PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG OPERATING
LEASE NO.:	NMNM121958
WELL NAME & NO.:	DOMINATOR 25 FED COM 404H
SURFACE HOLE FOOTAGE:	310'/S & 1950'/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,

Approval Date: 05/02/2018

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 12% - 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 404H
SURFACE HOLE FOOTAGE:	310'/S & 1950'/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.

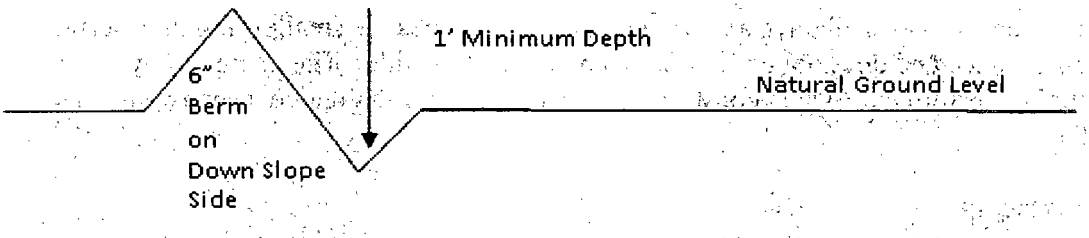
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

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:

400 foot road with 4% road slope: $\frac{400'}{4\%} + 100' = 200'$ 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

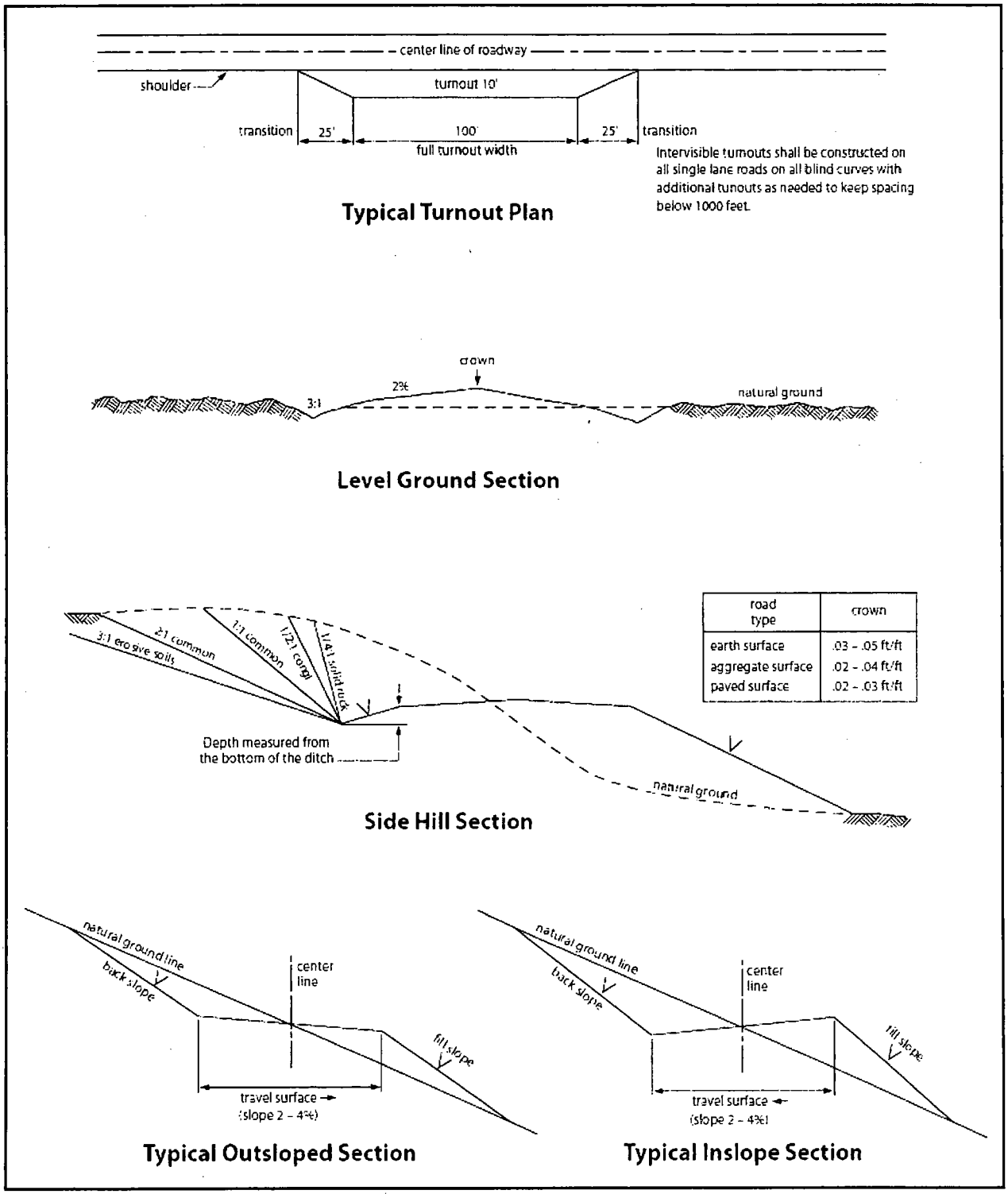


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

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

AFMSS

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

Operator Certification Data Report

05/03/2018

Operator Certification

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

NAME: Mayte Reyes **Signed on:** 12/08/2017

Title: Regulatory Analyst

Street Address: 2208 W Main Street

City: Artesia **State:** NM **Zip:** 88210

Phone: (575)748-6945

Email address: Mreyes1@concho.com

Field Representative

Representative Name: Rand French

Street Address: 2208 West Main Street

City: Artesia **State:** NM **Zip:** 88210

Phone: (575)748-6940

Email address: rfrench@concho.com

AFMSS

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

Application Data Report

05/03/2018

APD ID: 10400025354 **Submission Date:** 12/11/2017

Operator Name: COG OPERATING LLC

Well Name: DOMINATOR 25 FEDERAL COM **Well Number:** 404H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400025354 **Tie to previous NOS?** **Submission Date:** 12/11/2017

BLM Office: CARLSBAD **User:** Mayte Reyes **Title:** Regulatory Analyst

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

Lease number: NMNM121958 **Lease Acres:** 360

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

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

Agreement number:

Agreement name:

Keep application confidential? YES

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

Operator letter of designation:

Operator Info

Operator Organization Name: COG OPERATING LLC

Operator Address: 600 West Illinois Ave

Zip: 79701

Operator PO Box:

Operator City: Midland **State:** TX

Operator Phone: (432)683-7443

Operator Internet Address: RODOM@CONCHO.COM

Section 2 - Well Information

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

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

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

Well Name: DOMINATOR 25 FEDERAL COM **Well Number:** 404H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** WILDCAT **Pool Name:** BONE SPRING

Is the proposed well in an area containing other mineral resources? USEABLE WATER,OIL

Operator Name: COG OPERATING LLC

Well Name: DOMINATOR 25 FEDERAL COM **Well Number:** 404H

Describe other minerals:

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

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** DOMINATOR 25 FEDERAL COM **Number:** 104H, 304H, 404H, 403H, 706H, 705H, 605H AND 502H

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

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: EXPLORATORY (WILDCAT)

Describe sub-type:

Distance to town: 19 Miles **Distance to nearest well:** 580 FT **Distance to lease line:** 200 FT

Reservoir well spacing assigned acres Measurement: 160 Acres

Well plat: COG_Dominator_404H_C102_20171208111838.pdf

Well work start Date: 03/01/2018 **Duration:** 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number:

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	310	FSL	1950	FEL	25S	33E	25	Aliquot SWSE	32.09511	-103.523824	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 121958	3341	0	0
KOP Leg #1	310	FSL	1950	FEL	25S	33E	25	Aliquot SWSE	32.09511	-103.523824	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 121958	3341	0	0
PPP Leg #1	330	FSL	2310	FEL	25S	33E	25	Aliquot SWSE	32.095163	-103.524986	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 121958	-659	4000	4000

Operator Name: COG OPERATING LLC

Well Name: DOMINATOR 25 FEDERAL COM **Well Number:** 404H

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
PPP Leg #1	1320	FSL	2310	FEL	25S	33E	25	Aliquot NWSE	32.097883	-103.524986	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 114987	-7360	11800	10701
EXIT Leg #1	330	FNL	2310	FEL	25S	33E	25	Aliquot NWNE	32.107856	-103.524984	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 121958	-7344	15500	10685
BHL Leg #1	200	FNL	2310	FEL	25S	33E	25	Aliquot NWNE	32.108213	-103.523824	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 121958	-7344	15579	10685

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
#404H

OH
Plan #1 - IP

Anticollision Report

28 November, 2017

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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	15,579.22	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						
#104H - OH - Plan #1 - IP	3,000.00	2,999.50	59.90	46.70	4.537	CC, ES
#104H - OH - Plan #1 - IP	3,100.00	3,098.36	60.84	47.21	4.465	SF
#304H - OH - Plan #1 - IP	3,500.00	3,499.60	30.00	14.55	1.942	CC, ES, SF
#403H - OH - Plan #1 - IP	3,000.00	3,000.00	30.00	16.80	2.272	CC, ES
#403H - OH - Plan #1 - IP	3,100.00	3,099.59	30.66	17.04	2.250	SF
#502H - OH - Plan #1 - IP	3,000.00	3,000.10	42.43	29.22	3.213	CC, ES
#502H - OH - Plan #1 - IP	3,100.00	3,099.47	43.16	29.54	3.168	SF
#605H - OH - Plan #1 - IP	3,000.00	2,999.50	30.00	16.80	2.272	CC, ES, SF
#705H - OH - Plan #1 - IP	2,000.00	1,998.80	42.43	33.72	4.873	CC
#705H - OH - Plan #1 - IP	8,600.00	8,601.52	43.01	5.53	1.148	Level 2, ES
#705H - OH - Plan #1 - IP	10,250.00	10,247.75	49.96	5.89	1.134	Level 2, SF
#706H - OH - Plan #1 - IP	10,325.00	10,324.30	44.78	0.66	1.015	Level 2, ES, SF
#706H - OH - Plan #1 - IP	10,326.20	10,325.48	44.78	0.66	1.015	Level 2, CC

Offset Design Dominator 25 Fed COM - #104H - 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	-90.48	-0.50	-59.90	59.90				
100.00	100.00	100.50	99.50	0.08	0.09	-90.48	-0.50	-59.90	59.90	59.73	.170	352.991	
200.00	200.00	200.50	199.50	0.31	0.31	-90.48	-0.50	-59.90	59.90	59.28	.619	96.736	
300.00	300.00	300.50	299.50	0.53	0.53	-90.48	-0.50	-59.90	59.90	58.83	1.069	56.048	
400.00	400.00	400.50	399.50	0.76	0.76	-90.48	-0.50	-59.90	59.90	58.38	1.518	39.454	
500.00	500.00	500.50	499.50	0.98	0.98	-90.48	-0.50	-59.90	59.90	57.93	1.968	30.441	
600.00	600.00	600.50	599.50	1.21	1.21	-90.48	-0.50	-59.90	59.90	57.48	2.417	24.780	
700.00	700.00	700.50	699.50	1.43	1.43	-90.48	-0.50	-59.90	59.90	57.04	2.867	20.894	
800.00	800.00	800.50	799.50	1.66	1.66	-90.48	-0.50	-59.90	59.90	56.59	3.316	18.062	
900.00	900.00	900.50	899.50	1.88	1.88	-90.48	-0.50	-59.90	59.90	56.14	3.766	15.906	
1,000.00	1,000.00	1,000.50	999.50	2.11	2.11	-90.48	-0.50	-59.90	59.90	55.69	4.215	14.210	
1,100.00	1,100.00	1,100.50	1,099.50	2.33	2.33	-90.48	-0.50	-59.90	59.90	55.24	4.665	12.841	
1,200.00	1,200.00	1,200.50	1,199.50	2.56	2.56	-90.48	-0.50	-59.90	59.90	54.79	5.115	11.712	
1,300.00	1,300.00	1,300.50	1,299.50	2.78	2.78	-90.48	-0.50	-59.90	59.90	54.34	5.564	10.766	
1,400.00	1,400.00	1,400.50	1,399.50	3.01	3.01	-90.48	-0.50	-59.90	59.90	53.89	6.014	9.961	

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 #404H
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Reference Well:	#404H	**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 - #104H - 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
1,500.00	1,500.00	1,500.50	1,499.50	3.23	3.23	-90.48	-0.50	-59.90	59.90	53.44	6.463	9.268	
1,600.00	1,600.00	1,600.50	1,599.50	3.46	3.46	-90.48	-0.50	-59.90	59.90	52.99	6.913	8.666	
1,700.00	1,700.00	1,700.50	1,699.50	3.68	3.68	-90.48	-0.50	-59.90	59.90	52.54	7.362	8.136	
1,800.00	1,800.00	1,800.50	1,799.50	3.91	3.91	-90.48	-0.50	-59.90	59.90	52.09	7.812	7.668	
1,900.00	1,900.00	1,900.50	1,899.50	4.13	4.13	-90.48	-0.50	-59.90	59.90	51.64	8.261	7.251	
2,000.00	2,000.00	2,000.50	1,999.50	4.35	4.36	-90.48	-0.50	-59.90	59.90	51.19	8.711	6.877	
2,100.00	2,100.00	2,100.50	2,099.50	4.58	4.58	-90.48	-0.50	-59.90	59.90	50.74	9.160	6.539	
2,200.00	2,200.00	2,200.50	2,199.50	4.80	4.81	-90.48	-0.50	-59.90	59.90	50.29	9.610	6.233	
2,300.00	2,300.00	2,300.50	2,299.50	5.03	5.03	-90.48	-0.50	-59.90	59.90	49.84	10.059	5.955	
2,400.00	2,400.00	2,400.50	2,399.50	5.25	5.26	-90.48	-0.50	-59.90	59.90	49.39	10.509	5.700	
2,500.00	2,500.00	2,500.50	2,499.50	5.48	5.48	-90.48	-0.50	-59.90	59.90	48.94	10.958	5.466	
2,600.00	2,600.00	2,600.50	2,599.50	5.70	5.70	-90.48	-0.50	-59.90	59.90	48.49	11.408	5.251	
2,700.00	2,700.00	2,700.50	2,699.50	5.93	5.93	-90.48	-0.50	-59.90	59.90	48.04	11.858	5.052	
2,800.00	2,800.00	2,800.50	2,799.50	6.15	6.15	-90.48	-0.50	-59.90	59.90	47.60	12.307	4.867	
2,900.00	2,900.00	2,900.50	2,899.50	6.38	6.38	-90.48	-0.50	-59.90	59.90	47.15	12.757	4.696	
3,000.00	3,000.00	2,999.50	2,999.50	6.60	6.60	-90.48	-0.50	-59.90	59.90	46.70	13.204	4.537	CC, ES
3,100.00	3,100.00	3,098.36	3,098.35	6.83	6.80	-91.30	-1.38	-60.81	60.84	47.21	13.625	4.465	SF
3,200.00	3,200.00	3,197.08	3,196.99	7.05	6.98	-93.63	-4.03	-63.56	63.73	49.71	14.019	4.546	
3,300.00	3,300.00	3,295.54	3,295.25	7.28	7.16	-97.06	-8.44	-68.12	68.77	54.36	14.410	4.772	
3,400.00	3,400.00	3,405.38	3,393.96	7.50	7.36	-100.91	-14.31	-74.20	75.77	60.94	14.829	5.109	
3,500.00	3,500.00	3,505.76	3,493.20	7.73	7.56	-104.19	-20.34	-80.44	83.21	67.98	15.238	5.461	
3,600.00	3,600.00	3,606.14	3,592.44	7.95	7.76	-106.92	-26.37	-86.69	90.89	75.23	15.651	5.807	
3,700.00	3,700.00	3,693.48	3,691.68	8.18	7.94	-109.22	-32.40	-92.93	98.73	82.69	16.041	6.155	
3,800.00	3,800.00	3,806.91	3,790.92	8.40	8.17	-111.18	-38.43	-99.18	106.71	90.23	16.484	6.473	
3,900.00	3,900.00	3,892.71	3,890.16	8.63	8.35	-112.87	-44.46	-105.43	114.80	97.92	16.876	6.803	
4,000.00	4,000.00	4,007.67	3,989.40	8.85	8.60	-114.33	-50.50	-111.67	122.97	105.65	17.327	7.097	
4,100.00	4,099.99	4,107.95	4,088.74	9.05	8.82	32.64	-56.53	-117.92	130.12	112.39	17.723	7.342	
4,200.00	4,199.91	4,208.08	4,188.23	9.22	9.04	32.31	-62.58	-124.18	135.08	116.98	18.096	7.464	
4,266.67	4,266.45	4,258.56	4,254.61	9.34	9.16	32.44	-66.61	-128.36	137.16	118.84	18.314	7.489	
4,300.00	4,299.70	4,291.88	4,287.81	9.40	9.23	32.58	-68.63	-130.45	137.95	119.51	18.440	7.481	
4,400.00	4,399.46	4,408.15	4,387.40	9.58	9.50	32.98	-74.68	-136.72	140.35	121.49	18.856	7.443	
4,500.00	4,499.22	4,491.81	4,486.98	9.76	9.69	33.36	-80.74	-142.99	142.74	123.53	19.210	7.431	
4,600.00	4,598.97	4,608.22	4,586.57	9.94	9.96	33.73	-86.79	-149.25	145.15	125.51	19.635	7.392	
4,700.00	4,698.73	4,708.25	4,686.15	10.13	10.20	34.09	-92.84	-155.52	147.56	127.53	20.031	7.367	
4,800.00	4,798.48	4,808.29	4,785.74	10.32	10.43	34.44	-98.89	-161.79	149.97	129.54	20.431	7.341	
4,900.00	4,898.24	4,891.68	4,885.33	10.52	10.63	34.78	-104.94	-168.06	152.40	131.60	20.798	7.327	
5,000.00	4,998.00	5,008.35	4,984.91	10.72	10.92	35.11	-111.00	-174.32	154.82	133.58	21.241	7.289	
5,100.00	5,097.75	5,108.39	5,084.50	10.92	11.16	35.42	-117.05	-180.59	157.25	135.60	21.651	7.263	
5,200.00	5,197.51	5,208.42	5,184.09	11.12	11.40	35.73	-123.10	-186.86	159.69	137.63	22.065	7.237	
5,300.00	5,297.27	5,308.45	5,283.67	11.32	11.65	36.03	-129.15	-193.13	162.13	139.65	22.481	7.212	
5,400.00	5,397.02	5,391.51	5,383.26	11.53	11.85	36.32	-135.21	-199.39	164.58	141.71	22.864	7.198	
5,500.00	5,496.78	5,508.52	5,482.84	11.74	12.14	36.60	-141.26	-205.66	167.03	143.70	23.324	7.161	
5,600.00	5,596.54	5,608.55	5,582.43	11.95	12.39	36.87	-147.31	-211.93	169.48	145.73	23.749	7.136	
5,700.00	5,696.29	5,708.59	5,682.02	12.17	12.65	37.14	-153.36	-218.19	171.94	147.76	24.177	7.112	
5,800.00	5,796.05	5,808.62	5,781.60	12.38	12.90	37.39	-159.42	-224.46	174.40	149.79	24.607	7.087	
5,900.00	5,895.80	5,891.35	5,881.19	12.60	13.11	37.64	-165.47	-230.73	176.86	151.86	25.001	7.074	
6,000.00	5,995.56	5,991.31	5,980.78	12.82	13.36	37.89	-171.52	-237.00	179.33	153.89	25.436	7.050	
6,100.00	6,095.32	6,108.72	6,080.36	13.04	13.66	38.12	-177.57	-243.26	181.80	155.88	25.912	7.016	
6,200.00	6,195.07	6,191.25	6,179.95	13.26	13.87	38.35	-183.62	-249.53	184.27	157.96	26.311	7.003	
6,300.00	6,294.83	6,291.21	6,279.53	13.48	14.13	38.58	-189.68	-255.80	186.74	159.99	26.752	6.981	
6,400.00	6,394.59	6,408.82	6,379.12	13.71	14.43	38.80	-195.73	-262.07	189.22	161.99	27.235	6.948	
6,500.00	6,494.34	6,508.85	6,478.71	13.93	14.69	39.01	-201.78	-268.33	191.70	164.02	27.680	6.926	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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 - #104H - 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
6,600.00	6,594.10	6,591.11	6,578.29	14.16	14.90	39.22	-207.83	-274.60	194.19	166.10	28.086	6.914	
6,700.00	6,693.86	6,708.92	6,677.88	14.39	15.21	39.42	-213.89	-280.87	196.68	168.10	28.575	6.883	
6,800.00	6,793.61	6,791.05	6,777.47	14.62	15.42	39.62	-219.94	-287.14	199.16	170.18	28.984	6.871	
6,900.00	6,893.37	6,908.99	6,877.05	14.85	15.73	39.81	-225.99	-293.40	201.66	172.18	29.477	6.841	
7,000.00	6,993.13	7,009.02	6,976.64	15.08	15.99	40.00	-232.04	-299.67	204.15	174.22	29.930	6.821	
7,100.00	7,092.88	7,109.05	7,076.23	15.31	16.25	40.18	-238.10	-305.94	206.64	176.26	30.385	6.801	
7,200.00	7,192.64	7,209.09	7,175.81	15.54	16.51	40.36	-244.15	-312.21	209.14	178.30	30.841	6.781	
7,300.00	7,292.39	7,309.12	7,275.40	15.78	16.78	40.53	-250.20	-318.47	211.64	180.34	31.298	6.762	
7,400.00	7,392.15	7,409.15	7,374.98	16.01	17.04	40.70	-256.25	-324.74	214.14	182.39	31.756	6.743	
7,500.00	7,491.91	7,509.19	7,474.57	16.25	17.30	40.87	-262.31	-331.01	216.65	184.43	32.216	6.725	
7,600.00	7,591.66	7,609.22	7,574.16	16.48	17.57	41.03	-268.36	-337.27	219.15	186.47	32.677	6.707	
7,700.00	7,691.42	7,690.75	7,673.74	16.72	17.78	41.19	-274.41	-343.54	221.66	188.56	33.096	6.697	
7,800.00	7,791.18	7,793.10	7,775.73	16.96	18.05	41.38	-280.42	-349.76	223.93	190.36	33.571	6.670	
7,900.00	7,890.93	7,898.57	7,881.00	17.19	18.31	41.86	-284.92	-354.42	224.16	190.10	34.059	6.582	
8,000.00	7,990.69	8,003.92	7,986.28	17.43	18.55	42.70	-287.39	-356.99	221.97	187.43	34.542	6.426	
8,100.00	8,090.45	8,107.59	8,089.95	17.67	18.75	43.90	-287.93	-357.54	217.53	182.52	35.014	6.213	
8,200.00	8,190.20	8,207.34	8,189.70	17.91	18.94	45.20	-287.93	-357.54	212.55	177.07	35.481	5.991	
8,300.00	8,289.96	8,307.10	8,289.46	18.15	19.13	46.56	-287.93	-357.54	207.69	171.74	35.953	5.777	
8,400.00	8,389.72	8,406.86	8,389.22	18.39	19.31	47.99	-287.93	-357.54	202.95	166.52	36.429	5.571	
8,500.00	8,489.47	8,506.61	8,488.97	18.64	19.50	49.49	-287.93	-357.54	198.34	161.43	36.910	5.374	
8,600.00	8,589.23	8,606.37	8,588.73	18.88	19.69	51.05	-287.93	-357.54	193.88	156.48	37.395	5.185	
8,700.00	8,688.98	8,706.13	8,688.48	19.12	19.88	52.69	-287.93	-357.54	189.56	151.68	37.885	5.004	
8,800.00	8,788.74	8,805.88	8,788.24	19.36	20.07	54.40	-287.93	-357.54	185.41	147.03	38.379	4.831	
8,811.29	8,800.00	8,817.14	8,799.50	19.39	20.09	54.60	-287.93	-357.54	184.95	146.52	38.435	4.812	
8,900.00	8,888.56	8,905.70	8,888.06	19.60	20.26	55.88	-287.93	-357.54	182.01	143.14	38.864	4.683	
9,000.00	8,988.50	9,005.64	8,988.00	19.83	20.46	56.74	-287.93	-357.54	180.15	140.83	39.315	4.582	
9,077.95	9,066.45	9,083.59	9,065.95	19.99	20.61	-91.05	-287.93	-357.54	179.71	140.07	39.639	4.534	
9,100.00	9,088.50	9,105.64	9,088.00	20.03	20.65	-91.05	-287.93	-357.54	179.71	139.99	39.727	4.524	
9,167.95	9,156.45	9,173.65	9,155.95	20.16	20.77	-90.42	-285.95	-357.55	179.70	139.69	40.011	4.491	
9,200.00	9,188.50	9,205.33	9,187.37	20.23	20.82	-89.17	-282.03	-357.58	179.75	139.58	40.167	4.475	
9,300.00	9,288.50	9,298.97	9,277.83	20.42	20.92	-81.71	-258.40	-357.76	182.09	141.39	40.697	4.474	
9,400.00	9,388.50	9,380.88	9,351.88	20.62	20.97	-71.29	-223.61	-358.01	193.61	152.58	41.024	4.719	
9,500.00	9,488.50	9,449.31	9,408.43	20.82	20.98	-61.14	-185.19	-358.29	220.85	180.04	40.809	5.412	
9,600.00	9,588.50	9,505.17	9,450.15	21.02	20.97	-52.93	-148.09	-358.57	265.14	224.96	40.179	6.599	
9,700.00	9,688.50	9,550.00	9,480.32	21.22	20.96	-46.84	-114.95	-358.81	323.52	284.02	39.497	8.191	
9,800.00	9,788.50	9,587.32	9,502.97	21.42	20.95	-42.27	-85.31	-359.03	392.16	353.18	38.985	10.059	
9,900.00	9,888.50	9,617.55	9,519.58	21.62	20.94	-38.92	-60.05	-359.21	468.04	429.38	38.654	12.108	
10,000.00	9,988.50	9,642.62	9,532.11	21.82	20.93	-36.39	-38.35	-359.37	549.03	510.54	38.483	14.267	
10,100.00	10,088.50	9,663.62	9,541.73	22.02	20.93	-34.44	-19.68	-359.51	633.72	595.29	38.433	16.489	
10,200.00	10,188.50	9,681.42	9,549.23	22.22	20.92	-32.89	-3.54	-359.63	721.16	682.69	38.474	18.744	
10,239.04	10,227.54	9,687.64	9,551.71	22.30	20.92	-32.37	2.17	-359.67	755.90	717.39	38.509	19.629	
10,250.00	10,238.50	9,689.37	9,552.38	22.32	20.91	-18.09	3.75	-359.68	765.65	727.13	38.519	19.877	
10,275.00	10,263.46	9,700.00	9,556.41	22.37	20.91	-15.78	13.60	-359.76	787.62	749.05	38.574	20.418	
10,300.00	10,288.33	9,700.00	9,556.41	22.41	20.91	-14.50	13.60	-359.76	808.97	770.40	38.568	20.975	
10,325.00	10,313.03	9,700.00	9,556.41	22.45	20.91	-13.39	13.60	-359.76	829.87	791.31	38.562	21.520	
10,350.00	10,337.50	9,707.58	9,559.15	22.49	20.91	-12.12	20.67	-359.81	850.19	811.60	38.591	22.031	
10,375.00	10,361.67	9,712.74	9,560.95	22.52	20.90	-11.14	25.50	-359.84	869.95	831.34	38.606	22.534	
10,400.00	10,385.47	9,725.00	9,565.01	22.55	20.90	-10.06	37.07	-359.93	889.16	850.51	38.650	23.006	
10,425.00	10,408.83	9,725.00	9,565.01	22.58	20.90	-9.50	37.07	-359.93	907.59	868.95	38.640	23.489	
10,450.00	10,431.70	9,725.00	9,565.01	22.61	20.90	-9.01	37.07	-359.93	925.46	886.83	38.631	23.956	
10,475.00	10,454.01	9,735.32	9,568.20	22.63	20.89	-8.31	46.88	-360.00	942.58	903.92	38.660	24.381	
10,500.00	10,475.70	9,741.38	9,569.97	22.65	20.89	-7.79	52.67	-360.04	959.03	920.36	38.672	24.799	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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 - #104H - 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
10,525.00	10,496.71	9,750.00	9,572.37	22.67	20.89	-7.28	60.95	-360.10	974.76	936.07	38.692	25.193	
10,550.00	10,516.98	9,750.00	9,572.37	22.68	20.89	-7.00	60.95	-360.10	989.74	951.06	38.685	25.585	
10,575.00	10,536.45	9,760.34	9,575.04	22.69	20.88	-6.55	70.95	-360.18	1,003.93	965.22	38.708	25.936	
10,600.00	10,555.08	9,766.90	9,576.63	22.71	20.88	-6.22	77.30	-360.22	1,017.36	978.64	38.721	26.274	
10,625.00	10,572.82	9,775.00	9,578.47	22.72	20.88	-5.89	85.20	-360.28	1,029.99	991.25	38.738	26.589	
10,650.00	10,589.60	9,775.00	9,578.47	22.72	20.88	-5.73	85.20	-360.28	1,041.85	1,003.12	38.736	26.896	
10,675.00	10,605.40	9,787.12	9,580.97	22.73	20.88	-5.39	97.06	-360.37	1,052.81	1,014.04	38.763	27.160	
10,700.00	10,620.16	9,800.00	9,583.29	22.74	20.88	-5.07	109.72	-360.46	1,063.02	1,024.23	38.792	27.403	
10,725.00	10,633.84	9,800.00	9,583.29	22.74	20.88	-4.97	109.72	-360.46	1,072.28	1,033.49	38.796	27.639	
10,750.00	10,646.41	9,808.03	9,584.56	22.75	20.88	-4.76	117.65	-360.52	1,080.74	1,041.92	38.818	27.842	
10,775.00	10,657.83	9,815.12	9,585.58	22.75	20.89	-4.59	124.67	-360.57	1,088.33	1,049.49	38.839	28.021	
10,800.00	10,668.07	9,825.00	9,586.82	22.75	20.91	-4.39	134.47	-360.65	1,095.06	1,056.19	38.867	28.175	
10,825.00	10,677.10	9,825.00	9,586.82	22.76	20.91	-4.34	134.47	-360.65	1,100.91	1,062.02	38.885	28.312	
10,850.00	10,684.90	9,836.65	9,588.02	22.80	20.94	-4.15	146.06	-360.73	1,105.82	1,066.90	38.919	28.413	
10,875.00	10,691.45	9,850.00	9,589.05	22.89	20.99	-3.95	159.36	-360.83	1,109.93	1,070.97	38.956	28.492	
10,900.00	10,696.73	9,850.00	9,589.05	22.98	20.99	-3.92	159.36	-360.83	1,113.03	1,074.04	38.986	28.549	
10,925.00	10,700.72	9,858.45	9,589.51	23.09	21.02	-3.80	167.80	-360.89	1,115.28	1,076.25	39.025	28.578	
10,950.00	10,703.41	9,865.74	9,589.79	23.20	21.05	-3.71	175.09	-360.94	1,116.63	1,077.56	39.067	28.582	
10,975.00	10,704.80	9,875.00	9,589.98	23.33	21.09	-3.60	184.34	-361.01	1,117.08	1,077.96	39.113	28.560	
10,991.13	10,705.00	9,877.77	9,590.00	23.41	21.11	-3.57	187.11	-361.03	1,116.88	1,077.73	39.144	28.532	
11,000.00	10,704.96	9,882.27	9,590.00	23.45	21.13	-3.52	191.61	-361.07	1,116.70	1,077.53	39.162	28.515	
11,100.00	10,704.52	9,973.81	9,589.60	24.05	21.61	-2.58	283.15	-361.74	1,115.57	1,076.17	39.398	28.315	
11,200.00	10,704.09	10,072.36	9,589.17	24.76	22.24	-1.73	381.70	-362.46	1,114.93	1,075.24	39.686	28.094	
11,300.00	10,703.65	10,171.45	9,588.74	25.57	23.00	-1.05	480.78	-363.19	1,114.60	1,074.57	40.028	27.846	
11,400.00	10,703.21	10,270.94	9,588.30	26.47	23.87	-0.53	580.27	-363.92	1,114.46	1,074.04	40.424	27.570	
11,500.00	10,702.77	10,370.73	9,587.86	27.44	24.85	-0.19	680.05	-364.66	1,114.42	1,073.55	40.872	27.266	
11,587.91	10,702.39	10,458.59	9,587.48	28.35	25.79	-0.03	767.91	-365.30	1,114.42	1,073.11	41.309	26.977	
11,600.00	10,702.33	10,470.68	9,587.43	28.48	25.92	-0.02	780.00	-365.39	1,114.42	1,073.05	41.371	26.937	
11,636.42	10,702.18	10,507.10	9,587.27	28.87	26.32	-0.01	816.42	-365.66	1,114.42	1,072.86	41.562	26.814	
11,700.00	10,701.90	10,570.68	9,586.99	29.58	27.08	-0.01	879.99	-366.13	1,114.42	1,072.50	41.919	26.585	
11,800.00	10,701.46	10,670.68	9,586.55	30.74	28.30	-0.01	979.99	-366.86	1,114.42	1,071.91	42.511	26.215	
11,900.00	10,701.03	10,770.68	9,586.11	31.97	29.59	-0.01	1,079.99	-367.60	1,114.42	1,071.28	43.144	25.830	
12,000.00	10,700.59	10,870.68	9,585.68	33.25	30.94	-0.01	1,179.98	-368.34	1,114.42	1,070.61	43.818	25.433	
12,100.00	10,700.16	10,970.68	9,585.24	34.58	32.34	-0.01	1,279.98	-369.07	1,114.43	1,069.90	44.530	25.026	
12,200.00	10,699.72	11,070.68	9,584.80	35.96	33.78	-0.01	1,379.98	-369.81	1,114.43	1,069.15	45.279	24.613	
12,300.00	10,699.28	11,170.68	9,584.37	37.38	35.25	-0.01	1,479.97	-370.54	1,114.43	1,068.37	46.061	24.194	
12,400.00	10,698.85	11,270.68	9,583.93	38.84	36.77	-0.01	1,579.97	-371.28	1,114.43	1,067.56	46.877	23.773	
12,500.00	10,698.41	11,370.68	9,583.49	40.33	38.31	-0.01	1,679.97	-372.01	1,114.43	1,066.71	47.724	23.352	
12,600.00	10,697.98	11,470.68	9,583.05	41.85	39.87	-0.01	1,779.96	-372.75	1,114.44	1,065.84	48.600	22.931	
12,700.00	10,697.54	11,570.68	9,582.62	43.39	41.46	-0.01	1,879.96	-373.48	1,114.44	1,064.93	49.504	22.512	
12,800.00	10,697.11	11,670.68	9,582.18	44.96	43.07	-0.01	1,979.95	-374.22	1,114.44	1,064.00	50.435	22.097	
12,900.00	10,696.67	11,770.68	9,581.74	46.54	44.70	-0.01	2,079.95	-374.96	1,114.44	1,063.05	51.390	21.686	
13,000.00	10,696.24	11,870.68	9,581.30	48.15	46.35	-0.01	2,179.95	-375.69	1,114.44	1,062.07	52.369	21.280	
13,100.00	10,695.80	11,970.68	9,580.87	49.77	48.01	-0.01	2,279.94	-376.43	1,114.44	1,061.07	53.371	20.881	
13,200.00	10,695.36	12,070.68	9,580.43	51.41	49.68	-0.01	2,379.94	-377.16	1,114.45	1,060.05	54.393	20.489	
13,300.00	10,694.93	12,170.68	9,579.99	53.06	51.37	-0.01	2,479.94	-377.90	1,114.45	1,059.01	55.436	20.104	
13,400.00	10,694.49	12,270.68	9,579.55	54.73	53.07	-0.01	2,579.93	-378.63	1,114.45	1,057.95	56.497	19.726	
13,500.00	10,694.06	12,370.68	9,579.12	56.40	54.77	0.00	2,679.93	-379.37	1,114.45	1,056.88	57.575	19.356	
13,600.00	10,693.62	12,470.68	9,578.68	58.09	56.49	0.00	2,779.92	-380.10	1,114.45	1,055.78	58.671	18.995	
13,700.00	10,693.19	12,570.68	9,578.24	59.79	58.22	0.00	2,879.92	-380.84	1,114.46	1,054.67	59.782	18.642	
13,800.00	10,692.75	12,670.68	9,577.80	61.49	59.95	0.00	2,979.92	-381.58	1,114.46	1,053.55	60.909	18.297	
13,900.00	10,692.32	12,770.68	9,577.37	63.20	61.69	0.00	3,079.91	-382.31	1,114.46	1,052.41	62.050	17.961	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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 - #104H - 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	10,691.88	12,870.68	9,576.93	64.92	63.43	0.00	3,179.91	-383.05	1,114.46	1,051.26	63.203	17.633	
14,100.00	10,691.44	12,970.68	9,576.49	66.65	65.18	0.00	3,279.91	-383.78	1,114.46	1,050.09	64.370	17.313	
14,200.00	10,691.01	13,070.68	9,576.06	68.39	66.94	0.00	3,379.90	-384.52	1,114.46	1,048.92	65.549	17.002	
14,300.00	10,690.57	13,170.68	9,575.62	70.13	68.70	0.00	3,479.90	-385.25	1,114.47	1,047.73	66.739	16.699	
14,400.00	10,690.14	13,270.68	9,575.18	71.87	70.46	0.00	3,579.90	-385.99	1,114.47	1,046.53	67.940	16.404	
14,500.00	10,689.70	13,370.68	9,574.74	73.62	72.23	0.00	3,679.89	-386.72	1,114.47	1,045.32	69.151	16.117	
14,600.00	10,689.27	13,470.68	9,574.31	75.38	74.01	0.00	3,779.89	-387.46	1,114.47	1,044.10	70.372	15.837	
14,700.00	10,688.83	13,570.68	9,573.87	77.14	75.79	0.00	3,879.88	-388.20	1,114.47	1,042.87	71.601	15.565	
14,800.00	10,688.40	13,670.68	9,573.43	78.90	77.57	0.00	3,979.88	-388.93	1,114.48	1,041.64	72.840	15.300	
14,900.00	10,687.96	13,770.68	9,572.99	80.67	79.35	0.00	4,079.88	-389.67	1,114.48	1,040.39	74.087	15.043	
15,000.00	10,687.52	13,870.68	9,572.56	82.44	81.14	0.00	4,179.87	-390.40	1,114.48	1,039.14	75.342	14.792	
15,100.00	10,687.09	13,970.68	9,572.12	84.22	82.93	0.00	4,279.87	-391.14	1,114.48	1,037.88	76.604	14.549	
15,200.00	10,686.65	14,070.68	9,571.68	86.00	84.72	0.00	4,379.87	-391.87	1,114.48	1,036.61	77.874	14.311	
15,300.00	10,686.22	14,170.68	9,571.24	87.78	86.52	0.00	4,479.86	-392.61	1,114.48	1,035.33	79.150	14.081	
15,400.00	10,685.78	14,270.68	9,570.81	89.56	88.31	0.00	4,579.86	-393.34	1,114.49	1,034.05	80.433	13.856	
15,500.00	10,685.35	14,370.68	9,570.37	91.35	90.11	0.00	4,679.86	-394.08	1,114.49	1,032.77	81.722	13.638	
15,579.47	10,685.00	14,450.15	9,570.02	92.77	91.54	0.00	4,759.33	-394.66	1,114.49	1,031.74	82.750	13.468	

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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
0.00	0.00	0.40	-0.40	0.00	0.00	-90.38	-0.20	-30.00	30.00				
100.00	100.00	100.40	99.60	0.08	0.09	-90.38	-0.20	-30.00	30.00	29.83	.169	177.022	
200.00	200.00	200.40	199.60	0.31	0.31	-90.38	-0.20	-30.00	30.00	29.38	.619	48.466	
300.00	300.00	300.40	299.60	0.53	0.53	-90.38	-0.20	-30.00	30.00	28.93	1.069	28.076	
400.00	400.00	400.40	399.60	0.76	0.76	-90.38	-0.20	-30.00	30.00	28.48	1.518	19.762	
500.00	500.00	500.40	499.60	0.98	0.98	-90.38	-0.20	-30.00	30.00	28.03	1.968	15.247	
600.00	600.00	600.40	599.60	1.21	1.21	-90.38	-0.20	-30.00	30.00	27.58	2.417	12.412	
700.00	700.00	700.40	699.60	1.43	1.43	-90.38	-0.20	-30.00	30.00	27.13	2.867	10.465	
800.00	800.00	800.40	799.60	1.66	1.66	-90.38	-0.20	-30.00	30.00	26.68	3.316	9.047	
900.00	900.00	900.40	899.60	1.88	1.88	-90.38	-0.20	-30.00	30.00	26.23	3.766	7.967	
1,000.00	1,000.00	1,000.40	999.60	2.11	2.11	-90.38	-0.20	-30.00	30.00	25.79	4.215	7.117	
1,100.00	1,100.00	1,100.40	1,099.60	2.33	2.33	-90.38	-0.20	-30.00	30.00	25.34	4.665	6.431	
1,200.00	1,200.00	1,200.40	1,199.60	2.56	2.56	-90.38	-0.20	-30.00	30.00	24.89	5.114	5.866	
1,300.00	1,300.00	1,300.40	1,299.60	2.78	2.78	-90.38	-0.20	-30.00	30.00	24.44	5.564	5.392	
1,400.00	1,400.00	1,400.40	1,399.60	3.01	3.01	-90.38	-0.20	-30.00	30.00	23.99	6.013	4.989	
1,500.00	1,500.00	1,500.40	1,499.60	3.23	3.23	-90.38	-0.20	-30.00	30.00	23.54	6.463	4.642	
1,600.00	1,600.00	1,600.40	1,599.60	3.46	3.46	-90.38	-0.20	-30.00	30.00	23.09	6.912	4.340	
1,700.00	1,700.00	1,700.40	1,699.60	3.68	3.68	-90.38	-0.20	-30.00	30.00	22.64	7.362	4.075	
1,800.00	1,800.00	1,800.40	1,799.60	3.91	3.91	-90.38	-0.20	-30.00	30.00	22.19	7.812	3.841	
1,900.00	1,900.00	1,900.40	1,899.60	4.13	4.13	-90.38	-0.20	-30.00	30.00	21.74	8.261	3.632	
2,000.00	2,000.00	2,000.40	1,999.60	4.35	4.36	-90.38	-0.20	-30.00	30.00	21.29	8.711	3.444	
2,100.00	2,100.00	2,100.40	2,099.60	4.58	4.58	-90.38	-0.20	-30.00	30.00	20.84	9.160	3.275	
2,200.00	2,200.00	2,200.40	2,199.60	4.80	4.81	-90.38	-0.20	-30.00	30.00	20.39	9.610	3.122	
2,300.00	2,300.00	2,300.40	2,299.60	5.03	5.03	-90.38	-0.20	-30.00	30.00	19.94	10.059	2.982	
2,400.00	2,400.00	2,400.40	2,399.60	5.25	5.25	-90.38	-0.20	-30.00	30.00	19.49	10.509	2.855	
2,500.00	2,500.00	2,500.40	2,499.60	5.48	5.48	-90.38	-0.20	-30.00	30.00	19.04	10.958	2.738	
2,600.00	2,600.00	2,600.40	2,599.60	5.70	5.70	-90.38	-0.20	-30.00	30.00	18.59	11.408	2.630	
2,700.00	2,700.00	2,700.40	2,699.60	5.93	5.93	-90.38	-0.20	-30.00	30.00	18.14	11.857	2.530	
2,800.00	2,800.00	2,800.40	2,799.60	6.15	6.15	-90.38	-0.20	-30.00	30.00	17.69	12.307	2.438	
2,900.00	2,900.00	2,900.40	2,899.60	6.38	6.38	-90.38	-0.20	-30.00	30.00	17.24	12.756	2.352	
3,000.00	3,000.00	3,000.40	2,999.60	6.60	6.60	-90.38	-0.20	-30.00	30.00	16.79	13.206	2.272	
3,100.00	3,100.00	3,100.40	3,099.60	6.83	6.83	-90.38	-0.20	-30.00	30.00	16.35	13.655	2.197	
3,200.00	3,200.00	3,200.40	3,199.60	7.05	7.05	-90.38	-0.20	-30.00	30.00	15.90	14.105	2.127	
3,300.00	3,300.00	3,300.40	3,299.60	7.28	7.28	-90.38	-0.20	-30.00	30.00	15.45	14.554	2.061	
3,400.00	3,400.00	3,400.40	3,399.60	7.50	7.50	-90.38	-0.20	-30.00	30.00	15.00	15.004	2.000	
3,500.00	3,500.00	3,499.60	3,499.60	7.73	7.73	-90.38	-0.20	-30.00	30.00	14.55	15.452	1.942	CC, ES, SF
3,600.00	3,600.00	3,599.07	3,599.06	7.95	7.92	-92.20	-1.18	-30.83	30.85	14.98	15.873	1.944	
3,700.00	3,700.00	3,698.41	3,698.32	8.18	8.10	-97.10	-4.15	-33.31	33.59	17.33	16.265	2.065	
3,800.00	3,800.00	3,802.54	3,797.16	8.40	8.29	-103.61	-9.07	-37.44	38.60	21.94	16.660	2.317	
3,900.00	3,900.00	3,902.85	3,896.54	8.63	8.47	-109.52	-15.06	-42.47	45.16	28.10	17.062	2.647	
4,000.00	4,000.00	4,003.16	3,995.93	8.85	8.66	-113.90	-21.05	-47.50	52.08	34.61	17.467	2.982	
4,100.00	4,099.99	4,096.63	4,095.40	9.05	8.84	31.37	-27.05	-52.53	58.11	40.28	17.835	3.258	
4,200.00	4,199.91	4,203.46	4,195.01	9.22	9.05	30.35	-33.05	-57.57	61.98	43.77	18.206	3.404	
4,266.67	4,266.45	4,263.19	4,261.46	9.34	9.17	30.40	-37.06	-60.93	63.31	44.87	18.434	3.434	
4,300.00	4,299.70	4,303.47	4,294.69	9.40	9.25	30.56	-39.06	-62.61	63.72	45.15	18.569	3.432	
4,400.00	4,399.46	4,396.52	4,394.37	9.58	9.43	31.03	-45.07	-67.65	64.96	46.04	18.924	3.433	
4,500.00	4,499.22	4,496.51	4,494.05	9.76	9.64	31.49	-51.08	-72.70	66.21	46.91	19.297	3.431	
4,600.00	4,598.97	4,603.50	4,593.73	9.94	9.86	31.92	-57.09	-77.74	67.46	47.77	19.688	3.426	
4,700.00	4,698.73	4,696.49	4,693.42	10.13	10.06	32.35	-63.10	-82.78	68.72	48.66	20.057	3.426	
4,800.00	4,798.48	4,796.48	4,793.10	10.32	10.28	32.75	-69.11	-87.82	69.98	49.53	20.444	3.423	
4,900.00	4,898.24	4,903.53	4,892.78	10.52	10.51	33.14	-75.12	-92.87	71.24	50.39	20.849	3.417	
5,000.00	4,998.00	4,996.46	4,992.46	10.72	10.71	33.52	-81.13	-97.91	72.50	51.27	21.229	3.415	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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
5,100.00	5,097.75	5,096.45	5,092.15	10.92	10.93	33.89	-87.14	-102.95	73.77	52.14	21.628	3.411	
5,200.00	5,197.51	5,203.56	5,191.83	11.12	11.17	34.24	-93.15	-107.99	75.04	53.00	22.045	3.404	
5,300.00	5,297.27	5,296.43	5,291.51	11.32	11.38	34.58	-99.16	-113.04	76.32	53.88	22.435	3.402	
5,400.00	5,397.02	5,403.58	5,391.20	11.53	11.63	34.91	-105.17	-118.08	77.60	54.74	22.859	3.394	
5,500.00	5,496.78	5,503.58	5,490.88	11.74	11.86	35.23	-111.18	-123.12	78.87	55.60	23.271	3.389	
5,600.00	5,596.54	5,603.59	5,590.56	11.95	12.09	35.54	-117.19	-128.17	80.16	56.47	23.686	3.384	
5,700.00	5,696.29	5,703.60	5,690.24	12.17	12.32	35.84	-123.20	-133.21	81.44	57.34	24.104	3.379	
5,800.00	5,796.05	5,803.61	5,789.93	12.38	12.55	36.13	-129.21	-138.25	82.73	58.20	24.525	3.373	
5,900.00	5,895.80	5,896.38	5,889.61	12.60	12.77	36.41	-135.22	-143.29	84.01	59.08	24.933	3.370	
6,000.00	5,995.56	6,003.63	5,989.29	12.82	13.02	36.68	-141.23	-148.34	85.30	59.93	25.374	3.362	
6,100.00	6,095.32	6,096.36	6,088.97	13.04	13.24	36.95	-147.24	-153.38	86.60	60.81	25.787	3.358	
6,200.00	6,195.07	6,203.65	6,188.66	13.26	13.50	37.21	-153.25	-158.42	87.89	61.66	26.233	3.350	
6,300.00	6,294.83	6,303.66	6,288.34	13.48	13.74	37.46	-159.26	-163.47	89.19	62.52	26.666	3.345	
6,400.00	6,394.59	6,403.67	6,388.02	13.71	13.98	37.70	-165.27	-168.51	90.48	63.38	27.101	3.339	
6,500.00	6,494.34	6,503.68	6,487.70	13.93	14.22	37.93	-171.28	-173.55	91.78	64.24	27.538	3.333	
6,600.00	6,594.10	6,603.69	6,587.39	14.16	14.47	38.16	-177.29	-178.59	93.08	65.10	27.977	3.327	
6,700.00	6,693.86	6,703.69	6,687.07	14.39	14.71	38.38	-183.30	-183.64	94.38	65.97	28.418	3.321	
6,800.00	6,793.61	6,796.30	6,786.75	14.62	14.94	38.60	-189.31	-188.68	95.69	66.84	28.844	3.317	
6,900.00	6,893.37	6,903.71	6,886.43	14.85	15.20	38.81	-195.32	-193.72	96.99	67.69	29.305	3.310	
7,000.00	6,993.13	7,003.72	6,986.12	15.08	15.45	39.02	-201.33	-198.77	98.30	68.55	29.752	3.304	
7,100.00	7,092.88	7,096.27	7,085.80	15.31	15.68	39.22	-207.34	-203.81	99.60	69.42	30.182	3.300	
7,200.00	7,192.64	7,203.74	7,185.48	15.54	15.94	39.41	-213.35	-208.85	100.91	70.26	30.648	3.293	
7,300.00	7,292.39	7,303.75	7,285.17	15.78	16.19	39.60	-219.36	-213.89	102.22	71.12	31.099	3.287	
7,400.00	7,392.15	7,396.24	7,384.85	16.01	16.42	39.78	-225.37	-218.94	103.53	72.00	31.534	3.283	
7,500.00	7,491.91	7,503.77	7,484.53	16.25	16.69	39.96	-231.38	-223.98	104.84	72.84	32.005	3.276	
7,600.00	7,591.66	7,596.22	7,584.21	16.48	16.92	40.14	-237.39	-229.02	106.15	73.71	32.443	3.272	
7,700.00	7,691.42	7,696.21	7,683.90	16.72	17.17	40.31	-243.39	-234.06	107.47	74.57	32.899	3.267	
7,800.00	7,791.18	7,803.79	7,783.58	16.96	17.44	40.48	-249.40	-239.11	108.78	75.41	33.373	3.260	
7,900.00	7,890.93	7,903.80	7,883.26	17.19	17.69	40.64	-255.41	-244.15	110.10	76.27	33.832	3.254	
8,000.00	7,990.69	8,003.81	7,982.94	17.43	17.94	40.80	-261.42	-249.19	111.41	77.12	34.292	3.249	
8,100.00	8,090.45	8,096.18	8,082.63	17.67	18.18	40.96	-267.43	-254.24	112.73	78.00	34.735	3.245	
8,200.00	8,190.20	8,203.83	8,182.31	17.91	18.45	41.11	-273.44	-259.28	114.05	78.83	35.214	3.239	
8,300.00	8,289.96	8,296.99	8,282.83	18.15	18.69	41.30	-279.40	-264.27	115.25	79.59	35.665	3.231	
8,400.00	8,389.72	8,399.55	8,385.22	18.39	18.93	42.07	-283.83	-267.99	114.74	78.58	36.154	3.174	
8,500.00	8,489.47	8,501.97	8,487.59	18.64	19.16	43.65	-286.16	-269.95	112.05	75.40	36.656	3.057	
8,600.00	8,589.23	8,603.21	8,588.83	18.88	19.36	46.09	-286.54	-270.27	107.50	70.33	37.166	2.892	
8,700.00	8,688.98	8,702.96	8,688.58	19.12	19.55	48.89	-286.54	-270.27	102.78	65.09	37.686	2.727	
8,800.00	8,788.74	8,802.72	8,788.34	19.36	19.74	51.95	-286.54	-270.27	98.32	60.11	38.218	2.573	
8,811.29	8,800.00	8,813.98	8,799.60	19.39	19.77	52.31	-286.54	-270.27	97.84	59.56	38.279	2.556	
8,900.00	8,888.56	8,902.54	8,888.16	19.60	19.94	54.74	-286.54	-270.27	94.77	56.03	38.739	2.446	
9,000.00	8,988.50	9,002.48	8,988.10	19.83	20.13	56.41	-286.54	-270.27	92.87	53.66	39.213	2.368	
9,077.95	9,066.45	9,080.43	9,066.05	19.99	20.28	-91.19	-286.54	-270.27	92.44	52.90	39.542	2.338	
9,100.00	9,088.50	9,102.47	9,088.10	20.03	20.33	-91.19	-286.54	-270.27	92.44	52.81	39.629	2.333	
9,200.00	9,188.50	9,202.47	9,188.10	20.23	20.52	-91.19	-286.54	-270.27	92.44	52.41	40.027	2.309	
9,300.00	9,288.50	9,302.47	9,288.10	20.42	20.72	-91.19	-286.54	-270.27	92.44	52.01	40.425	2.287	
9,400.00	9,388.50	9,402.47	9,388.10	20.62	20.91	-91.19	-286.54	-270.27	92.44	51.61	40.825	2.264	
9,500.00	9,488.50	9,502.47	9,488.10	20.82	21.11	-91.19	-286.54	-270.27	92.44	51.21	41.225	2.242	
9,600.00	9,588.50	9,602.47	9,588.10	21.02	21.31	-91.19	-286.54	-270.27	92.44	50.81	41.627	2.221	
9,700.00	9,688.50	9,702.47	9,688.10	21.22	21.51	-91.19	-286.54	-270.27	92.44	50.41	42.029	2.199	
9,703.88	9,692.37	9,706.35	9,691.97	21.22	21.51	-91.19	-286.54	-270.27	92.44	50.39	42.045	2.199	
9,800.00	9,788.50	9,801.00	9,786.51	21.42	21.69	-89.31	-283.51	-270.70	92.86	50.39	42.476	2.186	
9,900.00	9,888.50	9,894.16	9,877.46	21.62	21.82	-77.95	-264.24	-273.39	98.26	55.22	43.041	2.283	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
10,000.00	9,988.50	9,977.11	9,953.92	21.82	21.90	-62.52	-232.64	-277.80	117.72	74.55	43.176	2.727	
10,100.00	10,088.50	10,047.40	10,013.58	22.02	21.94	-49.84	-195.95	-282.92	156.38	113.67	42.709	3.662	
10,200.00	10,188.50	10,105.34	10,058.23	22.22	21.96	-41.35	-159.45	-288.02	211.35	169.21	42.139	5.016	
10,239.04	10,227.54	10,125.00	10,072.33	22.30	21.96	-38.93	-145.88	-289.92	236.17	194.21	41.959	5.629	
10,250.00	10,238.50	10,130.25	10,076.00	22.32	21.96	-24.52	-142.16	-290.44	243.32	201.41	41.911	5.806	
10,275.00	10,263.46	10,142.33	10,084.28	22.37	21.97	-22.31	-133.45	-291.65	259.43	217.62	41.807	6.205	
10,300.00	10,288.33	10,154.43	10,092.35	22.41	21.97	-20.39	-124.52	-292.90	275.18	233.47	41.707	6.598	
10,325.00	10,313.03	10,166.54	10,100.19	22.45	21.97	-18.72	-115.38	-294.18	290.53	248.92	41.614	6.982	
10,350.00	10,337.50	10,178.67	10,107.81	22.49	21.97	-17.26	-106.03	-295.48	305.47	263.95	41.525	7.356	
10,375.00	10,361.67	10,190.81	10,115.19	22.52	21.97	-15.98	-96.49	-296.81	319.96	278.52	41.441	7.721	
10,400.00	10,385.47	10,200.00	10,120.62	22.55	21.97	-14.99	-89.14	-297.84	334.00	292.67	41.323	8.083	
10,425.00	10,408.83	10,215.12	10,129.23	22.58	21.97	-13.85	-76.84	-299.56	347.50	306.21	41.287	8.417	
10,450.00	10,431.70	10,225.00	10,134.65	22.61	21.97	-13.05	-68.65	-300.70	360.52	319.33	41.190	8.753	
10,475.00	10,454.01	10,239.46	10,142.26	22.63	21.97	-12.17	-56.48	-302.40	372.99	331.84	41.149	9.064	
10,500.00	10,475.70	10,250.00	10,147.57	22.65	21.97	-11.50	-47.46	-303.66	384.94	343.87	41.071	9.373	
10,525.00	10,496.71	10,263.82	10,154.23	22.67	21.97	-10.81	-35.46	-305.34	396.33	355.30	41.030	9.660	
10,550.00	10,516.98	10,275.00	10,159.35	22.68	21.97	-10.26	-25.63	-306.71	407.16	366.19	40.968	9.938	
10,575.00	10,536.45	10,288.21	10,165.11	22.69	21.97	-9.71	-13.85	-308.35	417.40	376.48	40.928	10.199	
10,600.00	10,555.08	10,300.00	10,169.97	22.71	21.97	-9.24	-3.21	-309.84	427.07	386.19	40.882	10.446	
10,625.00	10,572.82	10,312.62	10,174.87	22.72	21.97	-8.80	8.30	-311.45	436.14	395.29	40.846	10.678	
10,650.00	10,589.60	10,325.00	10,179.39	22.72	21.97	-8.40	19.72	-313.04	444.60	403.79	40.815	10.893	
10,675.00	10,605.40	10,337.03	10,183.48	22.73	21.97	-8.04	30.93	-314.61	452.46	411.67	40.786	11.094	
10,700.00	10,620.16	10,350.00	10,187.58	22.74	21.97	-7.69	43.11	-316.31	459.70	418.93	40.769	11.276	
10,725.00	10,633.84	10,361.46	10,190.92	22.74	21.97	-7.40	53.97	-317.82	466.31	425.56	40.749	11.444	
10,750.00	10,646.41	10,375.00	10,194.52	22.75	21.98	-7.10	66.89	-319.63	472.30	431.55	40.747	11.591	
10,775.00	10,657.83	10,385.90	10,197.16	22.75	21.99	-6.86	77.36	-321.09	477.64	436.90	40.740	11.724	
10,800.00	10,668.07	10,400.00	10,200.20	22.75	22.02	-6.60	91.00	-323.00	482.36	441.61	40.750	11.837	
10,825.00	10,677.10	10,410.34	10,202.18	22.76	22.05	-6.41	101.05	-324.40	486.42	445.66	40.758	11.934	
10,850.00	10,684.90	10,425.00	10,204.60	22.80	22.10	-6.18	115.37	-326.40	489.85	449.06	40.781	12.012	
10,875.00	10,691.45	10,434.78	10,205.97	22.89	22.14	-6.02	124.96	-327.74	492.60	451.80	40.805	12.072	
10,900.00	10,696.73	10,450.00	10,207.70	22.98	22.20	-5.81	139.94	-329.83	494.73	453.89	40.841	12.114	
10,925.00	10,700.72	10,459.23	10,208.52	23.09	22.24	-5.69	149.04	-331.10	496.17	455.29	40.883	12.137	
10,950.00	10,703.41	10,475.00	10,209.50	23.20	22.31	-5.50	164.63	-333.28	497.00	456.07	40.932	12.142	
10,975.00	10,704.80	10,483.67	10,209.82	23.33	22.35	-5.41	173.22	-334.48	497.12	456.13	40.993	12.127	
10,991.13	10,705.00	10,491.56	10,209.97	23.41	22.39	-5.33	181.02	-335.57	496.87	455.83	41.035	12.108	
11,000.00	10,704.96	10,499.00	10,210.00	23.45	22.42	-5.25	188.39	-336.60	496.71	455.66	41.055	12.099	
11,100.00	10,704.52	10,593.65	10,209.59	24.05	22.94	-4.29	282.33	-348.14	495.93	454.64	41.290	12.011	
11,200.00	10,704.09	10,694.40	10,209.15	24.76	23.61	-3.26	382.68	-357.00	495.34	453.78	41.560	11.919	
11,300.00	10,703.65	10,794.83	10,208.71	25.57	24.38	-2.23	482.96	-362.33	494.91	453.04	41.877	11.818	
11,400.00	10,703.21	10,894.87	10,208.27	26.47	25.24	-1.20	582.99	-364.19	494.65	452.41	42.243	11.710	
11,500.00	10,702.77	11,005.35	10,207.83	27.44	26.30	-0.44	682.77	-364.92	494.56	451.87	42.690	11.585	
11,600.00	10,702.33	11,105.40	10,207.40	28.48	27.35	-0.08	782.71	-365.65	494.54	451.38	43.166	11.457	
11,612.14	10,702.28	11,106.74	10,207.34	28.61	27.36	-0.06	794.85	-365.74	494.54	451.34	43.198	11.448	
11,636.42	10,702.18	11,131.02	10,207.24	28.87	27.63	-0.05	819.13	-365.92	494.54	451.22	43.325	11.415	
11,700.00	10,701.90	11,205.40	10,206.96	29.58	28.47	-0.05	882.71	-366.38	494.54	450.85	43.692	11.319	
11,800.00	10,701.46	11,305.40	10,206.52	30.74	29.67	-0.05	982.70	-367.11	494.54	450.28	44.260	11.174	
11,900.00	10,701.03	11,394.60	10,206.09	31.97	30.80	-0.04	1,082.70	-367.84	494.55	449.71	44.835	11.030	
12,000.00	10,700.59	11,505.40	10,205.65	33.25	32.26	-0.04	1,182.70	-368.57	494.55	449.03	45.518	10.865	
12,100.00	10,700.16	11,605.40	10,205.21	34.58	33.63	-0.04	1,282.69	-369.30	494.55	448.34	46.204	10.704	
12,200.00	10,699.72	11,705.40	10,204.78	35.96	35.04	-0.04	1,382.69	-370.03	494.55	447.62	46.926	10.539	
12,300.00	10,699.28	11,805.40	10,204.34	37.38	36.49	-0.04	1,482.68	-370.76	494.55	446.87	47.682	10.372	
12,400.00	10,698.85	11,905.40	10,203.90	38.84	37.98	-0.04	1,582.68	-371.49	494.55	446.08	48.471	10.203	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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
12,500.00	10,698.41	11,994.60	10,203.46	40.33	39.33	-0.04	1,682.68	-372.22	494.55	445.31	49.244	10.043	
12,600.00	10,697.98	12,105.40	10,203.03	41.85	41.04	-0.04	1,782.67	-372.95	494.56	444.42	50.140	9.864	
12,700.00	10,697.54	12,205.40	10,202.59	43.39	42.60	-0.03	1,882.67	-373.68	494.56	443.54	51.017	9.694	
12,800.00	10,697.11	12,305.40	10,202.15	44.96	44.19	-0.03	1,982.67	-374.41	494.56	442.64	51.921	9.525	
12,900.00	10,696.67	12,405.40	10,201.72	46.54	45.80	-0.03	2,082.66	-375.14	494.56	441.71	52.850	9.358	
13,000.00	10,696.24	12,505.40	10,201.28	48.15	47.43	-0.03	2,182.66	-375.87	494.56	440.76	53.803	9.192	
13,100.00	10,695.80	12,605.40	10,200.84	49.77	49.07	-0.03	2,282.66	-376.60	494.56	439.78	54.778	9.028	
13,200.00	10,695.36	12,694.60	10,200.41	51.41	50.55	-0.03	2,382.65	-377.32	494.56	438.84	55.720	8.876	
13,300.00	10,694.93	12,794.60	10,199.97	53.06	52.22	-0.03	2,482.65	-378.05	494.56	437.83	56.737	8.717	
13,400.00	10,694.49	12,905.40	10,199.53	54.73	54.08	-0.03	2,582.64	-378.78	494.57	436.74	57.830	8.552	
13,500.00	10,694.06	13,005.40	10,199.10	56.40	55.77	-0.03	2,682.64	-379.51	494.57	435.68	58.885	8.399	
13,600.00	10,693.62	13,105.40	10,198.66	58.09	57.47	-0.02	2,782.64	-380.24	494.57	434.61	59.957	8.249	
13,700.00	10,693.19	13,205.40	10,198.22	59.79	59.19	-0.02	2,882.63	-380.97	494.57	433.52	61.046	8.102	
13,800.00	10,692.75	13,305.40	10,197.78	61.49	60.90	-0.02	2,982.63	-381.70	494.57	432.42	62.151	7.958	
13,900.00	10,692.32	13,394.60	10,197.35	63.20	62.44	-0.02	3,082.63	-382.43	494.57	431.36	63.208	7.825	
14,000.00	10,691.88	13,505.40	10,196.91	64.92	64.36	-0.02	3,182.62	-383.16	494.57	430.17	64.403	7.679	
14,100.00	10,691.44	13,605.40	10,196.47	66.65	66.10	-0.02	3,282.62	-383.89	494.58	429.03	65.549	7.545	
14,200.00	10,691.01	13,705.40	10,196.04	68.39	67.85	-0.02	3,382.62	-384.62	494.58	427.87	66.708	7.414	
14,300.00	10,690.57	13,805.40	10,195.60	70.13	69.60	-0.02	3,482.61	-385.35	494.58	426.70	67.878	7.286	
14,400.00	10,690.14	13,905.40	10,195.16	71.87	71.36	-0.01	3,582.61	-386.08	494.58	425.52	69.060	7.162	
14,500.00	10,689.70	13,994.60	10,194.73	73.62	72.93	-0.01	3,682.60	-386.81	494.58	424.39	70.187	7.047	
14,600.00	10,689.27	14,094.60	10,194.29	75.38	74.69	-0.01	3,782.60	-387.54	494.58	423.19	71.390	6.928	
14,700.00	10,688.83	14,205.40	10,193.85	77.14	76.65	-0.01	3,882.60	-388.27	494.58	421.92	72.668	6.806	
14,800.00	10,688.40	14,294.60	10,193.42	78.90	78.23	-0.01	3,982.59	-389.00	494.58	420.76	73.823	6.700	
14,900.00	10,687.96	14,405.40	10,192.98	80.67	80.20	-0.01	4,082.59	-389.73	494.59	419.47	75.121	6.584	
15,000.00	10,687.52	14,505.40	10,192.54	82.44	81.98	-0.01	4,182.59	-390.46	494.59	418.23	76.360	6.477	
15,100.00	10,687.09	14,594.60	10,192.10	84.22	83.57	-0.01	4,282.58	-391.19	494.59	417.05	77.538	6.379	
15,200.00	10,686.65	14,705.40	10,191.67	86.00	85.55	0.00	4,382.58	-391.92	494.59	415.73	78.861	6.272	
15,300.00	10,686.22	14,805.40	10,191.23	87.78	87.34	0.00	4,482.58	-392.65	494.59	414.47	80.122	6.173	
15,400.00	10,685.78	14,905.40	10,190.79	89.56	89.13	0.00	4,582.57	-393.37	494.59	413.20	81.391	6.077	
15,500.00	10,685.35	14,994.60	10,190.36	91.35	90.73	0.00	4,682.57	-394.10	494.59	412.00	82.596	5.988	
15,579.47	10,685.00	15,074.08	10,190.01	92.77	92.16	0.00	4,762.04	-394.68	494.60	410.98	83.614	5.915	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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	0.00	0.00	0.00	0.00	89.43	0.30	30.00	30.00				
100.00	100.00	100.00	100.00	0.08	0.08	89.43	0.30	30.00	30.00	29.83	.169	177.971	
200.00	200.00	200.00	200.00	0.31	0.31	89.43	0.30	30.00	30.00	29.38	.618	48.538	
300.00	300.00	300.00	300.00	0.53	0.53	89.43	0.30	30.00	30.00	28.93	1.068	28.101	
400.00	400.00	400.00	400.00	0.76	0.76	89.43	0.30	30.00	30.00	28.48	1.517	19.775	
500.00	500.00	500.00	500.00	0.98	0.98	89.43	0.30	30.00	30.00	28.03	1.967	15.255	
600.00	600.00	600.00	600.00	1.21	1.21	89.43	0.30	30.00	30.00	27.59	2.416	12.417	
700.00	700.00	700.00	700.00	1.43	1.43	89.43	0.30	30.00	30.00	27.14	2.866	10.469	
800.00	800.00	800.00	800.00	1.66	1.66	89.43	0.30	30.00	30.00	26.69	3.315	9.049	
900.00	900.00	900.00	900.00	1.88	1.88	89.43	0.30	30.00	30.00	26.24	3.765	7.969	
1,000.00	1,000.00	1,000.00	1,000.00	2.11	2.11	89.43	0.30	30.00	30.00	25.79	4.214	7.119	
1,100.00	1,100.00	1,100.00	1,100.00	2.33	2.33	89.43	0.30	30.00	30.00	25.34	4.664	6.433	
1,200.00	1,200.00	1,200.00	1,200.00	2.56	2.56	89.43	0.30	30.00	30.00	24.89	5.113	5.867	
1,300.00	1,300.00	1,300.00	1,300.00	2.78	2.78	89.43	0.30	30.00	30.00	24.44	5.563	5.393	
1,400.00	1,400.00	1,400.00	1,400.00	3.01	3.01	89.43	0.30	30.00	30.00	23.99	6.012	4.990	
1,500.00	1,500.00	1,500.00	1,500.00	3.23	3.23	89.43	0.30	30.00	30.00	23.54	6.462	4.643	
1,600.00	1,600.00	1,600.00	1,600.00	3.46	3.46	89.43	0.30	30.00	30.00	23.09	6.912	4.341	
1,700.00	1,700.00	1,700.00	1,700.00	3.68	3.68	89.43	0.30	30.00	30.00	22.64	7.361	4.076	
1,800.00	1,800.00	1,800.00	1,800.00	3.91	3.91	89.43	0.30	30.00	30.00	22.19	7.811	3.841	
1,900.00	1,900.00	1,900.00	1,900.00	4.13	4.13	89.43	0.30	30.00	30.00	21.74	8.260	3.632	
2,000.00	2,000.00	2,000.00	2,000.00	4.35	4.35	89.43	0.30	30.00	30.00	21.29	8.710	3.445	
2,100.00	2,100.00	2,100.00	2,100.00	4.58	4.58	89.43	0.30	30.00	30.00	20.84	9.159	3.276	
2,200.00	2,200.00	2,200.00	2,200.00	4.80	4.80	89.43	0.30	30.00	30.00	20.39	9.609	3.122	
2,300.00	2,300.00	2,300.00	2,300.00	5.03	5.03	89.43	0.30	30.00	30.00	19.94	10.058	2.983	
2,400.00	2,400.00	2,400.00	2,400.00	5.25	5.25	89.43	0.30	30.00	30.00	19.49	10.508	2.855	
2,500.00	2,500.00	2,500.00	2,500.00	5.48	5.48	89.43	0.30	30.00	30.00	19.04	10.957	2.738	
2,600.00	2,600.00	2,600.00	2,600.00	5.70	5.70	89.43	0.30	30.00	30.00	18.59	11.407	2.630	
2,700.00	2,700.00	2,700.00	2,700.00	5.93	5.93	89.43	0.30	30.00	30.00	18.15	11.856	2.530	
2,800.00	2,800.00	2,800.00	2,800.00	6.15	6.15	89.43	0.30	30.00	30.00	17.70	12.306	2.438	
2,900.00	2,900.00	2,900.00	2,900.00	6.38	6.38	89.43	0.30	30.00	30.00	17.25	12.755	2.352	
3,000.00	3,000.00	3,000.00	3,000.00	6.60	6.60	89.43	0.30	30.00	30.00	16.80	13.205	2.272	CC, ES
3,100.00	3,100.00	3,099.59	3,099.58	6.83	6.80	91.54	-0.82	30.65	30.66	17.04	13.625	2.250	SF
3,200.00	3,200.00	3,199.05	3,198.96	7.05	6.97	97.33	-4.19	32.59	32.88	18.86	14.017	2.345	
3,300.00	3,300.00	3,301.54	3,298.16	7.28	7.15	105.14	-9.68	35.76	37.09	22.68	14.415	2.573	
3,400.00	3,400.00	3,401.79	3,397.68	7.50	7.34	111.81	-15.70	39.24	42.33	27.51	14.816	2.857	
3,500.00	3,500.00	3,502.03	3,497.19	7.73	7.52	116.96	-21.73	42.72	48.01	32.79	15.221	3.154	
3,600.00	3,600.00	3,602.27	3,596.70	7.95	7.71	121.00	-27.76	46.20	54.00	38.37	15.629	3.455	
3,700.00	3,700.00	3,702.52	3,696.22	8.18	7.91	124.22	-33.78	49.68	60.20	44.16	16.039	3.753	
3,800.00	3,800.00	3,802.76	3,795.73	8.40	8.11	126.83	-39.81	53.16	66.55	50.10	16.453	4.045	
3,900.00	3,900.00	3,903.00	3,895.24	8.63	8.31	128.98	-45.84	56.64	73.02	56.15	16.868	4.329	
4,000.00	4,000.00	4,003.25	3,994.76	8.85	8.51	130.78	-51.86	60.12	79.57	62.28	17.286	4.603	
4,100.00	4,099.99	4,096.54	4,094.30	9.05	8.71	-80.45	-57.89	63.60	85.96	68.30	17.665	4.866	
4,200.00	4,199.91	4,203.65	4,193.86	9.22	8.93	-81.40	-63.92	67.08	91.94	73.90	18.049	5.094	
4,266.67	4,266.45	4,262.86	4,260.22	9.34	9.06	-82.82	-67.94	69.40	95.76	77.47	18.285	5.237	
4,300.00	4,299.70	4,303.89	4,293.38	9.40	9.15	-83.69	-69.95	70.56	97.65	79.23	18.426	5.300	
4,400.00	4,399.46	4,404.15	4,392.88	9.58	9.36	-86.10	-75.97	74.04	103.47	84.66	18.811	5.500	
4,500.00	4,499.22	4,504.41	4,492.38	9.76	9.58	-88.24	-82.00	77.51	109.44	90.24	19.201	5.700	
4,600.00	4,598.97	4,604.67	4,591.88	9.94	9.80	-90.16	-88.02	80.99	115.55	95.96	19.596	5.897	
4,700.00	4,698.73	4,704.93	4,691.38	10.13	10.02	-91.89	-94.05	84.47	121.78	101.78	19.997	6.090	
4,800.00	4,798.48	4,805.19	4,790.88	10.32	10.25	-93.45	-100.07	87.95	128.11	107.71	20.403	6.279	
4,900.00	4,898.24	4,905.44	4,890.37	10.52	10.47	-94.86	-106.10	91.43	134.53	113.71	20.814	6.463	
5,000.00	4,998.00	5,005.70	4,989.87	10.72	10.70	-96.14	-112.13	94.91	141.01	119.78	21.229	6.642	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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	5,097.75	5,105.96	5,089.37	10.92	10.93	-97.31	-118.15	98.39	147.57	125.92	21.649	6.816	
5,200.00	5,197.51	5,206.22	5,188.87	11.12	11.16	-98.38	-124.18	101.87	154.17	132.10	22.072	6.985	
5,300.00	5,297.27	5,293.52	5,288.37	11.32	11.36	-99.36	-130.20	105.35	160.83	138.36	22.471	7.157	
5,400.00	5,397.02	5,406.73	5,387.87	11.53	11.63	-100.27	-136.23	108.82	167.53	144.60	22.929	7.306	
5,500.00	5,496.78	5,506.99	5,487.37	11.74	11.86	-101.10	-142.25	112.30	174.27	150.91	23.363	7.459	
5,600.00	5,596.54	5,607.25	5,586.87	11.95	12.09	-101.87	-148.28	115.78	181.04	157.25	23.800	7.607	
5,700.00	5,696.29	5,707.51	5,686.37	12.17	12.33	-102.59	-154.30	119.26	187.85	163.61	24.239	7.750	
5,800.00	5,796.05	5,807.77	5,785.86	12.38	12.57	-103.25	-160.33	122.74	194.68	170.00	24.681	7.888	
5,900.00	5,895.80	5,908.03	5,885.36	12.60	12.81	-103.87	-166.36	126.22	201.53	176.41	25.126	8.021	
6,000.00	5,995.56	6,008.28	5,984.86	12.82	13.05	-104.45	-172.38	129.70	208.41	182.84	25.573	8.150	
6,100.00	6,095.32	6,108.54	6,084.36	13.04	13.29	-104.99	-178.41	133.18	215.31	189.28	26.023	8.274	
6,200.00	6,195.07	6,208.80	6,183.86	13.26	13.53	-105.50	-184.43	136.65	222.22	195.75	26.474	8.394	
6,300.00	6,294.83	6,290.94	6,283.36	13.48	13.72	-105.98	-190.46	140.13	229.15	202.27	26.887	8.523	
6,400.00	6,394.59	6,409.32	6,382.86	13.71	14.01	-106.43	-196.48	143.61	236.10	208.71	27.384	8.622	
6,500.00	6,494.34	6,509.57	6,482.36	13.93	14.25	-106.85	-202.51	147.09	243.06	215.22	27.841	8.730	
6,600.00	6,594.10	6,609.83	6,581.86	14.16	14.50	-107.25	-208.53	150.57	250.03	221.73	28.300	8.835	
6,700.00	6,693.86	6,689.91	6,681.35	14.39	14.69	-107.63	-214.56	154.05	257.01	228.30	28.714	8.951	
6,800.00	6,793.61	6,789.65	6,780.85	14.62	14.93	-107.99	-220.58	157.53	264.01	234.83	29.176	9.049	
6,900.00	6,893.37	6,889.39	6,880.35	14.85	15.18	-108.33	-226.61	161.01	271.01	241.37	29.638	9.144	
7,000.00	6,993.13	6,989.14	6,979.85	15.08	15.42	-108.65	-232.64	164.49	278.02	247.92	30.102	9.236	
7,100.00	7,092.88	7,088.88	7,079.35	15.31	15.67	-108.96	-238.66	167.96	285.04	254.48	30.568	9.325	
7,200.00	7,192.64	7,188.62	7,178.85	15.54	15.91	-109.25	-244.69	171.44	292.07	261.04	31.035	9.411	
7,300.00	7,292.39	7,288.36	7,278.35	15.78	16.16	-109.53	-250.71	174.92	299.11	267.61	31.503	9.495	
7,400.00	7,392.15	7,388.10	7,377.85	16.01	16.40	-109.80	-256.74	178.40	306.15	274.18	31.972	9.576	
7,500.00	7,491.91	7,487.84	7,477.35	16.25	16.65	-110.05	-262.76	181.88	313.20	280.76	32.442	9.654	
7,600.00	7,591.66	7,587.59	7,576.84	16.48	16.90	-110.29	-268.79	185.36	320.26	287.34	32.914	9.730	
7,700.00	7,691.42	7,687.33	7,676.34	16.72	17.14	-110.53	-274.81	188.84	327.32	293.93	33.386	9.804	
7,800.00	7,791.18	7,788.65	7,777.43	16.96	17.39	-110.76	-280.85	192.32	334.32	300.46	33.865	9.872	
7,900.00	7,890.93	7,894.57	7,883.21	17.19	17.64	-111.27	-285.32	194.90	340.02	305.67	34.354	9.898	
8,000.00	7,990.69	8,000.50	7,989.11	17.43	17.87	-112.14	-287.25	196.02	343.97	309.14	34.829	9.876	
8,100.00	8,090.45	8,101.83	8,090.45	17.67	18.07	-113.21	-287.33	196.06	346.72	311.45	35.271	9.830	
8,200.00	8,190.20	8,201.58	8,190.20	17.91	18.26	-114.26	-287.33	196.06	349.53	313.83	35.707	9.789	
8,300.00	8,289.96	8,301.34	8,289.96	18.15	18.45	-115.29	-287.33	196.06	352.46	316.32	36.143	9.752	
8,400.00	8,389.72	8,401.10	8,389.72	18.39	18.64	-116.31	-287.33	196.06	355.51	318.93	36.579	9.719	
8,500.00	8,489.47	8,500.85	8,489.47	18.64	18.83	-117.30	-287.33	196.06	358.66	321.64	37.014	9.690	
8,600.00	8,589.23	8,600.61	8,589.23	18.88	19.02	-118.28	-287.33	196.06	361.92	324.47	37.449	9.664	
8,700.00	8,688.98	8,700.37	8,688.98	19.12	19.22	-119.24	-287.33	196.06	365.28	327.40	37.883	9.642	
8,800.00	8,788.74	8,800.12	8,788.74	19.36	19.41	-120.19	-287.33	196.06	368.74	330.43	38.317	9.623	
8,811.29	8,800.00	8,811.38	8,800.00	19.39	19.43	-120.29	-287.33	196.06	369.14	330.77	38.366	9.621	
8,900.00	8,888.56	8,900.06	8,888.56	19.60	19.61	-121.01	-287.33	196.06	371.78	333.03	38.747	9.595	
9,000.00	8,988.50	9,000.12	8,988.50	19.83	19.80	-121.48	-287.33	196.06	373.51	334.35	39.166	9.537	
9,077.95	9,066.45	9,077.83	9,066.45	19.99	19.95	90.41	-287.33	196.06	373.93	334.45	39.481	9.471	
9,100.00	9,088.50	9,100.12	9,088.50	20.03	20.00	90.41	-287.33	196.06	373.93	334.36	39.568	9.450	
9,200.00	9,188.50	9,200.12	9,188.50	20.23	20.19	90.41	-287.33	196.06	373.93	333.96	39.965	9.356	
9,300.00	9,288.50	9,300.12	9,288.50	20.42	20.39	90.41	-287.33	196.06	373.93	333.57	40.362	9.264	
9,400.00	9,388.50	9,400.12	9,388.50	20.62	20.59	90.41	-287.33	196.06	373.93	333.17	40.761	9.174	
9,500.00	9,488.50	9,500.12	9,488.50	20.82	20.79	90.41	-287.33	196.06	373.93	332.77	41.161	9.085	
9,600.00	9,588.50	9,600.12	9,588.50	21.02	20.99	90.41	-287.33	196.06	373.93	332.37	41.562	8.997	
9,700.00	9,688.50	9,700.12	9,688.50	21.22	21.19	90.41	-287.33	196.06	373.93	331.97	41.963	8.911	
9,800.00	9,788.50	9,800.12	9,788.50	21.42	21.39	90.41	-287.33	196.06	373.93	331.56	42.366	8.826	
9,900.00	9,888.50	9,900.12	9,888.50	21.62	21.59	90.41	-287.33	196.06	373.93	331.16	42.770	8.743	
10,000.00	9,988.50	10,000.12	9,988.50	21.82	21.79	90.41	-287.33	196.06	373.93	330.75	43.174	8.661	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	***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
10,100.00	10,088.50	10,100.12	10,088.50	22.02	21.99	90.41	-287.33	196.06	373.93	330.35	43.580	8.580	
10,200.00	10,188.50	10,200.12	10,188.50	22.22	22.19	90.41	-287.33	196.06	373.93	329.94	43.986	8.501	
10,239.04	10,227.54	10,238.92	10,227.54	22.30	22.27	90.41	-287.33	196.06	373.93	329.78	44.145	8.471	
10,250.00	10,238.50	10,248.81	10,237.43	22.32	22.29	103.74	-287.23	196.08	373.97	329.79	44.186	8.464	
10,275.00	10,263.46	10,271.38	10,259.97	22.37	22.33	103.70	-286.24	196.22	374.42	330.14	44.276	8.456	
10,300.00	10,288.33	10,293.93	10,282.43	22.41	22.37	103.62	-284.20	196.52	375.33	330.98	44.358	8.462	
10,325.00	10,313.03	10,316.47	10,304.75	22.45	22.41	103.50	-281.11	196.97	376.72	332.29	44.431	8.479	
10,350.00	10,337.50	10,338.99	10,326.88	22.49	22.44	103.34	-276.99	197.58	378.57	334.07	44.496	8.508	
10,375.00	10,361.67	10,361.48	10,348.75	22.52	22.47	103.14	-271.86	198.33	380.88	336.33	44.554	8.549	
10,400.00	10,385.47	10,383.93	10,370.33	22.55	22.50	102.90	-265.71	199.23	383.64	339.04	44.605	8.601	
10,425.00	10,408.83	10,406.34	10,391.55	22.58	22.53	102.62	-258.59	200.27	386.85	342.20	44.649	8.664	
10,450.00	10,431.70	10,428.71	10,412.37	22.61	22.55	102.30	-250.50	201.45	390.50	345.81	44.687	8.738	
10,475.00	10,454.01	10,451.03	10,432.74	22.63	22.57	101.95	-241.48	202.77	394.57	349.85	44.720	8.823	
10,500.00	10,475.70	10,473.31	10,452.62	22.65	22.58	101.56	-231.54	204.22	399.05	354.30	44.749	8.917	
10,525.00	10,496.71	10,495.53	10,471.97	22.67	22.60	101.14	-220.73	205.80	403.93	359.16	44.775	9.021	
10,550.00	10,516.98	10,517.70	10,490.75	22.68	22.61	100.68	-209.06	207.51	409.21	364.41	44.799	9.134	
10,575.00	10,536.45	10,539.82	10,508.92	22.69	22.62	100.19	-196.58	209.34	414.85	370.03	44.822	9.256	
10,600.00	10,555.08	10,561.90	10,526.44	22.71	22.63	99.67	-183.30	211.28	420.85	376.01	44.845	9.385	
10,625.00	10,572.82	10,583.93	10,543.30	22.72	22.64	99.13	-169.27	213.33	427.20	382.33	44.870	9.521	
10,650.00	10,589.60	10,605.91	10,559.45	22.72	22.65	98.55	-154.51	215.49	433.87	388.97	44.897	9.664	
10,675.00	10,605.40	10,627.87	10,574.87	22.73	22.66	97.95	-139.06	217.75	440.84	395.92	44.927	9.812	
10,700.00	10,620.16	10,649.79	10,589.54	22.74	22.66	97.33	-122.95	220.10	448.11	403.15	44.962	9.966	
10,725.00	10,633.84	10,671.69	10,603.44	22.74	22.67	96.69	-106.20	222.55	455.64	410.64	45.002	10.125	
10,750.00	10,646.41	10,693.58	10,616.54	22.75	22.67	96.02	-88.85	225.09	463.43	418.38	45.050	10.287	
10,775.00	10,657.83	10,715.46	10,628.81	22.75	22.67	95.34	-70.92	227.71	471.45	426.34	45.104	10.452	
10,800.00	10,668.07	10,737.36	10,640.25	22.75	22.67	94.65	-52.45	230.41	479.67	434.51	45.167	10.620	
10,825.00	10,677.10	10,759.27	10,650.83	22.76	22.68	93.94	-33.46	233.19	488.09	442.85	45.239	10.789	
10,850.00	10,684.90	10,781.23	10,660.54	22.80	22.68	93.22	-13.98	236.04	496.68	451.36	45.321	10.959	
10,875.00	10,691.45	10,803.23	10,669.35	22.89	22.68	92.50	5.96	238.96	505.42	460.01	45.413	11.129	
10,900.00	10,696.73	10,825.29	10,677.24	22.98	22.69	91.77	26.35	241.94	514.28	468.77	45.516	11.299	
10,925.00	10,700.72	10,847.44	10,684.20	23.09	22.71	91.03	47.16	244.98	523.26	477.63	45.630	11.467	
10,950.00	10,703.41	10,869.70	10,690.20	23.20	22.75	90.30	68.36	248.08	532.32	486.56	45.754	11.634	
10,975.00	10,704.80	10,892.07	10,695.22	23.33	22.81	89.57	89.93	251.24	541.44	495.55	45.892	11.798	
10,991.13	10,705.00	10,906.57	10,697.92	23.41	22.86	89.10	104.03	253.30	547.35	501.36	45.987	11.902	
11,000.00	10,704.96	10,914.60	10,699.23	23.45	22.88	89.26	111.86	254.44	550.59	504.55	46.041	11.959	
11,100.00	10,704.52	11,011.96	10,704.91	24.05	23.26	89.95	207.91	268.41	585.47	538.65	46.821	12.505	
11,200.00	10,704.09	11,133.03	10,704.38	24.76	23.89	89.96	328.15	282.52	614.45	566.42	48.034	12.792	
11,300.00	10,703.65	11,257.97	10,703.83	25.57	24.71	89.97	452.74	291.73	635.90	586.30	49.595	12.822	
11,400.00	10,703.21	11,385.69	10,703.27	26.47	25.71	89.98	580.39	295.53	649.57	598.10	51.469	12.621	
11,500.00	10,702.77	11,504.94	10,702.80	27.44	26.78	89.99	689.75	295.04	656.32	602.82	53.501	12.267	
11,600.00	10,702.33	11,604.99	10,702.36	28.48	27.78	90.00	789.70	294.31	659.35	603.81	55.536	11.872	
11,636.42	10,702.18	11,631.43	10,702.20	28.87	28.07	90.00	826.12	294.04	659.58	603.36	56.216	11.733	
11,700.00	10,701.90	11,704.99	10,701.93	29.58	28.87	90.00	889.69	293.58	659.59	601.86	57.726	11.426	
11,800.00	10,701.46	11,804.99	10,701.49	30.74	30.02	90.00	989.69	292.85	659.59	599.53	60.064	10.982	
11,900.00	10,701.03	11,904.99	10,701.05	31.97	31.25	90.00	1,089.69	292.11	659.60	597.07	62.534	10.548	
12,000.00	10,700.59	12,004.99	10,700.62	33.25	32.53	90.00	1,189.68	291.38	659.61	594.49	65.120	10.129	
12,100.00	10,700.16	12,104.99	10,700.18	34.58	33.87	90.00	1,289.68	290.65	659.62	591.81	67.810	9.727	
12,200.00	10,699.72	12,204.99	10,699.74	35.96	35.25	90.00	1,389.68	289.92	659.63	589.04	70.592	9.344	
12,300.00	10,699.28	12,304.99	10,699.31	37.38	36.67	90.00	1,489.67	289.19	659.64	586.18	73.455	8.980	
12,400.00	10,698.85	12,404.99	10,698.87	38.84	38.13	90.00	1,589.67	288.46	659.65	583.26	76.390	8.635	
12,500.00	10,698.41	12,504.99	10,698.44	40.33	39.62	90.00	1,689.67	287.72	659.65	580.27	79.389	8.309	
12,600.00	10,697.98	12,604.99	10,698.00	41.85	41.14	90.00	1,789.66	286.99	659.66	577.22	82.445	8.001	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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
12,700.00	10,697.54	12,704.99	10,697.56	43.39	42.69	90.00	1,889.66	286.26	659.67	574.12	85.553	7.711	
12,800.00	10,697.11	12,804.99	10,697.13	44.96	44.26	90.00	1,989.65	285.53	659.68	570.97	88.706	7.437	
12,900.00	10,696.67	12,904.99	10,696.69	46.54	45.85	90.00	2,089.65	284.80	659.69	567.79	91.899	7.178	
13,000.00	10,696.24	13,004.99	10,696.25	48.15	47.46	90.00	2,189.65	284.07	659.70	564.57	95.130	6.935	
13,100.00	10,695.80	13,104.99	10,695.82	49.77	49.09	90.00	2,289.64	283.34	659.71	561.31	98.394	6.705	
13,200.00	10,695.36	13,204.99	10,695.38	51.41	50.73	90.00	2,389.64	282.60	659.71	558.03	101.688	6.488	
13,300.00	10,694.93	13,304.99	10,694.94	53.06	52.38	90.00	2,489.64	281.87	659.72	554.71	105.009	6.283	
13,400.00	10,694.49	13,404.99	10,694.51	54.73	54.05	90.00	2,589.63	281.14	659.73	551.38	108.355	6.089	
13,500.00	10,694.06	13,504.99	10,694.07	56.40	55.73	90.00	2,689.63	280.41	659.74	548.02	111.723	5.905	
13,600.00	10,693.62	13,604.99	10,693.64	58.09	57.42	90.00	2,789.63	279.68	659.75	544.64	115.112	5.731	
13,700.00	10,693.19	13,704.99	10,693.20	59.79	59.12	90.00	2,889.62	278.95	659.76	541.24	118.519	5.567	
13,800.00	10,692.75	13,804.99	10,692.76	61.49	60.83	90.00	2,989.62	278.22	659.77	537.82	121.944	5.410	
13,900.00	10,692.32	13,904.99	10,692.33	63.20	62.55	90.00	3,089.61	277.48	659.77	534.39	125.384	5.262	
14,000.00	10,691.88	14,004.99	10,691.89	64.92	64.27	90.00	3,189.61	276.75	659.78	530.94	128.839	5.121	
14,100.00	10,691.44	14,104.99	10,691.45	66.65	66.00	90.00	3,289.61	276.02	659.79	527.48	132.307	4.987	
14,200.00	10,691.01	14,204.99	10,691.02	68.39	67.74	90.00	3,389.60	275.29	659.80	524.01	135.787	4.859	
14,300.00	10,690.57	14,304.99	10,690.58	70.13	69.48	90.00	3,489.60	274.56	659.81	520.53	139.279	4.737	
14,400.00	10,690.14	14,404.99	10,690.15	71.87	71.23	90.00	3,589.60	273.83	659.82	517.04	142.782	4.621	
14,500.00	10,689.70	14,504.99	10,689.71	73.62	72.99	90.00	3,689.59	273.10	659.83	513.53	146.294	4.510	
14,600.00	10,689.27	14,604.99	10,689.27	75.38	74.75	90.00	3,789.59	272.36	659.83	510.02	149.815	4.404	
14,700.00	10,688.83	14,704.99	10,688.84	77.14	76.51	90.00	3,889.59	271.63	659.84	506.50	153.345	4.303	
14,800.00	10,688.40	14,804.99	10,688.40	78.90	78.28	90.00	3,989.58	270.90	659.85	502.97	156.883	4.206	
14,900.00	10,687.96	14,904.99	10,687.96	80.67	80.05	90.00	4,089.58	270.17	659.86	499.43	160.428	4.113	
15,000.00	10,687.52	15,004.99	10,687.53	82.44	81.82	90.00	4,189.57	269.44	659.87	495.89	163.980	4.024	
15,100.00	10,687.09	15,104.99	10,687.09	84.22	83.60	90.00	4,289.57	268.71	659.88	492.34	167.539	3.939	
15,200.00	10,686.65	15,204.99	10,686.66	86.00	85.38	90.00	4,389.57	267.98	659.89	488.78	171.103	3.857	
15,300.00	10,686.22	15,304.99	10,686.22	87.78	87.16	90.00	4,489.56	267.24	659.89	485.22	174.674	3.778	
15,400.00	10,685.78	15,404.99	10,685.78	89.56	88.95	90.00	4,589.56	266.51	659.90	481.65	178.250	3.702	
15,500.00	10,685.35	15,504.99	10,685.35	91.35	90.74	90.00	4,689.56	265.78	659.91	478.08	181.830	3.629	
15,579.47	10,685.00	15,574.48	10,685.00	92.77	91.98	90.00	4,769.03	265.20	659.92	475.42	184.500	3.577	

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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	0.10	0.10	0.00	0.00	134.43	-29.70	30.30	42.43				
100.00	100.00	100.10	100.10	0.08	0.08	134.43	-29.70	30.30	42.43	42.26	.169	251.355	
200.00	200.00	200.10	200.10	0.31	0.31	134.43	-29.70	30.30	42.43	41.81	.618	68.618	
300.00	300.00	300.10	300.10	0.53	0.53	134.43	-29.70	30.30	42.43	41.36	1.068	39.732	
400.00	400.00	400.10	400.10	0.76	0.76	134.43	-29.70	30.30	42.43	40.91	1.517	27.961	
500.00	500.00	500.10	500.10	0.98	0.98	134.43	-29.70	30.30	42.43	40.46	1.967	21.571	
600.00	600.00	600.10	600.10	1.21	1.21	134.43	-29.70	30.30	42.43	40.01	2.416	17.558	
700.00	700.00	700.10	700.10	1.43	1.43	134.43	-29.70	30.30	42.43	39.56	2.866	14.804	
800.00	800.00	800.10	800.10	1.66	1.66	134.43	-29.70	30.30	42.43	39.11	3.316	12.797	
900.00	900.00	900.10	900.10	1.88	1.88	134.43	-29.70	30.30	42.43	38.66	3.765	11.269	
1,000.00	1,000.00	1,000.10	1,000.10	2.11	2.11	134.43	-29.70	30.30	42.43	38.21	4.215	10.067	
1,100.00	1,100.00	1,100.10	1,100.10	2.33	2.33	134.43	-29.70	30.30	42.43	37.76	4.664	9.097	
1,200.00	1,200.00	1,200.10	1,200.10	2.56	2.56	134.43	-29.70	30.30	42.43	37.31	5.114	8.297	
1,300.00	1,300.00	1,300.10	1,300.10	2.78	2.78	134.43	-29.70	30.30	42.43	36.87	5.563	7.627	
1,400.00	1,400.00	1,400.10	1,400.10	3.01	3.01	134.43	-29.70	30.30	42.43	36.42	6.013	7.056	
1,500.00	1,500.00	1,500.10	1,500.10	3.23	3.23	134.43	-29.70	30.30	42.43	35.97	6.462	6.566	
1,600.00	1,600.00	1,600.10	1,600.10	3.46	3.46	134.43	-29.70	30.30	42.43	35.52	6.912	6.139	
1,700.00	1,700.00	1,700.10	1,700.10	3.68	3.68	134.43	-29.70	30.30	42.43	35.07	7.361	5.764	
1,800.00	1,800.00	1,800.10	1,800.10	3.91	3.91	134.43	-29.70	30.30	42.43	34.62	7.811	5.432	
1,900.00	1,900.00	1,900.10	1,900.10	4.13	4.13	134.43	-29.70	30.30	42.43	34.17	8.260	5.136	
2,000.00	2,000.00	2,000.10	2,000.10	4.35	4.36	134.43	-29.70	30.30	42.43	33.72	8.710	4.871	
2,100.00	2,100.00	2,100.10	2,100.10	4.58	4.58	134.43	-29.70	30.30	42.43	33.27	9.159	4.632	
2,200.00	2,200.00	2,200.10	2,200.10	4.80	4.80	134.43	-29.70	30.30	42.43	32.82	9.609	4.416	
2,300.00	2,300.00	2,300.10	2,300.10	5.03	5.03	134.43	-29.70	30.30	42.43	32.37	10.059	4.218	
2,400.00	2,400.00	2,400.10	2,400.10	5.25	5.25	134.43	-29.70	30.30	42.43	31.92	10.508	4.038	
2,500.00	2,500.00	2,500.10	2,500.10	5.48	5.48	134.43	-29.70	30.30	42.43	31.47	10.958	3.872	
2,600.00	2,600.00	2,600.10	2,600.10	5.70	5.70	134.43	-29.70	30.30	42.43	31.02	11.407	3.719	
2,700.00	2,700.00	2,700.10	2,700.10	5.93	5.93	134.43	-29.70	30.30	42.43	30.57	11.857	3.578	
2,800.00	2,800.00	2,800.10	2,800.10	6.15	6.15	134.43	-29.70	30.30	42.43	30.12	12.306	3.448	
2,900.00	2,900.00	2,900.10	2,900.10	6.38	6.38	134.43	-29.70	30.30	42.43	29.67	12.756	3.326	
3,000.00	3,000.00	3,000.10	3,000.10	6.60	6.60	134.43	-29.70	30.30	42.43	29.22	13.205	3.213	CC, ES
3,100.00	3,100.00	3,099.47	3,099.46	6.83	6.80	135.86	-30.97	30.05	43.16	29.54	13.623	3.168	SF
3,200.00	3,200.00	3,201.31	3,198.60	7.05	6.97	139.87	-34.77	29.31	45.50	31.49	14.017	3.246	
3,300.00	3,300.00	3,301.44	3,298.33	7.28	7.14	144.64	-39.90	28.32	48.96	34.55	14.413	3.397	
3,400.00	3,400.00	3,401.58	3,398.06	7.50	7.32	148.76	-45.03	27.32	52.71	37.90	14.814	3.558	
3,500.00	3,500.00	3,501.72	3,497.78	7.73	7.50	152.31	-50.16	26.32	56.70	41.48	15.217	3.726	
3,600.00	3,600.00	3,601.85	3,597.51	7.95	7.68	155.39	-55.29	25.33	60.87	45.25	15.624	3.896	
3,700.00	3,700.00	3,701.99	3,697.23	8.18	7.87	158.07	-60.42	24.33	65.20	49.17	16.032	4.067	
3,800.00	3,800.00	3,802.13	3,796.96	8.40	8.06	160.41	-65.55	23.33	69.65	53.21	16.444	4.236	
3,900.00	3,900.00	3,902.27	3,896.69	8.63	8.25	162.47	-70.68	22.33	74.21	57.35	16.857	4.402	
4,000.00	4,000.00	4,002.40	3,996.41	8.85	8.45	164.28	-75.81	21.34	78.85	61.57	17.272	4.565	
4,100.00	4,099.99	4,102.49	4,096.19	9.05	8.65	-46.72	-80.95	20.34	82.65	64.99	17.662	4.680	
4,200.00	4,199.91	4,202.51	4,196.03	9.22	8.85	-47.09	-86.08	19.34	84.68	66.65	18.030	4.697	
4,266.67	4,266.45	4,264.14	4,262.59	9.34	8.98	-48.06	-89.51	18.67	85.05	66.79	18.269	4.656	
4,269.90	4,269.68	4,267.37	4,265.82	9.34	8.98	-48.12	-89.67	18.64	85.05	66.77	18.281	4.653	
4,300.00	4,299.70	4,302.54	4,295.86	9.40	9.05	-48.69	-91.22	18.34	85.06	66.65	18.404	4.622	
4,400.00	4,399.46	4,397.42	4,395.69	9.58	9.25	-50.58	-96.36	17.34	85.13	66.36	18.774	4.535	
4,500.00	4,499.22	4,502.62	4,495.51	9.76	9.47	-52.47	-101.49	16.35	85.30	66.13	19.169	4.450	
4,600.00	4,598.97	4,602.66	4,595.33	9.94	9.68	-54.34	-106.63	15.35	85.56	66.00	19.559	4.374	
4,700.00	4,698.73	4,702.70	4,695.16	10.13	9.89	-56.21	-111.76	14.35	85.91	65.95	19.954	4.305	
4,800.00	4,798.48	4,802.74	4,794.98	10.32	10.10	-58.05	-116.90	13.35	86.35	65.99	20.354	4.242	
4,900.00	4,898.24	4,902.78	4,894.80	10.52	10.31	-59.88	-122.03	12.35	86.88	66.12	20.759	4.185	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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
5,000.00	4,998.00	4,997.18	4,994.63	10.72	10.52	-61.68	-127.17	11.35	87.49	66.34	21.157	4.135	
5,100.00	5,097.75	5,102.86	5,094.45	10.92	10.75	-63.45	-132.30	10.36	88.19	66.61	21.583	4.086	
5,200.00	5,197.51	5,202.90	5,194.27	11.12	10.96	-65.20	-137.44	9.36	88.98	66.98	22.002	4.044	
5,300.00	5,297.27	5,302.94	5,294.10	11.32	11.18	-66.91	-142.57	8.36	89.84	67.42	22.425	4.006	
5,400.00	5,397.02	5,402.98	5,393.92	11.53	11.40	-68.59	-147.71	7.36	90.79	67.94	22.852	3.973	
5,500.00	5,496.78	5,503.02	5,493.74	11.74	11.63	-70.23	-152.84	6.36	91.81	68.53	23.282	3.943	
5,600.00	5,596.54	5,603.06	5,593.57	11.95	11.85	-71.83	-157.98	5.36	92.90	69.19	23.716	3.917	
5,700.00	5,696.29	5,703.10	5,693.39	12.17	12.07	-73.40	-163.12	4.37	94.07	69.91	24.154	3.894	
5,800.00	5,796.05	5,803.14	5,793.21	12.38	12.30	-74.93	-168.25	3.37	95.30	70.71	24.595	3.875	
5,900.00	5,895.80	5,903.17	5,893.04	12.60	12.52	-76.41	-173.39	2.37	96.60	71.56	25.039	3.858	
6,000.00	5,995.56	6,003.21	5,992.86	12.82	12.75	-77.86	-178.52	1.37	97.97	72.48	25.485	3.844	
6,100.00	6,095.32	6,103.25	6,092.69	13.04	12.97	-79.27	-183.66	0.37	99.39	73.45	25.935	3.832	
6,200.00	6,195.07	6,203.29	6,192.51	13.26	13.20	-80.63	-188.79	-0.62	100.87	74.49	26.386	3.823	
6,300.00	6,294.83	6,303.33	6,292.33	13.48	13.43	-81.96	-193.93	-1.62	102.41	75.57	26.840	3.816	
6,400.00	6,394.59	6,403.37	6,392.16	13.71	13.66	-83.24	-199.06	-2.62	104.00	76.70	27.296	3.810	
6,500.00	6,494.34	6,496.59	6,491.98	13.93	13.87	-84.49	-204.20	-3.62	105.64	77.90	27.738	3.809	
6,600.00	6,594.10	6,603.45	6,591.80	14.16	14.12	-85.70	-209.33	-4.62	107.33	79.12	28.213	3.804	
6,700.00	6,693.86	6,703.49	6,691.63	14.39	14.35	-86.87	-214.47	-5.62	109.07	80.39	28.675	3.804	
6,800.00	6,793.61	6,803.53	6,791.45	14.62	14.58	-88.00	-219.61	-6.61	110.85	81.71	29.137	3.804	
6,900.00	6,893.37	6,903.57	6,891.27	14.85	14.81	-89.10	-224.74	-7.61	112.67	83.07	29.601	3.806	
7,000.00	6,993.13	7,003.61	6,991.10	15.08	15.04	-90.16	-229.88	-8.61	114.53	84.47	30.067	3.809	
7,100.00	7,092.88	7,103.65	7,090.92	15.31	15.27	-91.18	-235.01	-9.61	116.43	85.90	30.533	3.813	
7,200.00	7,192.64	7,203.69	7,190.74	15.54	15.51	-92.18	-240.15	-10.61	118.37	87.37	31.001	3.818	
7,300.00	7,292.39	7,303.73	7,290.57	15.78	15.74	-93.14	-245.28	-11.60	120.34	88.87	31.469	3.824	
7,400.00	7,392.15	7,403.77	7,390.39	16.01	15.97	-94.07	-250.42	-12.60	122.35	90.41	31.939	3.831	
7,500.00	7,491.91	7,503.81	7,490.21	16.25	16.21	-94.97	-255.55	-13.60	124.38	91.97	32.409	3.838	
7,600.00	7,591.66	7,603.85	7,590.04	16.48	16.44	-95.84	-260.69	-14.60	126.45	93.57	32.880	3.846	
7,700.00	7,691.42	7,703.89	7,689.86	16.72	16.68	-96.68	-265.82	-15.60	128.54	95.19	33.352	3.854	
7,800.00	7,791.18	7,796.08	7,789.69	16.96	16.89	-97.50	-270.96	-16.60	130.66	96.85	33.806	3.865	
7,900.00	7,890.93	7,903.96	7,889.51	17.19	17.15	-98.29	-276.09	-17.59	132.80	98.51	34.297	3.872	
8,000.00	7,990.69	7,996.00	7,989.33	17.43	17.36	-99.05	-281.23	-18.59	134.97	100.22	34.752	3.884	
8,100.00	8,090.45	8,096.57	8,089.81	17.67	17.59	-100.23	-285.36	-19.40	136.97	101.75	35.222	3.889	
8,200.00	8,190.20	8,197.02	8,190.25	17.91	17.80	-102.44	-286.91	-19.70	138.60	102.94	35.667	3.886	
8,300.00	8,289.96	8,303.17	8,290.06	18.15	18.01	-105.21	-286.92	-19.70	140.28	104.18	36.102	3.886	
8,400.00	8,389.72	8,403.42	8,389.82	18.39	18.20	-107.92	-286.92	-19.70	142.27	105.75	36.519	3.896	
8,500.00	8,489.47	8,503.66	8,489.57	18.64	18.40	-110.55	-286.92	-19.70	144.58	107.64	36.931	3.915	
8,600.00	8,589.23	8,603.90	8,589.33	18.88	18.59	-113.08	-286.92	-19.70	147.17	109.83	37.339	3.942	
8,700.00	8,688.98	8,704.15	8,689.08	19.12	18.78	-115.53	-286.92	-19.70	150.05	112.31	37.744	3.975	
8,800.00	8,788.74	8,804.39	8,788.84	19.36	18.98	-117.88	-286.92	-19.70	153.19	115.05	38.147	4.016	
8,811.29	8,800.00	8,806.87	8,800.10	19.39	18.99	-118.14	-286.92	-19.70	153.56	115.39	38.175	4.023	
8,900.00	8,888.56	8,904.57	8,888.66	19.60	19.18	-119.84	-286.92	-19.70	156.07	117.52	38.547	4.049	
9,000.00	8,988.50	9,004.63	8,988.60	19.83	19.37	-120.92	-286.92	-19.70	157.76	118.81	38.949	4.051	
9,077.95	9,066.45	9,073.32	9,066.55	19.99	19.51	90.83	-286.92	-19.70	158.17	118.93	39.241	4.031	
9,100.00	9,088.50	9,104.63	9,088.60	20.03	19.57	90.83	-286.92	-19.70	158.17	118.83	39.346	4.020	
9,200.00	9,188.50	9,204.63	9,188.60	20.23	19.77	90.83	-286.92	-19.70	158.17	118.43	39.743	3.980	
9,300.00	9,288.50	9,304.63	9,288.60	20.42	19.97	90.83	-286.92	-19.70	158.17	118.03	40.140	3.941	
9,400.00	9,388.50	9,404.63	9,388.60	20.62	20.17	90.83	-286.92	-19.70	158.17	117.64	40.538	3.902	
9,500.00	9,488.50	9,504.63	9,488.60	20.82	20.36	90.83	-286.92	-19.70	158.17	117.24	40.937	3.864	
9,600.00	9,588.50	9,604.63	9,588.60	21.02	20.56	90.83	-286.92	-19.70	158.17	116.84	41.338	3.826	
9,700.00	9,688.50	9,704.63	9,688.60	21.22	20.76	90.83	-286.92	-19.70	158.17	116.43	41.739	3.790	
9,800.00	9,788.50	9,804.63	9,788.60	21.42	20.97	90.83	-286.92	-19.70	158.17	116.03	42.141	3.753	
9,900.00	9,888.50	9,904.63	9,888.60	21.62	21.17	90.83	-286.92	-19.70	158.17	115.63	42.544	3.718	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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
10,000.00	9,988.50	10,004.63	9,988.60	21.82	21.37	90.83	-286.92	-19.70	158.17	115.22	42.949	3.683	
10,100.00	10,088.50	10,104.63	10,088.60	22.02	21.57	90.83	-286.92	-19.70	158.17	114.82	43.354	3.648	
10,200.00	10,188.50	10,204.63	10,188.60	22.22	21.77	90.83	-286.92	-19.70	158.17	114.41	43.760	3.615	
10,239.04	10,227.54	10,234.41	10,227.64	22.30	21.83	90.83	-286.92	-19.70	158.17	114.27	43.900	3.603	
10,250.00	10,238.50	10,245.37	10,238.60	22.32	21.86	104.20	-286.92	-19.70	158.20	114.26	43.944	3.600	
10,275.00	10,263.46	10,270.33	10,263.56	22.37	21.91	104.59	-286.92	-19.70	158.51	114.46	44.049	3.599	
10,300.00	10,288.33	10,304.80	10,288.43	22.41	21.98	105.40	-286.92	-19.70	159.17	114.99	44.174	3.603	
10,325.00	10,313.03	10,319.90	10,313.13	22.45	22.01	106.58	-286.92	-19.70	160.24	115.97	44.261	3.620	
10,350.00	10,337.50	10,344.37	10,337.60	22.49	22.06	108.10	-286.92	-19.70	161.79	117.42	44.368	3.647	
10,375.00	10,361.67	10,368.54	10,361.77	22.52	22.11	109.92	-286.92	-19.70	163.94	119.47	44.472	3.686	
10,400.00	10,385.47	10,407.66	10,385.57	22.55	22.19	111.97	-286.92	-19.70	166.80	122.19	44.604	3.739	
10,425.00	10,408.83	10,415.70	10,408.93	22.58	22.20	114.18	-286.92	-19.70	170.48	125.81	44.668	3.817	
10,450.00	10,431.70	10,438.57	10,431.80	22.61	22.25	116.49	-286.92	-19.70	175.13	130.37	44.757	3.913	
10,475.00	10,454.01	10,460.88	10,454.11	22.63	22.30	118.81	-286.92	-19.70	180.84	136.00	44.839	4.033	
10,500.00	10,475.70	10,482.57	10,475.80	22.65	22.34	121.09	-286.92	-19.70	187.72	142.81	44.912	4.180	
10,525.00	10,496.71	10,503.58	10,496.81	22.67	22.38	123.26	-286.92	-19.70	195.85	150.87	44.976	4.354	
10,550.00	10,516.98	10,523.85	10,517.08	22.68	22.42	125.28	-286.92	-19.70	205.26	160.23	45.033	4.558	
10,575.00	10,536.45	10,543.32	10,536.55	22.69	22.46	127.09	-286.92	-19.70	215.99	170.91	45.082	4.791	
10,600.00	10,555.08	10,561.95	10,555.18	22.71	22.50	128.68	-286.92	-19.70	228.04	182.91	45.124	5.054	
10,625.00	10,572.82	10,579.69	10,572.92	22.72	22.54	130.01	-286.92	-19.70	241.37	196.20	45.160	5.345	
10,650.00	10,589.60	10,603.53	10,589.70	22.72	22.59	131.05	-286.92	-19.70	255.94	210.73	45.207	5.662	
10,675.00	10,605.40	10,612.27	10,605.50	22.73	22.60	131.80	-286.92	-19.70	271.70	226.48	45.220	6.008	
10,700.00	10,620.16	10,627.03	10,620.26	22.74	22.63	132.21	-286.92	-19.70	288.58	243.33	45.243	6.378	
10,725.00	10,633.84	10,640.71	10,633.94	22.74	22.66	132.27	-286.92	-19.70	306.50	261.24	45.264	6.771	
10,750.00	10,646.41	10,653.28	10,646.51	22.75	22.69	131.93	-286.92	-19.70	325.39	280.11	45.281	7.186	
10,775.00	10,657.83	10,664.70	10,657.93	22.75	22.71	131.15	-286.92	-19.70	345.16	299.86	45.295	7.620	
10,800.00	10,668.07	10,674.94	10,668.17	22.75	22.73	129.86	-286.92	-19.70	365.73	320.42	45.307	8.072	
10,825.00	10,677.10	10,683.97	10,677.20	22.76	22.75	127.97	-286.92	-19.70	387.01	341.69	45.315	8.540	
10,850.00	10,684.90	10,708.23	10,685.00	22.80	22.80	125.36	-286.92	-19.70	408.92	363.57	45.355	9.016	
10,875.00	10,691.45	10,701.68	10,691.55	22.89	22.79	121.88	-286.92	-19.70	431.38	386.05	45.331	9.516	
10,900.00	10,696.73	10,703.60	10,696.83	22.98	22.79	117.34	-286.92	-19.70	454.30	408.98	45.324	10.023	
10,925.00	10,700.72	10,707.59	10,700.82	23.09	22.80	111.52	-286.92	-19.70	477.60	432.28	45.321	10.538	
10,950.00	10,703.41	10,710.28	10,703.51	23.20	22.81	104.26	-286.92	-19.70	501.20	455.88	45.316	11.060	
10,975.00	10,704.80	10,711.67	10,704.90	23.33	22.81	95.50	-286.92	-19.70	525.02	479.71	45.307	11.588	
10,991.13	10,705.00	10,711.87	10,705.10	23.41	22.81	89.16	-286.92	-19.70	540.46	495.16	45.301	11.930	
11,000.00	10,704.96	10,711.83	10,705.06	23.45	22.81	89.15	-286.92	-19.70	548.97	503.67	45.297	12.119	
11,100.00	10,704.52	10,711.39	10,704.62	24.05	22.81	89.11	-286.92	-19.70	645.08	599.82	45.258	14.253	
11,200.00	10,704.09	10,710.96	10,704.19	24.76	22.81	89.10	-286.92	-19.70	741.40	696.17	45.228	16.393	
11,300.00	10,703.65	10,710.52	10,703.75	25.57	22.81	89.10	-286.92	-19.70	837.75	792.54	45.204	18.532	
11,400.00	10,703.21	10,710.08	10,703.31	26.47	22.81	89.11	-286.92	-19.70	934.02	888.84	45.186	20.671	
11,500.00	10,702.77	12,400.28	11,617.82	27.44	28.35	160.36	691.37	-34.61	971.53	923.25	48.279	20.123	
11,600.00	10,702.33	12,500.23	11,617.38	28.48	29.33	160.18	791.32	-35.35	972.55	923.59	48.957	19.865	
11,636.42	10,702.18	12,536.65	11,617.22	28.87	29.72	160.17	827.74	-35.62	972.63	923.41	49.218	19.762	
11,700.00	10,701.90	12,600.23	11,616.95	29.58	30.40	160.17	891.31	-36.09	972.63	922.95	49.681	19.577	
11,800.00	10,701.46	12,700.23	11,616.51	30.74	31.54	160.17	991.31	-36.83	972.63	922.16	50.463	19.274	
11,900.00	10,701.03	12,800.23	11,616.07	31.97	32.74	160.17	1,091.31	-37.57	972.62	921.32	51.300	18.959	
12,000.00	10,700.59	12,900.23	11,615.63	33.25	34.00	160.17	1,191.30	-38.31	972.62	920.43	52.191	18.636	
12,100.00	10,700.16	13,000.23	11,615.20	34.58	35.32	160.17	1,291.30	-39.05	972.62	919.49	53.132	18.306	
12,200.00	10,699.72	13,100.23	11,614.76	35.96	36.68	160.17	1,391.30	-39.79	972.62	918.50	54.121	17.971	
12,300.00	10,699.28	13,200.23	11,614.32	37.38	38.08	160.17	1,491.29	-40.53	972.62	917.46	55.156	17.634	
12,400.00	10,698.85	13,300.23	11,613.88	38.84	39.52	160.17	1,591.29	-41.28	972.61	916.38	56.233	17.296	
12,500.00	10,698.41	13,400.23	11,613.45	40.33	40.99	160.17	1,691.29	-42.02	972.61	915.26	57.350	16.959	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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
12,600.00	10,697.98	13,500.23	11,613.01	41.85	42.49	160.17	1,791.28	-42.76	972.61	914.11	58.505	16.624	
12,700.00	10,697.54	13,600.23	11,612.57	43.39	44.02	160.17	1,891.28	-43.50	972.61	912.91	59.697	16.293	
12,800.00	10,697.11	13,700.23	11,612.14	44.96	45.57	160.17	1,991.27	-44.24	972.61	911.69	60.922	15.965	
12,900.00	10,696.67	13,800.23	11,611.70	46.54	47.14	160.17	2,091.27	-44.98	972.61	910.43	62.178	15.642	
13,000.00	10,696.24	13,900.23	11,611.26	48.15	48.73	160.17	2,191.27	-45.72	972.60	909.14	63.465	15.325	
13,100.00	10,695.80	14,000.23	11,610.82	49.77	50.35	160.17	2,291.26	-46.46	972.60	907.82	64.779	15.014	
13,200.00	10,695.36	14,100.23	11,610.39	51.41	51.97	160.17	2,391.26	-47.20	972.60	906.48	66.120	14.710	
13,300.00	10,694.93	14,200.23	11,609.95	53.06	53.61	160.17	2,491.26	-47.94	972.60	905.11	67.486	14.412	
13,400.00	10,694.49	14,300.23	11,609.51	54.73	55.27	160.17	2,591.25	-48.68	972.60	903.72	68.875	14.121	
13,500.00	10,694.06	14,400.23	11,609.07	56.40	56.93	160.17	2,691.25	-49.42	972.59	902.31	70.286	13.838	
13,600.00	10,693.62	14,500.23	11,608.64	58.09	58.61	160.17	2,791.24	-50.17	972.59	900.87	71.718	13.561	
13,700.00	10,693.19	14,600.23	11,608.20	59.79	60.30	160.17	2,891.24	-50.91	972.59	899.42	73.169	13.292	
13,800.00	10,692.75	14,700.23	11,607.76	61.49	62.00	160.17	2,991.24	-51.65	972.59	897.95	74.638	13.031	
13,900.00	10,692.32	14,800.23	11,607.33	63.20	63.70	160.17	3,091.23	-52.39	972.59	896.46	76.125	12.776	
14,000.00	10,691.88	14,900.23	11,606.89	64.92	65.42	160.17	3,191.23	-53.13	972.59	894.96	77.628	12.529	
14,100.00	10,691.44	15,000.23	11,606.45	66.65	67.14	160.17	3,291.23	-53.87	972.58	893.44	79.147	12.288	
14,200.00	10,691.01	15,100.23	11,606.01	68.39	68.86	160.17	3,391.22	-54.61	972.58	891.90	80.680	12.055	
14,300.00	10,690.57	15,200.23	11,605.58	70.13	70.60	160.17	3,491.22	-55.35	972.58	890.35	82.226	11.828	
14,400.00	10,690.14	15,300.23	11,605.14	71.87	72.34	160.17	3,591.21	-56.09	972.58	888.79	83.786	11.608	
14,500.00	10,689.70	15,400.23	11,604.70	73.62	74.08	160.17	3,691.21	-56.83	972.58	887.22	85.357	11.394	
14,600.00	10,689.27	15,500.23	11,604.27	75.38	75.83	160.17	3,791.21	-57.57	972.57	885.63	86.941	11.187	
14,700.00	10,688.83	15,600.23	11,603.83	77.14	77.59	160.17	3,891.20	-58.31	972.57	884.04	88.535	10.985	
14,800.00	10,688.40	15,700.23	11,603.39	78.90	79.35	160.17	3,991.20	-59.06	972.57	882.43	90.139	10.790	
14,900.00	10,687.96	15,800.23	11,602.95	80.67	81.11	160.17	4,091.20	-59.80	972.57	880.82	91.754	10.600	
15,000.00	10,687.52	15,900.23	11,602.52	82.44	82.88	160.17	4,191.19	-60.54	972.57	879.19	93.377	10.415	
15,100.00	10,687.09	16,000.23	11,602.08	84.22	84.65	160.17	4,291.19	-61.28	972.56	877.56	95.010	10.236	
15,200.00	10,686.65	16,100.23	11,601.64	86.00	86.42	160.17	4,391.19	-62.02	972.56	875.91	96.651	10.063	
15,300.00	10,686.22	16,200.23	11,601.20	87.78	88.20	160.17	4,491.18	-62.76	972.56	874.26	98.300	9.894	
15,400.00	10,685.78	16,300.23	11,600.77	89.56	89.98	160.17	4,591.18	-63.50	972.56	872.60	99.956	9.730	
15,500.00	10,685.35	16,400.23	11,600.33	91.35	91.76	160.17	4,691.17	-64.24	972.56	870.94	101.620	9.571	
15,579.47	10,685.00	16,479.70	11,599.98	92.77	93.18	160.17	4,770.64	-64.83	972.56	869.61	102.947	9.447	

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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	0.50	-0.50	0.00	0.00	179.62	-30.00	0.20	30.00				
100.00	100.00	100.50	99.50	0.08	0.09	179.62	-30.00	0.20	30.00	29.83	.170	176.788	
200.00	200.00	200.50	199.50	0.31	0.31	179.62	-30.00	0.20	30.00	29.38	.619	48.448	
300.00	300.00	300.50	299.50	0.53	0.53	179.62	-30.00	0.20	30.00	28.93	1.069	28.070	
400.00	400.00	400.50	399.50	0.76	0.76	179.62	-30.00	0.20	30.00	28.48	1.518	19.759	
500.00	500.00	500.50	499.50	0.98	0.98	179.62	-30.00	0.20	30.00	28.03	1.968	15.246	
600.00	600.00	600.50	599.50	1.21	1.21	179.62	-30.00	0.20	30.00	27.58	2.417	12.411	
700.00	700.00	700.50	699.50	1.43	1.43	179.62	-30.00	0.20	30.00	27.13	2.867	10.465	
800.00	800.00	800.50	799.50	1.66	1.66	179.62	-30.00	0.20	30.00	26.68	3.316	9.046	
900.00	900.00	900.50	899.50	1.88	1.88	179.62	-30.00	0.20	30.00	26.23	3.766	7.966	
1,000.00	1,000.00	1,000.50	999.50	2.11	2.11	179.62	-30.00	0.20	30.00	25.79	4.215	7.117	
1,100.00	1,100.00	1,100.50	1,099.50	2.33	2.33	179.62	-30.00	0.20	30.00	25.34	4.665	6.431	
1,200.00	1,200.00	1,200.50	1,199.50	2.56	2.56	179.62	-30.00	0.20	30.00	24.89	5.115	5.866	
1,300.00	1,300.00	1,300.50	1,299.50	2.78	2.78	179.62	-30.00	0.20	30.00	24.44	5.564	5.392	
1,400.00	1,400.00	1,400.50	1,399.50	3.01	3.01	179.62	-30.00	0.20	30.00	23.99	6.014	4.989	
1,500.00	1,500.00	1,500.50	1,499.50	3.23	3.23	179.62	-30.00	0.20	30.00	23.54	6.463	4.642	
1,600.00	1,600.00	1,600.50	1,599.50	3.46	3.46	179.62	-30.00	0.20	30.00	23.09	6.913	4.340	
1,700.00	1,700.00	1,700.50	1,699.50	3.68	3.68	179.62	-30.00	0.20	30.00	22.64	7.362	4.075	
1,800.00	1,800.00	1,800.50	1,799.50	3.91	3.91	179.62	-30.00	0.20	30.00	22.19	7.812	3.840	
1,900.00	1,900.00	1,900.50	1,899.50	4.13	4.13	179.62	-30.00	0.20	30.00	21.74	8.261	3.631	
2,000.00	2,000.00	2,000.50	1,999.50	4.35	4.36	179.62	-30.00	0.20	30.00	21.29	8.711	3.444	
2,100.00	2,100.00	2,100.50	2,099.50	4.58	4.58	179.62	-30.00	0.20	30.00	20.84	9.160	3.275	
2,200.00	2,200.00	2,200.50	2,199.50	4.80	4.81	179.62	-30.00	0.20	30.00	20.39	9.610	3.122	
2,300.00	2,300.00	2,300.50	2,299.50	5.03	5.03	179.62	-30.00	0.20	30.00	19.94	10.059	2.982	
2,400.00	2,400.00	2,400.50	2,399.50	5.25	5.26	179.62	-30.00	0.20	30.00	19.49	10.509	2.855	
2,500.00	2,500.00	2,500.50	2,499.50	5.48	5.48	179.62	-30.00	0.20	30.00	19.04	10.958	2.738	
2,600.00	2,600.00	2,600.50	2,599.50	5.70	5.70	179.62	-30.00	0.20	30.00	18.59	11.408	2.630	
2,700.00	2,700.00	2,700.50	2,699.50	5.93	5.93	179.62	-30.00	0.20	30.00	18.14	11.858	2.530	
2,800.00	2,800.00	2,800.50	2,799.50	6.15	6.15	179.62	-30.00	0.20	30.00	17.69	12.307	2.438	
2,900.00	2,900.00	2,900.50	2,899.50	6.38	6.38	179.62	-30.00	0.20	30.00	17.24	12.757	2.352	
3,000.00	3,000.00	2,999.50	2,999.50	6.60	6.60	179.62	-30.00	0.20	30.00	16.80	13.204	2.272	CC, ES, SF
3,100.00	3,100.00	3,098.73	3,098.72	6.83	6.80	-179.77	-31.23	-0.13	31.24	17.62	13.621	2.294	
3,200.00	3,200.00	3,197.82	3,197.73	7.05	6.97	-178.18	-34.95	-1.11	35.01	21.01	14.006	2.500	
3,300.00	3,300.00	3,297.32	3,297.05	7.28	7.14	-176.32	-40.66	-2.62	40.82	26.42	14.398	2.835	
3,400.00	3,400.00	3,402.87	3,396.68	7.50	7.32	-174.88	-46.56	-4.17	46.83	32.02	14.808	3.162	
3,500.00	3,500.00	3,503.05	3,496.31	7.73	7.50	-173.76	-52.45	-5.73	52.86	37.64	15.212	3.475	
3,600.00	3,600.00	3,603.24	3,595.94	7.95	7.69	-172.88	-58.34	-7.29	58.90	43.28	15.618	3.771	
3,700.00	3,700.00	3,703.43	3,695.56	8.18	7.88	-172.16	-64.23	-8.84	64.96	48.93	16.027	4.053	
3,800.00	3,800.00	3,803.61	3,795.19	8.40	8.07	-171.56	-70.12	-10.40	71.02	54.58	16.438	4.320	
3,900.00	3,900.00	3,903.80	3,894.82	8.63	8.27	-171.06	-76.01	-11.96	77.09	60.24	16.851	4.575	
4,000.00	4,000.00	4,003.99	3,994.45	8.85	8.47	-170.63	-81.90	-13.51	83.17	65.90	17.267	4.816	
4,100.00	4,099.99	4,104.11	4,094.14	9.05	8.67	-22.56	-87.80	-15.07	88.04	70.38	17.657	4.986	
4,200.00	4,199.91	4,195.85	4,193.91	9.22	8.86	-23.13	-93.70	-16.63	90.50	72.49	18.008	5.025	
4,266.67	4,266.45	4,262.51	4,260.44	9.34	9.00	-23.87	-97.63	-17.67	90.81	72.55	18.255	4.975	
4,300.00	4,299.70	4,295.83	4,293.71	9.40	9.07	-24.32	-99.60	-18.19	90.71	72.33	18.379	4.935	
4,400.00	4,399.46	4,404.19	4,393.50	9.58	9.29	-25.66	-105.50	-19.75	90.43	71.66	18.772	4.817	
4,500.00	4,499.22	4,504.21	4,493.29	9.76	9.50	-27.01	-111.40	-21.31	90.21	71.05	19.153	4.710	
4,600.00	4,598.97	4,604.23	4,593.08	9.94	9.72	-28.36	-117.30	-22.87	90.03	70.49	19.538	4.608	
4,700.00	4,698.73	4,695.74	4,692.87	10.13	9.91	-29.72	-123.20	-24.43	89.91	70.00	19.910	4.516	
4,800.00	4,798.48	4,804.28	4,792.66	10.32	10.15	-31.08	-129.11	-25.98	89.83	69.51	20.320	4.421	
4,895.50	4,893.75	4,891.20	4,887.96	10.51	10.34	-32.39	-134.74	-27.47	89.81	69.13	20.682	4.342	
4,900.00	4,898.24	4,904.30	4,892.45	10.52	10.37	-32.45	-135.01	-27.54	89.81	69.09	20.718	4.335	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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
5,000.00	4,998.00	5,004.33	4,992.24	10.72	10.59	-33.81	-140.91	-29.10	89.84	68.72	21.119	4.254	
5,100.00	5,097.75	5,104.35	5,092.03	10.92	10.81	-35.17	-146.81	-30.66	89.92	68.39	21.524	4.177	
5,200.00	5,197.51	5,204.37	5,191.82	11.12	11.03	-36.53	-152.71	-32.22	90.04	68.11	21.934	4.105	
5,300.00	5,297.27	5,304.39	5,291.61	11.32	11.26	-37.88	-158.61	-33.78	90.22	67.88	22.347	4.037	
5,400.00	5,397.02	5,404.42	5,391.41	11.53	11.48	-39.23	-164.51	-35.34	90.45	67.69	22.763	3.974	
5,500.00	5,496.78	5,504.44	5,491.20	11.74	11.71	-40.57	-170.41	-36.90	90.73	67.55	23.184	3.914	
5,600.00	5,596.54	5,604.46	5,590.99	11.95	11.94	-41.90	-176.31	-38.46	91.06	67.45	23.608	3.857	
5,700.00	5,696.29	5,704.49	5,690.78	12.17	12.17	-43.22	-182.21	-40.02	91.44	67.40	24.036	3.804	
5,800.00	5,796.05	5,804.51	5,790.57	12.38	12.40	-44.53	-188.11	-41.58	91.87	67.40	24.468	3.755	
5,900.00	5,895.80	5,895.47	5,890.36	12.60	12.61	-45.83	-194.02	-43.13	92.34	67.46	24.884	3.711	
6,000.00	5,995.56	6,004.55	5,990.15	12.82	12.86	-47.11	-199.92	-44.69	92.86	67.52	25.342	3.664	
6,100.00	6,095.32	6,104.58	6,089.94	13.04	13.09	-48.38	-205.82	-46.25	93.43	67.64	25.784	3.623	
6,200.00	6,195.07	6,204.60	6,189.73	13.26	13.32	-49.63	-211.72	-47.81	94.04	67.81	26.229	3.585	
6,300.00	6,294.83	6,304.62	6,289.52	13.48	13.56	-50.87	-217.62	-49.37	94.69	68.02	26.678	3.550	
6,400.00	6,394.59	6,404.65	6,389.31	13.71	13.79	-52.08	-223.52	-50.93	95.39	68.26	27.129	3.516	
6,500.00	6,494.34	6,504.67	6,489.10	13.93	14.03	-53.28	-229.42	-52.49	96.14	68.55	27.584	3.485	
6,600.00	6,594.10	6,604.69	6,588.89	14.16	14.26	-54.46	-235.32	-54.05	96.92	68.88	28.041	3.456	
6,700.00	6,693.86	6,704.71	6,688.68	14.39	14.50	-55.63	-241.22	-55.61	97.74	69.24	28.502	3.429	
6,800.00	6,793.61	6,804.74	6,788.47	14.62	14.74	-56.77	-247.12	-57.17	98.61	69.64	28.964	3.404	
6,900.00	6,893.37	6,904.76	6,888.27	14.85	14.97	-57.89	-253.03	-58.73	99.51	70.08	29.430	3.381	
7,000.00	6,993.13	7,004.78	6,988.06	15.08	15.21	-58.99	-258.93	-60.28	100.45	70.55	29.898	3.360	
7,100.00	7,092.88	7,104.81	7,087.85	15.31	15.45	-60.07	-264.83	-61.84	101.42	71.05	30.368	3.340	
7,200.00	7,192.64	7,204.83	7,187.64	15.54	15.69	-61.13	-270.73	-63.40	102.43	71.59	30.841	3.321	
7,300.00	7,292.39	7,295.15	7,287.43	15.78	15.91	-62.16	-276.63	-64.96	103.48	72.19	31.293	3.307	
7,400.00	7,392.15	7,395.85	7,387.95	16.01	16.15	-63.26	-282.39	-66.48	104.43	72.65	31.774	3.287	
7,500.00	7,491.91	7,497.68	7,489.71	16.25	16.38	-65.23	-286.11	-67.47	103.97	71.70	32.269	3.222	
7,600.00	7,591.66	7,600.85	7,591.16	16.48	16.59	-68.37	-287.22	-67.76	101.95	69.18	32.766	3.111	
7,700.00	7,691.42	7,701.10	7,690.92	16.72	16.78	-72.10	-287.22	-67.76	99.58	66.33	33.257	2.994	
7,800.00	7,791.18	7,801.34	7,790.68	16.96	16.98	-75.99	-287.22	-67.76	97.66	63.91	33.745	2.894	
7,900.00	7,890.93	7,901.58	7,890.43	17.19	17.17	-80.01	-287.22	-67.76	96.20	61.97	34.230	2.811	
8,000.00	7,990.69	8,001.83	7,990.19	17.43	17.37	-84.14	-287.22	-67.76	95.24	60.53	34.708	2.744	
8,100.00	8,090.45	8,102.07	8,089.95	17.67	17.56	-88.33	-287.22	-67.76	94.78	59.60	35.177	2.694	
8,139.81	8,130.16	8,137.64	8,129.66	17.77	17.63	-90.00	-287.22	-67.76	94.74	59.39	35.352	2.680	
8,200.00	8,190.20	8,202.31	8,189.70	17.91	17.76	-92.53	-287.22	-67.76	94.83	59.20	35.634	2.661	
8,300.00	8,289.96	8,302.56	8,289.46	18.15	17.96	-96.71	-287.22	-67.76	95.40	59.32	36.080	2.644	
8,400.00	8,389.72	8,402.80	8,389.22	18.39	18.15	-100.82	-287.22	-67.76	96.46	59.95	36.513	2.642	
8,500.00	8,489.47	8,503.05	8,488.97	18.64	18.35	-104.82	-287.22	-67.76	98.01	61.08	36.933	2.654	
8,600.00	8,589.23	8,603.29	8,588.73	18.88	18.55	-108.68	-287.22	-67.76	100.03	62.69	37.343	2.679	
8,700.00	8,688.98	8,703.53	8,688.48	19.12	18.75	-112.37	-287.22	-67.76	102.48	64.74	37.744	2.715	
8,800.00	8,788.74	8,803.78	8,788.24	19.36	18.95	-115.87	-287.22	-67.76	105.34	67.20	38.137	2.762	
8,811.29	8,800.00	8,807.48	8,799.50	19.39	18.96	-116.25	-287.22	-67.76	105.69	67.52	38.166	2.769	
8,900.00	8,888.56	8,903.96	8,888.06	19.60	19.15	-118.74	-287.22	-67.76	108.07	69.54	38.528	2.805	
9,000.00	8,988.50	9,004.02	8,988.00	19.83	19.36	-120.29	-287.22	-67.76	109.72	70.80	38.925	2.819	
9,077.95	9,066.45	9,073.93	9,065.95	19.99	19.50	91.35	-287.22	-67.76	110.13	70.90	39.221	2.808	
9,100.00	9,088.50	9,104.02	9,088.00	20.03	19.56	91.35	-287.22	-67.76	110.13	70.80	39.326	2.800	
9,200.00	9,188.50	9,204.02	9,188.00	20.23	19.76	91.35	-287.22	-67.76	110.13	70.40	39.726	2.772	
9,300.00	9,288.50	9,304.02	9,288.00	20.42	19.96	91.35	-287.22	-67.76	110.13	70.00	40.128	2.744	
9,400.00	9,388.50	9,404.02	9,388.00	20.62	20.16	91.35	-287.22	-67.76	110.13	69.60	40.530	2.717	
9,500.00	9,488.50	9,504.02	9,488.00	20.82	20.37	91.35	-287.22	-67.76	110.13	69.19	40.934	2.690	
9,600.00	9,588.50	9,604.02	9,588.00	21.02	20.57	91.35	-287.22	-67.76	110.13	68.79	41.338	2.664	
9,700.00	9,688.50	9,704.02	9,688.00	21.22	20.78	91.35	-287.22	-67.76	110.13	68.38	41.743	2.638	
9,800.00	9,788.50	9,804.02	9,788.00	21.42	20.98	91.35	-287.22	-67.76	110.13	67.98	42.150	2.613	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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
9,900.00	9,888.50	9,904.02	9,888.00	21.62	21.19	91.35	-287.22	-67.76	110.13	67.57	42.557	2.588	
10,000.00	9,988.50	10,004.02	9,988.00	21.82	21.39	91.35	-287.22	-67.76	110.13	67.16	42.965	2.563	
10,100.00	10,088.50	10,104.02	10,088.00	22.02	21.60	91.35	-287.22	-67.76	110.13	66.75	43.374	2.539	
10,200.00	10,188.50	10,204.02	10,188.00	22.22	21.80	91.35	-287.22	-67.76	110.13	66.34	43.783	2.515	
10,239.04	10,227.54	10,235.02	10,227.04	22.30	21.87	91.35	-287.22	-67.76	110.13	66.20	43.927	2.507	
10,250.00	10,238.50	10,245.98	10,238.00	22.32	21.89	104.74	-287.22	-67.76	110.16	66.18	43.972	2.505	
10,275.00	10,263.46	10,270.95	10,262.96	22.37	21.94	105.32	-287.22	-67.76	110.48	66.40	44.081	2.506	
10,300.00	10,288.33	10,304.19	10,287.83	22.41	22.01	106.49	-287.22	-67.76	111.17	66.96	44.211	2.515	
10,325.00	10,313.03	10,320.52	10,312.53	22.45	22.05	108.21	-287.22	-67.76	112.33	68.02	44.310	2.535	
10,350.00	10,337.50	10,344.98	10,337.00	22.49	22.10	110.41	-287.22	-67.76	114.06	69.63	44.426	2.567	
10,375.00	10,361.67	10,369.15	10,361.17	22.52	22.15	113.01	-287.22	-67.76	116.49	71.95	44.540	2.615	
10,400.00	10,385.47	10,407.05	10,384.97	22.55	22.22	115.89	-287.22	-67.76	119.79	75.11	44.678	2.681	
10,425.00	10,408.83	10,416.31	10,408.33	22.58	22.24	118.93	-287.22	-67.76	124.10	79.35	44.749	2.773	
10,450.00	10,431.70	10,439.18	10,431.20	22.61	22.29	122.04	-287.22	-67.76	129.57	84.73	44.839	2.890	
10,475.00	10,454.01	10,461.49	10,453.51	22.63	22.34	125.09	-287.22	-67.76	136.31	91.39	44.918	3.035	
10,500.00	10,475.70	10,483.18	10,475.20	22.65	22.38	128.01	-287.22	-67.76	144.39	99.40	44.985	3.210	
10,525.00	10,496.71	10,504.19	10,496.21	22.67	22.43	130.72	-287.22	-67.76	153.85	108.81	45.042	3.416	
10,550.00	10,516.98	10,524.46	10,516.48	22.68	22.47	133.17	-287.22	-67.76	164.72	119.63	45.090	3.653	
10,575.00	10,536.45	10,543.94	10,535.95	22.69	22.51	135.32	-287.22	-67.76	176.96	131.83	45.131	3.921	
10,600.00	10,555.08	10,562.57	10,554.58	22.71	22.55	137.17	-287.22	-67.76	190.53	145.37	45.167	4.218	
10,625.00	10,572.82	10,580.30	10,572.32	22.72	22.58	138.70	-287.22	-67.76	205.38	160.18	45.198	4.544	
10,650.00	10,589.60	10,602.91	10,589.10	22.72	22.63	139.91	-287.22	-67.76	221.42	176.18	45.239	4.894	
10,675.00	10,605.40	10,612.88	10,604.90	22.73	22.65	140.78	-287.22	-67.76	238.59	193.34	45.252	5.272	
10,700.00	10,620.16	10,627.64	10,619.66	22.74	22.68	141.30	-287.22	-67.76	256.80	211.52	45.275	5.672	
10,725.00	10,633.84	10,641.32	10,633.34	22.74	22.71	141.46	-287.22	-67.76	275.97	230.67	45.296	6.093	
10,750.00	10,646.41	10,653.89	10,645.91	22.75	22.74	141.21	-287.22	-67.76	296.02	250.71	45.314	6.533	
10,775.00	10,657.83	10,665.31	10,657.33	22.75	22.76	140.52	-287.22	-67.76	316.87	271.54	45.330	6.990	
10,800.00	10,668.07	10,675.55	10,667.57	22.75	22.78	139.31	-287.22	-67.76	338.43	293.09	45.344	7.464	
10,825.00	10,677.10	10,684.58	10,676.60	22.76	22.80	137.45	-287.22	-67.76	360.63	315.27	45.355	7.951	
10,850.00	10,684.90	10,707.62	10,684.40	22.80	22.85	134.79	-287.22	-67.76	383.38	337.99	45.395	8.445	
10,875.00	10,691.45	10,701.07	10,690.95	22.89	22.84	131.07	-287.22	-67.76	406.61	361.24	45.373	8.962	
10,900.00	10,696.73	10,704.21	10,696.23	22.98	22.84	125.96	-287.22	-67.76	430.24	384.87	45.371	9.483	
10,925.00	10,700.72	10,708.20	10,700.22	23.09	22.85	119.00	-287.22	-67.76	454.19	408.82	45.371	10.011	
10,950.00	10,703.41	10,710.89	10,702.91	23.20	22.86	109.68	-287.22	-67.76	478.38	433.01	45.368	10.545	
10,975.00	10,704.80	10,712.28	10,704.30	23.33	22.86	97.72	-287.22	-67.76	502.74	457.38	45.362	11.083	
10,991.13	10,705.00	10,712.48	10,704.50	23.41	22.86	88.81	-287.22	-67.76	518.51	473.16	45.357	11.432	
11,000.00	10,704.96	10,712.45	10,704.46	23.45	22.86	88.81	-287.22	-67.76	527.20	481.84	45.353	11.624	
11,100.00	10,704.52	10,712.01	10,704.02	24.05	22.86	88.80	-287.22	-67.76	625.09	579.77	45.321	13.792	
11,200.00	10,704.09	10,711.57	10,703.59	24.76	22.86	88.82	-287.22	-67.76	722.94	677.64	45.296	15.960	
11,300.00	10,703.65	10,711.13	10,703.15	25.57	22.86	88.86	-287.22	-67.76	820.66	775.39	45.276	18.126	
11,400.00	10,703.21	10,710.69	10,702.71	26.47	22.86	88.91	-287.22	-67.76	918.20	872.94	45.260	20.287	
11,500.00	10,702.77	10,710.25	10,702.27	27.44	22.85	88.97	-287.22	-67.76	1,015.51	970.26	45.248	22.443	
11,600.00	10,702.33	10,709.82	10,701.83	28.48	22.85	89.02	-287.22	-67.76	1,112.54	1,067.30	45.238	24.593	
11,636.42	10,702.18	10,709.66	10,701.68	28.87	22.85	89.04	-287.22	-67.76	1,147.81	1,102.57	45.235	25.374	
11,700.00	10,701.90	10,709.38	10,701.40	29.58	22.85	88.99	-287.22	-67.76	1,209.43	1,164.20	45.232	26.738	
11,800.00	10,701.46	10,708.95	10,700.96	30.74	22.85	88.90	-287.22	-67.76	1,306.74	1,261.51	45.233	28.889	
11,900.00	10,701.03	10,708.51	10,700.53	31.97	22.85	88.82	-287.22	-67.76	1,404.43	1,359.19	45.238	31.045	
12,000.00	10,700.59	10,708.07	10,700.09	33.25	22.85	88.73	-287.22	-67.76	1,502.42	1,457.18	45.247	33.205	
12,100.00	10,700.16	10,707.64	10,699.66	34.58	22.85	88.64	-287.22	-67.76	1,600.67	1,555.41	45.259	35.366	
12,200.00	10,699.72	10,707.20	10,699.22	35.96	22.85	88.56	-287.22	-67.76	1,699.11	1,653.84	45.275	37.529	
12,300.00	10,699.28	10,706.77	10,698.78	37.38	22.85	88.47	-287.22	-67.76	1,797.73	1,752.44	45.293	39.691	
12,400.00	10,698.85	14,235.38	12,528.95	38.84	41.16	175.94	1,593.85	-241.31	1,835.22	1,779.45	55.770	32.907	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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
12,500.00	10,698.41	14,335.38	12,528.51	40.33	42.58	175.94	1,693.85	-242.05	1,835.21	1,778.70	56.516	32.473	
12,600.00	10,697.98	14,435.38	12,528.07	41.85	44.04	175.94	1,793.84	-242.79	1,835.21	1,777.92	57.290	32.034	
12,700.00	10,697.54	14,535.38	12,527.63	43.39	45.52	175.94	1,893.84	-243.53	1,835.21	1,777.11	58.092	31.591	
12,800.00	10,697.11	14,635.38	12,527.19	44.96	47.03	175.94	1,993.84	-244.26	1,835.20	1,776.28	58.921	31.147	
12,900.00	10,696.67	14,735.38	12,526.75	46.54	48.56	175.94	2,093.83	-245.00	1,835.20	1,775.42	59.775	30.702	
13,000.00	10,696.24	14,835.38	12,526.31	48.15	50.11	175.94	2,193.83	-245.74	1,835.19	1,774.54	60.653	30.257	
13,100.00	10,695.80	14,935.38	12,525.87	49.77	51.69	175.94	2,293.83	-246.47	1,835.19	1,773.64	61.555	29.814	
13,200.00	10,695.36	15,035.38	12,525.43	51.41	53.28	175.94	2,393.82	-247.21	1,835.19	1,772.71	62.478	29.373	
13,300.00	10,694.93	15,135.38	12,524.99	53.06	54.89	175.94	2,493.82	-247.95	1,835.18	1,771.76	63.423	28.935	
13,400.00	10,694.49	15,235.38	12,524.55	54.73	56.51	175.94	2,593.81	-248.69	1,835.18	1,770.79	64.389	28.502	
13,500.00	10,694.06	15,335.38	12,524.11	56.40	58.15	175.94	2,693.81	-249.42	1,835.18	1,769.80	65.373	28.072	
13,600.00	10,693.62	15,435.38	12,523.67	58.09	59.79	175.94	2,793.81	-250.16	1,835.17	1,768.79	66.376	27.648	
13,700.00	10,693.19	15,535.38	12,523.23	59.79	61.45	175.94	2,893.80	-250.90	1,835.17	1,767.77	67.397	27.229	
13,800.00	10,692.75	15,635.38	12,522.79	61.49	63.13	175.94	2,993.80	-251.64	1,835.16	1,766.73	68.435	26.816	
13,900.00	10,692.32	15,735.38	12,522.35	63.20	64.81	175.94	3,093.80	-252.37	1,835.16	1,765.67	69.489	26.409	
14,000.00	10,691.88	15,835.38	12,521.91	64.92	66.50	175.94	3,193.79	-253.11	1,835.16	1,764.60	70.559	26.009	
14,100.00	10,691.44	15,935.38	12,521.47	66.65	68.19	175.94	3,293.79	-253.85	1,835.15	1,763.51	71.643	25.615	
14,200.00	10,691.01	16,035.38	12,521.03	68.39	69.90	175.94	3,393.79	-254.59	1,835.15	1,762.41	72.741	25.228	
14,300.00	10,690.57	16,135.38	12,520.59	70.13	71.61	175.94	3,493.78	-255.32	1,835.14	1,761.29	73.853	24.849	
14,400.00	10,690.14	16,235.38	12,520.15	71.87	73.33	175.94	3,593.78	-256.06	1,835.14	1,760.16	74.977	24.476	
14,500.00	10,689.70	16,335.38	12,519.71	73.62	75.06	175.94	3,693.77	-256.80	1,835.14	1,759.02	76.114	24.110	
14,600.00	10,689.27	16,435.38	12,519.27	75.38	76.79	175.94	3,793.77	-257.54	1,835.13	1,757.87	77.263	23.752	
14,700.00	10,688.83	16,535.38	12,518.83	77.14	78.53	175.94	3,893.77	-258.27	1,835.13	1,756.71	78.423	23.401	
14,800.00	10,688.40	16,635.38	12,518.39	78.90	80.27	175.94	3,993.76	-259.01	1,835.12	1,755.53	79.593	23.056	
14,900.00	10,687.96	16,735.38	12,517.95	80.67	82.02	175.94	4,093.76	-259.75	1,835.12	1,754.35	80.774	22.719	
15,000.00	10,687.52	16,835.38	12,517.51	82.44	83.77	175.94	4,193.76	-260.49	1,835.12	1,753.15	81.965	22.389	
15,100.00	10,687.09	16,935.38	12,517.07	84.22	85.52	175.94	4,293.75	-261.22	1,835.11	1,751.95	83.165	22.066	
15,200.00	10,686.65	17,035.38	12,516.63	86.00	87.28	175.94	4,393.75	-261.96	1,835.11	1,750.73	84.374	21.750	
15,300.00	10,686.22	17,135.38	12,516.19	87.78	89.05	175.94	4,493.74	-262.70	1,835.10	1,749.51	85.592	21.440	
15,400.00	10,685.78	17,235.38	12,515.75	89.56	90.81	175.94	4,593.74	-263.44	1,835.10	1,748.28	86.818	21.137	
15,500.00	10,685.35	17,335.38	12,515.31	91.35	92.58	175.94	4,693.74	-264.17	1,835.10	1,747.04	88.052	20.841	
15,579.47	10,685.00	17,414.85	12,514.96	92.77	93.99	175.94	4,773.21	-264.76	1,835.09	1,746.06	89.037	20.610	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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	1.20	-1.20	0.00	0.00	-135.38	-30.20	-29.80	42.43				
100.00	100.00	101.20	98.80	0.08	0.09	-135.38	-30.20	-29.80	42.43	42.26	.171	247.719	
200.00	200.00	201.20	198.80	0.31	0.31	-135.38	-30.20	-29.80	42.43	41.81	.621	68.343	
300.00	300.00	301.20	298.80	0.53	0.54	-135.38	-30.20	-29.80	42.43	41.36	1.070	39.639	
400.00	400.00	401.20	398.80	0.76	0.76	-135.38	-30.20	-29.80	42.43	40.91	1.520	27.915	
500.00	500.00	501.20	498.80	0.98	0.99	-135.38	-30.20	-29.80	42.43	40.46	1.969	21.543	
600.00	600.00	601.20	598.80	1.21	1.21	-135.38	-30.20	-29.80	42.43	40.01	2.419	17.540	
700.00	700.00	701.20	698.80	1.43	1.44	-135.38	-30.20	-29.80	42.43	39.56	2.868	14.791	
800.00	800.00	801.20	798.80	1.66	1.66	-135.38	-30.20	-29.80	42.43	39.11	3.318	12.787	
900.00	900.00	901.20	898.80	1.88	1.89	-135.38	-30.20	-29.80	42.43	38.66	3.768	11.261	
1,000.00	1,000.00	1,001.20	998.80	2.11	2.11	-135.38	-30.20	-29.80	42.43	38.21	4.217	10.061	
1,100.00	1,100.00	1,101.20	1,098.80	2.33	2.33	-135.38	-30.20	-29.80	42.43	37.76	4.667	9.092	
1,200.00	1,200.00	1,201.20	1,198.80	2.56	2.56	-135.38	-30.20	-29.80	42.43	37.31	5.116	8.293	
1,300.00	1,300.00	1,301.20	1,298.80	2.78	2.78	-135.38	-30.20	-29.80	42.43	36.86	5.566	7.623	
1,400.00	1,400.00	1,401.20	1,398.80	3.01	3.01	-135.38	-30.20	-29.80	42.43	36.41	6.015	7.053	
1,500.00	1,500.00	1,501.20	1,498.80	3.23	3.23	-135.38	-30.20	-29.80	42.43	35.96	6.465	6.563	
1,600.00	1,600.00	1,601.20	1,598.80	3.46	3.46	-135.38	-30.20	-29.80	42.43	35.51	6.914	6.136	
1,700.00	1,700.00	1,701.20	1,698.80	3.68	3.68	-135.38	-30.20	-29.80	42.43	35.06	7.364	5.762	
1,800.00	1,800.00	1,801.20	1,798.80	3.91	3.91	-135.38	-30.20	-29.80	42.43	34.61	7.813	5.430	
1,900.00	1,900.00	1,901.20	1,898.80	4.13	4.13	-135.38	-30.20	-29.80	42.43	34.16	8.263	5.135	
2,000.00	2,000.00	1,998.80	1,998.80	4.35	4.35	-135.38	-30.20	-29.80	42.43	33.72	8.707	4.873 CC	
2,100.00	2,100.00	2,097.78	2,097.77	4.58	4.55	-136.04	-31.37	-30.25	43.59	34.46	9.125	4.777	
2,200.00	2,200.00	2,196.62	2,196.54	4.80	4.72	-137.85	-34.92	-31.61	47.16	37.65	9.516	4.956	
2,300.00	2,300.00	2,304.86	2,294.84	5.03	4.91	-140.32	-40.84	-33.88	53.21	43.29	9.922	5.363	
2,400.00	2,400.00	2,394.83	2,394.23	5.25	5.08	-142.69	-48.14	-36.69	60.70	50.39	10.309	5.888	
2,500.00	2,500.00	2,505.48	2,493.61	5.48	5.29	-144.54	-55.44	-39.49	68.26	57.53	10.738	6.357	
2,600.00	2,600.00	2,605.79	2,593.00	5.70	5.49	-146.02	-62.74	-42.29	75.89	64.74	11.151	6.805	
2,700.00	2,700.00	2,706.10	2,692.38	5.93	5.70	-147.23	-70.05	-45.10	83.55	71.99	11.568	7.223	
2,800.00	2,800.00	2,806.40	2,791.77	6.15	5.91	-148.23	-77.35	-47.90	91.25	79.26	11.988	7.612	
2,900.00	2,900.00	2,906.71	2,891.15	6.38	6.12	-149.08	-84.65	-50.70	98.97	86.56	12.410	7.975	
3,000.00	3,000.00	3,007.02	2,990.53	6.60	6.34	-149.81	-91.95	-53.50	106.71	93.87	12.835	8.314	
3,100.00	3,100.00	3,092.67	3,089.92	6.83	6.53	-150.43	-99.25	-56.31	114.46	101.23	13.232	8.650	
3,200.00	3,200.00	3,207.64	3,189.30	7.05	6.79	-150.98	-106.56	-59.11	122.22	108.53	13.690	8.928	
3,300.00	3,300.00	3,307.95	3,288.69	7.28	7.02	-151.46	-113.86	-61.91	130.00	115.88	14.121	9.206	
3,400.00	3,400.00	3,408.25	3,388.07	7.50	7.26	-151.89	-121.16	-64.72	137.78	123.23	14.553	9.467	
3,500.00	3,500.00	3,508.56	3,487.46	7.73	7.49	-152.27	-128.46	-67.52	145.57	130.58	14.987	9.713	
3,600.00	3,600.00	3,591.13	3,586.84	7.95	7.69	-152.62	-135.77	-70.32	153.36	137.98	15.385	9.969	
3,700.00	3,700.00	3,709.18	3,686.23	8.18	7.97	-152.93	-143.07	-73.13	161.16	145.31	15.858	10.163	
3,800.00	3,800.00	3,790.51	3,785.61	8.40	8.16	-153.21	-150.37	-75.93	168.97	152.71	16.255	10.395	
3,900.00	3,900.00	3,909.80	3,884.99	8.63	8.45	-153.47	-157.67	-78.73	176.78	160.04	16.734	10.564	
4,000.00	4,000.00	3,989.90	3,984.38	8.85	8.65	-153.70	-164.97	-81.53	184.59	167.46	17.130	10.775	
4,100.00	4,099.99	4,089.68	4,083.85	9.05	8.89	-5.95	-172.28	-84.34	191.10	173.56	17.542	10.894	
4,200.00	4,199.91	4,189.59	4,183.46	9.22	9.14	-6.26	-179.60	-87.15	195.02	177.09	17.929	10.877	
4,266.67	4,266.45	4,256.24	4,249.90	9.34	9.30	-6.52	-184.48	-89.02	196.19	178.00	18.190	10.786	
4,300.00	4,299.70	4,289.57	4,283.13	9.40	9.39	-6.65	-186.92	-89.96	196.49	178.17	18.321	10.725	
4,400.00	4,399.46	4,389.56	4,382.81	9.58	9.64	-7.06	-194.25	-92.77	197.40	178.68	18.715	10.548	
4,500.00	4,499.22	4,489.54	4,482.49	9.76	9.89	-7.46	-201.57	-95.58	198.31	179.20	19.112	10.376	
4,600.00	4,598.97	4,589.53	4,582.16	9.94	10.14	-7.86	-208.90	-98.39	199.23	179.72	19.512	10.211	
4,700.00	4,698.73	4,689.52	4,681.84	10.13	10.39	-8.26	-216.22	-101.21	200.16	180.25	19.915	10.051	
4,800.00	4,798.48	4,789.50	4,781.52	10.32	10.64	-8.65	-223.54	-104.02	201.10	180.78	20.320	9.897	
4,900.00	4,898.24	4,889.49	4,881.20	10.52	10.89	-9.04	-230.87	-106.83	202.05	181.33	20.728	9.748	
5,000.00	4,998.00	4,989.47	4,980.87	10.72	11.15	-9.42	-238.19	-109.64	203.01	181.87	21.138	9.604	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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	5,097.75	5,089.46	5,080.55	10.92	11.40	-9.81	-245.51	-112.45	203.98	182.43	21.550	9.466	
5,200.00	5,197.51	5,189.45	5,180.23	11.12	11.66	-10.18	-252.84	-115.26	204.96	183.00	21.964	9.332	
5,300.00	5,297.27	5,289.43	5,279.91	11.32	11.92	-10.56	-260.16	-118.07	205.95	183.57	22.380	9.202	
5,400.00	5,397.02	5,389.42	5,379.59	11.53	12.17	-10.93	-267.49	-120.89	206.94	184.14	22.798	9.077	
5,500.00	5,496.78	5,489.40	5,479.26	11.74	12.43	-11.30	-274.81	-123.70	207.94	184.73	23.218	8.956	
5,600.00	5,596.54	5,595.11	5,584.74	11.95	12.69	-11.68	-281.21	-126.15	207.59	183.93	23.663	8.773	
5,700.00	5,696.29	5,700.75	5,690.31	12.17	12.93	-12.09	-284.88	-127.56	204.48	180.39	24.097	8.486	
5,800.00	5,796.05	5,805.30	5,794.85	12.38	13.14	-12.53	-285.86	-127.94	198.66	174.15	24.508	8.106	
5,900.00	5,895.80	5,905.06	5,894.60	12.60	13.32	-12.98	-285.86	-127.94	191.85	166.95	24.908	7.703	
6,000.00	5,995.56	6,004.81	5,994.36	12.82	13.51	-13.46	-285.86	-127.94	185.06	159.75	25.309	7.312	
6,100.00	6,095.32	6,104.57	6,094.12	13.04	13.69	-13.98	-285.86	-127.94	178.28	152.57	25.713	6.934	
6,200.00	6,195.07	6,204.32	6,193.87	13.26	13.88	-14.55	-285.86	-127.94	171.52	145.40	26.120	6.567	
6,300.00	6,294.83	6,304.08	6,293.63	13.48	14.06	-15.16	-285.86	-127.94	164.78	138.25	26.528	6.211	
6,400.00	6,394.59	6,403.84	6,393.39	13.71	14.25	-15.82	-285.86	-127.94	158.06	131.12	26.939	5.867	
6,500.00	6,494.34	6,503.59	6,493.14	13.93	14.44	-16.54	-285.86	-127.94	151.35	124.00	27.353	5.533	
6,600.00	6,594.10	6,603.35	6,592.90	14.16	14.63	-17.32	-285.86	-127.94	144.68	116.91	27.769	5.210	
6,700.00	6,693.86	6,703.11	6,692.66	14.39	14.82	-18.18	-285.86	-127.94	138.03	109.85	28.187	4.897	
6,800.00	6,793.61	6,802.86	6,792.41	14.62	15.02	-19.13	-285.86	-127.94	131.42	102.82	28.608	4.594	
6,900.00	6,893.37	6,902.62	6,892.17	14.85	15.21	-20.18	-285.86	-127.94	124.85	95.82	29.033	4.300	
7,000.00	6,993.13	7,002.38	6,991.93	15.08	15.40	-21.35	-285.86	-127.94	118.33	88.87	29.461	4.016	
7,100.00	7,092.88	7,102.13	7,091.68	15.31	15.60	-22.65	-285.86	-127.94	111.86	81.97	29.892	3.742	
7,200.00	7,192.64	7,201.89	7,191.44	15.54	15.79	-24.11	-285.86	-127.94	105.45	75.12	30.329	3.477	
7,300.00	7,292.39	7,301.65	7,291.19	15.78	15.99	-25.75	-285.86	-127.94	99.12	68.35	30.770	3.221	
7,400.00	7,392.15	7,401.40	7,390.95	16.01	16.19	-27.62	-285.86	-127.94	92.89	61.67	31.219	2.975	
7,500.00	7,491.91	7,501.16	7,490.71	16.25	16.38	-29.76	-285.86	-127.94	86.76	55.09	31.675	2.739	
7,600.00	7,591.66	7,600.91	7,590.46	16.48	16.58	-32.21	-285.86	-127.94	80.78	48.64	32.140	2.513	
7,700.00	7,691.42	7,700.67	7,690.22	16.72	16.78	-35.05	-285.86	-127.94	74.96	42.35	32.617	2.298	
7,800.00	7,791.18	7,800.43	7,789.98	16.96	16.98	-38.36	-285.86	-127.94	69.36	36.25	33.109	2.095	
7,900.00	7,890.93	7,900.18	7,889.73	17.19	17.18	-42.23	-285.86	-127.94	64.03	30.42	33.617	1.905	
8,000.00	7,990.69	8,000.06	7,989.49	17.43	17.38	-46.78	-285.86	-127.94	59.05	24.90	34.147	1.729	
8,100.00	8,090.45	8,100.30	8,089.25	17.67	17.59	-52.13	-285.86	-127.94	54.50	19.81	34.698	1.571	
8,200.00	8,190.20	8,200.55	8,189.00	17.91	17.79	-58.37	-285.86	-127.94	50.52	15.25	35.270	1.432	Level 3
8,300.00	8,289.96	8,300.79	8,288.76	18.15	17.99	-65.58	-285.86	-127.94	47.23	11.37	35.853	1.317	Level 3
8,400.00	8,389.72	8,401.03	8,388.52	18.39	18.20	-73.72	-285.86	-127.94	44.79	8.36	36.431	1.229	Level 2
8,500.00	8,489.47	8,501.28	8,488.27	18.64	18.40	-82.58	-285.86	-127.94	43.35	6.37	36.979	1.172	Level 2
8,580.42	8,569.70	8,578.95	8,568.50	18.83	18.56	-90.00	-285.86	-127.94	42.98	5.61	37.375	1.150	Level 2
8,600.00	8,589.23	8,601.52	8,588.03	18.88	18.61	-91.82	-285.86	-127.94	43.01	5.53	37.472	1.148	Level 2, ES
8,700.00	8,688.98	8,701.77	8,687.78	19.12	18.81	-100.96	-285.86	-127.94	43.79	5.89	37.898	1.155	Level 2
8,800.00	8,788.74	8,802.01	8,787.54	19.36	19.02	-109.57	-285.86	-127.94	45.63	7.37	38.264	1.193	Level 2
8,811.29	8,800.00	8,809.25	8,798.80	19.39	19.03	-110.49	-285.86	-127.94	45.90	7.61	38.294	1.199	Level 2
8,900.00	8,888.56	8,902.19	8,887.36	19.60	19.22	-116.30	-285.86	-127.94	47.96	9.35	38.604	1.242	Level 2
9,000.00	8,988.50	9,002.25	8,987.30	19.83	19.43	-119.79	-285.86	-127.94	49.53	10.56	38.970	1.271	Level 3
9,077.95	9,066.45	9,075.70	9,065.25	19.99	19.58	91.41	-285.86	-127.94	49.93	10.66	39.268	1.272	Level 3
9,100.00	9,088.50	9,102.25	9,087.30	20.03	19.64	91.41	-285.86	-127.94	49.93	10.57	39.366	1.268	Level 3
9,200.00	9,188.50	9,202.25	9,187.30	20.23	19.84	91.41	-285.86	-127.94	49.93	10.16	39.772	1.255	Level 3
9,300.00	9,288.50	9,302.25	9,287.30	20.42	20.05	91.41	-285.86	-127.94	49.93	9.75	40.179	1.243	Level 2
9,400.00	9,388.50	9,402.25	9,387.30	20.62	20.26	91.41	-285.86	-127.94	49.93	9.35	40.586	1.230	Level 2
9,500.00	9,488.50	9,502.25	9,487.30	20.82	20.47	91.41	-285.86	-127.94	49.93	8.94	40.995	1.218	Level 2
9,600.00	9,588.50	9,602.25	9,587.30	21.02	20.68	91.41	-285.86	-127.94	49.93	8.53	41.404	1.206	Level 2
9,700.00	9,688.50	9,702.25	9,687.30	21.22	20.88	91.41	-285.86	-127.94	49.93	8.12	41.814	1.194	Level 2
9,800.00	9,788.50	9,802.25	9,787.30	21.42	21.09	91.41	-285.86	-127.94	49.93	7.71	42.225	1.183	Level 2
9,900.00	9,888.50	9,902.25	9,887.30	21.62	21.30	91.41	-285.86	-127.94	49.93	7.30	42.637	1.171	Level 2

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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
10,000.00	9,988.50	10,002.25	9,987.30	21.82	21.51	91.41	-285.86	-127.94	49.93	6.88	43.049	1.160	Level 2
10,100.00	10,088.50	10,102.25	10,087.30	22.02	21.72	91.41	-285.86	-127.94	49.93	6.47	43.462	1.149	Level 2
10,200.00	10,188.50	10,202.25	10,187.30	22.22	21.93	91.41	-285.86	-127.94	49.93	6.06	43.876	1.138	Level 2
10,239.04	10,227.54	10,236.79	10,226.34	22.30	22.01	91.41	-285.86	-127.94	49.93	5.90	44.028	1.134	Level 2
10,250.00	10,238.50	10,247.75	10,237.30	22.32	22.03	104.88	-285.86	-127.94	49.96	5.89	44.076	1.134	Level 2, SF
10,275.00	10,263.46	10,272.71	10,262.26	22.37	22.08	106.19	-285.86	-127.94	50.29	6.09	44.199	1.138	Level 2
10,300.00	10,288.33	10,302.42	10,287.13	22.41	22.14	108.82	-285.86	-127.94	51.06	6.71	44.348	1.151	Level 2
10,325.00	10,313.03	10,322.28	10,311.83	22.45	22.19	112.59	-285.86	-127.94	52.43	7.94	44.485	1.179	Level 2
10,350.00	10,337.50	10,346.75	10,336.30	22.49	22.24	117.23	-285.86	-127.94	54.63	10.00	44.630	1.224	Level 2
10,375.00	10,361.67	10,370.92	10,360.47	22.52	22.29	122.40	-285.86	-127.94	57.89	13.13	44.762	1.293	Level 3
10,400.00	10,385.47	10,405.28	10,384.27	22.55	22.36	127.72	-285.86	-127.94	62.44	17.54	44.893	1.391	Level 3
10,425.00	10,408.83	10,418.08	10,407.63	22.58	22.39	132.87	-285.86	-127.94	68.41	23.46	44.955	1.522	
10,450.00	10,431.70	10,440.95	10,430.50	22.61	22.44	137.63	-285.86	-127.94	75.90	30.88	45.019	1.686	
10,475.00	10,454.01	10,463.26	10,452.81	22.63	22.48	141.85	-285.86	-127.94	84.90	39.83	45.067	1.884	
10,500.00	10,475.70	10,484.95	10,474.50	22.65	22.53	145.51	-285.86	-127.94	95.39	50.28	45.106	2.115	
10,525.00	10,496.71	10,505.96	10,495.51	22.67	22.57	148.61	-285.86	-127.94	107.29	62.15	45.140	2.377	
10,550.00	10,516.98	10,526.23	10,515.78	22.68	22.62	151.20	-285.86	-127.94	120.53	75.36	45.174	2.668	
10,575.00	10,536.45	10,545.70	10,535.25	22.69	22.66	153.33	-285.86	-127.94	135.03	89.83	45.207	2.987	
10,600.00	10,555.08	10,564.33	10,553.88	22.71	22.70	155.07	-285.86	-127.94	150.71	105.47	45.240	3.331	
10,625.00	10,572.82	10,582.07	10,571.62	22.72	22.74	156.45	-285.86	-127.94	167.50	122.23	45.274	3.700	
10,650.00	10,589.60	10,601.15	10,588.40	22.72	22.78	157.51	-285.86	-127.94	185.31	140.00	45.312	4.090	
10,675.00	10,605.40	10,614.65	10,604.20	22.73	22.80	158.28	-285.86	-127.94	204.08	158.74	45.339	4.501	
10,700.00	10,620.16	10,629.41	10,618.96	22.74	22.84	158.77	-285.86	-127.94	223.73	178.36	45.371	4.931	
10,725.00	10,633.84	10,643.09	10,632.64	22.74	22.86	158.99	-285.86	-127.94	244.20	198.80	45.400	5.379	
10,750.00	10,646.41	10,655.66	10,645.21	22.75	22.89	158.92	-285.86	-127.94	265.42	219.99	45.427	5.843	
10,775.00	10,657.83	10,667.08	10,656.63	22.75	22.92	158.53	-285.86	-127.94	287.31	241.86	45.452	6.321	
10,800.00	10,668.07	10,677.32	10,666.87	22.75	22.94	157.75	-285.86	-127.94	309.81	264.34	45.474	6.813	
10,825.00	10,677.10	10,686.35	10,675.90	22.76	22.96	156.48	-285.86	-127.94	332.86	287.36	45.493	7.317	
10,850.00	10,684.90	10,705.85	10,683.70	22.80	23.00	154.53	-285.86	-127.94	356.37	310.84	45.533	7.827	
10,875.00	10,691.45	10,700.70	10,690.25	22.89	22.99	151.58	-285.86	-127.94	380.29	334.77	45.521	8.354	
10,900.00	10,696.73	10,705.98	10,695.53	22.98	23.00	147.04	-285.86	-127.94	404.53	359.00	45.530	8.885	
10,925.00	10,700.72	10,709.97	10,699.52	23.09	23.01	139.74	-285.86	-127.94	429.04	383.51	45.535	9.422	
10,950.00	10,703.41	10,712.66	10,702.21	23.20	23.01	127.35	-285.86	-127.94	453.75	408.21	45.538	9.964	
10,975.00	10,704.80	10,714.05	10,703.60	23.33	23.01	106.17	-285.86	-127.94	478.57	433.03	45.537	10.510	
10,991.13	10,705.00	10,714.25	10,703.80	23.41	23.01	87.45	-285.86	-127.94	494.62	449.08	45.535	10.862	
11,000.00	10,704.96	10,714.21	10,703.76	23.45	23.01	87.49	-285.86	-127.94	503.45	457.91	45.533	11.057	
11,100.00	10,704.52	10,713.78	10,703.32	24.05	23.01	87.82	-285.86	-127.94	602.87	557.36	45.516	13.245	
11,200.00	10,704.09	10,713.34	10,702.89	24.76	23.01	88.09	-285.86	-127.94	702.12	656.62	45.501	15.431	
11,300.00	10,703.65	10,712.90	10,702.45	25.57	23.01	88.31	-285.86	-127.94	801.15	755.66	45.488	17.612	
11,400.00	10,703.21	10,712.46	10,702.01	26.47	23.01	88.48	-285.86	-127.94	899.94	854.46	45.478	19.789	
11,500.00	10,702.77	10,712.02	10,701.57	27.44	23.01	88.63	-285.86	-127.94	998.46	952.99	45.469	21.959	
11,600.00	10,702.33	10,711.58	10,701.13	28.48	23.01	88.75	-285.86	-127.94	1,096.67	1,051.21	45.462	24.123	
11,636.42	10,702.18	10,711.43	10,700.98	28.87	23.01	88.79	-285.86	-127.94	1,132.35	1,086.90	45.459	24.909	
11,700.00	10,701.90	10,711.15	10,700.70	29.58	23.01	88.72	-285.86	-127.94	1,194.68	1,149.23	45.457	26.281	
11,800.00	10,701.46	10,710.71	10,700.26	30.74	23.01	88.62	-285.86	-127.94	1,292.97	1,247.51	45.459	28.442	
11,900.00	10,701.03	10,710.28	10,699.83	31.97	23.01	88.51	-285.86	-127.94	1,391.49	1,346.03	45.465	30.606	
12,000.00	10,700.59	10,709.84	10,699.39	33.25	23.01	88.40	-285.86	-127.94	1,490.21	1,444.74	45.474	32.771	
12,100.00	10,700.16	10,709.41	10,698.96	34.58	23.00	88.29	-285.86	-127.94	1,589.10	1,543.61	45.487	34.935	
12,200.00	10,699.72	10,708.97	10,698.52	35.96	23.00	88.18	-285.86	-127.94	1,688.11	1,642.61	45.502	37.100	
12,300.00	10,699.28	10,708.54	10,698.08	37.38	23.00	88.07	-285.86	-127.94	1,787.23	1,741.71	45.520	39.262	
12,400.00	10,698.85	10,708.10	10,697.65	38.84	23.00	87.96	-285.86	-127.94	1,886.45	1,840.91	45.541	41.423	
12,500.00	10,698.41	10,707.66	10,697.21	40.33	23.00	87.85	-285.86	-127.94	1,985.74	1,940.18	45.564	43.581	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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	10,697.98	14,700.02	12,773.13	41.85	44.67	-179.99	1,794.01	-372.96	2,076.37	2,018.39	57.975	35.815	
12,700.00	10,697.54	14,800.02	12,772.68	43.39	46.13	-179.99	1,894.01	-373.69	2,076.36	2,017.61	58.751	35.342	
12,800.00	10,697.11	14,900.02	12,772.24	44.96	47.61	-179.99	1,994.00	-374.43	2,076.36	2,016.80	59.553	34.865	
12,900.00	10,696.67	15,000.02	12,771.80	46.54	49.13	-179.99	2,094.00	-375.16	2,076.35	2,015.97	60.381	34.388	
13,000.00	10,696.24	15,100.02	12,771.36	48.15	50.66	-179.99	2,194.00	-375.89	2,076.34	2,015.11	61.232	33.910	
13,100.00	10,695.80	15,200.02	12,770.92	49.77	52.22	-179.99	2,293.99	-376.62	2,076.34	2,014.23	62.106	33.432	
13,200.00	10,695.36	15,300.02	12,770.47	51.41	53.79	-179.99	2,393.99	-377.35	2,076.33	2,013.33	63.002	32.957	
13,300.00	10,694.93	15,400.02	12,770.03	53.06	55.38	-179.99	2,493.98	-378.08	2,076.32	2,012.40	63.919	32.484	
13,400.00	10,694.49	15,500.02	12,769.59	54.73	56.99	-180.00	2,593.98	-378.82	2,076.32	2,011.46	64.856	32.014	
13,500.00	10,694.06	15,600.02	12,769.15	56.40	58.61	-180.00	2,693.98	-379.55	2,076.31	2,010.50	65.812	31.549	
13,600.00	10,693.62	15,700.02	12,768.71	58.09	60.24	-180.00	2,793.97	-380.28	2,076.30	2,009.52	66.787	31.089	
13,700.00	10,693.19	15,800.02	12,768.26	59.79	61.89	-180.00	2,893.97	-381.01	2,076.30	2,008.52	67.779	30.633	
13,800.00	10,692.75	15,900.02	12,767.82	61.49	63.55	-180.00	2,993.97	-381.74	2,076.29	2,007.50	68.788	30.184	
13,900.00	10,692.32	16,000.02	12,767.38	63.20	65.21	-180.00	3,093.96	-382.48	2,076.29	2,006.47	69.813	29.741	
14,000.00	10,691.88	16,100.02	12,766.94	64.92	66.89	-180.00	3,193.96	-383.21	2,076.28	2,005.43	70.854	29.304	
14,100.00	10,691.44	16,200.02	12,766.50	66.65	68.58	-180.00	3,293.96	-383.94	2,076.27	2,004.36	71.909	28.874	
14,200.00	10,691.01	16,300.02	12,766.06	68.39	70.27	-180.00	3,393.95	-384.67	2,076.27	2,003.29	72.978	28.450	
14,300.00	10,690.57	16,400.02	12,765.61	70.13	71.98	-180.00	3,493.95	-385.40	2,076.26	2,002.20	74.061	28.034	
14,400.00	10,690.14	16,500.02	12,765.17	71.87	73.69	-180.00	3,593.94	-386.14	2,076.25	2,001.10	75.157	27.626	
14,500.00	10,689.70	16,600.02	12,764.73	73.62	75.40	-180.00	3,693.94	-386.87	2,076.25	1,999.98	76.265	27.224	
14,600.00	10,689.27	16,700.02	12,764.29	75.38	77.13	-180.00	3,793.94	-387.60	2,076.24	1,998.86	77.384	26.830	
14,700.00	10,688.83	16,800.02	12,763.85	77.14	78.85	-180.00	3,893.93	-388.33	2,076.24	1,997.72	78.515	26.444	
14,800.00	10,688.40	16,900.02	12,763.40	78.90	80.59	-180.00	3,993.93	-389.06	2,076.23	1,996.57	79.657	26.065	
14,900.00	10,687.96	17,000.02	12,762.96	80.67	82.33	-180.00	4,093.93	-389.79	2,076.22	1,995.41	80.810	25.693	
15,000.00	10,687.52	17,100.02	12,762.52	82.44	84.07	-180.00	4,193.92	-390.53	2,076.22	1,994.24	81.972	25.328	
15,100.00	10,687.09	17,200.02	12,762.08	84.22	85.82	-180.00	4,293.92	-391.26	2,076.21	1,993.07	83.143	24.971	
15,200.00	10,686.65	17,300.02	12,761.64	86.00	87.57	-180.00	4,393.91	-391.99	2,076.20	1,991.88	84.324	24.622	
15,300.00	10,686.22	17,400.02	12,761.19	87.78	89.33	-180.00	4,493.91	-392.72	2,076.20	1,990.68	85.514	24.279	
15,400.00	10,685.78	17,500.02	12,760.75	89.56	91.09	-180.00	4,593.91	-393.45	2,076.19	1,989.48	86.712	23.944	
15,500.00	10,685.35	17,600.02	12,760.31	91.35	92.85	-180.00	4,693.90	-394.19	2,076.18	1,988.27	87.918	23.615	
15,574.36	10,685.02	17,674.38	12,759.98	92.68	94.17	180.00	4,768.26	-394.73	2,076.18	1,987.36	88.820	23.375	
15,579.47	10,685.00	17,670.32	12,760.00	92.77	94.09	180.00	4,764.20	-394.70	2,076.20	1,987.43	88.775	23.387	

Anticollision Report

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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	1.60	-1.60	0.00	0.00	-117.06	-30.50	-59.70	67.04				
100.00	100.00	101.60	98.40	0.08	0.09	-117.06	-30.50	-59.70	67.04	66.87	.172	389.379	
200.00	200.00	201.60	198.40	0.31	0.31	-117.06	-30.50	-59.70	67.04	66.42	.622	107.833	
300.00	300.00	301.60	298.40	0.53	0.54	-117.06	-30.50	-59.70	67.04	65.97	1.071	62.582	
400.00	400.00	401.60	398.40	0.76	0.76	-117.06	-30.50	-59.70	67.04	65.52	1.521	44.083	
500.00	500.00	501.60	498.40	0.98	0.99	-117.06	-30.50	-59.70	67.04	65.07	1.970	34.025	
600.00	600.00	601.60	598.40	1.21	1.21	-117.06	-30.50	-59.70	67.04	64.62	2.420	27.704	
700.00	700.00	701.60	698.40	1.43	1.44	-117.06	-30.50	-59.70	67.04	64.17	2.869	23.364	
800.00	800.00	801.60	798.40	1.66	1.66	-117.06	-30.50	-59.70	67.04	63.72	3.319	20.199	
900.00	900.00	901.60	898.40	1.88	1.89	-117.06	-30.50	-59.70	67.04	63.27	3.768	17.790	
1,000.00	1,000.00	1,001.60	998.40	2.11	2.11	-117.06	-30.50	-59.70	67.04	62.82	4.218	15.894	
1,100.00	1,100.00	1,101.60	1,098.40	2.33	2.34	-117.06	-30.50	-59.70	67.04	62.37	4.667	14.363	
1,200.00	1,200.00	1,201.60	1,198.40	2.56	2.56	-117.06	-30.50	-59.70	67.04	61.92	5.117	13.101	
1,300.00	1,300.00	1,301.60	1,298.40	2.78	2.79	-117.06	-30.50	-59.70	67.04	61.47	5.567	12.043	
1,400.00	1,400.00	1,401.60	1,398.40	3.01	3.01	-117.06	-30.50	-59.70	67.04	61.02	6.016	11.143	
1,500.00	1,500.00	1,498.40	1,498.40	3.23	3.23	-117.06	-30.50	-59.70	67.04	60.58	6.458	10.380	
1,600.00	1,600.00	1,596.91	1,596.90	3.46	3.42	-117.59	-31.54	-60.36	68.12	61.24	6.878	9.904	
1,700.00	1,700.00	1,695.27	1,695.19	3.68	3.60	-119.09	-34.71	-62.38	71.46	64.19	7.274	9.824	
1,800.00	1,800.00	1,793.37	1,793.09	3.91	3.78	-121.31	-40.00	-65.75	77.14	69.47	7.671	10.056	
1,900.00	1,900.00	1,907.73	1,891.62	4.13	4.00	-123.83	-47.09	-70.27	84.86	76.75	8.106	10.469	
2,000.00	2,000.00	2,008.11	1,990.86	4.35	4.21	-125.99	-54.41	-74.93	92.91	84.39	8.523	10.901	
2,100.00	2,100.00	2,108.49	2,090.10	4.58	4.42	-127.80	-61.74	-79.60	101.08	92.13	8.945	11.300	
2,200.00	2,200.00	2,208.87	2,189.34	4.80	4.64	-129.34	-69.06	-84.26	109.32	99.95	9.370	11.668	
2,300.00	2,300.00	2,309.25	2,288.58	5.03	4.87	-130.66	-76.38	-88.93	117.64	107.84	9.798	12.007	
2,400.00	2,400.00	2,409.63	2,387.82	5.25	5.10	-131.81	-83.70	-93.59	126.01	115.78	10.229	12.319	
2,500.00	2,500.00	2,489.99	2,487.06	5.48	5.29	-132.81	-91.03	-98.26	134.42	123.80	10.620	12.658	
2,600.00	2,600.00	2,589.61	2,586.30	5.70	5.53	-133.70	-98.35	-102.93	142.87	131.82	11.053	12.926	
2,700.00	2,700.00	2,689.23	2,685.55	5.93	5.77	-134.48	-105.67	-107.59	151.35	139.86	11.488	13.175	
2,800.00	2,800.00	2,788.84	2,784.79	6.15	6.02	-135.19	-113.00	-112.26	159.86	147.93	11.924	13.406	
2,900.00	2,900.00	2,888.46	2,884.03	6.38	6.26	-135.82	-120.32	-116.92	168.38	156.02	12.362	13.621	
3,000.00	3,000.00	2,988.08	2,983.27	6.60	6.51	-136.39	-127.64	-121.59	176.93	164.13	12.802	13.821	
3,100.00	3,100.00	3,087.70	3,082.51	6.83	6.76	-136.91	-134.96	-126.25	185.49	172.25	13.242	14.008	
3,200.00	3,200.00	3,187.32	3,181.75	7.05	7.02	-137.38	-142.29	-130.92	194.07	180.38	13.684	14.182	
3,300.00	3,300.00	3,286.94	3,280.99	7.28	7.27	-137.82	-149.61	-135.58	202.65	188.53	14.126	14.346	
3,400.00	3,400.00	3,386.56	3,380.23	7.50	7.53	-138.21	-156.93	-140.25	211.25	196.68	14.570	14.499	
3,500.00	3,500.00	3,486.18	3,479.47	7.73	7.79	-138.58	-164.25	-144.91	219.86	204.84	15.014	14.643	
3,600.00	3,600.00	3,585.80	3,578.71	7.95	8.05	-138.92	-171.58	-149.58	228.47	213.01	15.459	14.779	
3,700.00	3,700.00	3,685.42	3,677.95	8.18	8.31	-139.23	-178.90	-154.24	237.09	221.19	15.904	14.907	
3,800.00	3,800.00	3,785.04	3,777.19	8.40	8.57	-139.53	-186.22	-158.91	245.72	229.37	16.351	15.028	
3,900.00	3,900.00	3,884.66	3,876.43	8.63	8.83	-139.80	-193.54	-163.57	254.36	237.56	16.798	15.143	
4,000.00	4,000.00	3,984.28	3,975.67	8.85	9.09	-140.05	-200.87	-168.24	263.00	245.75	17.245	15.251	
4,100.00	4,099.99	4,084.00	4,075.01	9.05	9.36	7.73	-208.20	-172.91	270.35	252.68	17.666	15.304	
4,200.00	4,199.91	4,183.88	4,174.51	9.22	9.62	7.60	-215.54	-177.58	275.11	257.05	18.062	15.232	
4,266.67	4,266.45	4,250.53	4,240.90	9.34	9.80	7.56	-220.44	-180.70	276.85	258.52	18.328	15.105	
4,300.00	4,299.70	4,283.85	4,274.11	9.40	9.89	7.55	-222.89	-182.26	277.43	258.97	18.461	15.028	
4,400.00	4,399.46	4,383.84	4,373.71	9.58	10.16	7.52	-230.24	-186.95	279.17	260.31	18.864	14.799	
4,500.00	4,499.22	4,483.82	4,473.31	9.76	10.42	7.49	-237.59	-191.63	280.91	261.64	19.269	14.578	
4,600.00	4,598.97	4,583.81	4,572.92	9.94	10.69	7.46	-244.94	-196.31	282.65	262.97	19.677	14.364	
4,700.00	4,698.73	4,683.79	4,672.52	10.13	10.96	7.43	-252.29	-200.99	284.39	264.30	20.088	14.158	
4,800.00	4,798.48	4,783.78	4,772.13	10.32	11.23	7.40	-259.64	-205.68	286.13	265.63	20.500	13.958	
4,900.00	4,898.24	4,883.76	4,871.73	10.52	11.50	7.37	-266.98	-210.36	287.87	266.96	20.915	13.764	
5,000.00	4,998.00	4,983.75	4,971.34	10.72	11.77	7.34	-274.33	-215.04	289.61	268.28	21.331	13.577	

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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	5,097.75	5,091.19	5,078.47	10.92	12.05	7.34	-281.16	-219.39	290.18	268.40	21.778	13.325	
5,200.00	5,197.51	5,199.29	5,186.45	11.12	12.31	7.41	-285.47	-222.13	287.95	265.73	22.215	12.962	
5,300.00	5,297.27	5,307.17	5,294.30	11.32	12.54	7.56	-287.19	-223.23	282.91	260.27	22.639	12.497	
5,400.00	5,397.02	5,408.29	5,395.42	11.53	12.71	7.75	-287.23	-223.26	276.04	253.01	23.028	11.987	
5,500.00	5,496.78	5,508.05	5,495.18	11.74	12.89	7.95	-287.23	-223.26	269.13	245.71	23.417	11.493	
5,600.00	5,596.54	5,607.80	5,594.94	11.95	13.07	8.16	-287.23	-223.26	262.22	238.41	23.808	11.014	
5,700.00	5,696.29	5,707.56	5,694.69	12.17	13.24	8.38	-287.23	-223.26	255.32	231.12	24.202	10.550	
5,800.00	5,796.05	5,807.32	5,794.45	12.38	13.42	8.61	-287.23	-223.26	248.42	223.82	24.597	10.099	
5,900.00	5,895.80	5,907.07	5,894.20	12.60	13.60	8.86	-287.23	-223.26	241.52	216.53	24.995	9.663	
6,000.00	5,995.56	6,006.83	5,993.96	12.82	13.78	9.13	-287.23	-223.26	234.63	209.24	25.395	9.239	
6,100.00	6,095.32	6,106.58	6,093.72	13.04	13.97	9.40	-287.23	-223.26	227.75	201.95	25.797	8.828	
6,200.00	6,195.07	6,206.34	6,193.47	13.26	14.15	9.70	-287.23	-223.26	220.87	194.67	26.201	8.430	
6,300.00	6,294.83	6,306.10	6,293.23	13.48	14.34	10.01	-287.23	-223.26	214.00	187.39	26.607	8.043	
6,400.00	6,394.59	6,405.85	6,392.99	13.71	14.52	10.35	-287.23	-223.26	207.13	180.12	27.015	7.667	
6,500.00	6,494.34	6,505.61	6,492.74	13.93	14.71	10.71	-287.23	-223.26	200.27	172.85	27.425	7.303	
6,600.00	6,594.10	6,605.37	6,592.50	14.16	14.90	11.09	-287.23	-223.26	193.42	165.59	27.836	6.949	
6,700.00	6,693.86	6,705.12	6,692.26	14.39	15.09	11.50	-287.23	-223.26	186.58	158.33	28.249	6.605	
6,800.00	6,793.61	6,804.88	6,792.01	14.62	15.28	11.95	-287.23	-223.26	179.75	151.09	28.664	6.271	
6,900.00	6,893.37	6,904.64	6,891.77	14.85	15.47	12.43	-287.23	-223.26	172.93	143.85	29.081	5.947	
7,000.00	6,993.13	7,004.39	6,991.53	15.08	15.66	12.94	-287.23	-223.26	166.12	136.62	29.499	5.631	
7,100.00	7,092.88	7,104.15	7,091.28	15.31	15.85	13.50	-287.23	-223.26	159.33	129.41	29.920	5.325	
7,200.00	7,192.64	7,203.91	7,191.04	15.54	16.05	14.12	-287.23	-223.26	152.56	122.21	30.342	5.028	
7,300.00	7,292.39	7,303.66	7,290.79	15.78	16.24	14.78	-287.23	-223.26	145.80	115.03	30.767	4.739	
7,400.00	7,392.15	7,403.42	7,390.55	16.01	16.44	15.52	-287.23	-223.26	139.07	107.87	31.193	4.458	
7,500.00	7,491.91	7,503.17	7,490.31	16.25	16.63	16.33	-287.23	-223.26	132.36	100.73	31.623	4.186	
7,600.00	7,591.66	7,602.93	7,590.06	16.48	16.83	17.22	-287.23	-223.26	125.68	93.62	32.055	3.921	
7,700.00	7,691.42	7,702.69	7,689.82	16.72	17.03	18.21	-287.23	-223.26	119.03	86.54	32.490	3.664	
7,800.00	7,791.18	7,802.44	7,789.58	16.96	17.23	19.32	-287.23	-223.26	112.42	79.50	32.928	3.414	
7,900.00	7,890.93	7,902.20	7,889.33	17.19	17.42	20.57	-287.23	-223.26	105.86	72.49	33.371	3.172	
8,000.00	7,990.69	8,001.96	7,989.09	17.43	17.62	21.99	-287.23	-223.26	99.36	65.54	33.818	2.938	
8,100.00	8,090.45	8,101.71	8,088.85	17.67	17.82	23.60	-287.23	-223.26	92.93	58.66	34.272	2.711	
8,200.00	8,190.20	8,201.47	8,188.60	17.91	18.02	25.44	-287.23	-223.26	86.58	51.84	34.733	2.493	
8,300.00	8,289.96	8,301.23	8,288.36	18.15	18.23	27.58	-287.23	-223.26	80.33	45.13	35.204	2.282	
8,400.00	8,389.72	8,400.98	8,388.12	18.39	18.43	30.07	-287.23	-223.26	74.22	38.53	35.687	2.080	
8,500.00	8,489.47	8,500.74	8,487.87	18.64	18.63	33.01	-287.23	-223.26	68.26	32.08	36.185	1.887	
8,600.00	8,589.23	8,600.50	8,587.63	18.88	18.83	36.49	-287.23	-223.26	62.53	25.82	36.702	1.704	
8,700.00	8,688.98	8,700.25	8,687.38	19.12	19.03	40.65	-287.23	-223.26	57.06	19.82	37.243	1.532	
8,800.00	8,788.74	8,800.01	8,787.14	19.36	19.24	45.66	-287.23	-223.26	51.96	14.15	37.813	1.374	Level 3
8,811.29	8,800.00	8,811.27	8,798.40	19.39	19.26	46.29	-287.23	-223.26	51.42	13.54	37.880	1.357	Level 3
8,900.00	8,888.56	8,900.17	8,886.96	19.60	19.44	50.70	-287.23	-223.26	47.99	9.60	38.386	1.250	Level 3
9,000.00	8,988.50	9,000.23	8,986.90	19.83	19.65	53.91	-287.23	-223.26	45.94	7.04	38.900	1.181	Level 2
9,077.95	9,066.45	9,077.72	9,064.85	19.99	19.81	-93.28	-287.23	-223.26	45.48	6.23	39.243	1.159	Level 2
9,100.00	9,088.50	9,100.24	9,086.90	20.03	19.85	-93.28	-287.23	-223.26	45.48	6.14	39.334	1.156	Level 2
9,200.00	9,188.50	9,200.24	9,186.90	20.23	20.06	-93.28	-287.23	-223.26	45.48	5.74	39.740	1.144	Level 2
9,300.00	9,288.50	9,300.24	9,286.90	20.42	20.27	-93.28	-287.23	-223.26	45.48	5.33	40.148	1.133	Level 2
9,400.00	9,388.50	9,400.24	9,386.90	20.62	20.47	-93.28	-287.23	-223.26	45.48	4.92	40.556	1.121	Level 2
9,500.00	9,488.50	9,500.24	9,486.90	20.82	20.68	-93.28	-287.23	-223.26	45.48	4.51	40.966	1.110	Level 2
9,600.00	9,588.50	9,600.24	9,586.90	21.02	20.89	-93.28	-287.23	-223.26	45.48	4.10	41.376	1.099	Level 2
9,700.00	9,688.50	9,700.24	9,686.90	21.22	21.09	-93.28	-287.23	-223.26	45.48	3.69	41.787	1.088	Level 2
9,800.00	9,788.50	9,800.24	9,786.90	21.42	21.30	-93.28	-287.23	-223.26	45.48	3.28	42.199	1.078	Level 2
9,900.00	9,888.50	9,900.24	9,886.90	21.62	21.51	-93.28	-287.23	-223.26	45.48	2.87	42.611	1.067	Level 2
10,000.00	9,988.50	10,000.24	9,986.90	21.82	21.72	-93.28	-287.23	-223.26	45.48	2.45	43.024	1.057	Level 2

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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
10,100.00	10,088.50	10,100.24	10,086.90	22.02	21.93	-93.28	-287.23	-223.26	45.48	2.04	43.438	1.047	Level 2
10,200.00	10,188.50	10,200.24	10,186.90	22.22	22.14	-93.28	-287.23	-223.26	45.48	1.62	43.853	1.037	Level 2
10,239.04	10,227.54	10,238.81	10,225.94	22.30	22.22	-93.28	-287.23	-223.26	45.48	1.46	44.014	1.033	Level 2
10,250.00	10,238.50	10,249.76	10,236.90	22.32	22.24	-80.11	-287.23	-223.26	45.45	1.40	44.056	1.032	Level 2
10,275.00	10,263.46	10,274.73	10,261.86	22.37	22.29	-81.67	-287.23	-223.26	45.26	1.14	44.121	1.026	Level 2
10,300.00	10,288.33	10,300.40	10,286.73	22.41	22.35	-84.88	-287.23	-223.26	44.96	0.82	44.144	1.019	Level 2
10,325.00	10,313.03	10,324.30	10,311.43	22.45	22.40	-89.73	-287.23	-223.26	44.78	0.66	44.121	1.015	Level 2, ES, SF
10,326.20	10,314.21	10,325.48	10,312.61	22.45	22.40	-90.00	-287.23	-223.26	44.78	0.66	44.119	1.015	Level 2, CC
10,350.00	10,337.50	10,348.77	10,335.90	22.49	22.45	-96.08	-287.23	-223.26	45.05	0.98	44.062	1.022	Level 2
10,375.00	10,361.67	10,372.93	10,360.07	22.52	22.50	-103.61	-287.23	-223.26	46.18	2.19	43.989	1.050	Level 2
10,400.00	10,385.47	10,403.27	10,383.87	22.55	22.56	-111.76	-287.23	-223.26	48.62	4.67	43.950	1.106	Level 2
10,425.00	10,408.83	10,420.10	10,407.23	22.58	22.60	-119.89	-287.23	-223.26	52.72	8.78	43.937	1.200	Level 2
10,450.00	10,431.70	10,442.97	10,430.10	22.61	22.65	-127.43	-287.23	-223.26	58.68	14.67	44.003	1.333	Level 3
10,475.00	10,454.01	10,465.28	10,452.41	22.63	22.69	-134.04	-287.23	-223.26	66.52	22.40	44.121	1.508	
10,500.00	10,475.70	10,486.96	10,474.10	22.65	22.74	-139.62	-287.23	-223.26	76.17	31.90	44.270	1.721	
10,525.00	10,496.71	10,507.97	10,495.11	22.67	22.78	-144.20	-287.23	-223.26	87.50	43.07	44.427	1.969	
10,550.00	10,516.98	10,528.24	10,515.38	22.68	22.83	-147.91	-287.23	-223.26	100.34	55.76	44.581	2.251	
10,575.00	10,536.45	10,547.72	10,534.85	22.69	22.87	-150.89	-287.23	-223.26	114.58	69.85	44.726	2.562	
10,600.00	10,555.08	10,566.35	10,553.48	22.71	22.91	-153.26	-287.23	-223.26	130.08	85.22	44.859	2.900	
10,625.00	10,572.82	10,584.08	10,571.22	22.72	22.94	-155.11	-287.23	-223.26	146.75	101.77	44.979	3.263	
10,650.00	10,589.60	10,600.87	10,588.00	22.72	22.98	-156.54	-287.23	-223.26	164.48	119.40	45.088	3.648	
10,675.00	10,605.40	10,616.66	10,603.80	22.73	23.01	-157.59	-287.23	-223.26	183.20	138.02	45.186	4.054	
10,700.00	10,620.16	10,631.42	10,618.56	22.74	23.04	-158.31	-287.23	-223.26	202.83	157.55	45.273	4.480	
10,725.00	10,633.84	10,645.10	10,632.24	22.74	23.07	-158.71	-287.23	-223.26	223.28	177.93	45.352	4.923	
10,750.00	10,646.41	10,657.67	10,644.81	22.75	23.10	-158.79	-287.23	-223.26	244.49	199.06	45.422	5.383	
10,775.00	10,657.83	10,669.09	10,656.23	22.75	23.12	-158.52	-287.23	-223.26	266.38	220.89	45.484	5.856	
10,800.00	10,668.07	10,679.33	10,666.47	22.75	23.15	-157.86	-287.23	-223.26	288.88	243.34	45.539	6.344	
10,825.00	10,677.10	10,688.37	10,675.50	22.76	23.16	-156.70	-287.23	-223.26	311.93	266.34	45.587	6.843	
10,850.00	10,684.90	10,703.83	10,683.30	22.80	23.20	-154.87	-287.23	-223.26	335.45	289.80	45.644	7.349	
10,875.00	10,691.45	10,702.72	10,689.85	22.89	23.19	-152.04	-287.23	-223.26	359.37	313.71	45.663	7.870	
10,900.00	10,696.73	10,707.99	10,695.13	22.98	23.21	-147.63	-287.23	-223.26	383.63	337.93	45.692	8.396	
10,925.00	10,700.72	10,711.98	10,699.12	23.09	23.21	-140.46	-287.23	-223.26	408.14	362.43	45.716	8.928	
10,950.00	10,703.41	10,714.68	10,701.81	23.20	23.22	-128.14	-287.23	-223.26	432.85	387.12	45.735	9.464	
10,975.00	10,704.80	10,716.07	10,703.20	23.33	23.22	-106.65	-287.23	-223.26	457.69	411.94	45.750	10.004	
10,991.13	10,705.00	10,716.27	10,703.40	23.41	23.22	-87.37	-287.23	-223.26	473.74	427.98	45.756	10.353	
11,000.00	10,704.96	10,716.23	10,703.36	23.45	23.22	-87.23	-287.23	-223.26	482.57	436.81	45.760	10.546	
11,100.00	10,704.52	10,715.79	10,702.92	24.05	23.22	-84.13	-287.23	-223.26	582.35	536.56	45.785	12.719	
11,200.00	10,704.09	10,715.35	10,702.49	24.76	23.22	-42.00	-287.23	-223.26	682.32	636.52	45.798	14.898	
11,300.00	10,703.65	10,714.91	10,702.05	25.57	23.22	81.47	-287.23	-223.26	782.30	736.50	45.805	17.079	
11,400.00	10,703.21	10,714.48	10,701.61	26.47	23.22	85.74	-287.23	-223.26	882.20	836.39	45.808	19.259	
11,500.00	10,702.77	10,714.04	10,701.17	27.44	23.22	87.09	-287.23	-223.26	981.93	936.12	45.809	21.435	
11,600.00	10,702.33	10,713.60	10,700.73	28.48	23.22	87.77	-287.23	-223.26	1,081.44	1,035.63	45.809	23.608	
11,636.42	10,702.18	10,713.44	10,700.58	28.87	23.22	87.94	-287.23	-223.26	1,117.62	1,071.81	45.808	24.398	
11,700.00	10,701.90	10,713.17	10,700.30	29.58	23.22	87.82	-287.23	-223.26	1,180.76	1,134.95	45.809	25.776	
11,800.00	10,701.46	10,712.73	10,699.86	30.74	23.22	87.63	-287.23	-223.26	1,280.16	1,234.35	45.814	27.943	
11,900.00	10,701.03	10,712.29	10,699.43	31.97	23.21	87.45	-287.23	-223.26	1,379.65	1,333.83	45.822	30.109	
12,000.00	10,700.59	10,711.86	10,698.99	33.25	23.21	87.26	-287.23	-223.26	1,479.21	1,433.38	45.834	32.273	
12,100.00	10,700.16	10,711.42	10,698.56	34.58	23.21	87.07	-287.23	-223.26	1,578.82	1,532.98	45.848	34.436	
12,200.00	10,699.72	10,710.99	10,698.12	35.96	23.21	86.89	-287.23	-223.26	1,678.48	1,632.62	45.865	36.596	
12,300.00	10,699.28	10,710.55	10,697.68	37.38	23.21	86.70	-287.23	-223.26	1,778.18	1,732.30	45.884	38.754	
12,400.00	10,698.85	10,710.12	10,697.25	38.84	23.21	86.52	-287.23	-223.26	1,877.91	1,832.01	45.906	40.908	
12,500.00	10,698.41	14,455.52	12,643.55	40.33	42.87	-179.11	1,693.11	-402.12	1,946.99	1,890.28	56.708	34.333	

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 #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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

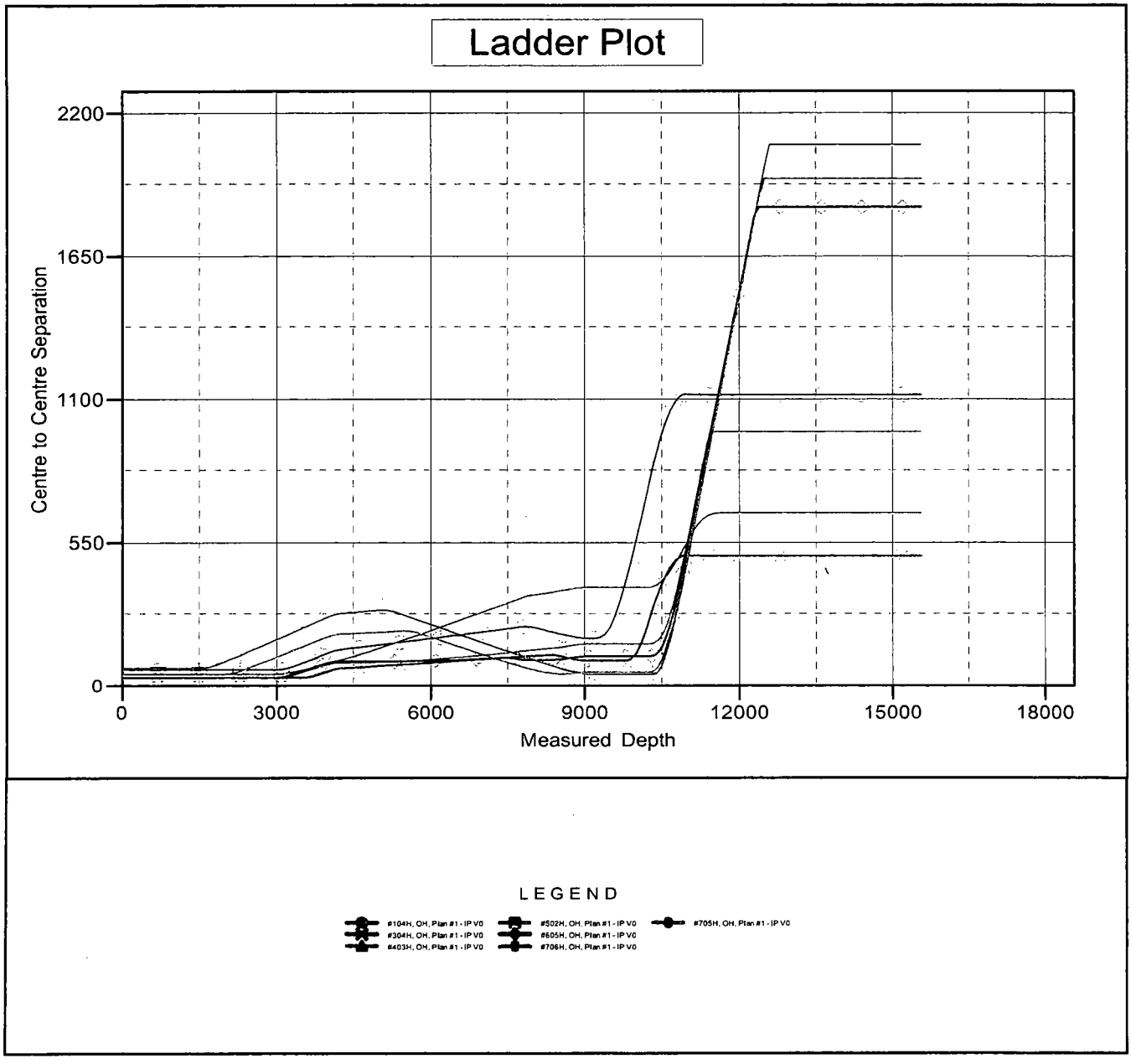
Offset Design Dominator 25 Fed COM - #706H - OH - Plan #1 - IP — **Offset Site Error:** 0.00 usft

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
12,600.00	10,697.98	14,555.52	12,643.12	41.85	44.30	-179.11	1,793.11	-402.86	1,946.99	1,889.53	57.459	33.885	
12,700.00	10,697.54	14,655.52	12,642.68	43.39	45.77	-179.11	1,893.11	-403.59	1,946.99	1,888.75	58.237	33.432	
12,800.00	10,697.11	14,755.52	12,642.25	44.96	47.26	-179.11	1,993.10	-404.32	1,946.99	1,887.95	59.041	32.977	
12,900.00	10,696.67	14,855.52	12,641.81	46.54	48.78	-179.11	2,093.10	-405.05	1,946.99	1,887.12	59.870	32.520	
13,000.00	10,696.24	14,955.52	12,641.37	48.15	50.32	-179.11	2,193.10	-405.79	1,946.99	1,886.26	60.724	32.063	
13,100.00	10,695.80	15,055.52	12,640.94	49.77	51.88	-179.11	2,293.09	-406.52	1,946.99	1,885.39	61.600	31.607	
13,200.00	10,695.36	15,155.52	12,640.50	51.41	53.45	-179.11	2,393.09	-407.25	1,946.99	1,884.49	62.499	31.152	
13,300.00	10,694.93	15,255.52	12,640.06	53.06	55.05	-179.11	2,493.08	-407.99	1,946.99	1,883.57	63.418	30.701	
13,400.00	10,694.49	15,355.52	12,639.63	54.73	56.66	-179.11	2,593.08	-408.72	1,946.98	1,882.63	64.358	30.252	
13,500.00	10,694.06	15,455.52	12,639.19	56.40	58.29	-179.11	2,693.08	-409.45	1,946.98	1,881.67	65.317	29.808	
13,600.00	10,693.62	15,555.52	12,638.75	58.09	59.92	-179.12	2,793.07	-410.19	1,946.98	1,880.69	66.295	29.368	
13,700.00	10,693.19	15,655.52	12,638.32	59.79	61.57	-179.12	2,893.07	-410.92	1,946.98	1,879.69	67.290	28.934	
13,800.00	10,692.75	15,755.52	12,637.88	61.49	63.24	-179.12	2,993.07	-411.65	1,946.98	1,878.68	68.303	28.505	
13,900.00	10,692.32	15,855.52	12,637.45	63.20	64.91	-179.12	3,093.06	-412.39	1,946.98	1,877.65	69.331	28.082	
14,000.00	10,691.88	15,955.52	12,637.01	64.92	66.59	-179.12	3,193.06	-413.12	1,946.98	1,876.60	70.375	27.666	
14,100.00	10,691.44	16,055.52	12,636.57	66.65	68.28	-179.12	3,293.06	-413.85	1,946.98	1,875.55	71.433	27.256	
14,200.00	10,691.01	16,155.52	12,636.14	68.39	69.98	-179.12	3,393.05	-414.58	1,946.98	1,874.47	72.506	26.853	
14,300.00	10,690.57	16,255.52	12,635.70	70.13	71.68	-179.12	3,493.05	-415.32	1,946.98	1,873.38	73.592	26.456	
14,400.00	10,690.14	16,355.52	12,635.26	71.87	73.40	-179.12	3,593.04	-416.05	1,946.98	1,872.28	74.691	26.067	
14,500.00	10,689.70	16,455.52	12,634.83	73.62	75.11	-179.12	3,693.04	-416.78	1,946.98	1,871.17	75.803	25.685	
14,600.00	10,689.27	16,555.52	12,634.39	75.38	76.84	-179.12	3,793.04	-417.52	1,946.97	1,870.05	76.926	25.310	
14,700.00	10,688.83	16,655.52	12,633.95	77.14	78.57	-179.12	3,893.03	-418.25	1,946.97	1,868.91	78.061	24.942	
14,800.00	10,688.40	16,755.52	12,633.52	78.90	80.31	-179.12	3,993.03	-418.98	1,946.97	1,867.77	79.206	24.581	
14,900.00	10,687.96	16,855.52	12,633.08	80.67	82.05	-179.12	4,093.03	-419.72	1,946.97	1,866.61	80.362	24.228	
15,000.00	10,687.52	16,955.52	12,632.65	82.44	83.80	-179.12	4,193.02	-420.45	1,946.97	1,865.44	81.528	23.881	
15,100.00	10,687.09	17,055.52	12,632.21	84.22	85.55	-179.12	4,293.02	-421.18	1,946.97	1,864.27	82.703	23.542	
15,200.00	10,686.65	17,155.52	12,631.77	86.00	87.30	-179.12	4,393.02	-421.91	1,946.97	1,863.08	83.887	23.209	
15,300.00	10,686.22	17,255.52	12,631.34	87.78	89.06	-179.12	4,493.01	-422.65	1,946.97	1,861.89	85.080	22.884	
15,400.00	10,685.78	17,355.52	12,630.90	89.56	90.82	-179.12	4,593.01	-423.38	1,946.97	1,860.69	86.282	22.565	
15,500.00	10,685.35	17,455.52	12,630.46	91.35	92.59	-179.12	4,693.00	-424.11	1,946.97	1,859.48	87.491	22.253	
15,572.12	10,685.03	17,526.52	12,630.00	92.64	93.84	-179.12	4,764.00	-424.70	1,946.81	1,858.46	88.355	22.034	
15,579.47	10,685.00	17,526.52	12,630.00	92.77	93.84	-179.12	4,764.00	-424.70	1,946.83	1,858.47	88.357	22.034	

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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

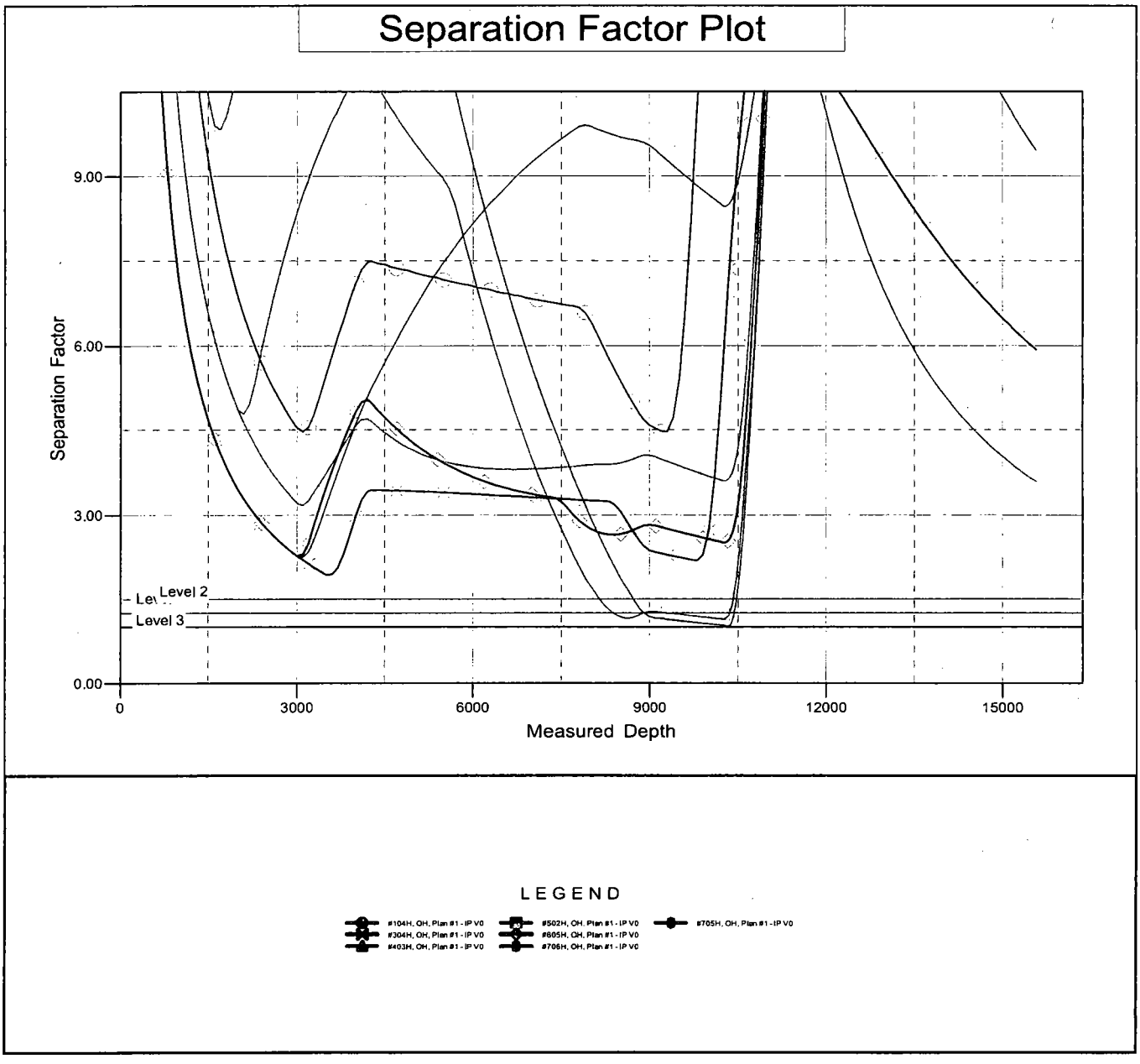
Reference Depths are relative to RKB @ 3365.60usft (Rig KB = 25')	Coordinates are relative to: #404H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Central Meridian is 104° 20' 0.000 W	Grid Convergence at Surface is: 0.43°



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

Company:	COG OPERATING, LLC	**Local Co-ordinate Reference:**	Well #404H
Project:	Lea County, NM (NAD27) NMEZ	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Reference Site:	Dominator 25 Fed COM	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	#404H	**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 @ 3365.60usft (Rig KB = 25')	Coordinates are relative to: #404H
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°



COG OPERATING, LLC

Lea County, NM (NAD27) NMEZ
Dominator 25 Fed COM
#404H

OH

Plan: Plan #1 - IP

Standard Planning Report

28 November, 2017

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #404H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Project:	Lea County, NM (NAD27) NMEZ	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site:	Dominator 25 Fed COM	**North Reference:**	Grid
Well:	#404H	**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 #404H

Well Position	**+N/-S**	6.40 usft	**Northing:**	399,221.10 usft	**Latitude:**	32° 5' 41.946 N
	+E/-W	724.00 usft	**Easting:**	750,833.50 usft	**Longitude:**	103° 31' 24.078 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**		**Ground Level:**	3,340.60 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/27/17	6.87	59.95	47,821.24658314

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	15,579.22	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	
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,266.67	4.00	212.00	4,266.45	-7.89	-4.93	1.50	1.50	0.00	212.00	
8,811.29	4.00	212.00	8,800.00	-276.74	-172.92	0.00	0.00	0.00	0.00	
9,077.95	0.00	0.00	9,066.45	-284.63	-177.85	1.50	-1.50	0.00	180.00	
10,239.04	0.00	0.00	10,227.54	-284.63	-177.85	0.00	0.00	0.00	0.00	
10,991.13	90.25	346.67	10,705.00	182.00	-288.42	12.00	12.00	0.00	346.67	
11,636.42	90.25	359.58	10,702.18	821.29	-365.52	2.00	0.00	2.00	89.97	
15,579.47	90.25	359.58	10,685.00	4,764.20	-394.70	0.00	0.00	0.00	0.00	PBHL(D25#404H)

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #404H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Project:	Lea County, NM (NAD27) NMEZ	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site:	Dominator 25 Fed COM	**North Reference:**	Grid
Well:	#404H	**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	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	1.50	212.00	4,099.99	-1.11	-0.69	-1.10	1.50	1.50	0.00
4,200.00	3.00	212.00	4,199.91	-4.44	-2.77	-4.42	1.50	1.50	0.00
4,266.67	4.00	212.00	4,266.45	-7.89	-4.93	-7.85	1.50	1.50	0.00
4,300.00	4.00	212.00	4,299.70	-9.86	-6.16	-9.82	0.00	0.00	0.00
4,400.00	4.00	212.00	4,399.46	-15.78	-9.86	-15.71	0.00	0.00	0.00
4,500.00	4.00	212.00	4,499.22	-21.69	-13.56	-21.59	0.00	0.00	0.00
4,600.00	4.00	212.00	4,598.97	-27.61	-17.25	-27.48	0.00	0.00	0.00
4,700.00	4.00	212.00	4,698.73	-33.53	-20.95	-33.37	0.00	0.00	0.00
4,800.00	4.00	212.00	4,798.48	-39.44	-24.65	-39.26	0.00	0.00	0.00
4,900.00	4.00	212.00	4,898.24	-45.36	-28.34	-45.15	0.00	0.00	0.00
5,000.00	4.00	212.00	4,998.00	-51.27	-32.04	-51.04	0.00	0.00	0.00
5,100.00	4.00	212.00	5,097.75	-57.19	-35.74	-56.92	0.00	0.00	0.00
5,200.00	4.00	212.00	5,197.51	-63.10	-39.43	-62.81	0.00	0.00	0.00

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Project:	Lea County, NM (NAD27) NMEZ	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site:	Dominator 25 Fed COM	**North Reference:**	Grid
Well:	#404H	**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	4.00	212.00	5,297.27	-69.02	-43.13	-68.70	0.00	0.00	0.00
5,400.00	4.00	212.00	5,397.02	-74.94	-46.82	-74.59	0.00	0.00	0.00
5,500.00	4.00	212.00	5,496.78	-80.85	-50.52	-80.48	0.00	0.00	0.00
5,600.00	4.00	212.00	5,596.54	-86.77	-54.22	-86.37	0.00	0.00	0.00
5,700.00	4.00	212.00	5,696.29	-92.68	-57.91	-92.26	0.00	0.00	0.00
5,800.00	4.00	212.00	5,796.05	-98.60	-61.61	-98.14	0.00	0.00	0.00
5,900.00	4.00	212.00	5,895.80	-104.51	-65.31	-104.03	0.00	0.00	0.00
6,000.00	4.00	212.00	5,995.56	-110.43	-69.00	-109.92	0.00	0.00	0.00
6,100.00	4.00	212.00	6,095.32	-116.35	-72.70	-115.81	0.00	0.00	0.00
6,200.00	4.00	212.00	6,195.07	-122.26	-76.40	-121.70	0.00	0.00	0.00
6,300.00	4.00	212.00	6,294.83	-128.18	-80.09	-127.59	0.00	0.00	0.00
6,400.00	4.00	212.00	6,394.59	-134.09	-83.79	-133.47	0.00	0.00	0.00
6,500.00	4.00	212.00	6,494.34	-140.01	-87.49	-139.36	0.00	0.00	0.00
6,600.00	4.00	212.00	6,594.10	-145.92	-91.18	-145.25	0.00	0.00	0.00
6,700.00	4.00	212.00	6,693.86	-151.84	-94.88	-151.14	0.00	0.00	0.00
6,800.00	4.00	212.00	6,793.61	-157.75	-98.58	-157.03	0.00	0.00	0.00
6,900.00	4.00	212.00	6,893.37	-163.67	-102.27	-162.92	0.00	0.00	0.00
7,000.00	4.00	212.00	6,993.13	-169.59	-105.97	-168.80	0.00	0.00	0.00
7,100.00	4.00	212.00	7,092.88	-175.50	-109.67	-174.69	0.00	0.00	0.00
7,200.00	4.00	212.00	7,192.64	-181.42	-113.36	-180.58	0.00	0.00	0.00
7,300.00	4.00	212.00	7,292.39	-187.33	-117.06	-186.47	0.00	0.00	0.00
7,400.00	4.00	212.00	7,392.15	-193.25	-120.76	-192.36	0.00	0.00	0.00
7,500.00	4.00	212.00	7,491.91	-199.16	-124.45	-198.25	0.00	0.00	0.00
7,600.00	4.00	212.00	7,591.66	-205.08	-128.15	-204.14	0.00	0.00	0.00
7,700.00	4.00	212.00	7,691.42	-211.00	-131.84	-210.02	0.00	0.00	0.00
7,800.00	4.00	212.00	7,791.18	-216.91	-135.54	-215.91	0.00	0.00	0.00
7,900.00	4.00	212.00	7,890.93	-222.83	-139.24	-221.80	0.00	0.00	0.00
8,000.00	4.00	212.00	7,990.69	-228.74	-142.93	-227.69	0.00	0.00	0.00
8,100.00	4.00	212.00	8,090.45	-234.66	-146.63	-233.58	0.00	0.00	0.00
8,200.00	4.00	212.00	8,190.20	-240.57	-150.33	-239.47	0.00	0.00	0.00
8,300.00	4.00	212.00	8,289.96	-246.49	-154.02	-245.35	0.00	0.00	0.00
8,400.00	4.00	212.00	8,389.72	-252.41	-157.72	-251.24	0.00	0.00	0.00
8,500.00	4.00	212.00	8,489.47	-258.32	-161.42	-257.13	0.00	0.00	0.00
8,600.00	4.00	212.00	8,589.23	-264.24	-165.11	-263.02	0.00	0.00	0.00
8,700.00	4.00	212.00	8,688.98	-270.15	-168.81	-268.91	0.00	0.00	0.00
8,800.00	4.00	212.00	8,788.74	-276.07	-172.51	-274.80	0.00	0.00	0.00
8,811.29	4.00	212.00	8,800.00	-276.74	-172.92	-275.46	0.00	0.00	0.00
8,900.00	2.67	212.00	8,888.56	-281.11	-175.66	-279.82	1.50	-1.50	0.00
9,000.00	1.17	212.00	8,988.50	-283.95	-177.43	-282.64	1.50	-1.50	0.00
9,077.95	0.00	0.00	9,066.45	-284.63	-177.85	-283.32	1.50	-1.50	0.00
9,100.00	0.00	0.00	9,088.50	-284.63	-177.85	-283.32	0.00	0.00	0.00
9,200.00	0.00	0.00	9,188.50	-284.63	-177.85	-283.32	0.00	0.00	0.00
9,300.00	0.00	0.00	9,288.50	-284.63	-177.85	-283.32	0.00	0.00	0.00
9,400.00	0.00	0.00	9,388.50	-284.63	-177.85	-283.32	0.00	0.00	0.00
9,500.00	0.00	0.00	9,488.50	-284.63	-177.85	-283.32	0.00	0.00	0.00
9,600.00	0.00	0.00	9,588.50	-284.63	-177.85	-283.32	0.00	0.00	0.00
9,700.00	0.00	0.00	9,688.50	-284.63	-177.85	-283.32	0.00	0.00	0.00
9,800.00	0.00	0.00	9,788.50	-284.63	-177.85	-283.32	0.00	0.00	0.00
9,900.00	0.00	0.00	9,888.50	-284.63	-177.85	-283.32	0.00	0.00	0.00
10,000.00	0.00	0.00	9,988.50	-284.63	-177.85	-283.32	0.00	0.00	0.00
10,100.00	0.00	0.00	10,088.50	-284.63	-177.85	-283.32	0.00	0.00	0.00
10,200.00	0.00	0.00	10,188.50	-284.63	-177.85	-283.32	0.00	0.00	0.00
10,239.04	0.00	0.00	10,227.54	-284.63	-177.85	-283.32	0.00	0.00	0.00

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Well:	#404H	**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)
KOP: 10239.04' MD, 10227.54' TVD									
10,250.00	1.31	346.67	10,238.50	-284.50	-177.88	-283.19	12.00	12.00	0.00
10,275.00	4.31	346.67	10,263.46	-283.31	-178.17	-282.00	12.00	12.00	0.00
10,300.00	7.31	346.67	10,288.33	-280.85	-178.75	-279.53	12.00	12.00	0.00
10,325.00	10.31	346.67	10,313.03	-277.12	-179.63	-275.79	12.00	12.00	0.00
10,350.00	13.31	346.67	10,337.50	-272.14	-180.81	-270.81	12.00	12.00	0.00
10,375.00	16.31	346.67	10,361.67	-265.92	-182.29	-264.58	12.00	12.00	0.00
10,400.00	19.31	346.67	10,385.47	-258.48	-184.05	-257.12	12.00	12.00	0.00
10,425.00	22.31	346.67	10,408.83	-249.83	-186.10	-248.46	12.00	12.00	0.00
10,450.00	25.31	346.67	10,431.70	-240.01	-188.43	-238.62	12.00	12.00	0.00
10,475.00	28.31	346.67	10,454.01	-229.04	-191.03	-227.63	12.00	12.00	0.00
10,500.00	31.31	346.67	10,475.70	-216.95	-193.89	-215.52	12.00	12.00	0.00
10,525.00	34.31	346.67	10,496.71	-203.76	-197.01	-202.31	12.00	12.00	0.00
10,550.00	37.31	346.67	10,516.98	-189.53	-200.39	-188.06	12.00	12.00	0.00
10,575.00	40.31	346.67	10,536.45	-174.28	-204.00	-172.78	12.00	12.00	0.00
10,600.00	43.31	346.67	10,555.08	-158.07	-207.84	-156.54	12.00	12.00	0.00
10,625.00	46.31	346.67	10,572.82	-140.92	-211.90	-139.37	12.00	12.00	0.00
10,650.00	49.31	346.67	10,589.60	-122.90	-216.17	-121.31	12.00	12.00	0.00
10,675.00	52.31	346.67	10,605.40	-104.05	-220.64	-102.43	12.00	12.00	0.00
10,700.00	55.31	346.67	10,620.16	-84.42	-225.29	-82.76	12.00	12.00	0.00
10,725.00	58.31	346.67	10,633.84	-64.06	-230.12	-62.37	12.00	12.00	0.00
10,750.00	61.31	346.67	10,646.41	-43.03	-235.10	-41.31	12.00	12.00	0.00
10,775.00	64.31	346.67	10,657.83	-21.40	-240.23	-19.63	12.00	12.00	0.00
10,800.00	67.31	346.67	10,668.07	0.79	-245.48	2.59	12.00	12.00	0.00
10,825.00	70.31	346.67	10,677.10	23.47	-250.86	25.31	12.00	12.00	0.00
10,850.00	73.31	346.67	10,684.90	46.58	-256.33	48.46	12.00	12.00	0.00
10,850.50	73.38	346.67	10,685.05	47.05	-256.44	48.93	12.00	12.00	0.00
FTP(D25#404H)									
10,875.00	76.31	346.67	10,691.45	70.06	-261.89	71.97	12.00	12.00	0.00
10,900.00	79.31	346.67	10,696.73	93.83	-267.53	95.79	12.00	12.00	0.00
10,925.00	82.31	346.67	10,700.72	117.84	-273.22	119.84	12.00	12.00	0.00
10,950.00	85.31	346.67	10,703.41	142.02	-278.95	144.07	12.00	12.00	0.00
10,975.00	88.31	346.67	10,704.80	166.31	-284.70	168.39	12.00	12.00	0.00
10,991.13	90.25	346.67	10,705.00	182.00	-288.42	184.11	12.00	12.00	0.00
EOC: 10991.13' MD, 10705.00' TVD, 90.25° INC, 346.67° AZ, 184.11' VS									
11,000.00	90.25	346.85	10,704.96	190.64	-290.45	192.76	2.00	0.00	2.00
11,100.00	90.25	348.85	10,704.52	288.39	-311.50	290.67	2.00	0.00	2.00
11,200.00	90.25	350.85	10,704.09	386.82	-329.13	389.22	2.00	0.00	2.00
11,300.00	90.25	352.85	10,703.65	485.80	-343.31	488.31	2.00	0.00	2.00
11,400.00	90.25	354.85	10,703.21	585.22	-354.02	587.80	2.00	0.00	2.00
11,500.00	90.25	356.85	10,702.77	684.95	-361.26	687.58	2.00	0.00	2.00
11,600.00	90.25	358.85	10,702.33	784.88	-365.02	787.53	2.00	0.00	2.00
11,636.42	90.25	359.58	10,702.18	821.29	-365.52	823.95	2.00	0.00	2.00
11,700.00	90.25	359.58	10,701.90	884.87	-365.99	887.53	0.00	0.00	0.00
11,800.00	90.25	359.58	10,701.46	984.87	-366.73	987.53	0.00	0.00	0.00
11,900.00	90.25	359.58	10,701.03	1,084.86	-367.47	1,087.53	0.00	0.00	0.00
12,000.00	90.25	359.58	10,700.59	1,184.86	-368.21	1,187.53	0.00	0.00	0.00
12,100.00	90.25	359.58	10,700.16	1,284.86	-368.95	1,287.53	0.00	0.00	0.00
12,200.00	90.25	359.58	10,699.72	1,384.85	-369.69	1,387.52	0.00	0.00	0.00
12,300.00	90.25	359.58	10,699.28	1,484.85	-370.43	1,487.52	0.00	0.00	0.00
12,400.00	90.25	359.58	10,698.85	1,584.84	-371.17	1,587.52	0.00	0.00	0.00
12,500.00	90.25	359.58	10,698.41	1,684.84	-371.91	1,687.52	0.00	0.00	0.00
12,600.00	90.25	359.58	10,697.98	1,784.84	-372.65	1,787.52	0.00	0.00	0.00

Database:	EDM 5000.14 Single User Db	**Local Co-ordinate Reference:**	Well #404H
Company:	COG OPERATING, LLC	**TVD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Project:	Lea County, NM (NAD27) NMEZ	**MD Reference:**	RKB @ 3365.60usft (Rig KB = 25')
Site:	Dominator 25 Fed COM	**North Reference:**	Grid
Well:	#404H	**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)
12,700.00	90.25	359.58	10,697.54	1,884.83	-373.39	1,887.52	0.00	0.00	0.00
12,800.00	90.25	359.58	10,697.11	1,984.83	-374.13	1,987.52	0.00	0.00	0.00
12,900.00	90.25	359.58	10,696.67	2,084.83	-374.87	2,087.52	0.00	0.00	0.00
13,000.00	90.25	359.58	10,696.24	2,184.82	-375.61	2,187.52	0.00	0.00	0.00
13,100.00	90.25	359.58	10,695.80	2,284.82	-376.35	2,287.52	0.00	0.00	0.00
13,200.00	90.25	359.58	10,695.36	2,384.81	-377.09	2,387.51	0.00	0.00	0.00
13,300.00	90.25	359.58	10,694.93	2,484.81	-377.83	2,487.51	0.00	0.00	0.00
13,400.00	90.25	359.58	10,694.49	2,584.81	-378.57	2,587.51	0.00	0.00	0.00
13,500.00	90.25	359.58	10,694.06	2,684.80	-379.31	2,687.51	0.00	0.00	0.00
13,600.00	90.25	359.58	10,693.62	2,784.80	-380.05	2,787.51	0.00	0.00	0.00
13,700.00	90.25	359.58	10,693.19	2,884.80	-380.79	2,887.51	0.00	0.00	0.00
13,800.00	90.25	359.58	10,692.75	2,984.79	-381.53	2,987.51	0.00	0.00	0.00
13,900.00	90.25	359.58	10,692.32	3,084.79	-382.27	3,087.51	0.00	0.00	0.00
14,000.00	90.25	359.58	10,691.88	3,184.79	-383.01	3,187.51	0.00	0.00	0.00
14,100.00	90.25	359.58	10,691.44	3,284.78	-383.75	3,287.51	0.00	0.00	0.00
14,200.00	90.25	359.58	10,691.01	3,384.78	-384.49	3,387.51	0.00	0.00	0.00
14,300.00	90.25	359.58	10,690.57	3,484.77	-385.23	3,487.50	0.00	0.00	0.00
14,400.00	90.25	359.58	10,690.14	3,584.77	-385.97	3,587.50	0.00	0.00	0.00
14,500.00	90.25	359.58	10,689.70	3,684.77	-386.71	3,687.50	0.00	0.00	0.00
14,600.00	90.25	359.58	10,689.27	3,784.76	-387.45	3,787.50	0.00	0.00	0.00
14,700.00	90.25	359.58	10,688.83	3,884.76	-388.19	3,887.50	0.00	0.00	0.00
14,800.00	90.25	359.58	10,688.40	3,984.76	-388.93	3,987.50	0.00	0.00	0.00
14,900.00	90.25	359.58	10,687.96	4,084.75	-389.67	4,087.50	0.00	0.00	0.00
15,000.00	90.25	359.58	10,687.52	4,184.75	-390.41	4,187.50	0.00	0.00	0.00
15,100.00	90.25	359.58	10,687.09	4,284.74	-391.15	4,287.50	0.00	0.00	0.00
15,200.00	90.25	359.58	10,686.65	4,384.74	-391.89	4,387.50	0.00	0.00	0.00
15,300.00	90.25	359.58	10,686.22	4,484.74	-392.63	4,487.49	0.00	0.00	0.00
15,400.00	90.25	359.58	10,685.78	4,584.73	-393.37	4,587.49	0.00	0.00	0.00
15,500.00	90.25	359.58	10,685.35	4,684.73	-394.11	4,687.49	0.00	0.00	0.00
15,579.47	90.25	359.58	10,685.00	4,764.20	-394.70	4,766.96	0.00	0.00	0.00

TD: 15579.47' MD, 10685.00' TVD - PBHL(D25#404H)

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#404H) - plan hits target center - Point	0.00	0.00	10,685.00	4,764.20	-394.70	403,985.30	750,438.80	32° 6' 29.120 N	103° 31' 28.250 W
FTP(D25#404H) - plan misses target center by 109.72usft at 10850.50usft MD (10685.05 TVD, 47.05 N, -256.44 E) - Point	0.00	0.00	10,705.00	16.93	-360.05	399,238.03	750,473.45	32° 5' 42.140 N	103° 31' 28.261 W

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
10,239.04	10,227.54	-284.63	-177.85	KOP: 10239.04' MD, 10227.54' TVD
10,991.13	10,705.00	182.00	-288.42	EOC: 10991.13' MD, 10705.00' TVD, 90.25° INC, 346.67° AZ, 184.11' VS
15,579.47	10,685.00	4,764.20	-394.70	TD: 15579.47' MD, 10685.00' 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

VEN ENERGY SERVICES, LLC.

COG OPERATING, LLC
#404H
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: 3340.60 RKB @ 3365.60usft (Rig KB = 25')

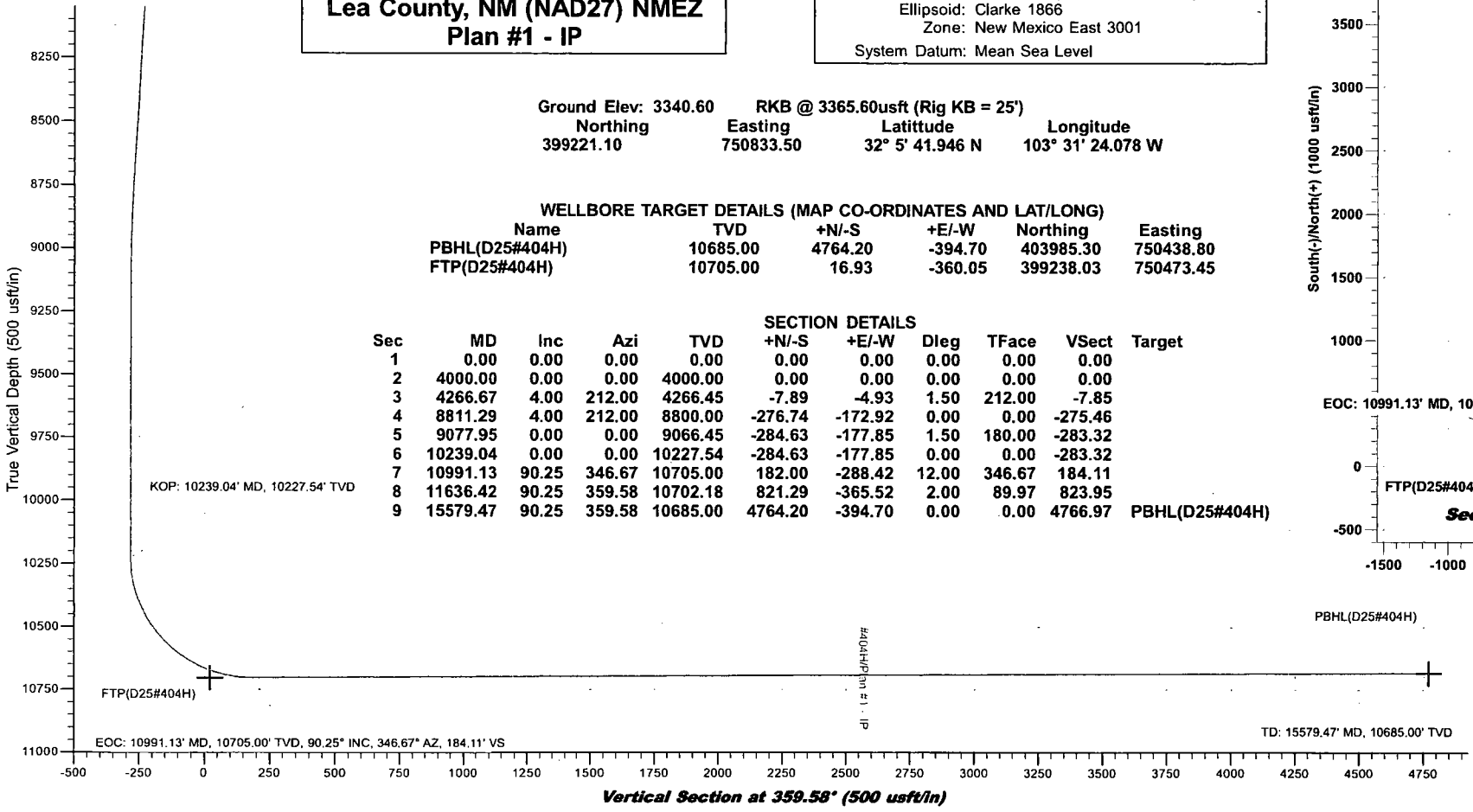
Northing	Easting	Latittude	Longitude
399221.10	750833.50	32° 5' 41.946 N	103° 31' 24.078 W

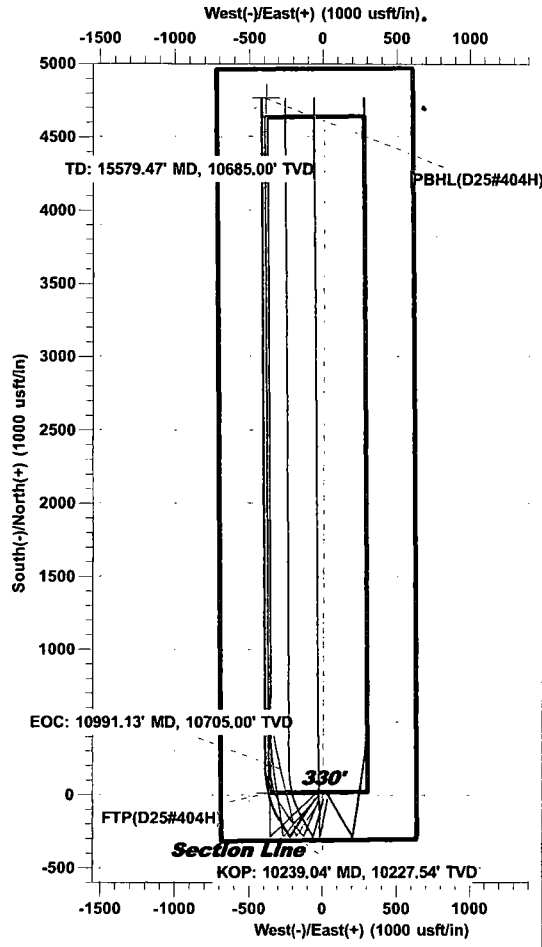
WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting
PBHL(D25#404H)	10685.00	4764.20	-394.70	403985.30	750438.80
FTP(D25#404H)	10705.00	16.93	-360.05	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	4000.00	0.00	0.00	4000.00	0.00	0.00	0.00	0.00	0.00	
3	4266.67	4.00	212.00	4266.45	-7.89	-4.93	1.50	212.00	-7.85	
4	8811.29	4.00	212.00	8800.00	-276.74	-172.92	0.00	0.00	-275.46	
5	9077.95	0.00	0.00	9066.45	-284.63	-177.85	1.50	180.00	-283.32	
6	10239.04	0.00	0.00	10227.54	-284.63	-177.85	0.00	0.00	-283.32	
7	10991.13	90.25	346.67	10705.00	182.00	-288.42	12.00	346.67	184.11	
8	11636.42	90.25	359.58	10702.18	821.29	-365.52	2.00	89.97	823.95	
9	15579.47	90.25	359.58	10685.00	4764.20	-394.70	0.00	0.00	4766.97	PBHL(D25#404H)





1:28, November 28 2017

Well Planning: Gabriel Cruz