

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

5. Lease Serial No.
NMNM18613A

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2

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

1. Type of Well
 Oil Well Gas Well Other

8. Well Name and No.
QUIEN SABE FEDERAL COM 702H

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

9. API Well No.
30-015-46127-00-X1

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

3b. Phone No. (include area code)
Ph: 575-748-6945

10. Field and Pool or Exploratory Area
PURPLE SAGE-WOLFCAMP (GAS)

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
Sec 24 T24S R27E NWNE 695FNL 2250FEL
32.208328 N Lat, 104.142738 W Lon

11. County or Parish, State
EDDY COUNTY, NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Change to Original APD
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

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

COG Operating respectfully requests approval for the following changes to the originally approved APD.

Name Change
From: Quien Sabe Federal Com 702H
To: Quien Sabe Federal Com 603H

BHL
From: 200' FSL & 1650' FEL Section 25. T24S. R27E
To: 200' FSL & 1310' FEL Section 25. T24S. R27E

C102 attached.

Carlsbad Field Office
OCD Artesia

NM OIL CONSERVATION
ARTESIA DISTRICT
AUG 21 2019

RECEIVED

14. I hereby certify that the foregoing is true and correct.
Electronic Submission #472006 verified by the BLM Well Information System
For COG OPERATING LLC, sent to the Carlsbad
Committed to AFMSS for processing by PRISCILLA PEREZ on 07/10/2019 (19PP2764SE)

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

Signature (Electronic Submission) Date 07/02/2019

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By NDUNGU KAMAU Title PETROLEUM ENGINEER Date 07/23/2019

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

Office Carlsbad

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

Additional data for EC transaction #472006 that would not fit on the form

32. Additional remarks, continued

Drilling changes
Drilling program attached.
AC attached.
Directional plan attached.

Revisions to Operator-Submitted EC Data for Sundry Notice #472006

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type:	APDCH NOI	APDCH NOI
Lease:	NMNM111412	NMNM18613A
Agreement:		
Operator:	COG OPERATING LLC 2208 WEST MAIN STREET ARTESIA, NM 88210 Ph: 575-748-6940	COG OPERATING LLC 600 W ILLINOIS AVENUE MIDLAND, TX 79701 Ph: 432.685.4385
Admin Contact:	MAYTE X REYES SENIOR REGULATORY ANALYST E-Mail: mreyes1@concho.com Ph: 575-748-6945	MAYTE X REYES REGULATORY ANALYST E-Mail: mreyes1@concho.com Ph: 575-748-6945
Tech Contact:	MAYTE X REYES SENIOR REGULATORY ANALYST E-Mail: mreyes1@concho.com Ph: 575-748-6945	MAYTE X REYES REGULATORY ANALYST E-Mail: mreyes1@concho.com Ph: 575-748-6945
Location:		
State:	NM	NM
County:	EDDY	EDDY
Field/Pool:	PURPLE SAGE; WOLFCAMP GAS	PURPLE SAGE-WOLFCAMP (GAS)
Well/Facility:	QUIEN SABE FEDERAL COM 603H Sec 24 T24S R27E NWNE 695FNL 2250FEL	QUIEN SABE FEDERAL COM 702H Sec 24 T24S R27E NWNE 695FNL 2250FEL 32.208328 N Lat, 104.142738 W Lon

**PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL**

**OPERATOR'S NAME: COG OPERATING LLC
LEASE NO.: NMNM18613A
COUNTY: EDDY**

QUIEN SABE FEDERAL COM 602H

**LOCATION: Section 24, T.26 S., R.27 E., NMPM
SURFACE HOLE FOOTAGE: 695'/N & 2310'/E
BOTTOM HOLE FOOTAGE: 200'/S & 2310'/E**

QUIEN SABE FEDERAL COM 603H

**LOCATION: Section 24, T.24 S., R.27 E., NMPM
SURFACE HOLE FOOTAGE: 695'/N & 2250'/E
BOTTOM HOLE FOOTAGE: 200'/S & 1310'/E**

QUIEN SABE FEDERAL COM 801H

**LOCATION: Section 24, T.24 S., R.27 E., NMPM
SURFACE HOLE FOOTAGE: 695'/N & 2280'/E
BOTTOM HOLE FOOTAGE: 200'/S & 2310'/E**

ALL PREVIOUS COAs STILL APPLY.

A. CASING

Casing Design:

1. The 13-3/8 inch surface casing shall be set at approximately **750 feet** (a minimum of **70 feet (Eddy County)**) into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

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

Option 1 (Single Stage):

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

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

b. Second stage above DV tool:

- Cement to surface. If cement does not circulate, contact the appropriate BLM office.

Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

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

Option 1 (Single Stage):

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
- b. Second stage above DV tool:
 - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

B. 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.

Option 1:

- a. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.
- b. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **5000 (5M)** psi.

Option 2:

1. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.
 - 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. 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.
 - e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

C. 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.

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. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
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. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
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

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, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
- 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

DISTRICT I
1825 N. FRENCH DR., HOBBS, NM 88240
Phone: (575) 393-6101 Fax: (575) 393-9720

DISTRICT II
811 E. FIRST ST., ARTESIA, NM 88210
Phone: (575) 748-1883 Fax: (575) 748-0720

DISTRICT III
1000 RIO BRAZOS RD., AZTEC, NM 87410
Phone: (505) 334-8178 Fax: (505) 334-8170

DISTRICT IV
1280 S. ST. FRANCIS DR., SANTA FE, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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

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

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-46127	Pool Code 98220	Pool Name Purple Sage; Wolfcamp Gas
Property Code 325762	Property Name QUIEN SABE FEDERAL COM	Well Number 603H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3123.5'

Surface Location

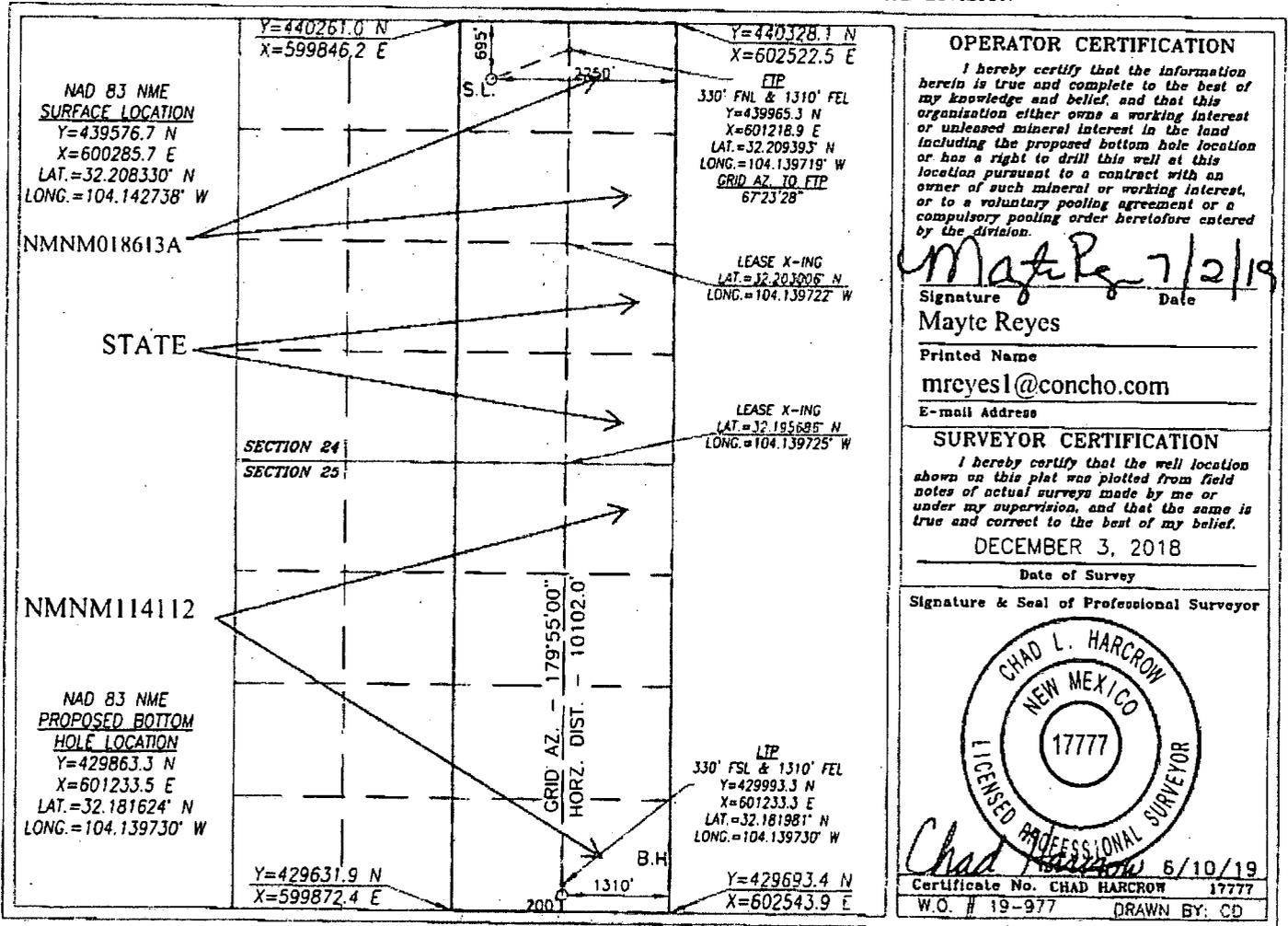
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	24	24-S	27-E		695	NORTH	2250	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
0	25	24-S	27-E		200	SOUTH	1310	EAST	EDDY

Dedicated Acres 640	Joint or Infill	Consolidation Code	Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



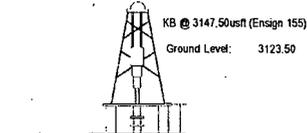
Rev 00-29-19



Project: Eddy County, NM (NAD27 NME)
 Site: Quien Sabe Fed Com
 Well: 603H
 Wellbore: OH \ 65012
 Design: Plan 2 06-28-19
 Rig: Ensign 155



GM
 Azimuths to Grid North
 True North: -0.10°
 Magnetic North: 7.02°
 Magnetic Field
 Strength: 47860.0nT
 Dip Angle: 59.93°
 Date: 8/21/2019
 Model: MVHD



WELL DETAILS						
+N-S	-E-W	Northing	Ground Level	Easting	Latitude	Longitude
0.00	0.00	439518.50	3123.50	559102.60	32° 12' 29.5526 N	104° 8' 32.0770 W

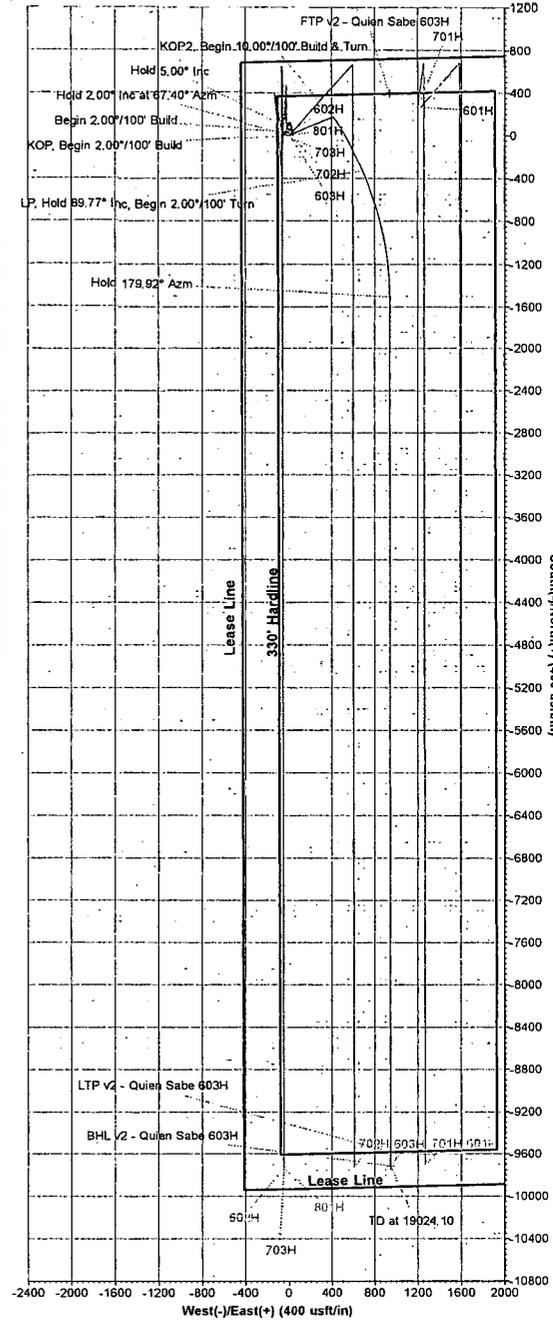
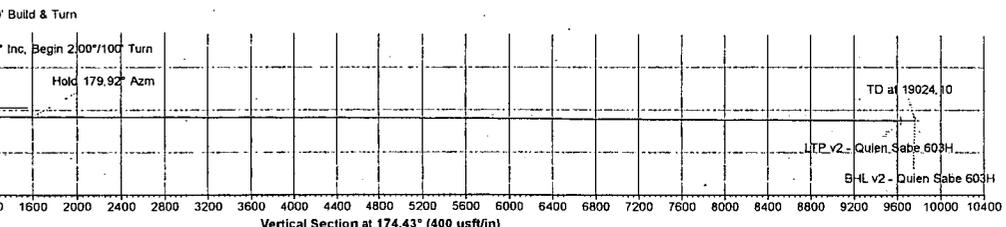
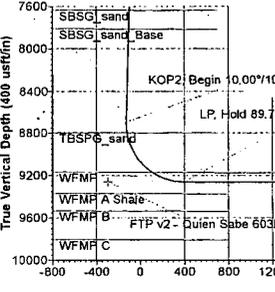
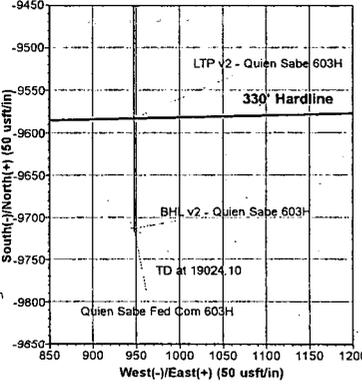
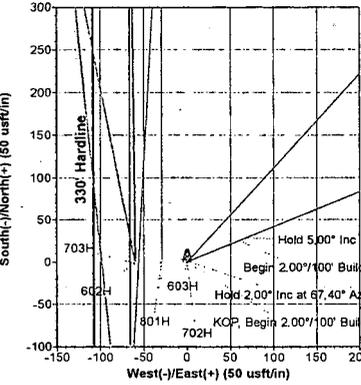
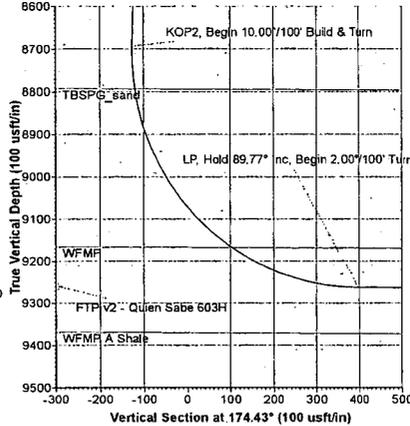
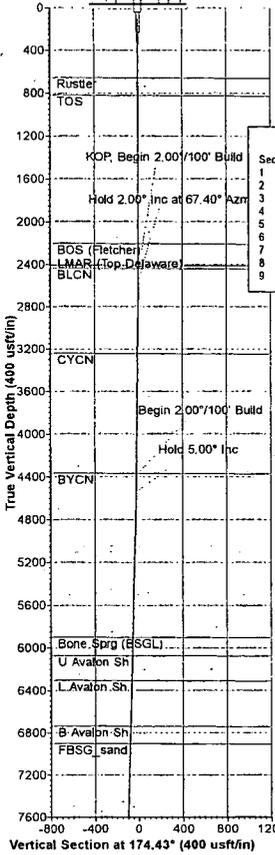
DESIGN TARGET DETAILS						
Name	TVD	+N-S	-E-W	Northing	Easting	Latitude
FTP v2 - Quien Sabe 603H	9260.00	388.50	933.10	439907.00	560035.70	32° 12' 33.3807 N
LTP v2 - Quien Sabe 603H	9299.48	-3583.20	947.40	429935.30	560050.00	32° 10' 54.6988 N
BHL v2 - Quien Sabe 603H	9300.00	-8713.30	947.60	429895.20	560050.20	32° 10' 53.4093 N

SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N-S	-E-W	Dleg	TFace	Vsect	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2463.00	0.00	0.00	2463.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP, Begin 2.00°/100' Build
3	2563.00	2.00	67.40	2562.98	-0.67	1.61	2.00	67.40	-0.51		Hold 2.00° Inc at 67.40° Azm
4	4393.00	2.00	67.40	4391.86	25.21	60.57	0.00	0.00	-19.21		Begin 2.00°/100' Build
5	4543.00	5.00	67.40	4541.57	28.73	69.03	2.00	0.00	-21.89		Hold 5.00° Inc
6	8710.29	5.00	67.40	8693.00	168.31	404.34	0.00	0.00	-128.28		KOP2, Begin 10.00°/100' Build & Turn
7	9206.57	89.77	155.76	9202.37	-331.68	683.85	10.00	89.38	395.51		LP, Hold 89.77° Inc, Begin 2.00°/100' Turn
8	10814.66	89.77	179.92	9267.27	-1503.93	936.42	2.00	90.05	1587.74		Hold 179.92° Azm
9	19024.10	89.77	179.92	9300.00	-9713.30	947.60	0.00	0.00	9759.41		TD at 19024.10

Map System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1886
 Zone Name: New Mexico East 3001
 Local Origin: Well 603H, Grid North
 Latitude: 32° 12' 29.5526 N
 Longitude: 104° 8' 32.0770 W
 Grid East: 559102.60
 Grid North: 439518.50
 Scale Factor: 1.000
 Geomagnetic Model: MVHD
 Sample Date: 21-Aug-19
 Magnetic Declination: 7.12°
 Dip Angle from Horizontal: 59.93°
 Magnetic Field Strength: 47859.96611345nT
 To convert a Magnetic Direction to a Grid Direction, Add 7.02°
 To convert a Magnetic Direction to a True Direction, Add 7.12° East
 To convert a True Direction to a Grid Direction, Subtract 0.10°

FORMATION TOP DETAILS				
TVDPath	MDPath	Formation	DipAngle	DipDir
657.50	657.50	Rustler	0.23	174.43
821.50	821.50	TOS	0.23	174.43
2207.50	2207.50	BOS (Fletcher)	0.23	174.43
2409.50	2409.50	LMAR (Top Delaware)	0.23	174.43
2440.50	2440.50	BLCN	0.23	174.43
3245.47	3245.91	CVCN	0.23	174.43
4370.42	4371.55	BYCN	0.23	174.43
5902.27	5908.60	Bone Sprg (BSGL)	0.23	174.43
6074.25	6081.54	U Avalon Sh	0.23	174.43
6309.33	6317.41	L Avalon Sh	0.23	174.43
6738.19	6748.01	B Avalon Sh	0.23	174.43
6905.17	6915.63	FBSG_sand	0.23	174.43
7636.09	7649.35	SBSG_sand	0.23	174.43
7812.08	7826.00	SBSG_sand_Base	0.23	174.43
8784.01	8812.24	TBSPG_sand	0.23	174.43
9167.91	9274.52	WFMP	0.23	174.43

LEGEND	
—	701H, OH, Plan 1 02-21-19 VO
—	801H, OH \ 65013, Plan 1 06-28-19 VO
—	703H, OH, Plan 1 02-15-19 VO
—	602H, OH \ 65011, Plan 2 06-28-19 VO
—	702H, OH, Plan 1 02-15-19 VO
—	601H, OH, Plan 1 02-21-19 VO
—	Plan 2 06-28-19



COG Operating, LLC - Quien Sabe Federal Com 603H

1. Geologic Formations

TVD of target	9,300' EOL	Pilot hole depth	NA
MD at TD:	19,024'	Deepest expected fresh water:	110'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards
Quaternary Fill	Surface	Water	
Rustler	657	Water	
Top of Salt	821	Salt	
Base of Salt	2207	Salt	
Lamar	2406	Salt Water	
Bell Canyon	2440	Salt Water	
Cherry Canyon	3245	Oil/Gas	
Brushy Canyon	4370	Oil/Gas	
Bone Spring Lime	5902	Oil/Gas	
U. Avalon Shale	6074	Oil/Gas	
L. Avalon Shale	6309	Oil/Gas	
1st Bone Spring Sand	6905	Oil/Gas	
2nd Bone Spring Sand	7636	Oil/Gas	
3rd Bone Spring Sand	8794	Oil/Gas	
Wolfcamp	9167	Target Oil/Gas	

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	750	13.375"	54.5	J55	STC	3.37	9.40	12.57
12.25"	0	8570	9.625"	40	HCL80	BTC	1.39	1.22	2.76
8.5	0	19,024	5.5"	20	P110	BTC	1.84	2.47	3.59
BLM Minimum Safety Factor							1.125	1	1.6 Dry 1.8 Wet

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

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	6045 psi at 9300' TVD
Abnormal Temperature	NO 150 Deg. F.

No abnormal pressure or temperature conditions are anticipated. Sufficient mud materials to maintain mud properties and weight increase requirements will be kept on location at all times.

Sufficient supplies of Paper/LCM for periodic sweeps to control seepage and losses will be maintained on location.

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H2S is present
Y	H2S Plan attached

8. Other Facets of Operation

Y	Is it a walking operation?
N	Is casing pre-set?

x	H2S Plan.
x	BOP & Choke Schematics.
x	Directional Plan