,100.00	2,100.00	2,100.50	2,100.50	4.58	4.58	89.52	0.50	59.90	59.90	50.74	9.160	6.539	
2,200.00	2,200.00	2,200.50	2,200.50	4.80	4.81	89.52	0.50	59.90	59.90	50.29	9.610	6.233	
2,300.00	2,300.00	2,300.50	2,300.50	5.03	5.03	89.52	0.50	59.90	59.90	49.84	10.059	5.955	
2,400.00	2,400.00	2,400.50	2,400.50	5.25	5.26	89.52	0.50	59.90	59.90	49.39	10.509	5.700	
2,500.00	2,500.00	2,500.50	2,500.50	5.48	5.48	89.52	0.50	59.90	59.90	48.94	10.958	5.466	
2,600.00	2,600.00	2,600.50	2,600.50	5.70	5.70	89.52	0.50	59.90	59.90	48.49	11.408	5.251	
2,700.00	2,700.00	2,700.50	2,700.50	5.93	5.93	89.52	0.50	59.90	59.90	48.04	11.858	5.052	
2,800.00	2,800.00	2,800.50	2,800.50	6.15	6.15	89.52	0.50	59.90	59.90	47.60	12.307	4.867	
2,900.00	2,900.00	2,900.50	2,900.50	6.38	6.38	89.52	0.50	59.90	59.90	47.15	12.757	4.696	
3,000.00	3,000.00	3,000.50	3,000.50	6.60	6.60	89.52	0.50	59.90	59.90	46.70	13.206	4.536	CC, ES
3,100.00	3,099.99	3,100.49	3,100.49	6.80	6.83	-137.32	0.50	59.90	60.86	47.23	13.631	4.465	
3,200.00	3,199.91	3,200.41	3,200.41	6.98	7.05	-139.68	0.50	59.90	63.80	49.77	14.032	4.547	
3,300.00	3,299.69	3,300.19	3,300.19	7.16	7.28	-143.15	0.50	59.90	68.92	54.48	14.437	4.774	
3,333.33	3,332.91	3,333.41	3,333.41	7.23	7.35	-144.46	0.50	59.90	71.15	56.58	14.572	4.882	
3,400.00	3,399.32	3,400.18	3,399.82	7.35	7.50	-147.01	0.50	59.90	75.96	61.11	14.845	5.117	
3,500.00	3,498.94	3,500.56	3,499.44	7.55	7.73	-150.27	0.50	59.90	83.41	68.15	15.256	5.467	
3,600.00	3,598.56	3,600.94	3,599.06	7.75	7.95	-152.98	0.50	59.90	91.09	75.42	15.670	5.813	
3,700.00	3,698.18	3,701.32	3,698.68	7.95	8.18	-155.28	0.50	59.90	98.94	82.85	16.087	6.150	
3,800.00	3,797.80	3,801.70	3,798.30	8.16	8.40	-157.23	0.50	59.90	106.92	90.42	16.505	6.478	
3,900.00	3,897.42	3,902.08	3,897.92	8.37	8.63	-158.91	0.50	59.90	115.01	98.09	16.926	6.795	
4,000.00	3,997.04	3,997.54	3,997.54	8.58	8.84	-160.37	0.50	59.90	123.19	105.85	17.338	7.105	
4,100.00	4,096.66	4,100.05	4,100.04	8.80	9.05	-161.37	-0.61	59.21	130.36	112.62	17.738	7.349	
4,200.00	4,196.28	4,202.95	4,202.85	9.03	9.23	-161.65	-4.07	57.04	135.29	117.18	18.109	7.471	
4,300.00	4,295.90	4,304.82	4,304.51	9.25	9.41	-161.35	-9.65	53.56	138.11	119.63	18.483	7.472	
4,400.00	4,395.52	4,404.79	4,404.24	9.48	9.58	-160.96	-15.56	49.86	140.50	121.64	18.865	7.448	
4,500.00	4,495.14	4,504.76	4,503.96	9.71	9.77	-160.57	-21.48	46.17	142.90	123.65	19.252	7.423	
4,600.00	4,594.76	4,604.72	4,603.68	9.94	9.95	-160.20	-27.39	42.47	145.30	125.66	19.643	7.397	
4,700.00	4,694.38	4,704.69	4,703.41	10.18	10.14	-159.84	-33.30	38.78	147.71	127.68	20.039	7.371	
4,800.00	4,794.00	4,804.66	4,803.13	10.41	10.33	-159.49	-39.22	35.08	150.13	129.69	20.438	7.346	
4,900.00	4,893.62	4,904.62	4,902.85	10.65	10.53	-159.16	-45.13	31.39	152.55	131.71	20.841	7.320	
5,000.00	4,993.24	5,004.59	5,002.58	10.89	10.73	-158.83	-51.04	27.69	154.98	133.73	21.248	7.294	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #404H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,092.85	5,104.56	5,102.30	11.14	10.93	-158.51	-56.96	24.00	157.41	135.75	21.658	7.268	
5,200.00	5,192.47	5,204.52	5,202.02	11.38	11.13	-158.21	-62.87	20.30	159.85	137.78	22.071	7.243	
5,300.00	5,292.09	5,304.49	5,301.75	11.63	11.33	-157.91	-68.79	16.61	162.29	139.80	22.487	7.217	
5,400.00	5,391.71	5,404.46	5,401.47	11.87	11.54	-157.62	-74.70	12.91	164.74	141.83	22.907	7.192	
5,500.00	5,491.33	5,504.42	5,501.19	12.12	11.75	-157.34	-80.61	9.22	167.18	143.86	23.329	7.166	
5,600.00	5,590.95	5,604.39	5,600.92	12.37	11.96	-157.07	-86.53	5.52	169.64	145.88	23.754	7.141	
5,700.00	5,690.57	5,704.36	5,700.64	12.62	12.18	-156.80	-92.44	1.82	172.09	147.91	24.181	7.117	
5,800.00	5,790.19	5,804.32	5,800.36	12.88	12.39	-156.55	-98.35	-1.87	174.55	149.94	24.611	7.092	
5,900.00	5,889.81	5,904.29	5,900.08	13.13	12.61	-156.30	-104.27	-5.57	177.02	151.97	25.044	7.068	
6,000.00	5,989.43	6,004.26	5,999.81	13.38	12.83	-156.05	-110.18	-9.26	179.49	154.01	25.478	7.045	
6,100.00	6,089.05	6,104.22	6,099.53	13.64	13.05	-155.82	-116.09	-12.96	181.96	156.04	25.915	7.021	
6,200.00	6,188.67	6,204.19	6,199.25	13.89	13.27	-155.59	-122.01	-16.65	184.43	158.08	26.354	6.998	
6,300.00	6,288.29	6,304.16	6,298.98	14.15	13.49	-155.36	-127.92	-20.35	186.91	160.11	26.795	6.975	
6,400.00	6,387.91	6,404.12	6,398.70	14.41	13.72	-155.15	-133.84	-24.04	189.38	162.15	27.238	6.953	
6,500.00	6,487.53	6,504.09	6,498.42	14.67	13.94	-154.93	-139.75	-27.74	191.87	164.18	27.682	6.931	
6,600.00	6,587.15	6,604.06	6,598.15	14.92	14.17	-154.73	-145.66	-31.43	194.35	166.22	28.129	6.909	
6,700.00	6,686.77	6,704.02	6,697.87	15.18	14.40	-154.53	-151.58	-35.13	196.84	168.26	28.577	6.888	
6,800.00	6,786.39	6,803.99	6,797.59	15.44	14.63	-154.33	-157.49	-38.82	199.33	170.30	29.027	6.867	
6,900.00	6,886.00	6,903.96	6,897.32	15.70	14.86	-154.14	-163.40	-42.52	201.82	172.34	29.478	6.846	
7,000.00	6,985.62	7,003.92	6,997.04	15.97	15.09	-153.95	-169.32	-46.21	204.31	174.38	29.931	6.826	
7,100.00	7,085.24	7,103.89	7,096.76	16.23	15.32	-153.77	-175.23	-49.91	206.81	176.42	30.385	6.806	
7,200.00	7,184.86	7,203.86	7,196.49	16.49	15.55	-153.59	-181.15	-53.60	209.30	178.46	30.841	6.787	
7,300.00	7,284.48	7,303.82	7,296.21	16.75	15.78	-153.42	-187.06	-57.30	211.80	180.51	31.298	6.767	
7,400.00	7,384.10	7,403.79	7,395.93	17.02	16.02	-153.25	-192.97	-61.00	214.30	182.55	31.756	6.748	
7,500.00	7,483.72	7,503.76	7,495.66	17.28	16.25	-153.08	-198.89	-64.69	216.81	184.59	32.216	6.730	
7,600.00	7,583.34	7,603.72	7,595.38	17.54	16.49	-152.92	-204.80	-68.39	219.31	186.64	32.676	6.712	
7,700.00	7,682.96	7,703.69	7,695.10	17.81	16.73	-152.76	-210.71	-72.08	221.82	188.68	33.138	6.694	
7,747.22	7,730.00	7,750.89	7,742.19	17.93	16.84	-152.69	-213.51	-73.83	223.00	189.65	33.357	6.685	
7,800.00	7,782.61	7,803.66	7,794.83	18.07	16.96	-152.57	-216.63	-75.78	224.00	190.40	33.601	6.667	
7,900.00	7,882.43	7,903.64	7,894.57	18.32	17.20	-152.10	-222.54	-79.47	224.13	190.07	34.069	6.579	
8,000.00	7,982.36	8,003.57	7,994.25	18.54	17.44	-151.29	-228.45	-83.17	221.98	187.44	34.540	6.427	
8,080.55	8,062.91	8,083.98	8,074.46	18.70	17.63	75.62	-233.21	-86.14	218.62	183.70	34.918	6.261	
8,100.00	8,082.36	8,103.38	8,093.82	18.74	17.68	75.87	-234.36	-86.86	217.64	182.63	35.009	6.217	
8,200.00	8,182.36	8,203.13	8,193.33	18.92	17.92	77.17	-240.26	-90.54	212.66	177.18	35.476	5.994	
8,300.00	8,282.36	8,302.89	8,292.84	19.11	18.16	78.53	-246.16	-94.23	207.79	171.84	35.947	5.780	
8,400.00	8,382.36	8,402.65	8,392.36	19.30	18.40	79.96	-252.06	-97.92	203.05	166.63	36.423	5.575	
8,500.00	8,482.36	8,502.40	8,491.87	19.49	18.64	81.45	-257.96	-101.61	198.44	161.53	36.904	5.377	
8,600.00	8,582.36	8,602.16	8,591.38	19.68	18.88	83.02	-263.86	-105.29	193.97	156.58	37.389	5.188	
8,700.00	8,682.36	8,701.92	8,690.90	19.87	19.13	84.65	-269.77	-108.98	189.65	151.77	37.879	5.007	
8,800.00	8,782.36	8,801.67	8,790.41	20.06	19.37	86.36	-275.67	-112.67	185.50	147.12	38.373	4.834	
8,900.00	8,882.36	8,899.09	8,887.65	20.25	19.60	87.84	-280.58	-115.74	182.09	143.24	38.853	4.687	
9,000.00	8,982.36	8,996.47	8,984.97	20.44	19.82	88.72	-283.39	-117.49	180.20	140.90	39.298	4.586	
9,100.00	9,082.36	9,105.64	9,082.86	20.64	20.04	88.95	-284.13	-117.95	179.71	139.99	39.727	4.524	
9,130.18	9,112.54	9,124.54	9,113.04	20.70	20.08	88.95	-284.13	-117.95	179.71	139.89	39.824	4.513	
9,150.00	9,132.35	9,144.36	9,132.85	20.73	20.12	89.50	-284.13	-117.95	179.71	139.80	39.906	4.503	
9,173.65	9,155.95	9,167.95	9,156.45	20.77	20.16	90.00	-284.13	-117.95	179.70	139.69	40.011	4.491	
9,175.00	9,157.29	9,169.30	9,157.79	20.78	20.16	90.04	-284.13	-117.95	179.70	139.69	40.018	4.491	
9,200.00	9,182.11	9,205.89	9,182.61	20.81	20.24	90.98	-284.13	-117.95	179.73	139.57	40.162	4.475	
9,225.00	9,206.74	9,218.74	9,207.24	20.85	20.26	92.31	-284.13	-117.95	179.86	139.59	40.268	4.466	
9,250.00	9,231.10	9,243.11	9,231.60	20.88	20.31	94.00	-284.13	-117.95	180.17	139.77	40.405	4.459	
9,275.00	9,255.15	9,267.15	9,255.65	20.90	20.36	96.01	-284.13	-117.95	180.79	140.25	40.546	4.459	SF
9,300.00	9,278.80	9,309.20	9,279.30	20.92	20.44	98.28	-284.13	-117.95	181.86	141.13	40.728	4.465	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #404H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,325.00	9,302.00	9,314.00	9,302.50	20.94	20.45	100.76	-284.13	-117.95	183.52	142.68	40.837	4.494	
9,350.00	9,324.67	9,336.68	9,325.17	20.95	20.49	103.39	-284.13	-117.95	185.94	144.96	40.979	4.537	
9,375.00	9,346.77	9,358.77	9,347.27	20.96	20.54	106.07	-284.13	-117.95	189.27	148.16	41.115	4.604	
9,400.00	9,368.22	9,380.23	9,368.72	20.97	20.58	108.76	-284.13	-117.95	193.68	152.44	41.241	4.696	
9,425.00	9,388.98	9,400.98	9,389.48	20.98	20.62	111.36	-284.13	-117.95	199.30	157.95	41.354	4.819	
9,450.00	9,408.97	9,420.98	9,409.47	20.98	20.66	113.82	-284.13	-117.95	206.23	164.78	41.451	4.975	
9,475.00	9,428.16	9,440.16	9,428.66	20.98	20.70	116.08	-284.13	-117.95	214.55	173.02	41.532	5.166	
9,500.00	9,446.47	9,458.48	9,446.97	20.97	20.74	118.10	-284.13	-117.95	224.30	182.70	41.596	5.392	
9,525.00	9,463.88	9,475.88	9,464.38	20.97	20.77	119.83	-284.13	-117.95	235.48	193.83	41.645	5.654	
9,550.00	9,480.32	9,507.68	9,480.82	20.96	20.83	121.25	-284.13	-117.95	248.06	206.35	41.710	5.947	
9,575.00	9,495.75	9,507.75	9,496.25	20.96	20.83	122.33	-284.13	-117.95	262.00	220.30	41.702	6.283	
9,600.00	9,510.13	9,522.13	9,510.63	20.95	20.86	123.04	-284.13	-117.95	277.24	235.52	41.716	6.646	
9,625.00	9,523.42	9,535.43	9,523.92	20.94	20.89	123.36	-284.13	-117.95	293.68	251.96	41.721	7.039	
9,650.00	9,535.59	9,547.59	9,536.09	20.93	20.91	123.25	-284.13	-117.95	311.24	269.52	41.720	7.460	
9,675.00	9,546.59	9,558.60	9,547.09	20.92	20.93	122.67	-284.13	-117.95	329.82	288.10	41.714	7.907	
9,700.00	9,556.41	9,568.41	9,556.91	20.91	20.95	121.56	-284.13	-117.95	349.32	307.62	41.704	8.376	
9,725.00	9,565.01	9,577.01	9,565.51	20.90	20.97	119.86	-284.13	-117.95	369.64	327.95	41.690	8.866	
9,750.00	9,572.37	9,584.37	9,572.87	20.89	20.99	117.47	-284.13	-117.95	390.69	349.02	41.674	9.375	
9,775.00	9,578.47	9,609.53	9,578.97	20.88	21.04	114.29	-284.13	-117.95	412.37	370.67	41.695	9.890	
9,800.00	9,583.29	9,604.71	9,583.79	20.88	21.03	110.21	-284.13	-117.95	434.58	392.92	41.655	10.433	
9,825.00	9,586.82	9,601.18	9,587.32	20.91	21.02	105.10	-284.13	-117.95	457.22	415.60	41.618	10.986	
9,850.00	9,589.05	9,601.06	9,589.55	20.99	21.02	98.90	-284.13	-117.95	480.22	438.63	41.590	11.546	
9,875.00	9,589.98	9,601.98	9,590.48	21.09	21.02	91.63	-284.13	-117.95	503.47	461.90	41.565	12.113	
9,882.27	9,590.00	9,602.00	9,590.50	21.13	21.02	89.33	-284.13	-117.95	510.27	468.71	41.557	12.279	
9,900.00	9,589.92	9,601.93	9,590.42	21.21	21.02	89.31	-284.13	-117.95	526.90	485.36	41.539	12.684	
10,000.00	9,589.49	9,601.49	9,589.99	21.75	21.02	89.17	-284.13	-117.95	621.84	580.38	41.455	15.000	
10,100.00	9,589.05	9,601.05	9,589.55	22.43	21.02	89.03	-284.13	-117.95	718.15	676.76	41.395	17.349	
10,200.00	9,588.61	9,600.61	9,589.11	23.23	21.02	88.89	-284.13	-117.95	815.35	774.00	41.353	19.717	
10,300.00	9,588.17	9,600.18	9,588.67	24.14	21.02	88.75	-284.13	-117.95	913.16	871.84	41.323	22.098	
10,400.00	9,587.74	9,600.26	9,588.24	25.15	21.02	88.61	-284.13	-117.95	1,011.39	970.09	41.304	24.487	
10,500.00	9,587.30	9,600.70	9,587.80	26.24	21.02	88.47	-284.13	-117.95	1,109.94	1,068.65	41.293	26.880	
10,600.00	9,586.86	11,729.30	10,701.77	27.42	29.92	179.99	914.67	-306.31	1,114.42	1,072.33	42.088	26.479	
10,700.00	9,586.42	11,829.30	10,701.34	28.67	31.10	179.99	1,014.67	-307.05	1,114.42	1,071.73	42.692	26.104	
10,800.00	9,585.99	11,929.30	10,700.90	29.98	32.34	179.99	1,114.67	-307.79	1,114.42	1,071.09	43.338	25.715	
10,900.00	9,585.55	12,029.30	10,700.46	31.34	33.64	179.99	1,214.66	-308.53	1,114.43	1,070.40	44.023	25.315	
11,000.00	9,585.11	12,129.30	10,700.03	32.75	34.99	179.99	1,314.66	-309.27	1,114.43	1,069.68	44.746	24.906	
11,100.00	9,584.67	12,229.30	10,699.59	34.20	36.38	179.99	1,414.65	-310.01	1,114.43	1,068.92	45.504	24.491	
11,200.00	9,584.24	12,329.30	10,699.16	35.69	37.81	179.99	1,514.65	-310.75	1,114.43	1,068.13	46.297	24.071	
11,300.00	9,583.80	12,429.30	10,698.72	37.21	39.28	179.99	1,614.65	-311.49	1,114.43	1,067.31	47.122	23.650	
11,400.00	9,583.36	12,529.30	10,698.29	38.76	40.77	179.99	1,714.64	-312.23	1,114.43	1,066.46	47.978	23.228	
11,500.00	9,582.92	12,629.30	10,697.85	40.34	42.30	179.99	1,814.64	-312.97	1,114.44	1,065.57	48.862	22.808	
11,600.00	9,582.49	12,729.30	10,697.41	41.93	43.85	179.99	1,914.64	-313.71	1,114.44	1,064.66	49.774	22.390	
11,700.00	9,582.05	12,829.30	10,696.98	43.55	45.42	179.99	2,014.63	-314.45	1,114.44	1,063.73	50.712	21.976	
11,800.00	9,581.61	12,929.30	10,696.54	45.18	47.01	179.99	2,114.63	-315.19	1,114.44	1,062.77	51.675	21.566	
11,900.00	9,581.18	13,029.30	10,696.11	46.83	48.62	179.99	2,214.63	-315.93	1,114.44	1,061.78	52.661	21.163	
12,000.00	9,580.74	13,129.30	10,695.67	48.50	50.25	179.99	2,314.62	-316.67	1,114.45	1,060.78	53.668	20.765	
12,100.00	9,580.30	13,229.30	10,695.24	50.18	51.89	179.99	2,414.62	-317.41	1,114.45	1,059.75	54.697	20.375	
12,200.00	9,579.86	13,329.30	10,694.80	51.87	53.55	179.99	2,514.61	-318.15	1,114.45	1,058.70	55.745	19.992	
12,300.00	9,579.43	13,429.30	10,694.37	53.57	55.22	180.00	2,614.61	-318.89	1,114.45	1,057.64	56.811	19.617	
12,400.00	9,578.99	13,529.30	10,693.93	55.28	56.90	180.00	2,714.61	-319.63	1,114.45	1,056.56	57.895	19.250	
12,500.00	9,578.55	13,629.30	10,693.49	56.99	58.59	180.00	2,814.60	-320.37	1,114.45	1,055.46	58.995	18.891	
12,600.00	9,578.11	13,729.30	10,693.06	58.72	60.28	180.00	2,914.60	-321.11	1,114.46	1,054.34	60.111	18.540	

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 #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #404H - OH - Plan #1 - IP — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
12,700.00	9,577.68	13,829.30	10,692.62	60.46	61.99	180.00	3,014.60	-321.85	1,114.46	1,053.22	61.242	18.198	
12,800.00	9,577.24	13,929.30	10,692.19	62.20	63.71	180.00	3,114.59	-322.59	1,114.46	1,052.07	62.386	17.864	
12,900.00	9,576.80	14,029.30	10,691.75	63.94	65.43	180.00	3,214.59	-323.33	1,114.46	1,050.92	63.544	17.538	
13,000.00	9,576.36	14,129.30	10,691.32	65.70	67.16	180.00	3,314.58	-324.07	1,114.46	1,049.75	64.714	17.221	
13,100.00	9,575.93	14,229.30	10,690.88	67.45	68.90	180.00	3,414.58	-324.81	1,114.47	1,048.57	65.896	16.912	
13,200.00	9,575.49	14,329.30	10,690.45	69.22	70.64	180.00	3,514.58	-325.55	1,114.47	1,047.38	67.090	16.612	
13,300.00	9,575.05	14,429.30	10,690.01	70.98	72.39	180.00	3,614.57	-326.29	1,114.47	1,046.18	68.294	16.319	
13,400.00	9,574.61	14,529.30	10,689.57	72.75	74.14	180.00	3,714.57	-327.03	1,114.47	1,044.96	69.508	16.034	
13,500.00	9,574.18	14,629.30	10,689.14	74.53	75.90	180.00	3,814.57	-327.77	1,114.47	1,043.74	70.731	15.756	
13,600.00	9,573.74	14,729.30	10,688.70	76.31	77.66	180.00	3,914.56	-328.51	1,114.47	1,042.51	71.964	15.487	
13,700.00	9,573.30	14,829.30	10,688.27	78.09	79.42	180.00	4,014.56	-329.25	1,114.48	1,041.27	73.205	15.224	
13,800.00	9,572.87	14,929.30	10,687.83	79.87	81.19	180.00	4,114.56	-329.99	1,114.48	1,040.02	74.454	14.969	
13,900.00	9,572.43	15,029.30	10,687.40	81.66	82.96	180.00	4,214.55	-330.73	1,114.48	1,038.77	75.711	14.720	
14,000.00	9,571.99	15,129.30	10,686.96	83.45	84.74	180.00	4,314.55	-331.47	1,114.48	1,037.51	76.976	14.478	
14,100.00	9,571.55	15,229.30	10,686.53	85.25	86.52	180.00	4,414.54	-332.21	1,114.48	1,036.24	78.247	14.243	
14,200.00	9,571.12	15,329.30	10,686.09	87.04	88.30	180.00	4,514.54	-332.95	1,114.48	1,034.96	79.525	14.014	
14,300.00	9,570.68	15,429.30	10,685.65	88.84	90.09	180.00	4,614.54	-333.69	1,114.49	1,033.68	80.810	13.791	
14,400.00	9,570.24	15,529.30	10,685.22	90.64	91.87	180.00	4,714.53	-334.43	1,114.49	1,032.39	82.101	13.575	
14,455.02	9,570.00	15,584.33	10,684.98	91.63	92.86	-180.00	4,769.55	-334.84	1,114.49	1,031.68	82.813	13.458	

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #502H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.60	0.60	0.00	0.00	107.94	-29.20	90.20	94.81				
100.00	100.00	100.60	100.60	0.08	0.09	107.94	-29.20	90.20	94.81	94.64	.170	557.950	
200.00	200.00	200.60	200.60	0.31	0.31	107.94	-29.20	90.20	94.81	94.19	.619	153.052	
300.00	300.00	300.60	300.60	0.53	0.54	107.94	-29.20	90.20	94.81	93.74	1.069	88.690	
400.00	400.00	400.60	400.60	0.76	0.76	107.94	-29.20	90.20	94.81	93.29	1.519	62.435	
500.00	500.00	500.60	500.60	0.98	0.98	107.94	-29.20	90.20	94.81	92.84	1.968	48.174	
600.00	600.00	600.60	600.60	1.21	1.21	107.94	-29.20	90.20	94.81	92.39	2.418	39.216	
700.00	700.00	700.60	700.60	1.43	1.43	107.94	-29.20	90.20	94.81	91.94	2.867	33.068	
800.00	800.00	800.60	800.60	1.66	1.66	107.94	-29.20	90.20	94.81	91.49	3.317	28.586	
900.00	900.00	900.60	900.60	1.88	1.88	107.94	-29.20	90.20	94.81	91.04	3.766	25.174	
1,000.00	1,000.00	1,000.60	1,000.60	2.11	2.11	107.94	-29.20	90.20	94.81	90.59	4.216	22.489	
1,100.00	1,100.00	1,100.60	1,100.60	2.33	2.33	107.94	-29.20	90.20	94.81	90.14	4.665	20.322	
1,200.00	1,200.00	1,200.60	1,200.60	2.56	2.56	107.94	-29.20	90.20	94.81	89.69	5.115	18.536	
1,300.00	1,300.00	1,300.60	1,300.60	2.78	2.78	107.94	-29.20	90.20	94.81	89.24	5.564	17.039	
1,400.00	1,400.00	1,400.60	1,400.60	3.01	3.01	107.94	-29.20	90.20	94.81	88.79	6.014	15.765	
1,500.00	1,500.00	1,500.60	1,500.60	3.23	3.23	107.94	-29.20	90.20	94.81	88.35	6.463	14.669	
1,600.00	1,600.00	1,600.60	1,600.60	3.46	3.46	107.94	-29.20	90.20	94.81	87.90	6.913	13.715	
1,700.00	1,700.00	1,700.60	1,700.60	3.68	3.68	107.94	-29.20	90.20	94.81	87.45	7.362	12.877	
1,800.00	1,800.00	1,800.60	1,800.60	3.91	3.91	107.94	-29.20	90.20	94.81	87.00	7.812	12.136	
1,900.00	1,900.00	1,900.60	1,900.60	4.13	4.13	107.94	-29.20	90.20	94.81	86.55	8.262	11.476	
2,000.00	2,000.00	2,000.60	2,000.60	4.35	4.36	107.94	-29.20	90.20	94.81	86.10	8.711	10.884	
2,100.00	2,100.00	2,100.60	2,100.60	4.58	4.58	107.94	-29.20	90.20	94.81	85.65	9.161	10.350	
2,200.00	2,200.00	2,200.60	2,200.60	4.80	4.81	107.94	-29.20	90.20	94.81	85.20	9.610	9.866	
2,300.00	2,300.00	2,300.60	2,300.60	5.03	5.03	107.94	-29.20	90.20	94.81	84.75	10.060	9.425	
2,400.00	2,400.00	2,400.60	2,400.60	5.25	5.26	107.94	-29.20	90.20	94.81	84.30	10.509	9.022	
2,500.00	2,500.00	2,500.60	2,500.60	5.48	5.48	107.94	-29.20	90.20	94.81	83.85	10.959	8.651	
2,600.00	2,600.00	2,600.60	2,600.60	5.70	5.70	107.94	-29.20	90.20	94.81	83.40	11.408	8.311	
2,700.00	2,700.00	2,700.60	2,700.60	5.93	5.93	107.94	-29.20	90.20	94.81	82.95	11.858	7.995	
2,800.00	2,800.00	2,800.60	2,800.60	6.15	6.15	107.94	-29.20	90.20	94.81	82.50	12.307	7.703	
2,900.00	2,900.00	2,900.60	2,900.60	6.38	6.38	107.94	-29.20	90.20	94.81	82.05	12.757	7.432	
3,000.00	3,000.00	3,000.60	3,000.60	6.60	6.60	107.94	-29.20	90.20	94.81	81.60	13.206	7.179	CC, ES
3,100.00	3,099.99	3,100.29	3,100.28	6.80	6.80	-117.96	-30.49	89.95	95.58	81.98	13.601	7.028	
3,200.00	3,199.91	3,200.05	3,199.86	6.98	6.97	-117.68	-34.34	89.20	97.91	83.96	13.945	7.021	SF
3,300.00	3,299.69	3,300.12	3,299.65	7.16	7.14	-117.97	-39.47	88.20	101.61	87.32	14.298	7.107	
3,333.33	3,332.91	3,333.17	3,332.89	7.23	7.20	-118.34	-41.18	87.87	103.12	88.71	14.418	7.153	
3,400.00	3,399.32	3,400.26	3,399.37	7.35	7.32	-119.23	-44.60	87.21	106.30	91.64	14.660	7.251	
3,500.00	3,498.94	3,500.40	3,499.09	7.55	7.50	-120.47	-49.73	86.21	111.11	96.08	15.031	7.392	
3,600.00	3,598.56	3,600.55	3,598.81	7.75	7.68	-121.60	-54.86	85.21	115.97	100.56	15.409	7.526	
3,700.00	3,698.18	3,700.69	3,698.53	7.95	7.87	-122.65	-59.99	84.21	120.87	105.08	15.794	7.653	
3,800.00	3,797.80	3,800.83	3,798.25	8.16	8.06	-123.61	-65.12	83.22	125.81	109.63	16.186	7.773	
3,900.00	3,897.42	3,900.98	3,897.97	8.37	8.25	-124.50	-70.25	82.22	130.78	114.20	16.585	7.886	
4,000.00	3,997.04	4,001.12	3,997.69	8.58	8.45	-125.32	-75.38	81.22	135.78	118.79	16.988	7.993	
4,100.00	4,096.66	4,101.26	4,097.41	8.80	8.65	-126.09	-80.51	80.23	140.81	123.41	17.397	8.094	
4,200.00	4,196.28	4,201.41	4,197.13	9.03	8.85	-126.80	-85.64	79.23	145.86	128.05	17.811	8.189	
4,300.00	4,295.90	4,301.55	4,296.85	9.25	9.05	-127.47	-90.77	78.23	150.93	132.70	18.229	8.280	
4,400.00	4,395.52	4,401.69	4,396.57	9.48	9.26	-128.09	-95.90	77.23	156.02	137.37	18.651	8.365	
4,500.00	4,495.14	4,501.84	4,496.29	9.71	9.47	-128.67	-101.03	76.24	161.12	142.05	19.076	8.446	
4,600.00	4,594.76	4,601.98	4,596.01	9.94	9.68	-129.22	-106.16	75.24	166.24	146.74	19.505	8.523	
4,700.00	4,694.38	4,702.12	4,695.73	10.18	9.89	-129.73	-111.29	74.24	171.38	151.44	19.938	8.596	
4,800.00	4,794.00	4,802.27	4,795.45	10.41	10.10	-130.21	-116.42	73.25	176.53	156.15	20.373	8.665	
4,900.00	4,893.62	4,902.41	4,895.17	10.65	10.31	-130.67	-121.55	72.25	181.69	160.88	20.811	8.730	
5,000.00	4,993.24	5,002.56	4,994.89	10.89	10.53	-131.10	-126.68	71.25	186.86	165.61	21.252	8.793	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #502H - OH - Plan #1 - IP — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,092.85	5,102.70	5,094.61	11.14	10.75	-131.51	-131.81	70.25	192.04	170.35	21.695	8.852	
5,200.00	5,192.47	5,202.84	5,194.33	11.38	10.96	-131.89	-136.94	69.26	197.23	175.09	22.141	8.908	
5,300.00	5,292.09	5,302.99	5,294.05	11.63	11.18	-132.26	-142.07	68.26	202.43	179.84	22.588	8.962	
5,400.00	5,391.71	5,403.13	5,393.77	11.87	11.40	-132.61	-147.20	67.26	207.64	184.60	23.038	9.013	
5,500.00	5,491.33	5,503.27	5,493.49	12.12	11.63	-132.94	-152.33	66.27	212.85	189.36	23.489	9.062	
5,600.00	5,590.95	5,603.42	5,593.21	12.37	11.85	-133.26	-157.46	65.27	218.07	194.13	23.942	9.108	
5,700.00	5,690.57	5,703.56	5,692.93	12.62	12.07	-133.56	-162.59	64.27	223.30	198.90	24.397	9.153	
5,800.00	5,790.19	5,803.70	5,792.65	12.88	12.30	-133.84	-167.72	63.27	228.53	203.68	24.854	9.195	
5,900.00	5,889.81	5,903.85	5,892.37	13.13	12.52	-134.12	-172.85	62.28	233.77	208.46	25.312	9.236	
6,000.00	5,989.43	6,003.99	5,992.09	13.38	12.75	-134.38	-177.98	61.28	239.02	213.25	25.771	9.275	
6,100.00	6,089.05	6,104.13	6,091.81	13.64	12.98	-134.63	-183.11	60.28	244.27	218.03	26.231	9.312	
6,200.00	6,188.67	6,204.28	6,191.53	13.89	13.20	-134.87	-188.24	59.29	249.52	222.82	26.693	9.348	
6,300.00	6,288.29	6,304.42	6,291.25	14.15	13.43	-135.10	-193.37	58.29	254.78	227.62	27.156	9.382	
6,400.00	6,387.91	6,404.56	6,390.97	14.41	13.66	-135.32	-198.50	57.29	260.04	232.42	27.620	9.415	
6,500.00	6,487.53	6,504.71	6,490.69	14.67	13.89	-135.53	-203.63	56.29	265.30	237.22	28.085	9.446	
6,600.00	6,587.15	6,604.85	6,590.41	14.92	14.12	-135.74	-208.76	55.30	270.57	242.02	28.551	9.477	
6,700.00	6,686.77	6,704.99	6,690.13	15.18	14.35	-135.93	-213.89	54.30	275.84	246.82	29.018	9.506	
6,800.00	6,786.39	6,805.14	6,789.85	15.44	14.58	-136.12	-219.02	53.30	281.12	251.63	29.486	9.534	
6,900.00	6,886.00	6,905.28	6,889.57	15.70	14.81	-136.30	-224.15	52.31	286.39	256.44	29.955	9.561	
7,000.00	6,985.62	7,005.42	6,989.29	15.97	15.05	-136.48	-229.28	51.31	291.67	261.25	30.425	9.587	
7,100.00	7,085.24	7,105.57	7,089.01	16.23	15.28	-136.65	-234.41	50.31	296.96	266.06	30.895	9.612	
7,200.00	7,184.86	7,205.71	7,188.72	16.49	15.51	-136.81	-239.54	49.31	302.24	270.88	31.366	9.636	
7,300.00	7,284.48	7,305.85	7,288.44	16.75	15.74	-136.97	-244.67	48.32	307.53	275.69	31.838	9.659	
7,400.00	7,384.10	7,406.00	7,388.16	17.02	15.98	-137.12	-249.80	47.32	312.82	280.51	32.310	9.682	
7,500.00	7,483.72	7,506.14	7,487.88	17.28	16.21	-137.27	-254.93	46.32	318.11	285.33	32.784	9.703	
7,600.00	7,583.34	7,606.28	7,587.60	17.54	16.45	-137.41	-260.06	45.32	323.41	290.15	33.257	9.724	
7,700.00	7,682.96	7,706.43	7,687.32	17.81	16.68	-137.55	-265.19	44.33	328.70	294.97	33.732	9.745	
7,747.22	7,730.00	7,740.72	7,734.41	17.93	16.76	-137.61	-267.62	43.86	331.20	297.28	33.926	9.763	
7,800.00	7,782.61	7,806.56	7,787.06	18.07	16.92	-137.66	-270.32	43.33	333.73	299.52	34.206	9.756	
7,900.00	7,882.43	7,906.62	7,886.86	18.32	17.15	-137.52	-275.46	42.33	337.04	302.36	34.679	9.719	
8,000.00	7,982.36	7,993.33	7,986.67	18.54	17.36	-137.06	-280.59	41.33	338.44	303.32	35.119	9.637	
8,080.55	8,062.91	8,072.63	8,065.89	18.70	17.54	89.44	-284.11	40.65	338.31	302.83	35.480	9.535	
8,100.00	8,082.36	8,091.73	8,084.98	18.74	17.58	89.54	-284.72	40.53	338.19	302.62	35.564	9.509	
8,200.00	8,182.36	8,190.01	8,183.24	18.92	17.79	89.82	-286.38	40.21	337.85	301.88	35.969	9.393	
8,207.62	8,189.98	8,216.01	8,190.58	18.94	17.84	89.83	-286.42	40.20	337.84	301.81	36.036	9.375	
8,300.00	8,282.36	8,289.73	8,282.96	19.11	17.98	89.83	-286.42	40.20	337.84	301.49	36.356	9.293	
8,400.00	8,382.36	8,389.73	8,382.96	19.30	18.18	89.83	-286.42	40.20	337.84	301.10	36.743	9.195	
8,500.00	8,482.36	8,489.73	8,482.96	19.49	18.37	89.83	-286.42	40.20	337.84	300.71	37.131	9.099	
8,600.00	8,582.36	8,589.73	8,582.96	19.68	18.56	89.83	-286.42	40.20	337.84	300.32	37.520	9.004	
8,700.00	8,682.36	8,689.73	8,682.96	19.87	18.76	89.83	-286.42	40.20	337.84	299.93	37.911	8.911	
8,800.00	8,782.36	8,789.73	8,782.96	20.06	18.95	89.83	-286.42	40.20	337.84	299.54	38.303	8.820	
8,900.00	8,882.36	8,889.73	8,882.96	20.25	19.15	89.83	-286.42	40.20	337.84	299.15	38.696	8.731	
9,000.00	8,982.36	8,989.73	8,982.96	20.44	19.34	89.83	-286.42	40.20	337.84	298.75	39.090	8.643	
9,100.00	9,082.36	9,089.73	9,082.96	20.64	19.54	89.83	-286.42	40.20	337.84	298.36	39.486	8.556	
9,130.18	9,112.54	9,119.91	9,113.14	20.70	19.60	89.83	-286.42	40.20	337.84	298.24	39.606	8.530	
9,150.00	9,132.35	9,139.72	9,132.95	20.73	19.64	90.32	-286.42	40.20	337.84	298.16	39.684	8.513	
9,175.00	9,157.29	9,164.66	9,157.89	20.78	19.69	90.60	-286.42	40.20	337.86	298.07	39.784	8.492	
9,200.00	9,182.11	9,189.48	9,182.71	20.81	19.74	91.10	-286.42	40.20	337.90	298.02	39.884	8.472	
9,225.00	9,206.74	9,214.11	9,207.34	20.85	19.79	91.81	-286.42	40.20	338.01	298.03	39.984	8.454	
9,250.00	9,231.10	9,238.47	9,231.70	20.88	19.83	92.70	-286.42	40.20	338.24	298.15	40.083	8.438	
9,275.00	9,255.15	9,262.52	9,255.75	20.90	19.88	93.76	-286.42	40.20	338.64	298.46	40.182	8.428	
9,300.00	9,278.80	9,286.17	9,279.40	20.92	19.93	94.97	-286.42	40.20	339.29	299.01	40.278	8.424	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #502H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,325.00	9,302.00	9,309.37	9,302.60	20.94	19.98	96.31	-286.42	40.20	340.28	299.91	40.372	8.428	
9,350.00	9,324.67	9,332.04	9,325.27	20.95	20.02	97.73	-286.42	40.20	341.69	301.23	40.464	8.444	
9,375.00	9,346.77	9,354.14	9,347.37	20.96	20.06	99.21	-286.42	40.20	343.64	303.09	40.552	8.474	
9,400.00	9,368.22	9,375.60	9,368.82	20.97	20.11	100.72	-286.42	40.20	346.22	305.58	40.636	8.520	
9,425.00	9,388.98	9,403.65	9,389.58	20.98	20.16	102.21	-286.42	40.20	349.53	308.80	40.730	8.582	
9,450.00	9,408.97	9,416.34	9,409.57	20.98	20.19	103.65	-286.42	40.20	353.67	312.88	40.790	8.671	
9,475.00	9,428.16	9,435.53	9,428.76	20.98	20.23	105.00	-286.42	40.20	358.74	317.88	40.856	8.780	
9,500.00	9,446.47	9,453.84	9,447.07	20.97	20.26	106.24	-286.42	40.20	364.82	323.90	40.920	8.915	
9,525.00	9,463.88	9,471.25	9,464.48	20.97	20.30	107.32	-286.42	40.20	371.96	330.98	40.975	9.078	
9,550.00	9,480.32	9,487.69	9,480.92	20.96	20.33	108.23	-286.42	40.20	380.22	339.20	41.024	9.268	
9,575.00	9,495.75	9,503.12	9,496.35	20.96	20.36	108.92	-286.42	40.20	389.64	348.57	41.065	9.488	
9,600.00	9,510.13	9,517.50	9,510.73	20.95	20.39	109.38	-286.42	40.20	400.22	359.12	41.100	9.738	
9,625.00	9,523.42	9,530.79	9,524.02	20.94	20.42	109.57	-286.42	40.20	411.95	370.83	41.129	10.016	
9,650.00	9,535.59	9,542.96	9,536.19	20.93	20.44	109.47	-286.42	40.20	424.83	383.68	41.151	10.324	
9,675.00	9,546.59	9,553.96	9,547.19	20.92	20.46	109.05	-286.42	40.20	438.80	397.63	41.167	10.659	
9,700.00	9,556.41	9,563.78	9,557.01	20.91	20.48	108.29	-286.42	40.20	453.81	412.64	41.178	11.021	
9,725.00	9,565.01	9,572.38	9,565.61	20.90	20.50	107.15	-286.42	40.20	469.81	428.63	41.183	11.408	
9,750.00	9,572.37	9,579.74	9,572.97	20.89	20.51	105.60	-286.42	40.20	486.71	445.53	41.184	11.818	
9,775.00	9,578.47	9,585.84	9,579.07	20.88	20.53	103.62	-286.42	40.20	504.45	463.27	41.180	12.250	
9,800.00	9,583.29	9,609.34	9,583.89	20.88	20.57	101.17	-286.42	40.20	522.92	481.71	41.210	12.689	
9,825.00	9,586.82	9,605.81	9,587.42	20.91	20.57	98.23	-286.42	40.20	542.04	500.86	41.184	13.161	
9,850.00	9,589.05	9,603.58	9,589.65	20.99	20.56	94.80	-286.42	40.20	561.73	520.57	41.160	13.647	
9,875.00	9,589.98	9,602.65	9,590.58	21.09	20.56	90.87	-286.42	40.20	581.88	540.74	41.138	14.144	
9,882.27	9,590.00	9,602.63	9,590.60	21.13	20.56	89.64	-286.42	40.20	587.81	546.68	41.133	14.291	
9,900.00	9,589.92	9,602.71	9,590.52	21.21	20.56	89.63	-286.42	40.20	602.41	561.29	41.119	14.650	
10,000.00	9,589.49	9,603.14	9,590.09	21.75	20.56	89.56	-286.42	40.20	687.49	646.44	41.055	16.746	
10,100.00	9,589.05	9,603.58	9,589.65	22.43	20.56	89.48	-286.42	40.20	776.14	735.13	41.010	18.926	
10,200.00	9,588.61	9,604.02	9,589.21	23.23	20.56	89.41	-286.42	40.20	867.26	826.28	40.979	21.164	
10,300.00	9,588.17	9,604.46	9,588.77	24.14	20.56	89.33	-286.42	40.20	960.15	919.20	40.959	23.442	
10,400.00	9,587.74	9,604.89	9,588.34	25.15	20.56	89.26	-286.42	40.20	1,054.35	1,013.40	40.947	25.749	
10,500.00	9,587.30	9,605.33	9,587.90	26.24	20.57	89.19	-286.42	40.20	1,149.52	1,108.58	40.941	28.077	
10,600.00	9,586.86	9,605.77	9,587.46	27.42	20.57	89.11	-286.42	40.20	1,245.45	1,204.51	40.941	30.420	
10,700.00	9,586.42	9,606.21	9,587.02	28.67	20.57	89.04	-286.42	40.20	1,341.97	1,301.03	40.946	32.774	
10,800.00	9,585.99	9,606.64	9,586.59	29.98	20.57	88.96	-286.42	40.20	1,438.97	1,398.02	40.954	35.136	
10,900.00	9,585.55	9,607.08	9,586.15	31.34	20.57	88.89	-286.42	40.20	1,536.35	1,495.39	40.966	37.503	
11,000.00	9,585.11	9,607.52	9,585.71	32.75	20.57	88.81	-286.42	40.20	1,634.05	1,593.07	40.981	39.874	
11,100.00	9,584.67	9,607.96	9,585.27	34.20	20.57	88.74	-286.42	40.20	1,732.02	1,691.02	40.998	42.246	
11,200.00	9,584.24	9,608.39	9,584.84	35.69	20.57	88.67	-286.42	40.20	1,830.20	1,789.18	41.018	44.619	
11,300.00	9,583.80	9,608.83	9,584.40	37.21	20.57	88.59	-286.42	40.20	1,928.57	1,887.53	41.041	46.991	
11,400.00	9,583.36	9,609.27	9,583.96	38.76	20.57	88.52	-286.42	40.20	2,027.10	1,986.03	41.065	49.363	
11,500.00	9,582.92	13,529.55	11,612.88	40.34	42.94	170.76	1,821.10	16.93	2,056.04	2,003.29	52.748	38.979	
11,600.00	9,582.49	13,629.55	11,612.44	41.93	44.47	170.76	1,921.10	16.19	2,056.04	2,002.33	53.713	38.278	
11,700.00	9,582.05	13,729.55	11,612.01	43.55	46.03	170.76	2,021.10	15.44	2,056.04	2,001.34	54.706	37.583	
11,800.00	9,581.61	13,829.55	11,611.57	45.18	47.61	170.76	2,121.09	14.70	2,056.04	2,000.32	55.725	36.896	
11,900.00	9,581.18	13,929.55	11,611.13	46.83	49.21	170.76	2,221.09	13.96	2,056.04	1,999.27	56.768	36.218	
12,000.00	9,580.74	14,029.55	11,610.70	48.50	50.82	170.76	2,321.08	13.22	2,056.04	1,998.20	57.835	35.550	
12,100.00	9,580.30	14,129.55	11,610.26	50.18	52.45	170.76	2,421.08	12.48	2,056.04	1,997.12	58.923	34.893	
12,200.00	9,579.86	14,229.55	11,609.82	51.87	54.10	170.76	2,521.08	11.74	2,056.04	1,996.01	60.033	34.249	
12,300.00	9,579.43	14,329.55	11,609.38	53.57	55.76	170.76	2,621.07	11.00	2,056.04	1,994.88	61.161	33.617	
12,400.00	9,578.99	14,429.55	11,608.95	55.28	57.43	170.76	2,721.07	10.26	2,056.04	1,993.73	62.309	32.997	
12,500.00	9,578.55	14,529.55	11,608.51	56.99	59.11	170.76	2,821.07	9.52	2,056.04	1,992.56	63.474	32.392	
12,600.00	9,578.11	14,629.55	11,608.07	58.72	60.80	170.76	2,921.06	8.78	2,056.03	1,991.38	64.656	31.800	

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 #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #502H - OH - Plan #1 - IP — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
12,700.00	9,577.68	14,729.55	11,607.63	60.46	62.50	170.76	3,021.06	8.04	2,056.03	1,990.18	65.853	31.222	
12,800.00	9,577.24	14,829.55	11,607.20	62.20	64.20	170.76	3,121.05	7.29	2,056.03	1,988.97	67.065	30.657	
12,900.00	9,576.80	14,929.55	11,606.76	63.94	65.92	170.76	3,221.05	6.55	2,056.03	1,987.74	68.292	30.107	
13,000.00	9,576.36	15,029.55	11,606.32	65.70	67.64	170.76	3,321.05	5.81	2,056.03	1,986.50	69.532	29.570	
13,100.00	9,575.93	15,129.55	11,605.89	67.45	69.37	170.76	3,421.04	5.07	2,056.03	1,985.25	70.784	29.047	
13,200.00	9,575.49	15,229.55	11,605.45	69.22	71.11	170.76	3,521.04	4.33	2,056.03	1,983.98	72.048	28.537	
13,300.00	9,575.05	15,329.55	11,605.01	70.98	72.85	170.76	3,621.04	3.59	2,056.03	1,982.71	73.324	28.040	
13,400.00	9,574.61	15,429.55	11,604.57	72.75	74.60	170.76	3,721.03	2.85	2,056.03	1,981.42	74.611	27.557	
13,500.00	9,574.18	15,529.55	11,604.14	74.53	76.35	170.77	3,821.03	2.11	2,056.03	1,980.12	75.908	27.086	
13,600.00	9,573.74	15,629.55	11,603.70	76.31	78.10	170.77	3,921.03	1.37	2,056.03	1,978.81	77.215	26.627	
13,700.00	9,573.30	15,729.55	11,603.26	78.09	79.86	170.77	4,021.02	0.63	2,056.03	1,977.50	78.531	26.181	
13,800.00	9,572.87	15,829.55	11,602.83	79.87	81.63	170.77	4,121.02	-0.11	2,056.03	1,976.17	79.856	25.747	
13,900.00	9,572.43	15,929.55	11,602.39	81.66	83.39	170.77	4,221.01	-0.85	2,056.03	1,974.84	81.189	25.324	
14,000.00	9,571.99	16,029.55	11,601.95	83.45	85.17	170.77	4,321.01	-1.60	2,056.02	1,973.49	82.530	24.912	
14,100.00	9,571.55	16,129.55	11,601.51	85.25	86.94	170.77	4,421.01	-2.34	2,056.02	1,972.14	83.879	24.512	
14,200.00	9,571.12	16,229.55	11,601.08	87.04	88.72	170.77	4,521.00	-3.08	2,056.02	1,970.79	85.235	24.122	
14,300.00	9,570.68	16,329.55	11,600.64	88.84	90.50	170.77	4,621.00	-3.82	2,056.02	1,969.42	86.599	23.742	
14,400.00	9,570.24	16,429.55	11,600.20	90.64	92.28	170.77	4,721.00	-4.56	2,056.02	1,968.05	87.968	23.372	
14,449.92	9,570.02	16,479.48	11,599.98	91.54	93.17	170.77	4,770.92	-4.93	2,056.02	1,967.37	88.654	23.191	
14,455.02	9,570.00	16,475.66	11,600.00	91.63	93.11	170.77	4,767.10	-4.90	2,056.04	1,967.42	88.617	23.201	

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #605H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	116.14	-29.50	60.10	66.95				
100.00	100.00	100.00	100.00	0.08	0.08	116.14	-29.50	60.10	66.95	66.78	.169	397.151	
200.00	200.00	200.00	200.00	0.31	0.31	116.14	-29.50	60.10	66.95	66.33	.618	108.314	
300.00	300.00	300.00	300.00	0.53	0.53	116.14	-29.50	60.10	66.95	65.88	1.068	62.708	
400.00	400.00	400.00	400.00	0.76	0.76	116.14	-29.50	60.10	66.95	65.43	1.517	44.128	
500.00	500.00	500.00	500.00	0.98	0.98	116.14	-29.50	60.10	66.95	64.98	1.967	34.042	
600.00	600.00	600.00	600.00	1.21	1.21	116.14	-29.50	60.10	66.95	64.53	2.416	27.708	
700.00	700.00	700.00	700.00	1.43	1.43	116.14	-29.50	60.10	66.95	64.08	2.866	23.362	
800.00	800.00	800.00	800.00	1.66	1.66	116.14	-29.50	60.10	66.95	63.63	3.315	20.194	
900.00	900.00	900.00	900.00	1.88	1.88	116.14	-29.50	60.10	66.95	63.18	3.765	17.783	
1,000.00	1,000.00	1,000.00	1,000.00	2.11	2.11	116.14	-29.50	60.10	66.95	62.74	4.214	15.886	
1,100.00	1,100.00	1,100.00	1,100.00	2.33	2.33	116.14	-29.50	60.10	66.95	62.29	4.664	14.355	
1,200.00	1,200.00	1,200.00	1,200.00	2.56	2.56	116.14	-29.50	60.10	66.95	61.84	5.113	13.093	
1,300.00	1,300.00	1,300.00	1,300.00	2.78	2.78	116.14	-29.50	60.10	66.95	61.39	5.563	12.035	
1,400.00	1,400.00	1,400.00	1,400.00	3.01	3.01	116.14	-29.50	60.10	66.95	60.94	6.012	11.135	
1,500.00	1,500.00	1,500.00	1,500.00	3.23	3.23	116.14	-29.50	60.10	66.95	60.49	6.462	10.360	
1,600.00	1,600.00	1,600.00	1,600.00	3.46	3.46	116.14	-29.50	60.10	66.95	60.04	6.912	9.687	
1,700.00	1,700.00	1,700.00	1,700.00	3.68	3.68	116.14	-29.50	60.10	66.95	59.59	7.361	9.095	
1,800.00	1,800.00	1,800.00	1,800.00	3.91	3.91	116.14	-29.50	60.10	66.95	59.14	7.811	8.572	
1,900.00	1,900.00	1,900.00	1,900.00	4.13	4.13	116.14	-29.50	60.10	66.95	58.69	8.260	8.105	
2,000.00	2,000.00	2,000.00	2,000.00	4.35	4.35	116.14	-29.50	60.10	66.95	58.24	8.710	7.687	
2,100.00	2,100.00	2,100.00	2,100.00	4.58	4.58	116.14	-29.50	60.10	66.95	57.79	9.159	7.310	
2,200.00	2,200.00	2,200.00	2,200.00	4.80	4.80	116.14	-29.50	60.10	66.95	57.34	9.609	6.968	
2,300.00	2,300.00	2,300.00	2,300.00	5.03	5.03	116.14	-29.50	60.10	66.95	56.89	10.058	6.656	
2,400.00	2,400.00	2,400.00	2,400.00	5.25	5.25	116.14	-29.50	60.10	66.95	56.44	10.508	6.371	
2,500.00	2,500.00	2,500.00	2,500.00	5.48	5.48	116.14	-29.50	60.10	66.95	55.99	10.957	6.110	
2,600.00	2,600.00	2,600.00	2,600.00	5.70	5.70	116.14	-29.50	60.10	66.95	55.54	11.407	5.869	
2,700.00	2,700.00	2,700.00	2,700.00	5.93	5.93	116.14	-29.50	60.10	66.95	55.09	11.856	5.647	
2,800.00	2,800.00	2,800.00	2,800.00	6.15	6.15	116.14	-29.50	60.10	66.95	54.64	12.306	5.440	
2,900.00	2,900.00	2,900.00	2,900.00	6.38	6.38	116.14	-29.50	60.10	66.95	54.19	12.755	5.249	
3,000.00	3,000.00	3,000.00	3,000.00	6.60	6.60	116.14	-29.50	60.10	66.95	53.74	13.205	5.070	CC, ES
3,100.00	3,099.99	3,099.65	3,099.64	6.80	6.80	-109.81	-30.76	59.77	67.65	54.05	13.600	4.974	SF
3,200.00	3,199.91	3,199.27	3,199.18	6.98	6.97	-109.66	-34.52	58.77	69.75	55.81	13.945	5.002	
3,300.00	3,299.69	3,300.91	3,298.82	7.16	7.14	-109.87	-40.27	57.25	73.15	58.84	14.301	5.115	
3,333.33	3,332.91	3,332.39	3,332.06	7.23	7.20	-110.31	-42.23	56.74	74.49	60.07	14.419	5.166	
3,400.00	3,399.32	3,401.02	3,398.53	7.35	7.32	-111.39	-46.17	55.70	77.29	62.62	14.665	5.270	
3,500.00	3,498.94	3,501.13	3,498.23	7.55	7.50	-112.87	-52.06	54.14	81.54	66.50	15.038	5.422	
3,600.00	3,598.56	3,601.24	3,597.93	7.75	7.69	-114.20	-57.96	52.58	85.83	70.41	15.419	5.566	
3,700.00	3,698.18	3,701.35	3,697.64	7.95	7.88	-115.40	-63.85	51.02	90.17	74.36	15.808	5.704	
3,800.00	3,797.80	3,801.46	3,797.34	8.16	8.07	-116.49	-69.75	49.47	94.55	78.34	16.205	5.835	
3,900.00	3,897.42	3,901.57	3,897.04	8.37	8.27	-117.49	-75.64	47.91	98.95	82.34	16.607	5.958	
4,000.00	3,997.04	4,001.69	3,996.74	8.58	8.46	-118.40	-81.54	46.35	103.39	86.37	17.016	6.076	
4,100.00	4,096.66	4,101.80	4,096.45	8.80	8.67	-119.24	-87.44	44.79	107.84	90.41	17.430	6.187	
4,200.00	4,196.28	4,201.91	4,196.15	9.03	8.87	-120.00	-93.33	43.24	112.32	94.47	17.850	6.293	
4,300.00	4,295.90	4,302.02	4,295.85	9.25	9.08	-120.71	-99.23	41.68	116.82	98.54	18.274	6.393	
4,400.00	4,395.52	4,402.13	4,395.55	9.48	9.29	-121.37	-105.12	40.12	121.33	102.63	18.703	6.487	
4,500.00	4,495.14	4,502.24	4,495.26	9.71	9.50	-121.98	-111.02	38.56	125.86	106.72	19.135	6.577	
4,600.00	4,594.76	4,602.35	4,594.96	9.94	9.71	-122.55	-116.91	37.00	130.40	110.83	19.572	6.663	
4,700.00	4,694.38	4,702.46	4,694.66	10.18	9.93	-123.08	-122.81	35.45	134.96	114.94	20.012	6.744	
4,800.00	4,794.00	4,802.58	4,794.36	10.41	10.15	-123.57	-128.71	33.89	139.52	119.06	20.455	6.821	
4,900.00	4,893.62	4,902.69	4,894.07	10.65	10.37	-124.04	-134.60	32.33	144.09	123.19	20.901	6.894	
5,000.00	4,993.24	5,002.80	4,993.77	10.89	10.59	-124.47	-140.50	30.77	148.68	127.33	21.350	6.964	

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 #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #605H - OH - Plan #1 - IP — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,092.85	5,102.91	5,093.47	11.14	10.81	-124.88	-146.39	29.22	153.27	131.46	21.802	7.030	
5,200.00	5,192.47	5,203.02	5,193.17	11.38	11.03	-125.26	-152.29	27.66	157.86	135.61	22.256	7.093	
5,300.00	5,292.09	5,303.13	5,292.87	11.63	11.26	-125.63	-158.18	26.10	162.47	139.76	22.713	7.153	
5,400.00	5,391.71	5,403.24	5,392.58	11.87	11.48	-125.97	-164.08	24.54	167.08	143.91	23.172	7.211	
5,500.00	5,491.33	5,503.35	5,492.28	12.12	11.71	-126.29	-169.98	22.98	171.70	148.06	23.633	7.265	
5,600.00	5,590.95	5,603.46	5,591.98	12.37	11.94	-126.60	-175.87	21.43	176.32	152.22	24.095	7.318	
5,700.00	5,690.57	5,703.58	5,691.68	12.62	12.17	-126.89	-181.77	19.87	180.95	156.39	24.560	7.368	
5,800.00	5,790.19	5,803.69	5,791.39	12.88	12.40	-127.17	-187.66	18.31	185.58	160.55	25.026	7.415	
5,900.00	5,889.81	5,903.80	5,891.09	13.13	12.63	-127.44	-193.56	16.75	190.21	164.72	25.494	7.461	
6,000.00	5,989.43	6,003.91	5,990.79	13.38	12.86	-127.69	-199.45	15.20	194.85	168.89	25.963	7.505	
6,100.00	6,089.05	6,104.02	6,090.49	13.64	13.09	-127.93	-205.35	13.64	199.49	173.06	26.434	7.547	
6,200.00	6,188.67	6,204.13	6,190.20	13.89	13.32	-128.16	-211.25	12.08	204.14	177.23	26.906	7.587	
6,300.00	6,288.29	6,304.24	6,289.90	14.15	13.56	-128.37	-217.14	10.52	208.79	181.41	27.380	7.626	
6,400.00	6,387.91	6,404.35	6,389.60	14.41	13.79	-128.58	-223.04	8.97	213.44	185.59	27.854	7.663	
6,500.00	6,487.53	6,504.47	6,489.30	14.67	14.03	-128.78	-228.93	7.41	218.10	189.77	28.330	7.698	
6,600.00	6,587.15	6,604.58	6,589.01	14.92	14.26	-128.97	-234.83	5.85	222.75	193.95	28.807	7.733	
6,700.00	6,686.77	6,704.69	6,688.71	15.18	14.50	-129.16	-240.73	4.29	227.41	198.13	29.285	7.766	
6,800.00	6,786.39	6,804.80	6,788.41	15.44	14.74	-129.33	-246.62	2.73	232.07	202.31	29.764	7.797	
6,900.00	6,886.00	6,904.91	6,888.11	15.70	14.97	-129.50	-252.52	1.18	236.74	206.49	30.244	7.828	
7,000.00	6,985.62	7,005.02	6,987.82	15.97	15.21	-129.67	-258.41	-0.38	241.40	210.68	30.724	7.857	
7,100.00	7,085.24	7,105.13	7,087.52	16.23	15.45	-129.82	-264.31	-1.94	246.07	214.87	31.206	7.885	
7,200.00	7,184.86	7,205.24	7,187.22	16.49	15.69	-129.98	-270.20	-3.50	250.74	219.05	31.688	7.913	
7,300.00	7,284.48	7,305.36	7,286.92	16.75	15.93	-130.12	-276.10	-5.05	255.41	223.24	32.171	7.939	
7,400.00	7,384.10	7,394.14	7,386.24	17.02	16.14	-130.30	-281.81	-6.56	260.11	227.49	32.626	7.973	
7,500.00	7,483.72	7,492.86	7,484.88	17.28	16.37	-130.90	-285.49	-7.54	265.16	232.08	33.082	8.015	
7,600.00	7,583.34	7,591.32	7,583.34	17.54	16.57	-132.01	-286.72	-7.86	270.71	237.21	33.503	8.080	
7,700.00	7,682.96	7,709.06	7,682.96	17.81	16.80	-133.35	-286.72	-7.86	276.63	242.69	33.940	8.151	
7,747.22	7,730.00	7,737.98	7,730.00	17.93	16.85	-133.97	-286.72	-7.86	279.48	245.39	34.095	8.197	
7,800.00	7,782.61	7,809.41	7,782.61	18.07	16.99	-134.62	-286.72	-7.86	282.44	248.10	34.344	8.224	
7,900.00	7,882.43	7,909.59	7,882.43	18.32	17.19	-135.52	-286.72	-7.86	286.72	251.97	34.748	8.251	
8,000.00	7,982.36	8,009.65	7,982.36	18.54	17.38	-136.02	-286.72	-7.86	289.17	254.02	35.151	8.226	
8,080.55	8,062.91	8,070.89	8,062.91	18.70	17.50	89.86	-286.72	-7.86	289.78	254.35	35.432	8.178	
8,100.00	8,082.36	8,109.66	8,082.36	18.74	17.58	89.86	-286.72	-7.86	289.78	254.23	35.546	8.152	
8,200.00	8,182.36	8,209.66	8,182.36	18.92	17.77	89.86	-286.72	-7.86	289.78	253.84	35.935	8.064	
8,300.00	8,282.36	8,309.66	8,282.36	19.11	17.97	89.86	-286.72	-7.86	289.78	253.45	36.326	7.977	
8,400.00	8,382.36	8,409.66	8,382.36	19.30	18.17	89.86	-286.72	-7.86	289.78	253.06	36.718	7.892	
8,500.00	8,482.36	8,509.66	8,482.36	19.49	18.37	89.86	-286.72	-7.86	289.78	252.67	37.111	7.808	
8,600.00	8,582.36	8,609.66	8,582.36	19.68	18.57	89.86	-286.72	-7.86	289.78	252.27	37.506	7.726	
8,700.00	8,682.36	8,709.66	8,682.36	19.87	18.76	89.86	-286.72	-7.86	289.78	251.88	37.902	7.646	
8,800.00	8,782.36	8,809.66	8,782.36	20.06	18.96	89.86	-286.72	-7.86	289.78	251.48	38.299	7.566	
8,900.00	8,882.36	8,909.66	8,882.36	20.25	19.17	89.86	-286.72	-7.86	289.78	251.08	38.697	7.488	
9,000.00	8,982.36	9,009.66	8,982.36	20.44	19.37	89.86	-286.72	-7.86	289.78	250.68	39.096	7.412	
9,100.00	9,082.36	9,109.66	9,082.36	20.64	19.57	89.86	-286.72	-7.86	289.78	250.28	39.496	7.337	
9,130.18	9,112.54	9,120.52	9,112.54	20.70	19.59	89.86	-286.72	-7.86	289.78	250.20	39.578	7.322	
9,150.00	9,132.35	9,140.34	9,132.35	20.73	19.63	90.36	-286.72	-7.86	289.78	250.12	39.659	7.307	
9,175.00	9,157.29	9,165.28	9,157.29	20.78	19.68	90.69	-286.72	-7.86	289.80	250.04	39.761	7.288	
9,200.00	9,182.11	9,209.91	9,182.11	20.81	19.77	91.27	-286.72	-7.86	289.85	249.94	39.905	7.263	
9,225.00	9,206.74	9,214.72	9,206.74	20.85	19.78	92.09	-286.72	-7.86	289.98	250.01	39.970	7.255	
9,250.00	9,231.10	9,239.09	9,231.10	20.88	19.83	93.13	-286.72	-7.86	290.24	250.16	40.075	7.242	
9,275.00	9,255.15	9,263.13	9,255.15	20.90	19.88	94.37	-286.72	-7.86	290.70	250.52	40.180	7.235	
9,300.00	9,278.80	9,286.78	9,278.80	20.92	19.93	95.78	-286.72	-7.86	291.46	251.18	40.284	7.235	
9,325.00	9,302.00	9,309.98	9,302.00	20.94	19.97	97.33	-286.72	-7.86	292.61	252.22	40.387	7.245	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #605H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,350.00	9,324.67	9,332.66	9,324.67	20.95	20.02	98.98	-286.72	-7.86	294.25	253.77	40.486	7.268	
9,375.00	9,346.77	9,354.75	9,346.77	20.96	20.06	100.70	-286.72	-7.86	296.51	255.93	40.582	7.306	
9,400.00	9,368.22	9,376.21	9,368.22	20.97	20.11	102.43	-286.72	-7.86	299.49	258.82	40.673	7.363	
9,425.00	9,388.98	9,403.04	9,388.98	20.98	20.16	104.15	-286.72	-7.86	303.31	262.54	40.772	7.439	
9,450.00	9,408.97	9,416.96	9,408.97	20.98	20.19	105.80	-286.72	-7.86	308.07	267.23	40.839	7.544	
9,475.00	9,428.16	9,436.14	9,428.16	20.98	20.23	107.35	-286.72	-7.86	313.88	272.97	40.911	7.672	
9,500.00	9,446.47	9,454.46	9,446.47	20.97	20.27	108.75	-286.72	-7.86	320.80	279.82	40.975	7.829	
9,525.00	9,463.88	9,471.86	9,463.88	20.97	20.30	109.98	-286.72	-7.86	328.89	287.86	41.031	8.016	
9,550.00	9,480.32	9,488.30	9,480.32	20.96	20.34	111.00	-286.72	-7.86	338.21	297.13	41.079	8.233	
9,575.00	9,495.75	9,503.73	9,495.75	20.96	20.37	111.78	-286.72	-7.86	348.76	307.64	41.119	8.482	
9,600.00	9,510.13	9,518.11	9,510.13	20.95	20.40	112.29	-286.72	-7.86	360.53	319.38	41.151	8.761	
9,625.00	9,523.42	9,531.40	9,523.42	20.94	20.42	112.50	-286.72	-7.86	373.52	332.34	41.176	9.071	
9,650.00	9,535.59	9,543.57	9,535.59	20.93	20.45	112.39	-286.72	-7.86	387.67	346.47	41.194	9.411	
9,675.00	9,546.59	9,554.58	9,546.59	20.92	20.47	111.93	-286.72	-7.86	402.93	361.72	41.206	9.778	
9,700.00	9,556.41	9,564.39	9,556.41	20.91	20.49	111.07	-286.72	-7.86	419.23	378.01	41.212	10.172	
9,725.00	9,565.01	9,572.99	9,565.01	20.90	20.51	109.78	-286.72	-7.86	436.49	395.28	41.213	10.591	
9,750.00	9,572.37	9,580.35	9,572.37	20.89	20.52	108.03	-286.72	-7.86	454.63	413.42	41.210	11.032	
9,775.00	9,578.47	9,586.45	9,578.47	20.88	20.54	105.77	-286.72	-7.86	473.56	432.36	41.203	11.493	
9,800.00	9,583.29	9,608.73	9,583.29	20.88	20.58	102.96	-286.72	-7.86	493.19	451.96	41.228	11.963	
9,825.00	9,586.82	9,605.20	9,586.82	20.91	20.57	99.57	-286.72	-7.86	513.42	472.22	41.198	12.462	
9,850.00	9,589.05	9,602.97	9,589.05	20.99	20.57	95.59	-286.72	-7.86	534.16	492.99	41.172	12.974	
9,875.00	9,589.98	9,602.04	9,589.98	21.09	20.57	91.02	-286.72	-7.86	555.31	514.16	41.148	13.496	
9,882.27	9,590.00	9,602.02	9,590.00	21.13	20.57	89.58	-286.72	-7.86	561.52	520.38	41.141	13.649	
9,900.00	9,589.92	9,602.09	9,589.92	21.21	20.57	89.57	-286.72	-7.86	576.78	535.66	41.126	14.025	
10,000.00	9,589.49	9,602.53	9,589.49	21.75	20.57	89.48	-286.72	-7.86	665.14	624.09	41.056	16.201	
10,100.00	9,589.05	9,602.97	9,589.05	22.43	20.57	89.40	-286.72	-7.86	756.41	715.40	41.006	18.446	
10,200.00	9,588.61	9,603.41	9,588.61	23.23	20.57	89.31	-286.72	-7.86	849.64	808.67	40.971	20.738	
10,300.00	9,588.17	9,603.84	9,588.17	24.14	20.57	89.22	-286.72	-7.86	944.26	903.32	40.948	23.060	
10,400.00	9,587.74	9,604.28	9,587.74	25.15	20.57	89.14	-286.72	-7.86	1,039.89	998.96	40.933	25.405	
10,500.00	9,587.30	9,604.72	9,587.30	26.24	20.57	89.05	-286.72	-7.86	1,136.27	1,095.35	40.926	27.764	
10,600.00	9,586.86	9,605.16	9,586.86	27.42	20.57	88.96	-286.72	-7.86	1,233.23	1,192.30	40.924	30.135	
10,700.00	9,586.42	9,605.59	9,586.42	28.67	20.58	88.88	-286.72	-7.86	1,330.63	1,289.71	40.926	32.513	
10,800.00	9,585.99	9,606.03	9,585.99	29.98	20.58	88.79	-286.72	-7.86	1,428.40	1,387.47	40.933	34.896	
10,900.00	9,585.55	9,606.47	9,585.55	31.34	20.58	88.70	-286.72	-7.86	1,526.45	1,485.51	40.944	37.282	
11,000.00	9,585.11	9,606.91	9,585.11	32.75	20.58	88.62	-286.72	-7.86	1,624.75	1,583.79	40.957	39.669	
11,100.00	9,584.67	9,607.34	9,584.67	34.20	20.58	88.53	-286.72	-7.86	1,723.23	1,682.26	40.973	42.057	
11,200.00	9,584.24	9,607.78	9,584.24	35.69	20.58	88.44	-286.72	-7.86	1,821.89	1,780.89	40.992	44.444	
11,300.00	9,583.80	9,608.22	9,583.80	37.21	20.58	88.36	-286.72	-7.86	1,920.68	1,879.66	41.014	46.830	
11,400.00	9,583.36	9,608.65	9,583.36	38.76	20.58	88.27	-286.72	-7.86	2,019.59	1,978.55	41.038	49.213	
11,500.00	9,582.92	9,609.09	9,582.92	40.34	20.58	88.19	-286.72	-7.86	2,118.60	2,077.54	41.064	51.593	
11,600.00	9,582.49	9,609.53	9,582.49	41.93	20.58	88.10	-286.72	-7.86	2,217.70	2,176.61	41.092	53.970	
11,700.00	9,582.05	9,609.97	9,582.05	43.55	20.58	88.01	-286.72	-7.86	2,316.88	2,275.76	41.122	56.342	
11,800.00	9,581.61	9,589.60	9,581.61	45.18	20.54	87.93	-286.72	-7.86	2,416.13	2,375.02	41.110	58.772	
11,900.00	9,581.18	9,589.16	9,581.18	46.83	20.54	87.84	-286.72	-7.86	2,515.43	2,474.29	41.142	61.140	
12,000.00	9,580.74	9,588.72	9,580.74	48.50	20.54	87.75	-286.72	-7.86	2,614.79	2,573.62	41.176	63.502	
12,100.00	9,580.30	9,588.28	9,580.30	50.18	20.54	87.67	-286.72	-7.86	2,714.20	2,672.99	41.212	65.859	
12,200.00	9,579.86	9,587.85	9,579.86	51.87	20.54	87.58	-286.72	-7.86	2,813.65	2,772.40	41.250	68.210	
12,300.00	9,579.43	9,587.41	9,579.43	53.57	20.54	87.49	-286.72	-7.86	2,913.13	2,871.84	41.289	70.555	
12,400.00	9,578.99	15,364.73	12,523.98	55.28	58.63	177.47	2,723.66	-189.74	2,947.89	2,884.81	63.075	46.736	
12,500.00	9,578.55	15,464.73	12,523.54	56.99	60.28	177.47	2,823.66	-190.48	2,947.89	2,883.77	64.113	45.979	
12,600.00	9,578.11	15,564.73	12,523.10	58.72	61.94	177.47	2,923.65	-191.22	2,947.88	2,882.72	65.168	45.235	
12,700.00	9,577.68	15,664.73	12,522.66	60.46	63.62	177.47	3,023.65	-191.95	2,947.88	2,881.64	66.238	44.504	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #605H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
12,800.00	9,577.24	15,764.73	12,522.22	62.20	65.30	177.47	3,123.65	-192.69	2,947.88	2,880.56	67.323	43.787	
12,900.00	9,576.80	15,864.73	12,521.78	63.94	66.99	177.47	3,223.64	-193.43	2,947.88	2,879.45	68.423	43.083	
13,000.00	9,576.36	15,964.73	12,521.34	65.70	68.69	177.47	3,323.64	-194.17	2,947.87	2,878.34	69.536	42.394	
13,100.00	9,575.93	16,064.73	12,520.90	67.45	70.40	177.47	3,423.63	-194.90	2,947.87	2,877.21	70.662	41.718	
13,200.00	9,575.49	16,164.73	12,520.46	69.22	72.12	177.47	3,523.63	-195.64	2,947.87	2,876.07	71.800	41.057	
13,300.00	9,575.05	16,264.73	12,520.02	70.98	73.84	177.47	3,623.63	-196.38	2,947.87	2,874.92	72.950	40.410	
13,400.00	9,574.61	16,364.73	12,519.58	72.75	75.57	177.47	3,723.62	-197.12	2,947.87	2,873.75	74.111	39.777	
13,500.00	9,574.18	16,464.73	12,519.14	74.53	77.30	177.47	3,823.62	-197.85	2,947.86	2,872.58	75.282	39.157	
13,600.00	9,573.74	16,564.73	12,518.70	76.31	79.04	177.47	3,923.62	-198.59	2,947.86	2,871.40	76.464	38.552	
13,700.00	9,573.30	16,664.73	12,518.26	78.09	80.78	177.47	4,023.61	-199.33	2,947.86	2,870.20	77.656	37.961	
13,800.00	9,572.87	16,764.73	12,517.82	79.87	82.53	177.47	4,123.61	-200.07	2,947.86	2,869.00	78.857	37.382	
13,900.00	9,572.43	16,864.73	12,517.38	81.66	84.28	177.47	4,223.61	-200.80	2,947.85	2,867.79	80.067	36.818	
14,000.00	9,571.99	16,964.73	12,516.94	83.45	86.04	177.47	4,323.60	-201.54	2,947.85	2,866.57	81.285	36.266	
14,100.00	9,571.55	17,064.73	12,516.50	85.25	87.80	177.47	4,423.60	-202.28	2,947.85	2,865.34	82.511	35.727	
14,200.00	9,571.12	17,164.73	12,516.06	87.04	89.56	177.47	4,523.59	-203.02	2,947.85	2,864.10	83.746	35.200	
14,300.00	9,570.68	17,264.73	12,515.62	88.84	91.33	177.47	4,623.59	-203.75	2,947.84	2,862.86	84.987	34.686	
14,400.00	9,570.24	17,364.73	12,515.19	90.64	93.10	177.47	4,723.59	-204.49	2,947.84	2,861.60	86.236	34.183	
14,450.52	9,570.02	17,415.25	12,514.96	91.55	94.00	177.47	4,774.11	-204.86	2,947.84	2,860.97	86.869	33.934	
14,455.02	9,570.00	17,406.74	12,515.00	91.63	93.85	177.47	4,765.60	-204.80	2,947.87	2,861.07	86.798	33.963	

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #705H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.70	-0.70	0.00	0.00	134.62	-29.70	30.10	42.29				
100.00	100.00	100.70	99.30	0.08	0.09	134.62	-29.70	30.10	42.29	42.12	.170	248.524	
200.00	200.00	200.70	199.30	0.31	0.31	134.62	-29.70	30.10	42.29	41.67	.620	68.238	
300.00	300.00	300.70	299.30	0.53	0.54	134.62	-29.70	30.10	42.29	41.22	1.069	39.549	
400.00	400.00	400.70	399.30	0.76	0.76	134.62	-29.70	30.10	42.29	40.77	1.519	27.843	
500.00	500.00	500.70	499.30	0.98	0.98	134.62	-29.70	30.10	42.29	40.32	1.968	21.484	
600.00	600.00	600.70	599.30	1.21	1.21	134.62	-29.70	30.10	42.29	39.87	2.418	17.489	
700.00	700.00	700.70	699.30	1.43	1.43	134.62	-29.70	30.10	42.29	39.42	2.867	14.747	
800.00	800.00	800.70	799.30	1.66	1.66	134.62	-29.70	30.10	42.29	38.97	3.317	12.749	
900.00	900.00	900.70	899.30	1.88	1.88	134.62	-29.70	30.10	42.29	38.52	3.766	11.227	
1,000.00	1,000.00	1,000.70	999.30	2.11	2.11	134.62	-29.70	30.10	42.29	38.07	4.216	10.030	
1,100.00	1,100.00	1,100.70	1,099.30	2.33	2.33	134.62	-29.70	30.10	42.29	37.62	4.665	9.064	
1,200.00	1,200.00	1,200.70	1,199.30	2.56	2.56	134.62	-29.70	30.10	42.29	37.17	5.115	8.267	
1,300.00	1,300.00	1,300.70	1,299.30	2.78	2.78	134.62	-29.70	30.10	42.29	36.72	5.565	7.599	
1,400.00	1,400.00	1,400.70	1,399.30	3.01	3.01	134.62	-29.70	30.10	42.29	36.27	6.014	7.031	
1,500.00	1,500.00	1,500.70	1,499.30	3.23	3.23	134.62	-29.70	30.10	42.29	35.82	6.464	6.542	
1,600.00	1,600.00	1,600.70	1,599.30	3.46	3.46	134.62	-29.70	30.10	42.29	35.37	6.913	6.117	
1,700.00	1,700.00	1,700.70	1,699.30	3.68	3.68	134.62	-29.70	30.10	42.29	34.92	7.363	5.743	
1,800.00	1,800.00	1,800.70	1,799.30	3.91	3.91	134.62	-29.70	30.10	42.29	34.47	7.812	5.413	
1,900.00	1,900.00	1,900.70	1,899.30	4.13	4.13	134.62	-29.70	30.10	42.29	34.02	8.262	5.118	
2,000.00	2,000.00	1,999.30	1,999.30	4.35	4.35	134.62	-29.70	30.10	42.29	33.58	8.708	4.856	CC, ES
2,100.00	2,100.00	2,098.84	2,098.83	4.58	4.55	136.18	-30.89	29.64	42.82	33.69	9.128	4.691	
2,200.00	2,200.00	2,198.24	2,198.15	4.80	4.72	140.68	-34.50	28.26	44.61	35.09	9.523	4.684	SF
2,300.00	2,300.00	2,302.64	2,297.06	5.03	4.91	147.35	-40.50	25.95	48.15	38.22	9.930	4.849	
2,400.00	2,400.00	2,402.95	2,396.44	5.25	5.09	154.16	-47.80	23.15	53.19	42.85	10.338	5.145	
2,500.00	2,500.00	2,503.26	2,495.83	5.48	5.29	159.73	-55.10	20.35	58.84	48.09	10.750	5.474	
2,600.00	2,600.00	2,603.57	2,595.21	5.70	5.49	164.30	-62.41	17.55	64.95	53.79	11.165	5.818	
2,700.00	2,700.00	2,703.88	2,694.59	5.93	5.69	168.06	-69.71	14.74	71.41	59.82	11.584	6.164	
2,800.00	2,800.00	2,804.18	2,793.98	6.15	5.90	171.19	-77.01	11.94	78.11	66.11	12.005	6.507	
2,900.00	2,900.00	2,904.49	2,893.36	6.38	6.12	173.82	-84.31	9.14	85.01	72.59	12.428	6.841	
3,000.00	3,000.00	3,004.80	2,992.75	6.60	6.34	176.05	-91.61	6.33	92.07	79.21	12.853	7.163	
3,100.00	3,099.99	3,105.03	3,092.21	6.80	6.56	-48.54	-98.92	3.53	98.37	85.11	13.257	7.420	
3,200.00	3,199.91	3,205.14	3,191.80	6.98	6.79	-48.38	-106.24	0.72	102.97	89.33	13.642	7.548	
3,300.00	3,299.69	3,305.20	3,291.43	7.16	7.02	-49.31	-113.56	-2.09	105.84	91.81	14.036	7.541	
3,333.33	3,332.91	3,328.12	3,324.64	7.23	7.07	-49.85	-116.00	-3.03	106.43	92.29	14.148	7.523	
3,400.00	3,399.32	3,405.26	3,391.05	7.35	7.25	-51.04	-120.88	-4.90	107.46	93.02	14.441	7.441	
3,500.00	3,498.94	3,505.33	3,490.68	7.55	7.48	-52.79	-128.20	-7.71	109.08	94.22	14.853	7.344	
3,600.00	3,598.56	3,605.40	3,590.30	7.75	7.72	-54.49	-135.52	-10.52	110.80	95.53	15.273	7.255	
3,700.00	3,698.18	3,705.47	3,689.93	7.95	7.96	-56.13	-142.84	-13.33	112.61	96.91	15.700	7.173	
3,800.00	3,797.80	3,805.53	3,789.55	8.16	8.20	-57.72	-150.16	-16.14	114.52	98.38	16.133	7.098	
3,900.00	3,897.42	3,905.60	3,889.18	8.37	8.44	-59.26	-157.48	-18.95	116.51	99.93	16.574	7.030	
4,000.00	3,997.04	4,005.67	3,988.80	8.58	8.69	-60.75	-164.80	-21.76	118.58	101.56	17.020	6.967	
4,100.00	4,096.66	4,105.74	4,088.42	8.80	8.93	-62.18	-172.12	-24.57	120.72	103.25	17.473	6.909	
4,200.00	4,196.28	4,194.19	4,188.05	9.03	9.15	-63.56	-179.44	-27.38	122.94	105.04	17.904	6.867	
4,300.00	4,295.90	4,305.87	4,287.67	9.25	9.43	-64.89	-186.76	-30.19	125.23	106.84	18.394	6.808	
4,400.00	4,395.52	4,405.94	4,387.30	9.48	9.68	-66.18	-194.08	-33.00	127.59	108.72	18.863	6.764	
4,500.00	4,495.14	4,506.01	4,486.92	9.71	9.93	-67.42	-201.40	-35.81	130.00	110.67	19.336	6.723	
4,600.00	4,594.76	4,606.08	4,586.54	9.94	10.18	-68.61	-208.72	-38.62	132.48	112.66	19.814	6.686	
4,700.00	4,694.38	4,706.14	4,686.17	10.18	10.43	-69.75	-216.04	-41.43	135.01	114.71	20.296	6.652	
4,800.00	4,794.00	4,806.21	4,785.79	10.41	10.68	-70.86	-223.36	-44.24	137.59	116.81	20.781	6.621	
4,900.00	4,893.62	4,906.28	4,885.42	10.65	10.94	-71.92	-230.68	-47.05	140.22	118.95	21.271	6.592	
5,000.00	4,993.24	5,006.35	4,985.04	10.89	11.19	-72.95	-238.00	-49.86	142.90	121.14	21.763	6.566	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #705H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,092.85	5,106.42	5,084.66	11.14	11.45	-73.93	-245.32	-52.67	145.62	123.36	22.259	6.542	
5,200.00	5,192.47	5,206.48	5,184.29	11.38	11.70	-74.88	-252.64	-55.48	148.38	125.63	22.758	6.520	
5,300.00	5,292.09	5,293.45	5,283.91	11.63	11.93	-75.80	-259.96	-58.29	151.19	127.96	23.227	6.509	
5,400.00	5,391.71	5,406.62	5,383.54	11.87	12.22	-76.68	-267.28	-61.10	154.03	130.26	23.763	6.482	
5,500.00	5,491.33	5,493.39	5,483.24	12.12	12.44	-77.53	-274.60	-63.91	156.90	132.66	24.237	6.474	
5,600.00	5,590.95	5,595.85	5,585.49	12.37	12.69	-78.79	-280.74	-66.27	158.96	134.21	24.755	6.421	
5,700.00	5,690.57	5,698.16	5,687.71	12.62	12.93	-80.82	-284.32	-67.64	159.58	134.31	25.272	6.315	
5,800.00	5,790.19	5,800.06	5,789.49	12.88	13.13	-83.65	-285.36	-68.04	158.99	133.22	25.772	6.169	
5,900.00	5,889.81	5,900.44	5,889.11	13.13	13.31	-86.78	-285.36	-68.04	158.26	132.00	26.257	6.027	
6,000.00	5,989.43	6,000.82	5,988.73	13.38	13.50	-89.92	-285.36	-68.04	158.01	131.27	26.736	5.910	
6,002.49	5,991.91	6,001.66	5,991.21	13.39	13.50	-90.00	-285.36	-68.04	158.01	131.26	26.745	5.908	
6,100.00	6,089.05	6,101.20	6,088.35	13.64	13.68	-93.07	-285.36	-68.04	158.23	131.02	27.209	5.815	
6,200.00	6,188.67	6,201.58	6,187.97	13.89	13.87	-96.19	-285.36	-68.04	158.94	131.27	27.675	5.743	
6,300.00	6,288.29	6,301.96	6,287.59	14.15	14.06	-99.28	-285.36	-68.04	160.12	131.99	28.132	5.692	
6,400.00	6,387.91	6,402.34	6,387.21	14.41	14.25	-102.32	-285.36	-68.04	161.76	133.18	28.581	5.660	
6,500.00	6,487.53	6,502.72	6,486.83	14.67	14.44	-105.29	-285.36	-68.04	163.85	134.83	29.021	5.646	
6,600.00	6,587.15	6,603.10	6,586.45	14.92	14.63	-108.18	-285.36	-68.04	166.37	136.91	29.454	5.648	
6,700.00	6,686.77	6,703.48	6,686.07	15.18	14.82	-110.97	-285.36	-68.04	169.30	139.42	29.879	5.666	
6,800.00	6,786.39	6,803.86	6,785.69	15.44	15.02	-113.66	-285.36	-68.04	172.62	142.32	30.297	5.698	
6,900.00	6,886.00	6,904.24	6,885.30	15.70	15.21	-116.25	-285.36	-68.04	176.31	145.60	30.710	5.741	
7,000.00	6,985.62	7,004.63	6,984.92	15.97	15.41	-118.73	-285.36	-68.04	180.34	149.23	31.117	5.796	
7,100.00	7,085.24	7,105.01	7,084.54	16.23	15.60	-121.09	-285.36	-68.04	184.70	153.18	31.521	5.860	
7,200.00	7,184.86	7,205.39	7,184.16	16.49	15.80	-123.35	-285.36	-68.04	189.36	157.44	31.922	5.932	
7,300.00	7,284.48	7,305.77	7,283.78	16.75	16.00	-125.49	-285.36	-68.04	194.30	161.98	32.321	6.012	
7,400.00	7,384.10	7,406.15	7,383.40	17.02	16.20	-127.52	-285.36	-68.04	199.50	166.78	32.718	6.098	
7,500.00	7,483.72	7,506.53	7,483.02	17.28	16.40	-129.45	-285.36	-68.04	204.94	171.83	33.114	6.189	
7,600.00	7,583.34	7,606.91	7,582.64	17.54	16.59	-131.28	-285.36	-68.04	210.60	177.09	33.511	6.285	
7,700.00	7,682.96	7,707.29	7,682.26	17.81	16.80	-133.01	-285.36	-68.04	216.46	182.55	33.907	6.384	
7,747.22	7,730.00	7,739.75	7,729.30	17.93	16.86	-133.79	-285.36	-68.04	219.29	185.23	34.065	6.438	
7,800.00	7,782.61	7,807.64	7,781.91	18.07	17.00	-134.61	-285.36	-68.04	222.25	187.95	34.305	6.479	
7,900.00	7,882.43	7,907.82	7,881.73	18.32	17.20	-135.74	-285.36	-68.04	226.53	191.83	34.706	6.527	
8,000.00	7,982.36	8,007.89	7,981.66	18.54	17.40	-136.36	-285.36	-68.04	228.99	193.88	35.111	6.522	
8,080.55	8,062.91	8,072.66	8,062.21	18.70	17.53	89.48	-285.36	-68.04	229.61	194.21	35.402	6.486	
8,100.00	8,082.36	8,107.89	8,081.66	18.74	17.60	89.48	-285.36	-68.04	229.61	194.10	35.511	6.466	
8,200.00	8,182.36	8,207.89	8,181.66	18.92	17.80	89.48	-285.36	-68.04	229.61	193.70	35.907	6.395	
8,300.00	8,282.36	8,307.89	8,281.66	19.11	18.01	89.48	-285.36	-68.04	229.61	193.31	36.304	6.325	
8,400.00	8,382.36	8,407.89	8,381.66	19.30	18.21	89.48	-285.36	-68.04	229.61	192.91	36.703	6.256	
8,500.00	8,482.36	8,507.89	8,481.66	19.49	18.41	89.48	-285.36	-68.04	229.61	192.51	37.102	6.189	
8,600.00	8,582.36	8,607.89	8,581.66	19.68	18.62	89.48	-285.36	-68.04	229.61	192.11	37.503	6.122	
8,700.00	8,682.36	8,707.89	8,681.66	19.87	18.82	89.48	-285.36	-68.04	229.61	191.71	37.905	6.058	
8,800.00	8,782.36	8,807.89	8,781.66	20.06	19.03	89.48	-285.36	-68.04	229.61	191.30	38.308	5.994	
8,900.00	8,882.36	8,907.89	8,881.66	20.25	19.23	89.48	-285.36	-68.04	229.61	190.90	38.712	5.931	
9,000.00	8,982.36	9,007.89	8,981.66	20.44	19.44	89.48	-285.36	-68.04	229.61	190.49	39.116	5.870	
9,100.00	9,082.36	9,107.89	9,081.66	20.64	19.65	89.48	-285.36	-68.04	229.61	190.09	39.522	5.810	
9,130.18	9,112.54	9,122.29	9,111.84	20.70	19.68	89.48	-285.36	-68.04	229.61	190.00	39.612	5.796	
9,149.24	9,131.59	9,141.34	9,130.89	20.73	19.72	90.00	-285.36	-68.04	229.61	189.92	39.691	5.785	
9,150.00	9,132.35	9,142.10	9,131.65	20.73	19.72	90.01	-285.36	-68.04	229.61	189.92	39.694	5.784	
9,175.00	9,157.29	9,167.04	9,156.59	20.78	19.77	90.43	-285.36	-68.04	229.62	189.81	39.801	5.769	
9,200.00	9,182.11	9,208.14	9,181.41	20.81	19.86	91.16	-285.36	-68.04	229.66	189.71	39.946	5.749	
9,225.00	9,206.74	9,216.49	9,206.04	20.85	19.87	92.20	-285.36	-68.04	229.79	189.76	40.027	5.741	
9,250.00	9,231.10	9,240.86	9,230.40	20.88	19.92	93.52	-285.36	-68.04	230.07	189.93	40.143	5.731	
9,275.00	9,255.15	9,264.90	9,254.45	20.90	19.97	95.09	-285.36	-68.04	230.61	190.35	40.261	5.728	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #705H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,300.00	9,278.80	9,288.55	9,278.10	20.92	20.02	96.87	-285.36	-68.04	231.50	191.12	40.379	5.733	
9,325.00	9,302.00	9,311.75	9,301.30	20.94	20.07	98.82	-285.36	-68.04	232.87	192.37	40.497	5.750	
9,350.00	9,324.67	9,334.43	9,323.97	20.95	20.12	100.90	-285.36	-68.04	234.85	194.24	40.612	5.783	
9,375.00	9,346.77	9,356.52	9,346.07	20.96	20.16	103.04	-285.36	-68.04	237.58	196.86	40.722	5.834	
9,400.00	9,368.22	9,377.98	9,367.52	20.97	20.21	105.20	-285.36	-68.04	241.19	200.37	40.826	5.908	
9,425.00	9,388.98	9,401.27	9,388.28	20.98	20.26	107.31	-285.36	-68.04	245.82	204.89	40.928	6.006	
9,450.00	9,408.97	9,418.72	9,408.27	20.98	20.29	109.34	-285.36	-68.04	251.57	210.56	41.010	6.134	
9,475.00	9,428.16	9,437.91	9,427.46	20.98	20.33	111.22	-285.36	-68.04	258.53	217.44	41.088	6.292	
9,500.00	9,446.47	9,456.23	9,445.77	20.97	20.37	112.92	-285.36	-68.04	266.77	225.62	41.154	6.482	
9,525.00	9,463.88	9,473.63	9,463.18	20.97	20.41	114.39	-285.36	-68.04	276.34	235.13	41.210	6.706	
9,550.00	9,480.32	9,509.93	9,479.62	20.96	20.48	115.61	-285.36	-68.04	287.25	245.95	41.297	6.956	
9,575.00	9,495.75	9,505.50	9,495.05	20.96	20.47	116.54	-285.36	-68.04	299.48	258.18	41.291	7.253	
9,600.00	9,510.13	9,519.88	9,509.43	20.95	20.50	117.16	-285.36	-68.04	312.99	271.68	41.317	7.575	
9,625.00	9,523.42	9,533.17	9,522.72	20.94	20.53	117.42	-285.36	-68.04	327.75	286.41	41.336	7.929	
9,650.00	9,535.59	9,545.34	9,534.89	20.93	20.56	117.31	-285.36	-68.04	343.67	302.32	41.348	8.312	
9,675.00	9,546.59	9,556.34	9,545.89	20.92	20.58	116.78	-285.36	-68.04	360.68	319.33	41.354	8.722	
9,700.00	9,556.41	9,566.16	9,555.71	20.91	20.60	115.79	-285.36	-68.04	378.70	337.34	41.355	9.157	
9,725.00	9,565.01	9,574.76	9,564.31	20.90	20.62	114.30	-285.36	-68.04	397.62	356.27	41.351	9.616	
9,750.00	9,572.37	9,582.12	9,571.67	20.89	20.63	112.23	-285.36	-68.04	417.35	376.00	41.344	10.095	
9,775.00	9,578.47	9,588.22	9,577.77	20.88	20.65	109.53	-285.36	-68.04	437.79	396.46	41.333	10.592	
9,800.00	9,583.29	9,606.96	9,582.59	20.88	20.69	106.13	-285.36	-68.04	458.86	417.51	41.348	11.097	
9,825.00	9,586.82	9,603.43	9,586.12	20.91	20.68	101.97	-285.36	-68.04	480.44	439.13	41.317	11.628	
9,850.00	9,589.05	9,601.20	9,588.35	20.99	20.67	97.01	-285.36	-68.04	502.45	461.17	41.288	12.170	
9,875.00	9,589.98	9,600.27	9,589.28	21.09	20.67	91.28	-285.36	-68.04	524.80	483.54	41.262	12.719	
9,882.27	9,590.00	9,600.25	9,589.30	21.13	20.67	89.48	-285.36	-68.04	531.34	490.09	41.255	12.879	
9,900.00	9,589.92	9,600.33	9,589.22	21.21	20.67	89.46	-285.36	-68.04	547.39	506.15	41.240	13.273	
10,000.00	9,589.49	9,600.76	9,588.79	21.75	20.67	89.35	-285.36	-68.04	639.54	598.37	41.167	15.535	
10,100.00	9,589.05	9,601.20	9,588.35	22.43	20.67	89.24	-285.36	-68.04	733.75	692.64	41.116	17.846	
10,200.00	9,588.61	9,601.64	9,587.91	23.23	20.67	89.13	-285.36	-68.04	829.32	788.24	41.080	20.188	
10,300.00	9,588.17	9,602.08	9,587.47	24.14	20.67	89.02	-285.36	-68.04	925.82	884.77	41.056	22.550	
10,400.00	9,587.74	9,602.51	9,587.04	25.15	20.68	88.91	-285.36	-68.04	1,023.00	981.96	41.041	24.926	
10,500.00	9,587.30	9,602.95	9,586.60	26.24	20.68	88.80	-285.36	-68.04	1,120.67	1,079.64	41.033	27.312	
10,600.00	9,586.86	9,603.39	9,586.16	27.42	20.68	88.69	-285.36	-68.04	1,218.72	1,177.69	41.030	29.703	
10,700.00	9,586.42	9,603.83	9,585.72	28.67	20.68	88.58	-285.36	-68.04	1,317.06	1,276.03	41.032	32.098	
10,800.00	9,585.99	9,604.26	9,585.29	29.98	20.68	88.48	-285.36	-68.04	1,415.64	1,374.60	41.039	34.495	
10,900.00	9,585.55	9,604.70	9,584.85	31.34	20.68	88.37	-285.36	-68.04	1,514.40	1,473.35	41.048	36.893	
11,000.00	9,585.11	9,605.14	9,584.41	32.75	20.68	88.26	-285.36	-68.04	1,613.31	1,572.25	41.061	39.290	
11,100.00	9,584.67	9,605.58	9,583.97	34.20	20.68	88.15	-285.36	-68.04	1,712.36	1,671.28	41.077	41.686	
11,200.00	9,584.24	9,606.01	9,583.54	35.69	20.68	88.04	-285.36	-68.04	1,811.50	1,770.40	41.096	44.080	
11,300.00	9,583.80	9,606.45	9,583.10	37.21	20.68	87.93	-285.36	-68.04	1,910.74	1,869.62	41.117	46.471	
11,400.00	9,583.36	9,606.89	9,582.66	38.76	20.69	87.82	-285.36	-68.04	2,010.05	1,968.91	41.140	48.859	
11,500.00	9,582.92	9,607.32	9,582.22	40.34	20.69	87.71	-285.36	-68.04	2,109.42	2,068.26	41.166	51.242	
11,600.00	9,582.49	9,607.76	9,581.79	41.93	20.69	87.60	-285.36	-68.04	2,208.85	2,167.66	41.193	53.622	
11,700.00	9,582.05	9,608.20	9,581.35	43.55	20.69	87.49	-285.36	-68.04	2,308.33	2,267.11	41.223	55.996	
11,800.00	9,581.61	9,608.64	9,580.91	45.18	20.69	87.39	-285.36	-68.04	2,407.86	2,366.60	41.255	58.365	
11,900.00	9,581.18	9,609.07	9,580.48	46.83	20.69	87.28	-285.36	-68.04	2,507.42	2,466.13	41.288	60.729	
12,000.00	9,580.74	9,609.51	9,580.04	48.50	20.69	87.17	-285.36	-68.04	2,607.01	2,565.69	41.324	63.087	
12,100.00	9,580.30	9,609.95	9,579.60	50.18	20.69	87.06	-285.36	-68.04	2,706.64	2,665.28	41.361	65.439	
12,200.00	9,579.86	9,589.61	9,579.16	51.87	20.65	86.95	-285.36	-68.04	2,806.29	2,764.93	41.356	67.857	
12,300.00	9,579.43	9,589.18	9,578.73	53.57	20.65	86.84	-285.36	-68.04	2,905.96	2,864.57	41.395	70.201	
12,400.00	9,578.99	9,588.74	9,578.29	55.28	20.65	86.73	-285.36	-68.04	3,005.66	2,964.23	41.436	72.538	
12,500.00	9,578.55	9,588.30	9,577.85	56.99	20.65	86.62	-285.36	-68.04	3,105.38	3,063.90	41.478	74.868	

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 #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #705H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
12,600.00	9,578.11	15,829.40	12,768.14	58.72	62.37	-180.00	2,923.84	-321.33	3,190.75	3,124.97	65.781	48.506	
12,700.00	9,577.68	15,929.40	12,767.69	60.46	64.04	-180.00	3,023.84	-322.06	3,190.75	3,123.91	66.835	47.740	
12,800.00	9,577.24	16,029.40	12,767.25	62.20	65.71	-180.00	3,123.84	-322.79	3,190.74	3,122.84	67.905	46.988	
12,900.00	9,576.80	16,129.40	12,766.81	63.94	67.39	-180.00	3,223.83	-323.52	3,190.74	3,121.75	68.989	46.250	
13,000.00	9,576.36	16,229.40	12,766.37	65.70	69.08	-180.00	3,323.83	-324.25	3,190.73	3,120.65	70.086	45.526	
13,100.00	9,575.93	16,329.40	12,765.93	67.45	70.77	-180.00	3,423.82	-324.99	3,190.73	3,119.53	71.196	44.816	
13,200.00	9,575.49	16,429.40	12,765.48	69.22	72.48	-180.00	3,523.82	-325.72	3,190.73	3,118.41	72.319	44.120	
13,300.00	9,575.05	16,529.40	12,765.04	70.98	74.19	-180.00	3,623.82	-326.45	3,190.72	3,117.27	73.453	43.439	
13,400.00	9,574.61	16,629.40	12,764.60	72.75	75.91	-180.00	3,723.81	-327.18	3,190.72	3,116.12	74.599	42.772	
13,500.00	9,574.18	16,729.40	12,764.16	74.53	77.63	-180.00	3,823.81	-327.91	3,190.71	3,114.96	75.755	42.119	
13,600.00	9,573.74	16,829.40	12,763.72	76.31	79.36	-180.00	3,923.81	-328.65	3,190.71	3,113.79	76.922	41.480	
13,700.00	9,573.30	16,929.40	12,763.27	78.09	81.10	-180.00	4,023.80	-329.38	3,190.70	3,112.60	78.098	40.855	
13,800.00	9,572.87	17,029.40	12,762.83	79.87	82.84	-180.00	4,123.80	-330.11	3,190.70	3,111.41	79.284	40.244	
13,900.00	9,572.43	17,129.40	12,762.39	81.66	84.58	-180.00	4,223.80	-330.84	3,190.69	3,110.22	80.479	39.646	
14,000.00	9,571.99	17,229.40	12,761.95	83.45	86.33	-180.00	4,323.79	-331.57	3,190.69	3,109.01	81.682	39.062	
14,100.00	9,571.55	17,329.40	12,761.51	85.25	88.09	-180.00	4,423.79	-332.30	3,190.68	3,107.79	82.894	38.491	
14,200.00	9,571.12	17,429.40	12,761.06	87.04	89.84	-180.00	4,523.78	-333.04	3,190.68	3,106.57	84.113	37.933	
14,300.00	9,570.68	17,529.40	12,760.62	88.84	91.61	-180.00	4,623.78	-333.77	3,190.68	3,105.34	85.341	37.388	
14,400.00	9,570.24	17,629.40	12,760.18	90.64	93.37	-180.00	4,723.78	-334.50	3,190.67	3,104.10	86.575	36.855	
14,447.95	9,570.03	17,677.35	12,759.97	91.50	94.22	180.00	4,771.73	-334.85	3,190.67	3,103.50	87.169	36.603	
14,455.02	9,570.00	17,670.32	12,760.00	91.63	94.09	180.00	4,764.70	-334.80	3,190.70	3,103.58	87.125	36.622	

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #706H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	1.10	-1.10	0.00	0.00	179.62	-30.00	0.20	30.00				
100.00	100.00	101.10	98.90	0.08	0.09	179.62	-30.00	0.20	30.00	29.83	.171	175.394	
200.00	200.00	201.10	198.90	0.31	0.31	179.62	-30.00	0.20	30.00	29.38	.621	48.343	
300.00	300.00	301.10	298.90	0.53	0.54	179.62	-30.00	0.20	30.00	28.93	1.070	28.035	
400.00	400.00	401.10	398.90	0.76	0.76	179.62	-30.00	0.20	30.00	28.48	1.520	19.742	
500.00	500.00	501.10	498.90	0.98	0.99	179.62	-30.00	0.20	30.00	28.03	1.969	15.235	
600.00	600.00	601.10	598.90	1.21	1.21	179.62	-30.00	0.20	30.00	27.58	2.419	12.404	
700.00	700.00	701.10	698.90	1.43	1.44	179.62	-30.00	0.20	30.00	27.13	2.868	10.460	
800.00	800.00	801.10	798.90	1.66	1.66	179.62	-30.00	0.20	30.00	26.68	3.318	9.042	
900.00	900.00	901.10	898.90	1.88	1.88	179.62	-30.00	0.20	30.00	26.23	3.767	7.963	
1,000.00	1,000.00	1,001.10	998.90	2.11	2.11	179.62	-30.00	0.20	30.00	25.78	4.217	7.114	
1,100.00	1,100.00	1,101.10	1,098.90	2.33	2.33	179.62	-30.00	0.20	30.00	25.33	4.666	6.429	
1,200.00	1,200.00	1,201.10	1,198.90	2.56	2.56	179.62	-30.00	0.20	30.00	24.88	5.116	5.864	
1,300.00	1,300.00	1,301.10	1,298.90	2.78	2.78	179.62	-30.00	0.20	30.00	24.44	5.565	5.391	
1,400.00	1,400.00	1,401.10	1,398.90	3.01	3.01	179.62	-30.00	0.20	30.00	23.99	6.015	4.988	
1,500.00	1,500.00	1,498.90	1,498.90	3.23	3.23	179.62	-30.00	0.20	30.00	23.54	6.460	4.644	CC, ES
1,600.00	1,600.00	1,598.23	1,598.22	3.46	3.43	-179.12	-31.07	-0.48	31.08	24.20	6.881	4.516	
1,700.00	1,700.00	1,697.42	1,697.33	3.68	3.60	-175.76	-34.30	-2.54	34.43	27.15	7.279	4.730	
1,800.00	1,800.00	1,796.35	1,796.05	3.91	3.79	-171.44	-39.69	-5.97	40.24	32.56	7.679	5.240	
1,900.00	1,900.00	1,904.39	1,894.95	4.13	4.00	-167.33	-46.84	-10.53	48.17	40.06	8.103	5.944	
2,000.00	2,000.00	2,004.77	1,994.19	4.35	4.20	-164.33	-54.16	-15.19	56.45	47.93	8.520	6.625	
2,100.00	2,100.00	2,105.15	2,093.43	4.58	4.42	-162.10	-61.48	-19.86	64.84	55.90	8.941	7.252	
2,200.00	2,200.00	2,205.53	2,192.67	4.80	4.64	-160.38	-68.80	-24.52	73.31	63.94	9.365	7.828	
2,300.00	2,300.00	2,294.09	2,291.91	5.03	4.84	-159.02	-76.13	-29.19	81.83	72.06	9.768	8.377	
2,400.00	2,400.00	2,406.29	2,391.15	5.25	5.09	-157.92	-83.45	-33.85	90.39	80.17	10.222	8.843	
2,500.00	2,500.00	2,493.33	2,490.39	5.48	5.30	-157.01	-90.77	-38.52	98.97	88.35	10.626	9.314	
2,600.00	2,600.00	2,607.05	2,589.63	5.70	5.57	-156.24	-98.10	-43.18	107.58	96.49	11.088	9.702	
2,700.00	2,700.00	2,707.44	2,688.87	5.93	5.82	-155.59	-105.42	-47.85	116.20	104.68	11.524	10.083	
2,800.00	2,800.00	2,807.82	2,788.11	6.15	6.06	-155.03	-112.74	-52.51	124.84	112.87	11.962	10.436	
2,900.00	2,900.00	2,891.80	2,887.35	6.38	6.27	-154.54	-120.06	-57.18	133.48	121.12	12.366	10.794	
3,000.00	3,000.00	3,008.58	2,986.59	6.60	6.56	-154.10	-127.39	-61.84	142.14	129.30	12.842	11.068	
3,100.00	3,099.99	3,108.86	3,085.93	6.80	6.82	-19.86	-134.72	-66.51	149.57	136.31	13.259	11.281	
3,200.00	3,199.91	3,208.99	3,185.43	6.98	7.07	-19.97	-142.06	-71.19	154.55	140.89	13.655	11.318	
3,300.00	3,299.69	3,309.03	3,285.00	7.16	7.33	-20.41	-149.40	-75.87	157.07	143.02	14.056	11.174	
3,333.33	3,332.91	3,324.30	3,318.20	7.23	7.37	-20.63	-151.85	-77.43	157.37	143.22	14.152	11.120	
3,400.00	3,399.32	3,390.95	3,384.60	7.35	7.54	-21.11	-156.75	-80.55	157.71	143.28	14.423	10.934	
3,500.00	3,498.94	3,509.07	3,484.20	7.55	7.85	-21.83	-164.10	-85.23	158.23	143.35	14.874	10.638	
3,600.00	3,598.56	3,609.09	3,583.80	7.75	8.11	-22.54	-171.45	-89.91	158.77	143.48	15.290	10.384	
3,700.00	3,698.18	3,709.11	3,683.40	7.95	8.37	-23.25	-178.80	-94.60	159.34	143.63	15.710	10.143	
3,800.00	3,797.80	3,790.87	3,783.00	8.16	8.58	-23.96	-186.15	-99.28	159.94	143.85	16.092	9.939	
3,900.00	3,897.42	3,909.15	3,882.59	8.37	8.90	-24.65	-193.50	-103.96	160.56	144.00	16.560	9.695	
4,000.00	3,997.04	3,990.83	3,982.19	8.58	9.11	-25.35	-200.85	-108.64	161.20	144.25	16.949	9.511	
4,100.00	4,096.66	4,109.20	4,081.79	8.80	9.43	-26.03	-208.20	-113.32	161.87	144.44	17.425	9.289	
4,200.00	4,196.28	4,190.78	4,181.39	9.03	9.64	-26.72	-215.55	-118.01	162.56	144.74	17.821	9.122	
4,300.00	4,295.90	4,309.24	4,280.99	9.25	9.96	-27.39	-222.90	-122.69	163.27	144.96	18.303	8.920	
4,400.00	4,395.52	4,409.26	4,380.59	9.48	10.23	-28.06	-230.24	-127.37	164.00	145.25	18.747	8.748	
4,500.00	4,495.14	4,509.28	4,480.19	9.71	10.49	-28.72	-237.59	-132.05	164.76	145.56	19.195	8.584	
4,600.00	4,594.76	4,609.30	4,579.78	9.94	10.76	-29.38	-244.94	-136.73	165.54	145.89	19.645	8.427	
4,700.00	4,694.38	4,709.32	4,679.38	10.18	11.03	-30.03	-252.29	-141.42	166.34	146.24	20.098	8.276	
4,800.00	4,794.00	4,790.66	4,778.98	10.41	11.25	-30.68	-259.64	-146.10	167.16	146.65	20.511	8.150	
4,900.00	4,893.62	4,890.64	4,878.58	10.65	11.52	-31.32	-266.99	-150.78	168.00	147.03	20.969	8.012	
5,000.00	4,993.24	4,990.62	4,978.18	10.89	11.79	-31.95	-274.34	-155.46	168.86	147.43	21.430	7.880	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #706H - OH - Plan #1 - IP — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,092.85	5,094.87	5,082.15	11.14	12.06	-32.75	-280.85	-159.61	168.50	146.59	21.914	7.689	
5,200.00	5,192.47	5,199.07	5,186.22	11.38	12.31	-33.90	-284.96	-162.23	165.62	143.22	22.393	7.396	
5,300.00	5,292.09	5,302.97	5,290.11	11.63	12.53	-35.46	-286.68	-163.32	160.26	137.39	22.868	7.008	
5,400.00	5,391.71	5,403.48	5,390.61	11.87	12.71	-37.35	-286.73	-163.36	153.30	129.97	23.328	6.571	
5,500.00	5,491.33	5,503.10	5,490.23	12.12	12.88	-39.42	-286.73	-163.36	146.46	122.66	23.795	6.155	
5,600.00	5,590.95	5,602.72	5,589.85	12.37	13.06	-41.68	-286.73	-163.36	139.82	115.55	24.273	5.760	
5,700.00	5,690.57	5,702.34	5,689.47	12.62	13.23	-44.17	-286.73	-163.36	133.43	108.66	24.763	5.388	
5,800.00	5,790.19	5,801.96	5,789.09	12.88	13.41	-46.89	-286.73	-163.36	127.31	102.04	25.265	5.039	
5,900.00	5,889.81	5,901.58	5,888.71	13.13	13.59	-49.89	-286.73	-163.36	121.51	95.72	25.781	4.713	
6,000.00	5,989.43	6,001.20	5,988.33	13.38	13.77	-53.17	-286.73	-163.36	116.07	89.76	26.309	4.412	
6,100.00	6,089.05	6,100.82	6,087.95	13.64	13.96	-56.77	-286.73	-163.36	111.05	84.20	26.851	4.136	
6,200.00	6,188.67	6,200.44	6,187.57	13.89	14.14	-60.68	-286.73	-163.36	106.51	79.11	27.403	3.887	
6,300.00	6,288.29	6,300.06	6,287.19	14.15	14.32	-64.92	-286.73	-163.36	102.51	74.55	27.963	3.666	
6,400.00	6,387.91	6,400.33	6,386.81	14.41	14.51	-69.47	-286.73	-163.36	99.12	70.59	28.527	3.475	
6,500.00	6,487.53	6,500.71	6,486.43	14.67	14.70	-74.31	-286.73	-163.36	96.40	67.31	29.088	3.314	
6,600.00	6,587.15	6,601.09	6,586.05	14.92	14.89	-79.39	-286.73	-163.36	94.41	64.77	29.637	3.185	
6,700.00	6,686.77	6,701.47	6,685.67	15.18	15.08	-84.64	-286.73	-163.36	93.19	63.02	30.167	3.089	
6,800.00	6,786.39	6,801.85	6,785.29	15.44	15.27	-89.99	-286.73	-163.36	92.78	62.11	30.671	3.025	
6,800.17	6,786.56	6,801.68	6,785.46	15.44	15.27	-90.00	-286.73	-163.36	92.78	62.11	30.671	3.025	
6,900.00	6,886.00	6,902.23	6,884.90	15.70	15.46	-95.34	-286.73	-163.36	93.19	62.04	31.144	2.992	
7,000.00	6,985.62	7,002.61	6,984.52	15.97	15.66	-100.59	-286.73	-163.36	94.40	62.82	31.584	2.989 SF	
7,100.00	7,085.24	7,102.99	7,084.14	16.23	15.85	-105.67	-286.73	-163.36	96.39	64.40	31.994	3.013	
7,200.00	7,184.86	7,203.37	7,183.76	16.49	16.05	-110.51	-286.73	-163.36	99.11	66.73	32.377	3.061	
7,300.00	7,284.48	7,303.75	7,283.38	16.75	16.24	-115.07	-286.73	-163.36	102.50	69.76	32.740	3.131	
7,400.00	7,384.10	7,404.13	7,383.00	17.02	16.44	-119.31	-286.73	-163.36	106.50	73.41	33.089	3.218	
7,500.00	7,483.72	7,504.51	7,482.62	17.28	16.64	-123.22	-286.73	-163.36	111.03	77.60	33.430	3.321	
7,600.00	7,583.34	7,604.89	7,582.24	17.54	16.83	-126.81	-286.73	-163.36	116.05	82.28	33.768	3.437	
7,700.00	7,682.96	7,705.27	7,681.86	17.81	17.03	-130.10	-286.73	-163.36	121.49	87.38	34.107	3.562	
7,747.22	7,730.00	7,741.77	7,728.90	17.93	17.11	-131.55	-286.73	-163.36	124.18	89.94	34.246	3.626	
7,800.00	7,782.61	7,805.62	7,781.51	18.07	17.23	-133.01	-286.73	-163.36	127.04	92.59	34.451	3.688	
7,900.00	7,882.43	7,905.81	7,881.33	18.32	17.43	-134.98	-286.73	-163.36	131.23	96.42	34.815	3.769	
8,000.00	7,982.36	8,005.87	7,981.26	18.54	17.63	-136.04	-286.73	-163.36	133.67	98.47	35.201	3.797	
8,080.55	8,062.91	8,074.68	8,061.81	18.70	17.77	89.70	-286.73	-163.36	134.28	98.79	35.495	3.783	
8,100.00	8,082.36	8,105.87	8,081.26	18.74	17.83	89.70	-286.73	-163.36	134.28	98.69	35.596	3.772	
8,200.00	8,182.36	8,205.87	8,181.26	18.92	18.03	89.70	-286.73	-163.36	134.28	98.29	35.992	3.731	
8,300.00	8,282.36	8,305.87	8,281.26	19.11	18.23	89.70	-286.73	-163.36	134.28	97.89	36.389	3.690	
8,400.00	8,382.36	8,405.87	8,381.26	19.30	18.44	89.70	-286.73	-163.36	134.28	97.50	36.787	3.650	
8,500.00	8,482.36	8,505.87	8,481.26	19.49	18.64	89.70	-286.73	-163.36	134.28	97.10	37.186	3.611	
8,600.00	8,582.36	8,605.87	8,581.26	19.68	18.84	89.70	-286.73	-163.36	134.28	96.70	37.587	3.573	
8,700.00	8,682.36	8,705.87	8,681.26	19.87	19.05	89.70	-286.73	-163.36	134.28	96.29	37.988	3.535	
8,800.00	8,782.36	8,805.87	8,781.26	20.06	19.25	89.70	-286.73	-163.36	134.28	95.89	38.391	3.498	
8,900.00	8,882.36	8,905.87	8,881.26	20.25	19.45	89.70	-286.73	-163.36	134.28	95.49	38.795	3.461	
9,000.00	8,982.36	9,005.87	8,981.26	20.44	19.66	89.70	-286.73	-163.36	134.28	95.08	39.199	3.426	
9,100.00	9,082.36	9,105.88	9,081.26	20.64	19.87	89.70	-286.73	-163.36	134.28	94.68	39.605	3.391	
9,130.18	9,112.54	9,124.31	9,111.44	20.70	19.90	89.70	-286.73	-163.36	134.28	94.58	39.703	3.382	
9,150.00	9,132.35	9,144.12	9,131.25	20.73	19.94	90.30	-286.73	-163.36	134.28	94.50	39.788	3.375	
9,175.00	9,157.29	9,169.06	9,156.19	20.78	20.00	91.02	-286.73	-163.36	134.30	94.40	39.907	3.365	
9,200.00	9,182.11	9,206.12	9,181.01	20.81	20.07	92.27	-286.73	-163.36	134.39	94.33	40.064	3.354	
9,225.00	9,206.74	9,218.50	9,205.64	20.85	20.10	94.04	-286.73	-163.36	134.63	94.45	40.181	3.351	
9,250.00	9,231.10	9,242.87	9,230.00	20.88	20.15	96.28	-286.73	-163.36	135.15	94.81	40.334	3.351	
9,275.00	9,255.15	9,266.92	9,254.05	20.90	20.20	98.92	-286.73	-163.36	136.09	95.60	40.492	3.361	
9,300.00	9,278.80	9,309.43	9,277.70	20.92	20.28	101.90	-286.73	-163.36	137.63	96.94	40.693	3.382	

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

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Offset Design Dominator 25 Fed COM - #706H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,325.00	9,302.00	9,313.76	9,300.90	20.94	20.29	105.11	-286.73	-163.36	139.97	99.16	40.813	3.430	
9,350.00	9,324.67	9,336.44	9,323.57	20.95	20.34	108.45	-286.73	-163.36	143.29	102.33	40.964	3.498	
9,375.00	9,346.77	9,358.54	9,345.67	20.96	20.39	111.82	-286.73	-163.36	147.78	106.68	41.102	3.595	
9,400.00	9,368.22	9,379.99	9,367.12	20.97	20.43	115.11	-286.73	-163.36	153.58	112.35	41.223	3.726	
9,425.00	9,388.98	9,400.75	9,387.88	20.98	20.47	118.24	-286.73	-163.36	160.80	119.48	41.324	3.891	
9,450.00	9,408.97	9,420.74	9,407.87	20.98	20.51	121.13	-286.73	-163.36	169.52	128.11	41.404	4.094	
9,475.00	9,428.16	9,439.92	9,427.06	20.98	20.55	123.73	-286.73	-163.36	179.75	138.28	41.465	4.335	
9,500.00	9,446.47	9,458.24	9,445.37	20.97	20.59	126.00	-286.73	-163.36	191.48	149.97	41.509	4.613	
9,525.00	9,463.88	9,475.64	9,462.78	20.97	20.63	127.91	-286.73	-163.36	204.66	163.12	41.539	4.927	
9,550.00	9,480.32	9,507.92	9,479.22	20.96	20.70	129.45	-286.73	-163.36	219.21	177.62	41.591	5.271	
9,575.00	9,495.75	9,507.52	9,494.65	20.96	20.69	130.60	-286.73	-163.36	235.07	193.50	41.570	5.655	
9,600.00	9,510.13	9,521.90	9,509.03	20.95	20.72	131.34	-286.73	-163.36	252.12	210.54	41.575	6.064	
9,625.00	9,523.42	9,535.19	9,522.32	20.94	20.75	131.66	-286.73	-163.36	270.27	228.70	41.576	6.501	
9,650.00	9,535.59	9,547.35	9,534.49	20.93	20.78	131.52	-286.73	-163.36	289.43	247.85	41.574	6.962	
9,675.00	9,546.59	9,558.36	9,545.49	20.92	20.80	130.86	-286.73	-163.36	309.48	267.92	41.569	7.445	
9,700.00	9,556.41	9,568.18	9,555.31	20.91	20.82	129.63	-286.73	-163.36	330.35	288.79	41.562	7.948	
9,725.00	9,565.01	9,576.78	9,563.91	20.90	20.84	127.72	-286.73	-163.36	351.92	310.37	41.553	8.469	
9,750.00	9,572.37	9,584.13	9,571.27	20.89	20.85	125.00	-286.73	-163.36	374.11	332.57	41.542	9.006	
9,775.00	9,578.47	9,609.77	9,577.37	20.88	20.91	121.29	-286.73	-163.36	396.84	355.27	41.571	9.546	
9,800.00	9,583.29	9,604.94	9,582.19	20.88	20.90	116.35	-286.73	-163.36	420.00	378.46	41.536	10.112	
9,825.00	9,586.82	9,601.41	9,585.72	20.91	20.89	109.95	-286.73	-163.36	443.52	402.01	41.505	10.686	
9,850.00	9,589.05	9,600.82	9,587.95	20.99	20.89	101.89	-286.73	-163.36	467.31	425.82	41.482	11.265	
9,875.00	9,589.98	9,601.74	9,588.88	21.09	20.89	92.19	-286.73	-163.36	491.29	449.82	41.462	11.849	
9,882.27	9,590.00	9,601.77	9,588.90	21.13	20.89	89.10	-286.73	-163.36	498.28	456.83	41.456	12.019	
9,900.00	9,589.92	9,601.69	9,588.82	21.21	20.89	89.07	-286.73	-163.36	515.38	473.94	41.442	12.436	
10,000.00	9,589.49	9,601.25	9,588.39	21.75	20.89	88.88	-286.73	-163.36	612.48	571.10	41.378	14.802	
10,100.00	9,589.05	9,600.82	9,587.95	22.43	20.89	88.70	-286.73	-163.36	710.38	669.05	41.334	17.186	
10,200.00	9,588.61	9,600.38	9,587.51	23.23	20.89	88.51	-286.73	-163.36	808.80	767.50	41.304	19.582	
10,300.00	9,588.17	9,600.06	9,587.07	24.14	20.89	88.33	-286.73	-163.36	907.56	866.28	41.285	21.983	
10,400.00	9,587.74	9,600.50	9,586.64	25.15	20.89	88.14	-286.73	-163.36	1,006.57	965.30	41.274	24.387	
10,500.00	9,587.30	9,600.93	9,586.20	26.24	20.89	87.95	-286.73	-163.36	1,105.76	1,064.49	41.270	26.793	
10,600.00	9,586.86	9,601.37	9,585.76	27.42	20.89	87.77	-286.73	-163.36	1,205.08	1,163.81	41.270	29.200	
10,700.00	9,586.42	9,601.81	9,585.32	28.67	20.89	87.58	-286.73	-163.36	1,304.50	1,263.22	41.275	31.605	
10,800.00	9,585.99	9,602.25	9,584.89	29.98	20.89	87.39	-286.73	-163.36	1,404.00	1,362.72	41.283	34.009	
10,900.00	9,585.55	9,602.68	9,584.45	31.34	20.89	87.21	-286.73	-163.36	1,503.58	1,462.28	41.295	36.411	
11,000.00	9,585.11	9,603.12	9,584.01	32.75	20.89	87.02	-286.73	-163.36	1,603.20	1,561.89	41.309	38.810	
11,100.00	9,584.67	9,603.56	9,583.57	34.20	20.89	86.84	-286.73	-163.36	1,702.87	1,661.54	41.326	41.205	
11,200.00	9,584.24	9,604.00	9,583.14	35.69	20.89	86.65	-286.73	-163.36	1,802.57	1,761.23	41.346	43.597	
11,300.00	9,583.80	9,604.43	9,582.70	37.21	20.90	86.46	-286.73	-163.36	1,902.31	1,860.94	41.368	45.985	
11,400.00	9,583.36	9,604.87	9,582.26	38.76	20.90	86.28	-286.73	-163.36	2,002.07	1,960.68	41.392	48.369	
11,500.00	9,582.92	9,605.31	9,581.82	40.34	20.90	86.09	-286.73	-163.36	2,101.86	2,060.44	41.418	50.747	
11,600.00	9,582.49	9,605.75	9,581.39	41.93	20.90	85.91	-286.73	-163.36	2,201.66	2,160.21	41.446	53.121	
11,700.00	9,582.05	9,606.18	9,580.95	43.55	20.90	85.72	-286.73	-163.36	2,301.48	2,260.00	41.477	55.489	
11,800.00	9,581.61	9,606.62	9,580.51	45.18	20.90	85.53	-286.73	-163.36	2,401.32	2,359.81	41.509	57.851	
11,900.00	9,581.18	9,607.06	9,580.08	46.83	20.90	85.35	-286.73	-163.36	2,501.17	2,459.62	41.543	60.207	
12,000.00	9,580.74	9,607.50	9,579.64	48.50	20.90	85.16	-286.73	-163.36	2,601.03	2,559.45	41.579	62.557	
12,100.00	9,580.30	9,607.93	9,579.20	50.18	20.90	84.98	-286.73	-163.36	2,700.90	2,659.28	41.616	64.900	
12,200.00	9,579.86	9,608.37	9,578.76	51.87	20.90	84.79	-286.73	-163.36	2,800.78	2,759.12	41.655	67.237	
12,300.00	9,579.43	9,608.81	9,578.33	53.57	20.90	84.61	-286.73	-163.36	2,900.66	2,858.97	41.697	69.566	
12,400.00	9,578.99	9,609.24	9,577.89	55.28	20.91	84.42	-286.73	-163.36	3,000.56	2,958.82	41.739	71.888	
12,500.00	9,578.55	15,584.84	12,638.63	56.99	60.41	-179.44	2,822.88	-350.50	3,061.35	2,997.11	64.243	47.653	
12,600.00	9,578.11	15,684.84	12,638.19	58.72	62.06	-179.44	2,922.88	-351.23	3,061.35	2,996.07	65.285	46.892	

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 #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

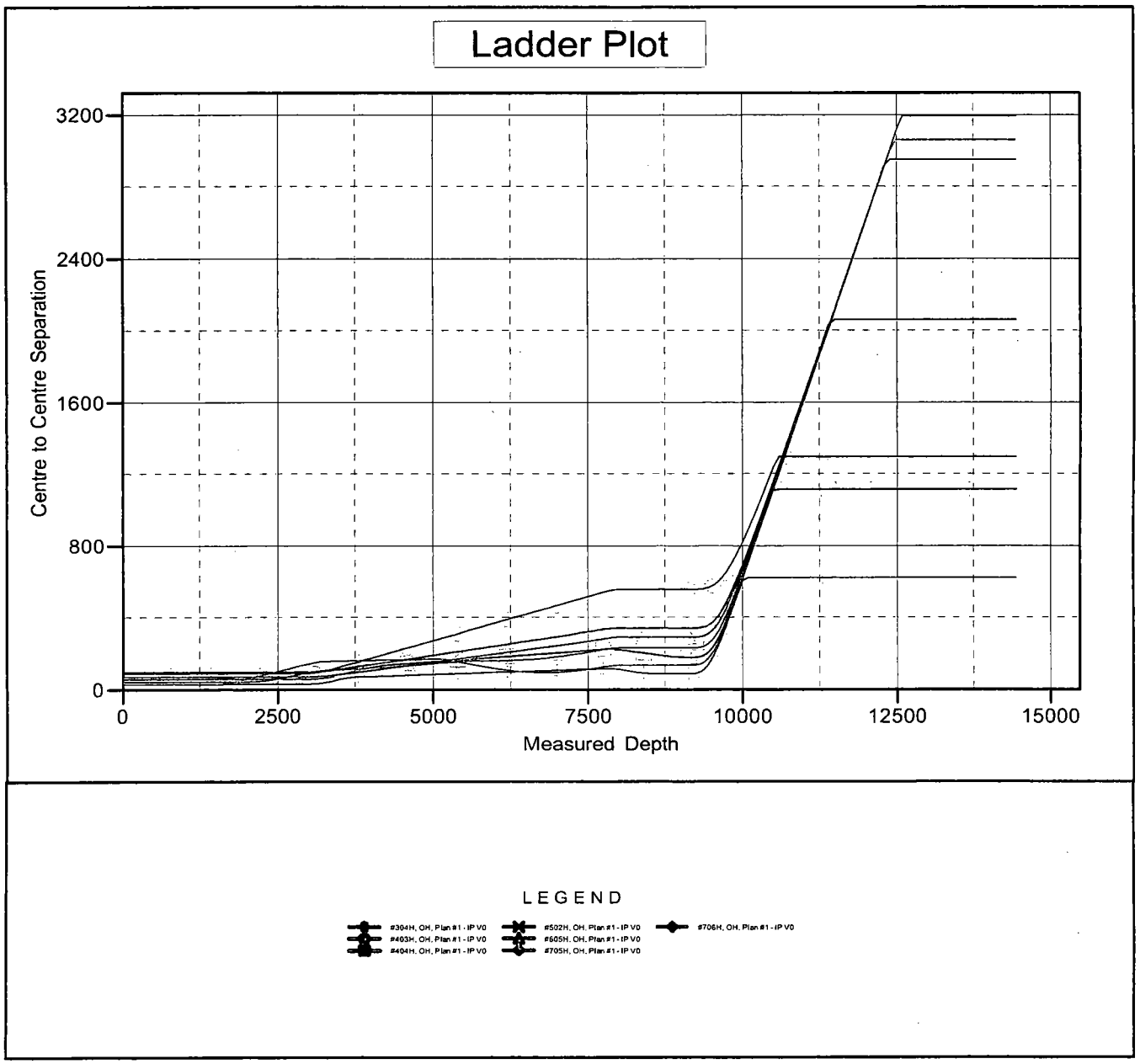
Offset Design Dominator 25 Fed COM - #706H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
12,700.00	9,577.68	15,784.84	12,637.75	60.46	63.72	-179.44	3,022.88	-351.97	3,061.35	2,995.01	66.343	46.144	
12,800.00	9,577.24	15,884.84	12,637.32	62.20	65.40	-179.44	3,122.87	-352.70	3,061.35	2,993.94	67.415	45.410	
12,900.00	9,576.80	15,984.84	12,636.88	63.94	67.08	-179.44	3,222.87	-353.43	3,061.36	2,992.85	68.502	44.690	
13,000.00	9,576.36	16,084.84	12,636.44	65.70	68.78	-179.44	3,322.87	-354.17	3,061.36	2,991.75	69.603	43.983	
13,100.00	9,575.93	16,184.84	12,636.01	67.45	70.48	-179.44	3,422.86	-354.90	3,061.36	2,990.64	70.716	43.291	
13,200.00	9,575.49	16,284.84	12,635.57	69.22	72.18	-179.44	3,522.86	-355.63	3,061.36	2,989.52	71.842	42.613	
13,300.00	9,575.05	16,384.84	12,635.14	70.98	73.90	-179.44	3,622.86	-356.37	3,061.36	2,988.38	72.979	41.948	
13,400.00	9,574.61	16,484.84	12,634.70	72.75	75.62	-179.44	3,722.85	-357.10	3,061.36	2,987.23	74.128	41.298	
13,500.00	9,574.18	16,584.84	12,634.26	74.53	77.35	-179.44	3,822.85	-357.83	3,061.36	2,986.07	75.288	40.662	
13,600.00	9,573.74	16,684.84	12,633.83	76.31	79.08	-179.44	3,922.84	-358.56	3,061.36	2,984.91	76.457	40.040	
13,700.00	9,573.30	16,784.84	12,633.39	78.09	80.82	-179.44	4,022.84	-359.30	3,061.36	2,983.73	77.637	39.432	
13,800.00	9,572.87	16,884.84	12,632.95	79.87	82.56	-179.44	4,122.84	-360.03	3,061.36	2,982.54	78.826	38.837	
13,900.00	9,572.43	16,984.84	12,632.52	81.66	84.31	-179.44	4,222.83	-360.76	3,061.37	2,981.34	80.024	38.256	
14,000.00	9,571.99	17,084.84	12,632.08	83.45	86.06	-179.44	4,322.83	-361.50	3,061.37	2,980.14	81.231	37.687	
14,100.00	9,571.55	17,184.84	12,631.65	85.25	87.82	-179.44	4,422.83	-362.23	3,061.37	2,978.92	82.445	37.132	
14,200.00	9,571.12	17,284.84	12,631.21	87.04	89.58	-179.44	4,522.82	-362.96	3,061.37	2,977.70	83.668	36.589	
14,300.00	9,570.68	17,384.84	12,630.77	88.84	91.34	-179.44	4,622.82	-363.70	3,061.37	2,976.47	84.898	36.059	
14,400.00	9,570.24	17,484.84	12,630.34	90.64	93.11	-179.44	4,722.82	-364.43	3,061.37	2,975.24	86.136	35.541	
14,441.66	9,570.06	17,526.52	12,630.00	91.39	93.84	-179.44	4,764.50	-364.80	3,061.22	2,974.56	86.653	35.327	
14,455.02	9,570.00	17,526.52	12,630.00	91.63	93.84	-179.44	4,764.50	-364.80	3,061.25	2,974.55	86.694	35.311	

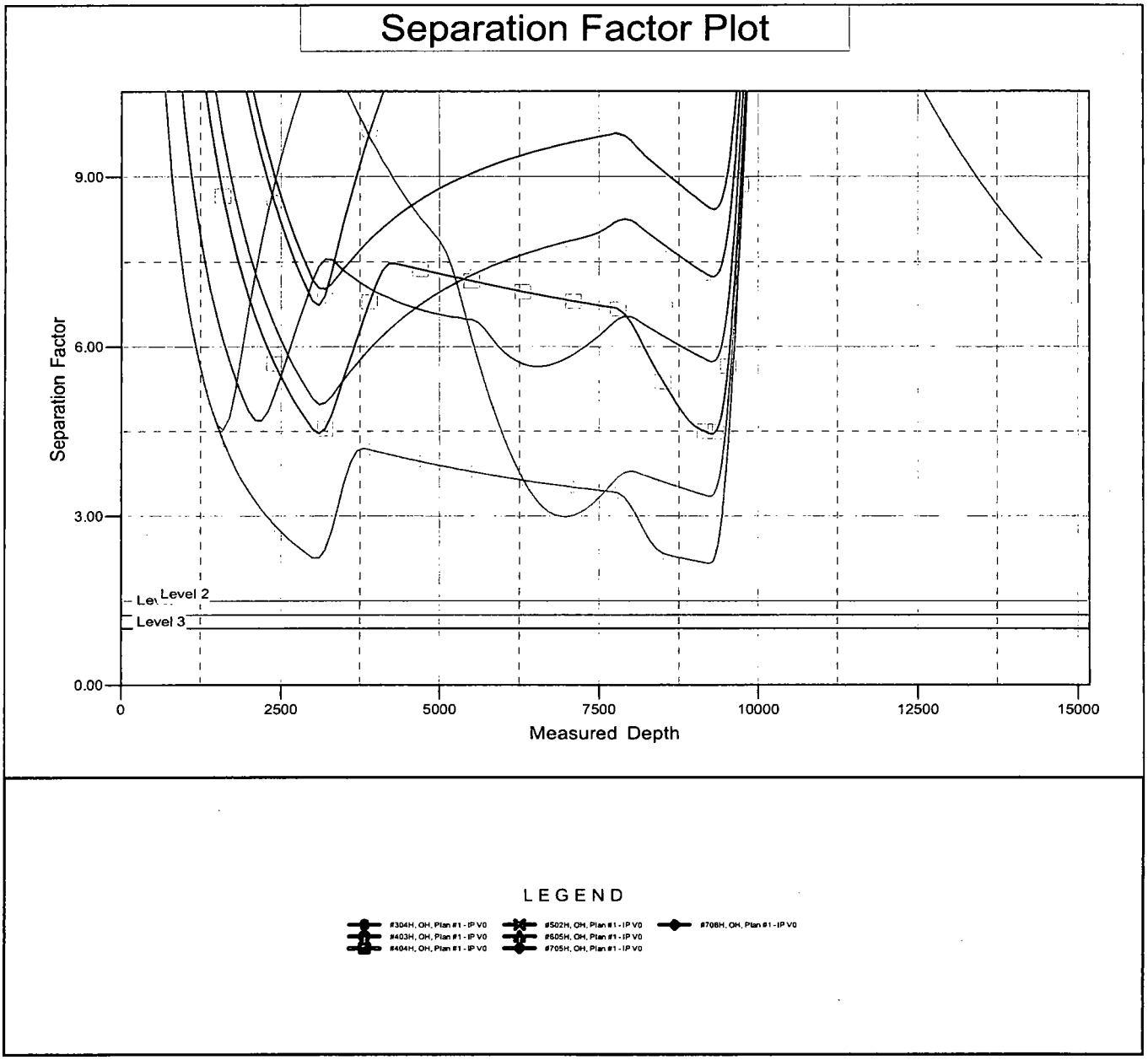
Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to RKB @ 3365.10usft (Rig KB = 25')	Coordinates are relative to: #104H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Central Meridian is 104° 20' 0.000 W	Grid Convergence at Surface is: 0.43°



Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #104H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.000 sigma
Reference Wellbore	OH	**Database:**	EDM 5000.14 Single User Db
Reference Design:	Plan #1 - IP	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to RKB @ 3365.10usft (Rig KB = 25')	Coordinates are relative to: #104H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Central Meridian is 104° 20' 0.000 W	Grid Convergence at Surface is: 0.43°



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

COG OPERATING, LLC

Lea County, NM (NAD27) NMEZ
Dominator 25 Fed COM
#104H

OH

Plan: Plan #1 - IP

Standard Planning Report

28 November, 2017

Planning Report

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #104H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Project:	Lea County, NM (NAD27) NMEZ	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site:	Dominator 25 Fed COM	**North Reference:**	Grid
Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

Project 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 Dominator 25 Fed COM

Site Position:		**Northing:**	399,214.70 usft	**Latitude:**	32° 5' 41.936 N
From:	Map	**Easting:**	750,109.50 usft	**Longitude:**	103° 31' 32.494 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.43 °

Well #104H

Well Position	**+N/-S**	5.90 usft	**Northing:**	399,220.60 usft	**Latitude:**	32° 5' 41.946 N
	+E/-W	664.10 usft	**Easting:**	750,773.60 usft	**Longitude:**	103° 31' 24.774 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**		**Ground Level:**	3,340.10 usft

Wellbore OH

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	11/27/17	6.87	59.95	47,821.22988371

Design Plan #1 - IP

Audit Notes:

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

Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**
	0.00	0.00	0.00	359.58

Plan Survey Tool Program **Date** 11/28/17

	Depth From (usft)	**Depth To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Remarks**
1	0.00	14,455.02	Plan #1 - IP (OH)	MWD	
				MWD v3:standard declination	

Plan Sections

Measured Depth (usft)	**Inclination (°)**	**Azimuth (°)**	**Vertical Depth (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Dogleg Rate (°/100usft)**	**Build Rate (°/100usft)**	**Turn Rate (°/100usft)**	**TFO (°)**	**Target**
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,333.33	5.00	226.00	3,332.91	-10.10	-10.46	1.50	1.50	0.00	226.00	
7,747.22	5.00	226.00	7,730.00	-277.33	-287.18	0.00	0.00	0.00	0.00	
8,080.55	0.00	0.00	8,062.91	-287.43	-297.64	1.50	-1.50	0.00	180.00	
9,130.18	0.00	0.00	9,112.54	-287.43	-297.64	0.00	0.00	0.00	0.00	
9,882.27	90.25	359.58	9,590.00	192.11	-301.17	12.00	12.00	-0.06	359.58	
14,455.02	90.25	359.58	9,570.00	4,764.70	-334.80	0.00	0.00	0.00	0.00	PBHL(D25#104H)

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #104H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Project:	Lea County, NM (NAD27) NMEZ	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site:	Dominator 25 Fed COM	**North Reference:**	Grid
Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
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
1,200.00	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	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	1.50	226.00	3,099.99	-0.91	-0.94	-0.90	1.50	1.50	0.00
3,200.00	3.00	226.00	3,199.91	-3.64	-3.77	-3.61	1.50	1.50	0.00
3,300.00	4.50	226.00	3,299.69	-8.18	-8.47	-8.12	1.50	1.50	0.00
3,333.33	5.00	226.00	3,332.91	-10.10	-10.46	-10.02	1.50	1.50	0.00
3,400.00	5.00	226.00	3,399.32	-14.13	-14.64	-14.03	0.00	0.00	0.00
3,500.00	5.00	226.00	3,498.94	-20.19	-20.90	-20.03	0.00	0.00	0.00
3,600.00	5.00	226.00	3,598.56	-26.24	-27.17	-26.04	0.00	0.00	0.00
3,700.00	5.00	226.00	3,698.18	-32.30	-33.44	-32.05	0.00	0.00	0.00
3,800.00	5.00	226.00	3,797.80	-38.35	-39.71	-38.06	0.00	0.00	0.00
3,900.00	5.00	226.00	3,897.42	-44.40	-45.98	-44.07	0.00	0.00	0.00
4,000.00	5.00	226.00	3,997.04	-50.46	-52.25	-50.07	0.00	0.00	0.00
4,100.00	5.00	226.00	4,096.66	-56.51	-58.52	-56.08	0.00	0.00	0.00
4,200.00	5.00	226.00	4,196.28	-62.57	-64.79	-62.09	0.00	0.00	0.00
4,300.00	5.00	226.00	4,295.90	-68.62	-71.06	-68.10	0.00	0.00	0.00
4,400.00	5.00	226.00	4,395.52	-74.68	-77.33	-74.11	0.00	0.00	0.00
4,500.00	5.00	226.00	4,495.14	-80.73	-83.60	-80.12	0.00	0.00	0.00
4,600.00	5.00	226.00	4,594.76	-86.79	-89.87	-86.12	0.00	0.00	0.00
4,700.00	5.00	226.00	4,694.38	-92.84	-96.14	-92.13	0.00	0.00	0.00
4,800.00	5.00	226.00	4,794.00	-98.89	-102.41	-98.14	0.00	0.00	0.00
4,900.00	5.00	226.00	4,893.62	-104.95	-108.68	-104.15	0.00	0.00	0.00
5,000.00	5.00	226.00	4,993.24	-111.00	-114.95	-110.16	0.00	0.00	0.00
5,100.00	5.00	226.00	5,092.85	-117.06	-121.22	-116.17	0.00	0.00	0.00
5,200.00	5.00	226.00	5,192.47	-123.11	-127.49	-122.17	0.00	0.00	0.00

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #104H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Project:	Lea County, NM (NAD27) NMEZ	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site:	Dominator 25 Fed COM	**North Reference:**	Grid
Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,300.00	5.00	226.00	5,292.09	-129.17	-133.76	-128.18	0.00	0.00	0.00
5,400.00	5.00	226.00	5,391.71	-135.22	-140.02	-134.19	0.00	0.00	0.00
5,500.00	5.00	226.00	5,491.33	-141.27	-146.29	-140.20	0.00	0.00	0.00
5,600.00	5.00	226.00	5,590.95	-147.33	-152.56	-146.21	0.00	0.00	0.00
5,700.00	5.00	226.00	5,690.57	-153.38	-158.83	-152.21	0.00	0.00	0.00
5,800.00	5.00	226.00	5,790.19	-159.44	-165.10	-158.22	0.00	0.00	0.00
5,900.00	5.00	226.00	5,889.81	-165.49	-171.37	-164.23	0.00	0.00	0.00
6,000.00	5.00	226.00	5,989.43	-171.55	-177.64	-170.24	0.00	0.00	0.00
6,100.00	5.00	226.00	6,089.05	-177.60	-183.91	-176.25	0.00	0.00	0.00
6,200.00	5.00	226.00	6,188.67	-183.65	-190.18	-182.26	0.00	0.00	0.00
6,300.00	5.00	226.00	6,288.29	-189.71	-196.45	-188.26	0.00	0.00	0.00
6,400.00	5.00	226.00	6,387.91	-195.76	-202.72	-194.27	0.00	0.00	0.00
6,500.00	5.00	226.00	6,487.53	-201.82	-208.99	-200.28	0.00	0.00	0.00
6,600.00	5.00	226.00	6,587.15	-207.87	-215.26	-206.29	0.00	0.00	0.00
6,700.00	5.00	226.00	6,686.77	-213.93	-221.53	-212.30	0.00	0.00	0.00
6,800.00	5.00	226.00	6,786.39	-219.98	-227.80	-218.31	0.00	0.00	0.00
6,900.00	5.00	226.00	6,886.00	-226.04	-234.07	-224.31	0.00	0.00	0.00
7,000.00	5.00	226.00	6,985.62	-232.09	-240.34	-230.32	0.00	0.00	0.00
7,100.00	5.00	226.00	7,085.24	-238.14	-246.61	-236.33	0.00	0.00	0.00
7,200.00	5.00	226.00	7,184.86	-244.20	-252.87	-242.34	0.00	0.00	0.00
7,300.00	5.00	226.00	7,284.48	-250.25	-259.14	-248.35	0.00	0.00	0.00
7,400.00	5.00	226.00	7,384.10	-256.31	-265.41	-254.35	0.00	0.00	0.00
7,500.00	5.00	226.00	7,483.72	-262.36	-271.68	-260.36	0.00	0.00	0.00
7,600.00	5.00	226.00	7,583.34	-268.42	-277.95	-266.37	0.00	0.00	0.00
7,700.00	5.00	226.00	7,682.96	-274.47	-284.22	-272.38	0.00	0.00	0.00
7,747.22	5.00	226.00	7,730.00	-277.33	-287.18	-275.22	0.00	0.00	0.00
7,800.00	4.21	226.00	7,782.61	-280.27	-290.23	-278.14	1.50	-1.50	0.00
7,900.00	2.71	226.00	7,882.43	-284.46	-294.57	-282.30	1.50	-1.50	0.00
8,000.00	1.21	226.00	7,982.36	-286.84	-297.03	-284.65	1.50	-1.50	0.00
8,080.55	0.00	0.00	8,062.91	-287.43	-297.64	-285.24	1.50	-1.50	0.00
8,100.00	0.00	0.00	8,082.36	-287.43	-297.64	-285.24	0.00	0.00	0.00
8,200.00	0.00	0.00	8,182.36	-287.43	-297.64	-285.24	0.00	0.00	0.00
8,300.00	0.00	0.00	8,282.36	-287.43	-297.64	-285.24	0.00	0.00	0.00
8,400.00	0.00	0.00	8,382.36	-287.43	-297.64	-285.24	0.00	0.00	0.00
8,500.00	0.00	0.00	8,482.36	-287.43	-297.64	-285.24	0.00	0.00	0.00
8,600.00	0.00	0.00	8,582.36	-287.43	-297.64	-285.24	0.00	0.00	0.00
8,700.00	0.00	0.00	8,682.36	-287.43	-297.64	-285.24	0.00	0.00	0.00
8,800.00	0.00	0.00	8,782.36	-287.43	-297.64	-285.24	0.00	0.00	0.00
8,900.00	0.00	0.00	8,882.36	-287.43	-297.64	-285.24	0.00	0.00	0.00
9,000.00	0.00	0.00	8,982.36	-287.43	-297.64	-285.24	0.00	0.00	0.00
9,100.00	0.00	0.00	9,082.36	-287.43	-297.64	-285.24	0.00	0.00	0.00
9,130.18	0.00	0.00	9,112.54	-287.43	-297.64	-285.24	0.00	0.00	0.00
KOP: 9130.18' MD, 9112.54' TVD									
9,150.00	2.38	359.58	9,132.35	-287.01	-297.64	-284.83	12.00	12.00	0.00
9,175.00	5.38	359.58	9,157.29	-285.32	-297.65	-283.13	12.00	12.00	0.00
9,200.00	8.38	359.58	9,182.11	-282.33	-297.68	-280.14	12.00	12.00	0.00
9,225.00	11.38	359.58	9,206.74	-278.04	-297.71	-275.85	12.00	12.00	0.00
9,250.00	14.38	359.58	9,231.10	-272.47	-297.75	-270.28	12.00	12.00	0.00
9,275.00	17.38	359.58	9,255.15	-265.63	-297.80	-263.44	12.00	12.00	0.00
9,300.00	20.38	359.58	9,278.80	-257.54	-297.86	-255.35	12.00	12.00	0.00
9,325.00	23.38	359.58	9,302.00	-248.23	-297.93	-246.04	12.00	12.00	0.00
9,350.00	26.38	359.58	9,324.67	-237.71	-298.00	-235.52	12.00	12.00	0.00
9,375.00	29.38	359.58	9,346.77	-226.03	-298.09	-223.83	12.00	12.00	0.00

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #104H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Project:	Lea County, NM (NAD27) NMEZ	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site:	Dominator 25 Fed COM	**North Reference:**	Grid
Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,400.00	32.38	359.58	9,368.22	-213.20	-298.18	-211.01	12.00	12.00	0.00
9,425.00	35.38	359.58	9,388.98	-199.26	-298.29	-197.07	12.00	12.00	0.00
9,450.00	38.38	359.58	9,408.97	-184.26	-298.40	-182.07	12.00	12.00	0.00
9,475.00	41.38	359.58	9,428.16	-168.24	-298.51	-166.04	12.00	12.00	0.00
9,500.00	44.38	359.58	9,446.47	-151.23	-298.64	-149.03	12.00	12.00	0.00
9,525.00	47.38	359.58	9,463.88	-133.28	-298.77	-131.09	12.00	12.00	0.00
9,550.00	50.38	359.58	9,480.32	-114.45	-298.91	-112.26	12.00	12.00	0.00
9,575.00	53.38	359.58	9,495.75	-94.79	-299.06	-92.59	12.00	12.00	0.00
9,600.00	56.38	359.58	9,510.13	-74.34	-299.21	-72.15	12.00	12.00	0.00
9,625.00	59.38	359.58	9,523.42	-53.17	-299.36	-50.98	12.00	12.00	0.00
9,650.00	62.38	359.58	9,535.59	-31.34	-299.52	-29.14	12.00	12.00	0.00
9,675.00	65.38	359.58	9,546.59	-8.89	-299.69	-6.70	12.00	12.00	0.00
9,700.00	68.38	359.58	9,556.41	14.10	-299.86	16.29	12.00	12.00	0.00
9,714.70	70.14	359.58	9,561.61	27.84	-299.96	30.04	12.00	12.00	0.00
FTP(D25#104H)									
9,725.00	71.38	359.58	9,565.01	37.57	-300.03	39.76	12.00	12.00	0.00
9,750.00	74.38	359.58	9,572.37	61.45	-300.20	63.65	12.00	12.00	0.00
9,775.00	77.38	359.58	9,578.47	85.70	-300.38	87.90	12.00	12.00	0.00
9,800.00	80.38	359.58	9,583.29	110.22	-300.56	112.42	12.00	12.00	0.00
9,825.00	83.38	359.58	9,586.82	134.97	-300.75	137.17	12.00	12.00	0.00
9,850.00	86.38	359.58	9,589.05	159.86	-300.93	162.07	12.00	12.00	0.00
9,875.00	89.38	359.58	9,589.98	184.84	-301.11	187.05	12.00	12.00	0.00
9,882.27	90.25	359.58	9,590.00	192.11	-301.17	194.32	12.00	12.00	0.00
EOC: 9882.27' MD, 9590.00' TVD, 90.25° INC, 359.58° AZ, 194.32' VS									
9,900.00	90.25	359.58	9,589.92	209.84	-301.30	212.05	0.00	0.00	0.00
10,000.00	90.25	359.58	9,589.49	309.84	-302.03	312.05	0.00	0.00	0.00
10,100.00	90.25	359.58	9,589.05	409.84	-302.77	412.04	0.00	0.00	0.00
10,200.00	90.25	359.58	9,588.61	509.83	-303.50	512.04	0.00	0.00	0.00
10,300.00	90.25	359.58	9,588.17	609.83	-304.24	612.04	0.00	0.00	0.00
10,400.00	90.25	359.58	9,587.74	709.82	-304.97	712.04	0.00	0.00	0.00
10,500.00	90.25	359.58	9,587.30	809.82	-305.71	812.04	0.00	0.00	0.00
10,600.00	90.25	359.58	9,586.86	909.82	-306.44	912.04	0.00	0.00	0.00
10,700.00	90.25	359.58	9,586.42	1,009.81	-307.18	1,012.04	0.00	0.00	0.00
10,800.00	90.25	359.58	9,585.99	1,109.81	-307.92	1,112.04	0.00	0.00	0.00
10,900.00	90.25	359.58	9,585.55	1,209.81	-308.65	1,212.04	0.00	0.00	0.00
11,000.00	90.25	359.58	9,585.11	1,309.80	-309.39	1,312.04	0.00	0.00	0.00
11,100.00	90.25	359.58	9,584.67	1,409.80	-310.12	1,412.03	0.00	0.00	0.00
11,200.00	90.25	359.58	9,584.24	1,509.80	-310.86	1,512.03	0.00	0.00	0.00
11,300.00	90.25	359.58	9,583.80	1,609.79	-311.59	1,612.03	0.00	0.00	0.00
11,400.00	90.25	359.58	9,583.36	1,709.79	-312.33	1,712.03	0.00	0.00	0.00
11,500.00	90.25	359.58	9,582.92	1,809.78	-313.06	1,812.03	0.00	0.00	0.00
11,600.00	90.25	359.58	9,582.49	1,909.78	-313.80	1,912.03	0.00	0.00	0.00
11,700.00	90.25	359.58	9,582.05	2,009.78	-314.54	2,012.03	0.00	0.00	0.00
11,800.00	90.25	359.58	9,581.61	2,109.77	-315.27	2,112.03	0.00	0.00	0.00
11,900.00	90.25	359.58	9,581.18	2,209.77	-316.01	2,212.03	0.00	0.00	0.00
12,000.00	90.25	359.58	9,580.74	2,309.77	-316.74	2,312.03	0.00	0.00	0.00
12,100.00	90.25	359.58	9,580.30	2,409.76	-317.48	2,412.03	0.00	0.00	0.00
12,200.00	90.25	359.58	9,579.86	2,509.76	-318.21	2,512.02	0.00	0.00	0.00
12,300.00	90.25	359.58	9,579.43	2,609.76	-318.95	2,612.02	0.00	0.00	0.00
12,400.00	90.25	359.58	9,578.99	2,709.75	-319.68	2,712.02	0.00	0.00	0.00
12,500.00	90.25	359.58	9,578.55	2,809.75	-320.42	2,812.02	0.00	0.00	0.00
12,600.00	90.25	359.58	9,578.11	2,909.74	-321.16	2,912.02	0.00	0.00	0.00
12,700.00	90.25	359.58	9,577.68	3,009.74	-321.89	3,012.02	0.00	0.00	0.00
12,800.00	90.25	359.58	9,577.24	3,109.74	-322.63	3,112.02	0.00	0.00	0.00

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #104H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Project:	Lea County, NM (NAD27) NMEZ	**MD Reference:**	RKB @ 3365.10usft (Rig KB = 25')
Site:	Dominator 25 Fed COM	**North Reference:**	Grid
Well:	#104H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 - IP		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,900.00	90.25	359.58	9,576.80	3,209.73	-323.36	3,212.02	0.00	0.00	0.00
13,000.00	90.25	359.58	9,576.36	3,309.73	-324.10	3,312.02	0.00	0.00	0.00
13,100.00	90.25	359.58	9,575.93	3,409.73	-324.83	3,412.02	0.00	0.00	0.00
13,200.00	90.25	359.58	9,575.49	3,509.72	-325.57	3,512.01	0.00	0.00	0.00
13,300.00	90.25	359.58	9,575.05	3,609.72	-326.30	3,612.01	0.00	0.00	0.00
13,400.00	90.25	359.58	9,574.61	3,709.72	-327.04	3,712.01	0.00	0.00	0.00
13,500.00	90.25	359.58	9,574.18	3,809.71	-327.78	3,812.01	0.00	0.00	0.00
13,600.00	90.25	359.58	9,573.74	3,909.71	-328.51	3,912.01	0.00	0.00	0.00
13,700.00	90.25	359.58	9,573.30	4,009.70	-329.25	4,012.01	0.00	0.00	0.00
13,800.00	90.25	359.58	9,572.87	4,109.70	-329.98	4,112.01	0.00	0.00	0.00
13,900.00	90.25	359.58	9,572.43	4,209.70	-330.72	4,212.01	0.00	0.00	0.00
14,000.00	90.25	359.58	9,571.99	4,309.69	-331.45	4,312.01	0.00	0.00	0.00
14,100.00	90.25	359.58	9,571.55	4,409.69	-332.19	4,412.01	0.00	0.00	0.00
14,200.00	90.25	359.58	9,571.12	4,509.69	-332.92	4,512.01	0.00	0.00	0.00
14,300.00	90.25	359.58	9,570.68	4,609.68	-333.66	4,612.00	0.00	0.00	0.00
14,400.00	90.25	359.58	9,570.24	4,709.68	-334.40	4,712.00	0.00	0.00	0.00
14,455.02	90.25	359.58	9,570.00	4,764.70	-334.80	4,767.02	0.00	0.00	0.00

TD: 14455.02' MD, 9570.00' TVD - PBHL(D25#104H)

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL(D25#104H)	0.00	0.00	9,570.00	4,764.70	-334.80	403,985.30	750,438.80	32° 6' 29.120 N	103° 31' 28.250 W
- plan hits target center									
- Point									
FTP(D25#104H)	0.00	0.00	9,590.00	17.43	-300.15	399,238.03	750,473.45	32° 5' 42.140 N	103° 31' 28.261 W
- plan misses target center by 30.23usft at 9714.70usft MD (9561.61 TVD, 27.84 N, -299.96 E)									
- Point									

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
9,130.18	9,112.54	-287.43	-297.64	KOP: 9130.18' MD, 9112.54' TVD
9,882.27	9,590.00	192.11	-301.17	EOC: 9882.27' MD, 9590.00' TVD, 90.25° INC, 359.58° AZ, 194.32' VS
14,455.02	9,570.00	4,764.70	-334.80	TD: 14455.02' MD, 9570.00' TVD

Azimuths to Grid North
True North: -0.43°
Magnetic North: 6.44°

Magnetic Field
Strength: 47821.2snT
Dip Angle: 59.95°
Date: 11/27/2017
Model: IGRF2015

CONCHO

ENERGY SERVICES, LLC.

COG OPERATING, LLC
#104H
Lea County, NM (NAD27) NMEZ
Plan #1 - IP

PROJECT DETAILS: Lea County, NM (NAD27) NMEZ	
Geodetic System:	US State Plane 1927 (Exact solution)
Datum:	NAD 1927 (NADCON CONUS)
Ellipsoid:	Clarke 1866
Zone:	New Mexico East 3001
System Datum:	Mean Sea Level

Ground Elev: 3340.10 RKB @ 3365.10usft (Rig KB = 25')

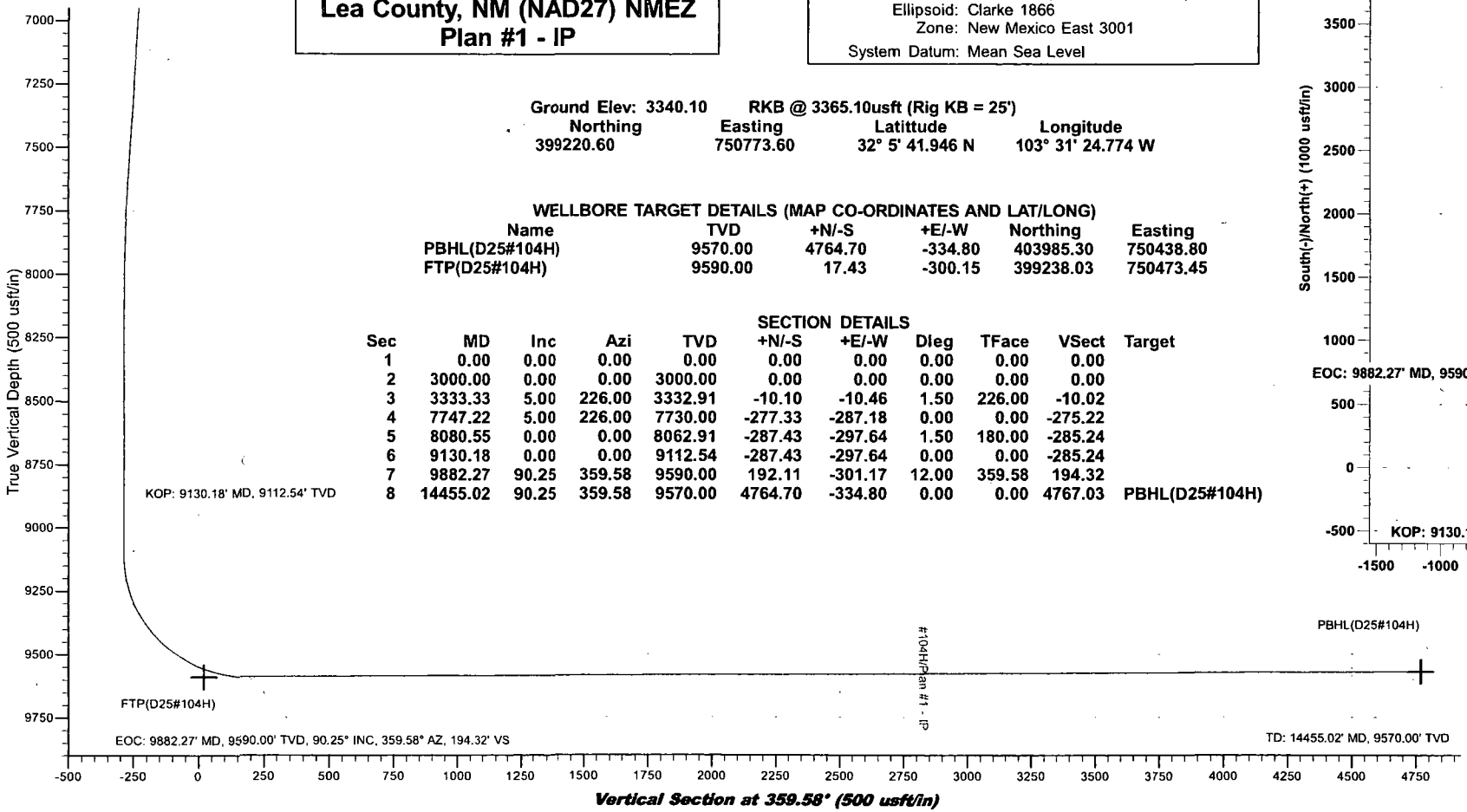
Northing	Easting	Latitude	Longitude
399220.60	750773.60	32° 5' 41.946 N	103° 31' 24.774 W

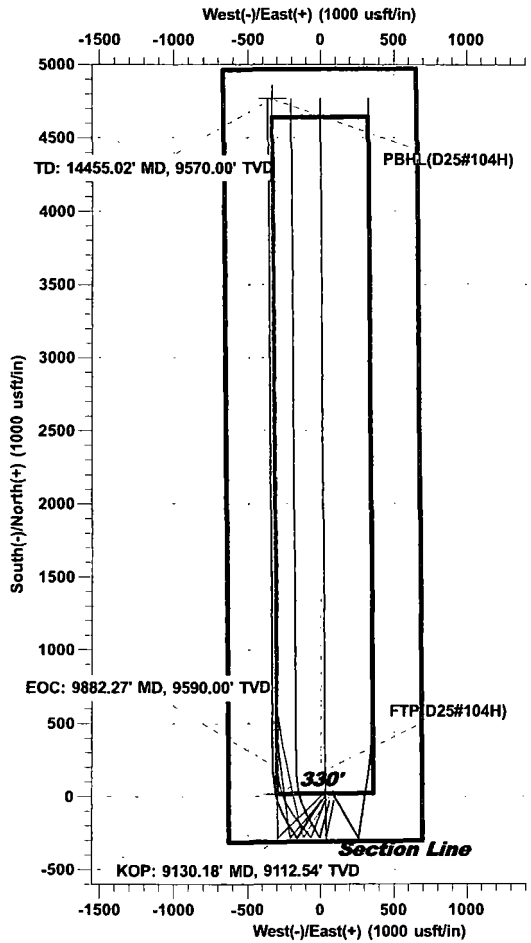
WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting
PBHL(D25#104H)	9570.00	4764.70	-334.80	403985.30	750438.80
FTP(D25#104H)	9590.00	17.43	-300.15	399238.03	750473.45

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3000.00	0.00	0.00	3000.00	0.00	0.00	0.00	0.00	0.00	
3	3333.33	5.00	226.00	3332.91	-10.10	-10.46	1.50	226.00	-10.02	
4	7747.22	5.00	226.00	7730.00	-277.33	-287.18	0.00	0.00	-275.22	
5	8080.55	0.00	0.00	8062.91	-287.43	-297.64	1.50	180.00	-285.24	
6	9130.18	0.00	0.00	9112.54	-287.43	-297.64	0.00	0.00	-285.24	
7	9882.27	90.25	359.58	9590.00	192.11	-301.17	12.00	359.58	194.32	
8	14455.02	90.25	359.58	9570.00	4764.70	-334.80	0.00	0.00	4767.03	PBHL(D25#104H)





1:50, November 28 2017

Well Planning: Gabriel Cruz

COG Operating, LLC - Dominator 25 Federal Com #104H

1. Geologic Formations

TVD of target	9,570' EOL	Pilot hole depth	NA
MD at TD:	14,455'	Deepest expected fresh water:	142'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	1070	Water	
Top of Salt	1575	Salt	
Base of Salt	5135	Salt	
Lamar	5153	Salt Water	
Bell Canyon	5295	Salt Water	
Cherry Canyon	6294	Oil/Gas	
Brushy Canyon	7874	Oil/Gas	
Bone Spring Lime	9340	Oil/Gas	
U. Avalon Shale	9414	Target Oil/Gas	
L. Avalon Shale	10025	Not Penetrated	
Basal Avalon	10175	Not Penetrated	
1st Bone Spring Sand	10372	Not Penetrated	
2nd Bone Spring Sand	10890	Not Penetrated	

2. Casing Program

Hole Size	Casing From	Casing To	Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17.5"	0	1095	13.375"	54.5	J55	STC	2.26	1.18	8.61
12.25"	0	4000	9.625"	40	J55	LTC	1.22	1.08	3.25
12.25"	4000	5180	9.625"	40	L80	LTC	1.14	1.57	5.73
8.75"	0	14,455	5.5"	17	P110	LTC	1.62	2.90	2.74
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

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