Form 3160-3 (June 2015)

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

UNITED STATI	FS			Expires: Ja	nuary 31	1, 2018		
DEPARTMENT OF THE	INTERIOR			5. Lease Serial No.				
BUREAU OF LAND MAN	NAGEMENT	Γ		NMNM092757				
APPLICATION FOR PERMIT TO	DRILL OR	REENTER	2.4	6. If Indian, Allotee	or Tribe	Name		
la. Type of work:	REENTER			7. If Unit or CA Agr	eement,	Name and No.		
1b. Type of Well:	Other				-			
	Single Zone	Multiple Zone	-	<ol><li>Lease Name and 'TOMAHAWK FED!</li></ol>	NO.	ALCOHOL: A		
To Type of Completion Tryalamor factoring	omgre zone			TOWATAWICTED				
				705H				
2. Name of Operator COG OPERATING LLC		3		9. API Well No. 30-015-47	309			
3a. Address 600 West Illinois Ave, Midland, TX 79701	3b. Phone N (432) 683-7	lo. (include area code) '443	700	10. Field and Pool, of PURPLE SAGE/PU	9550			
4. Location of Well (Report location clearly and in accordance	Location of Well (Report location clearly and in accordance with any State real							
At surface   SESW / 500 FSL / 1588 FWL / LAT 32.19	-104.113085		SEC 20/T24S/R28	E/NMP				
At proposed prod. zone SWSW / 200 FSL / 622 FWL /	LAT 32.16706	4 / LONG -104.1162	205					
14. Distance in miles and direction from nearest town or post o 3 miles	ffice*			12. County or Parish EDDY		13. State NM		
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig, unit line, if any)	16. No of ac		17. Spacin 1280.0	g Unit dedicated to the	nis well			
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.  30 feet	19. Proposed 9362 feet /	A VOICE	20, BLM/E FED: NMI	BIA Bond No. in file		D		
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approxi	mate date work will st	art*	23. Estimated duration	on			
3048 feet	07/01/2020			30 days				
	24. Attac	hments		man Alexaii				
The following, completed in accordance with the requirements (as applicable)	of Onshore Oil	and Gas Order No. 1,	and the Hy	ydraulic Fracturing ru	ıle per 4	3 CFR 3162.3-3		
Well plat certified by a registered surveyor.	All I	4. Bond to cover the Item 20 above).	operations	unless covered by an	existing	g bond on file (see		
<ol><li>A Drilling Plan.</li><li>A Surface Use Plan (if the location is on National Forest Syst</li></ol>	tem Lands, the	5. Operator certificat	tion.					
SUPO must be filed with the appropriate Forest Service Office				nation and/or plans as	may be r	requested by the		
25. Signature (Electronic Submission)		(Printed/Typed) E REYES / Ph: (432	2) 683-74		Date 03/27/2	2020		
Title Regulatory Analyst								
Approved by (Signature) (Electronic Submission)		<i>(Printed/Typed)</i> Layton / Ph: (575) 23	34-5959	1/2/11/11	Date 07/24/2	2020		
Title Assistant Field Manager Lands & Minerals	Office Carlsb	ad Field Office		T,	<b>-</b>	a		

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

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



NSL Required

(Continued on page 2)

\*(Instructions on page 2)

#### INSTRUCTIONS

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

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

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

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

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

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

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

#### NOTICES

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

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

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

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

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

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

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

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

**Approval Date: 07/24/2020** 

**Approval Date: 07/24/2020** 

# PECOS DISTRICT DRILLING OPERATIONS CONDITIONS OF APPROVAL

OPERATOR'S NAME:
LEASE NO.:
NMNM092757
WELL NAME & NO.:
SURFACE HOLE FOOTAGE:
BOTTOM HOLE FOOTAGE
LOCATION:
COUNTY:
CO

H2S	○ Yes	• No	
Potash	None	○ Secretary	← R-111-P
Cave/Karst Potential	○ Low	Medium	← High
Variance	○ None	Flex Hose	○ Other
Wellhead	Conventional	○ Multibowl	○ Both
Other	☐4 String Area	Capitan Reef	□ WIPP
Other	Fluid Filled	Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	□ COM	✓ Unit

#### 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 **10-3/4"** surface casing shall be set a minimum of 25' above the top of the salt and cemented to surface.
  - a. **If cement does not circulate to 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 **6 hours** after pumping cement, ideally between 8-10 hours after.
  - b. WOC time for a primary cement job will be a minimum of <u>8 hours</u> or <u>500 psi</u> compressive strength, whichever is greater. This is to include the lead cement.
  - c. If cement falls back, remedial cementing will be done prior to drilling out the shoe.
  - d. WOC time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 psi compressive strength, whichever is greater.

- 2. The **7-5/8"** intermediate casing shall be set be cemented to surface.
  - a. If cement does not circulate to surface, see B.1.a, c & d.
- 3. The 5-1/2" production casing shall be cemented with at least 200' tie-back into the previous casing. Operator shall provide method of verification.
  - a. In Medium Cave/Karst Areas, if cement does not circulate to surface on the first two casing strings, the cement on the 3<sup>rd</sup> casing string must come to surface.

#### C. PRESSURE CONTROL

- 1. 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.
- 2. 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.

#### D. SPECIAL REQUIREMENTS

- 2. The well sign for a unit well shall include the unit number (when applied for) in addition to the surface and bottom hole lease numbers. This also applies to participating area numbers. If a participating area has not been established, the operator can use the general unit designation, but will replace the unit number with the participating area number once it has been established.
  - a. A commercial well determination shall be submit after production has been established for at least six months. Secondary recovery unit wells are exempt from this requirement.

DR 7/22/2020

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## **GENERAL REQUIREMENTS**

- 1. The BLM is to be notified in advance for a representative to witness:
  - a. Spudding the well (minimum of 24 hours)
  - b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
  - c. BOP/BOPE tests (minimum of 4 hours)
    - Eddy County: Call the Carlsbad Field Office, (575) 361-2822
    - Lea County: Call the Hobbs Field Station, (575) 393-3612
- 2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
  - 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:
    - i. Notify the BLM when moving in and removing the Spudder Rig.
    - ii. Notify the BLM when moving in the 2<sup>nd</sup> Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
    - iii. BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
- 3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
- 4. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well vertical portion of hole) shall be available upon request. 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. <u>Wait on cement (WOC) for Potash Areas:</u> 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 intergrity 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 intergrity 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 the portion of 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: The flex line must meet the requirements of API 16C. 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. If the operator has proposed a multi-bowl wellhead assembly in the APD, it must meet or exceed the pressure rating of the BOP system. Additionally, 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. 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 Onshore Order 2 III.A.2.i must be followed.
- 5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the BOP/BOPE 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, except the casing pressure test which 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. The results of the test shall be made available upon request.
  - 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 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. This test shall be performed prior

- to the test at full stack pressure.
- f. BOP/BOPE must be tested 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

1. 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

- 1. 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.
- 2. Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

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**Approval Date: 07/24/2020** 



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

## APD Print Report

**APD ID:** 10400055556

Operator Name: COG OPERATING LLC

Well Name: TOMAHAWK FEDERAL UNIT

Well Type: OIL WELL

Submission Date: 03/27/2020

Federal/Indian APD: FED

Well Number: 705H

Well Work Type: Drill

Highlighted data reflects the most recent changes

**Show Final Text** 

#### **Application**

## **Section 1 - General**

 Submission Date: 03/27/2020

**BLM Office:** CARLSBAD

**User: MAYTE REYES** 

Title: Regulatory Analyst

Federal/Indian APD: FED

Lease Acres: 1081.18

Is the first lease penetrated for production Federal or Indian?  $\ensuremath{\mathsf{FED}}$ 

Lease number: NMNM092757

Allotted? Reservation:

Agreement in place? NO

Federal or Indian agreement:

Agreement number:

Agreement name:

Keep application confidential? YES

Surface access agreement in place?

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

**Master Development Plan name:** 

Well in Master SUPO? NO

**Master SUPO name:** 

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

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

Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H Well API Number:

Field/Pool or Exploratory? Field and Pool Field Name: PURPLE SAGE Pool Name: PURPLE SAGE

WOLFCAMP GAS

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

Is the proposed well in a Helium production area? N Use Existing Well Pad? N New surface disturbance?

Type of Well Pad: MULTIPLE WELL Multiple Well Pad Name: Number: 703H, 704H and 705H

Well Class: HORIZONTAL Tomahawk Federal Unit
Number of Legs: 1

Well Work Type: Drill
Well Type: OIL WELL
Describe Well Type:

Well sub-Type: EXPLORATORY (WILDCAT)

Describe sub-type:

Distance to town: 3 Miles Distance to nearest well: 30 FT Distance to lease line: 200 FT

Reservoir well spacing assigned acres Measurement: 1280 Acres

Well plat: COG\_Tomahawk\_705H\_Updated\_C102\_20200720134906.pdf

Well work start Date: 07/01/2020 Duration: 30 DAYS

## **Section 3 - Well Location Table**

**Survey Type:** RECTANGULAR

**Describe Survey Type:** 

Datum: NAD83 Vertical Datum: NAVD88

Survey number: Reference Datum: GROUND LEVEL

Wellbore	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	Will this well produce from this lease?
SHL Leg #1	500	FSL	158 8	FW L	24S	28E	20	Aliquot SESW		- 104.1130 85	EDD Y	NEW MEXI CO	NEW MEXI CO	F	FEE	304 8	0	0	Y
KOP Leg #1	500	FSL	158 8	FW L	24S	28E	20	Aliquot SESW		- 104.1130 85	EDD Y	NEW MEXI CO	14-44	F	FEE	304 8	0	0	Υ

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

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	Will this well produce from this lease?
10	FNL	622	FW	24S	28E	29	Aliquot	32.19594		EDD	NEW	NEW	F	FEE	-	972	936	Y
			L					2	104.1162	Y	I	l .			١.	2	2	
							W				CO	CO			4			
253	FSL	622	FW	24S	28E	29	Aliquot	32.18860	-	EDD	NEW	NEW	F	NMNM	-	124	936	Υ
9			L				NWS	7	104.1162	Υ				092757	632	00	8	
							W		01		CO	CO			0			
330	FSL	622	FW	24S	28E	32	Aliquot	32.21674	-	EDD	NEW	NEW	S	STATE	-	201	938	Υ
			L				sws	21	104.1162	Υ	MEXI	MEXI			633	37	7	
							W		05		co	CO			9			
200	FSL	622	FW	24S	28E	32	Aliquot	32.16706	-	EDD	NEW	NEW	S	STATE	-	202	936	Υ
			L				sws	4	104.1162	Υ	MEXI	MEXI			631	67	2	
							W		05		CO	CO			4			
	10 253 9 330	9 9 10 FNL 253 FSL	<ul> <li> <sup>9</sup>⁄<sub>2</sub> S<sub>ω</sub> </li> <li> <sup>10</sup>⁄<sub>2</sub> FNL 622     </li> <li> <sup>253</sup>⁄<sub>3</sub> FSL 622     </li> <li> <sup>330</sup>⁄<sub>3</sub> FSL 622     </li> </ul>	10 FNL 622 FW L 253 FSL 622 FW L 330 FSL 622 FW L	10 FNL 622 FW 24S 253 FSL 622 FW 24S 9 SSL 622 FW 24S L 24S	10 FNL 622 FW 24S 28E 253 FSL 622 FW 24S 28E 9 SSL 622 FW 24S 28E L 24S 28E	10 FNL 622 FW 24S 28E 29 253 FSL 622 FW 24S 28E 29 B 253 FSL 622 FW 24S 28E 29 C 253 FSL 622 FW 24S 28E 32	10       FNL       622       FW       24S       28E       29       Aliquot NWN W         253       FSL       622       FW       24S       28E       29       Aliquot NWS W         330       FSL       622       FW       24S       28E       32       Aliquot SWS W         200       FSL       622       FW       24S       28E       32       Aliquot SWS W	10       FNL       622       FW L       24S       28E       29       Aliquot NWN 2       32.19594         253       FSL       622       FW L       24S       28E       29       Aliquot NWS 7       32.18860       7         330       FSL       622       FW L       24S       28E       32       Aliquot SWS 21       32.21674         200       FSL       622       FW L       24S       28E       32       Aliquot SWS 4       32.16706	10       FNL       622       FW       24S       28E       29       Aliquot NWN 2       32.19594 - 104.1162         253       FSL       622       FW       24S       28E       29       Aliquot NWS 7       32.18860 - 104.1162         330       FSL       622       FW       24S       28E       32       Aliquot SWS 21       104.1162         200       FSL       622       FW       24S       28E       32       Aliquot SWS 21       104.1162         200       FSL       622       FW       24S       28E       32       Aliquot SWS 4       104.1162	10       FNL       622       FW       24S       28E       29       Aliquot NWN W       32.19594 - 104.1162       FDD 104.1162       FDD 104.1162       Y         253       FSL       622       FW       24S       28E       29       Aliquot NWS W       32.18860 - 104.1162       Y         330       FSL       622       FW       24S       28E       32       Aliquot SWS W       32.21674 - 104.1162       FDD 104.1162       FDD 104.1162       Y         200       FSL       622       FW       24S       28E       32       Aliquot SWS       32.16706 - 104.1162       FDD 104.1162       Y	10         FNL         622         FW         24S         28E         29         Aliquot NWN W         32.19594 - 104.1162         FDD NEW MEXI CO           253         FSL         622         FW L         24S         28E         29         Aliquot NWS W         32.18860 - 104.1162 O1         FDD NEW MEXI CO           330         FSL         622         FW L         24S         28E         32         Aliquot SWS W         32.21674 - 104.1162 O5         EDD NEW MEXI CO           200         FSL         622         FW 24S         28E         32         Aliquot SWS W         32.16706 - 104.1162 O5         EDD NEW MEXI CO	10       FNL       622       FW       24S       28E       29       Aliquot NWN W       32.19594 - 104.1162       - 104.1162       FDD NEW MEXI CO       NEW MEXI CO         253       FSL       622       FW       24S       28E       29       Aliquot NWS W       32.18860 - 104.1162 Out CO       - 104.1162 Out CO       NEW MEXI CO       NEW MEXI CO         330       FSL       622       FW       24S       28E       32       Aliquot SWS W       32.21674 - 104.1162 Out CO       EDD NEW MEXI CO       NEW MEXI CO         200       FSL       622       FW       24S       28E       32       Aliquot SWS W       32.16706 - 104.1162 Out CO       EDD NEW MEXI CO       NEW MEXI CO	10         FNL         622         FW         24S         28E         29         Aliquot NWN W         32.19594 - 104.1162         EDD NEW MEXI CO         NEW MEXI CO         F           253         FSL         622         FW         24S         28E         29         Aliquot NWS W         32.18860 - 104.1162         F         NEW MEXI CO         NEW MEXI CO	10 FNL 622 FW L 24S 28E 29 Aliquot NWN W 2 104.1162 FDD NEW MEXI CO CO FEE NWNN W 2 104.1162 FDD NEW MEXI CO CO FEE NWNN W 104.1162 FEE NEW MEXI CO CO FEE NWNN W 104.1162 FEE NEW MEXI CO CO FEE NWNN W 104.1162 FEE NW MEXI CO CO FEE NWNN W 104.1162 FEE NW MEXI CO CO FEE NWNN W 104.1162 FEE NWN W 10	10         FNL         622         FW         24S         28E         29         Aliquot NWN 2         32.19594 - 104.1162         EDD NEW MEXI CO         NEW MEXI CO         FEE         -631 4           253         FSL         622         FW         24S         28E         29         Aliquot NWS W         32.18860 - 104.1162         FEDD NEW MEXI CO         NEW MEXI CO         FEDD NEW MEXI CO         NEW MEXI CO         NEW MEXI CO         NEW MEXI CO         092757 632         632           330         FSL         622         FW         24S         28E         32         Aliquot SWS W         32.21674 - 104.1162         EDD NEW MEXI CO         NEW MEXI CO         S STATE - 633         633           200         FSL         622         FW         24S         28E         32         Aliquot SWS WS         32.16706 - 104.1162         EDD NEW MEXI MEXI MEXI MEXI MEXI MEXI MEXI MEXI	10 FNL 622 FW 24S 28E 29 Aliquot NWN W 22 104.1162 FDD NEW MEXI CO CO F F FEE - 972 631 4 2 2 2 3 5 FSL 622 FW L 24S 28E 29 Aliquot NWS W 24S 28E 32 Aliquot SWS W 32.16706 A	10 FNL 622 FW 24S 28E 29 Aliquot NWN W 2 104.1162 FDD NEW MEXI CO CO F

## Drilling Plan

## **Section 1 - Geologic Formations**

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
699153	QUATERNARY	3048	0	0	ALLUVIUM	NONE	N
699148	RUSTLER	2648	400	400	ANHYDRITE	USEABLE WATER	N
699149	TOP SALT	2122	926	926	SALT	NONE	N
699158	BASE OF SALT	802	2246	2246	SALT	NONE	N
699151	LAMAR	595	2453	2453	LIMESTONE	NONE	N
699152	BELL CANYON	559	2489	2489	SANDSTONE	NONE	N
699159	CHERRY CANYON	-231	3279	3279	SANDSTONE	NATURAL GAS, OIL	N
699160	BRUSHY CANYON	-1420	4468	4468	SANDSTONE	NATURAL GAS, OIL	N
699161	BONE SPRING LIME	-2937	5985	5985	LIMESTONE	NATURAL GAS, OIL	N
699168	UPPER AVALON SHALE	-3130	6178	6178	SANDSTONE	NATURAL GAS, OIL	N

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
699167		-3512	6560	6560	GILSONITE	NATURAL GAS, OIL	N
699162	BONE SPRING 1ST	-3895	6943	6943	SANDSTONE	NATURAL GAS, OIL	N
699163	BONE SPRING 2ND	-4639	7687	7687	SANDSTONE	NATURAL GAS, OIL	N
699155	BONE SPRING 3RD	-5815	8863	8863	SANDSTONE	NATURAL GAS, OIL	N
699150	WOLFCAMP	-6207	9255	9255	SHALE	NATURAL GAS, OIL	Y

## **Section 2 - Blowout Prevention**

Pressure Rating (PSI): 3M Rating Depth: 8715

**Equipment:** BOP and BOPE will be installed per Onshore Order #2 requirements prior to drilling below the surface casing and will be rated to the above pressure rating or greater, see attached diagrams. Required safety valves, with appropriate wrenches and subs for the drill string being utilized, will be in the open position and accessible on the rig floor.

**Requesting Variance?** YES

**Variance request:** A variance is requested for the use of a flexible choke line from the BOP to choke manifold. See attached for specs and hydrostatic test chart. 5M Annular variance requested. A variance is requested to use a multibowl wellhead. **Testing Procedure:** The BOP and BOPE will be fully tested per Onshore Order #2 when initially installed, whenever any seal subject to test pressure is broken, and/or following related repairs.

#### **Choke Diagram Attachment:**

COG\_Tomahawk\_705H\_3M\_Choke\_20200327082730.pdf

#### **BOP Diagram Attachment:**

COG\_Tomahawk\_705H\_3M\_BOP\_20200327082740.pdf

COG\_Tomahawk\_705H\_Flex\_Hose\_20200327082749.pdf

Pressure Rating (PSI): 5M Rating Depth: 9362

**Equipment:** BOP and BOPE will be installed per Onshore Order #2 requirements prior to drilling below the surface casing and will be rated to the above pressure rating or greater, see attached diagrams. Required safety valves, with appropriate wrenches and subs for the drill string being utilized, will be in the open position and accessible on the rig floor.

Requesting Variance? YES

**Variance request:** A variance is requested for the use of a flexible choke line from the BOP to choke manifold. See attached for specs and hydrostatic test chart. 5M Variance is requested. A variance is requested to use a multibowl wellhead. **Testing Procedure:** The BOP and BOPE will be fully tested per Onshore Order #2 when initially installed, whenever any seal

subject to test pressure is broken, and/or following related repairs.

#### **Choke Diagram Attachment:**

COG\_Tomahawk\_705H\_5M\_Choke\_20200327082624.pdf

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

COG\_Tomahawk\_705H\_5M\_Choke\_20200327082624.pdf

## **BOP Diagram Attachment:**

COG\_Tomahawk\_705H\_5M\_BOP\_20200327082632.pdf

COG\_Tomahawk\_705H\_Flex\_Hose\_20200327082642.pdf

## **Section 3 - Casing**

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	المارية
1	SURFACE	14.7 5	10.75	NEW	API	N	0	815	0	815	3048	2233	815	J-55	45.5	ST&C	5.73	11.3	DRY	13.2 9	DRY	13 9
2	INTERMED IATE	9.87 5	7.625	NEW	API	N	0	8715	0	8715	3585	-5667	8715	HCL -80		OTHER - BTC	2.04	1.5	DRY	2.79	DRY	2.
3	PRODUCTI ON	6.75	5.5	NEW	API	N	0	20267	0	9362	3585	-6314	20267	P- 110	23	OTHER - SF Torq	2.49	2.96	DRY	3.05	DRY	3.

### **Casing Attachments**

Casing ID: 1 String Type: SURFACE

**Inspection Document:** 

**Spec Document:** 

**Tapered String Spec:** 

Casing Design Assumptions and Worksheet(s):

COG\_TOMAHAWK\_705H\_Casing\_Prog\_20200327083120.pdf

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

#### **Casing Attachments**

Casing ID: 2 String Type: INTERMEDIATE

**Inspection Document:** 

**Spec Document:** 

**Tapered String Spec:** 

Casing Design Assumptions and Worksheet(s):

COG\_TOMAHAWK\_705H\_Casing\_Prog\_20200327083229.pdf

Casing ID: 3 String Type: PRODUCTION

**Inspection Document:** 

**Spec Document:** 

**Tapered String Spec:** 

Casing Design Assumptions and Worksheet(s):

COG\_TOMAHAWK\_705H\_Casing\_Prog\_20200327083341.pdf

## **Section 4 - Cement**

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	815	300	1.75	13.5	525	50	Class C +4% Gel	As needed
SURFACE	Tail			815	250	1.34	14.8	335	50	Class C + 2% CaCl2	As needed
INTERMEDIATE	Lead		0	8715	1400	2.8	11	3920	50	NeoCem	N/A
INTERMEDIATE	Tail			8715	300	1.1	16.4	330	50	Class H	N/A

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Lead		8215	2026 7	750	2	12.7	1500	35	Lead: 35:65:6 H Blend	As needed
PRODUCTION	Tail		8215	2026 7	1200	1.24	14.4	1488	35	Tail: 50:50:2 Class H Blend	As needed

## **Section 5 - Circulating Medium**

Mud System Type: Closed

Will an air or gas system be Used? NO

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

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

**Describe what will be on location to control well or mitigate other conditions:** Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

## **Circulating Medium Table**

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	НА	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
815	8715	OTHER : Diesel Brine Emulsion	8.6	9.4							Diesel Brine Emulsion
8715	2026 7	OIL-BASED MUD	10.5	12							ОВМ
0	815	OTHER : Fresh water gel	8.4	8.6							Fresh water gel

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

## **Section 6 - Test, Logging, Coring**

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

None planned

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

CEMENT BOND LOG, COMPENSATED NEUTRON LOG, GAMMA RAY LOG,

Coring operation description for the well:

None planned

#### **Section 7 - Pressure**

Anticipated Bottom Hole Pressure: 5845 Anticipated Surface Pressure: 3779

Anticipated Bottom Hole Temperature(F): 150

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

**Describe:** 

**Contingency Plans geoharzards description:** 

**Contingency Plans geohazards attachment:** 

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

COG\_Tomahawk\_705H\_H2S\_Schem\_20200327083709.pdf COG\_Tomahawk\_705H\_H2S\_SUP\_20200327083715.pdf

#### **Section 8 - Other Information**

#### Proposed horizontal/directional/multi-lateral plan submission:

COG\_TOMAHAWK\_705H\_Direct\_Prog\_20200327083738.pdf

COG\_TOMAHAWK\_705H\_Direct\_Prog\_Plot\_20200327083746.pdf

COG\_TOMAHAWK\_705H\_AC\_RPT\_20200327083756.pdf

#### Other proposed operations facets description:

Drilling Plan attached.

GCP attached.

Cement Plan attached.

#### Other proposed operations facets attachment:

COG\_TOMAHAWK\_705H\_Cement\_Prog\_20200327083812.pdf

COG\_TOMAHAWK\_705H\_Drilling\_Prog\_20200327083821.pdf

COG\_Tomahawk\_705H\_GCP\_20200327083905.pdf

#### Other Variance attachment:

#### **SUPO**

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

## **Section 1 - Existing Roads**

Will existing roads be used? YES

**Existing Road Map:** 

COG\_Tomahawk\_705H\_Vicinity\_Map\_20200326170305.pdf

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

ROW ID(s)

ID:

Do the existing roads need to be improved? YES

Existing Road Improvement Description: Existing roads will be maintained in the same condition or better.

**Existing Road Improvement Attachment:** 

## **Section 2 - New or Reconstructed Access Roads**

Will new roads be needed? YES

**New Road Map:** 

COG\_Tomahawk\_705H\_Road\_Plat\_Maps\_20200326170330.pdf

New road type: RESOURCE

**Length:** 1303.04 Feet **Width (ft.):** 30

Max slope (%): 33 Max grade (%): 1

Army Corp of Engineers (ACOE) permit required? N

**ACOE Permit Number(s):** 

New road travel width: 14

**New road access erosion control:** Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns.

New road access plan or profile prepared? N

New road access plan attachment:

Access road engineering design? N

Access road engineering design attachment:

**Turnout?** N

Access surfacing type: OTHER

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

Access topsoil source: ONSITE

Access surfacing type description: Caliche

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Blading

Access other construction information: No turnouts are planned.

Access miscellaneous information:

Number of access turnouts: Access turnout map:

## **Drainage Control**

New road drainage crossing: OTHER

**Drainage Control comments:** None necessary

Road Drainage Control Structures (DCS) description: None needed.

Road Drainage Control Structures (DCS) attachment:

#### **Access Additional Attachments**

## **Section 3 - Location of Existing Wells**

**Existing Wells Map?** YES

Attach Well map:

COG\_Tomahawk\_705H\_1\_Mile\_Data\_20200326170443.pdf COG\_Tomahawk\_705H\_1\_Mile\_Map\_20200326170453.pdf

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

Submit or defer a Proposed Production Facilities plan? SUBMIT

**Production Facilities description:** The new Tomahawk Fed Unit 20 O Central Tank Battery (CTB) proposed in Sec. 20, T24S, R28E will be utilized for the production of 10 Wolfcamp wells. Each well head will be connected to a buried 4 FP 601HT that will be used to carry oil, water and gas production from each wellhead to the inlet manifold of the CTB; the route for these flowlines will follow the flowline corridor route as shown in the exhibit drawing and in the attached plats. Additionally, each well pad will have one buried 6 FP 150 line for gas lift supply from the CTB; the route for this gas lift line will start on the CTB pad where designated by gas line in the exhibit drawing and then following the flowline corridor in the attached plats. **Production Facilities map:** 

COG\_Tomahawk\_Federal\_Unit\_20\_O\_CTB\_Schematic\_20200325143519.pdf COG\_Tomahawk\_705H\_CTB\_Flowline\_Powerline\_20200326170538.pdf

## **Section 5 - Location and Types of Water Supply**

**Water Source Table** 

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

Water source type: OTHER

Describe type: Brine Water

Water source use type: INTERMEDIATE/PRODUCTION

**CASING** 

Source latitude: Source longitude:

Source datum:

Water source permit type: PRIVATE CONTRACT

Water source transport method: TRUCKING

Source land ownership: COMMERCIAL

Source transportation land ownership: COMMERCIAL

Water source volume (barrels): 30000 Source volume (acre-feet): 3.866793

Source volume (gal): 1260000

Water source type: OTHER

Describe type: Fresh Water

Water source use type: ICE PAD CONSTRUCTION &

MAINTENANCE SURFACE CASING

STIMULATION

Source latitude: Source longitude:

Source datum:

Water source permit type: PRIVATE CONTRACT

Water source transport method: PIPELINE

Source land ownership: PRIVATE

Source transportation land ownership: PRIVATE

Water source volume (barrels): 450000 Source volume (acre-feet): 58.001892

Source volume (gal): 18900000

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

#### Water source and transportation map:

COG\_Tomahawk\_705H\_Brine\_H2O\_20200326170616.pdf COG\_Tomahawk\_705H\_Fresh\_H2O\_20200326170633.pdf

Water source comments: See attached maps

New water well? N

## **New Water Well Info**

Well latitude: Well Longitude: Well datum:

Well target aquifer:

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

**Aquifer comments:** 

Aquifer documentation:

Well depth (ft): Well casing type:

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

New water well casing?

Used casing source:

Drilling method: Drill material:

Grout material: Grout depth:

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

Well Production type: Completion Method:

Water well additional information:

State appropriation permit:

Additional information attachment:

#### **Section 6 - Construction Materials**

Using any construction materials: YES

**Construction Materials description:** Caliche will be obtained from the actual well site. If caliche does not exist or is not plentiful from the well site, the caliche source will be from the Hayhurst Caliche Pit located in Sec 18-T24S-R28E.

**Construction Materials source location attachment:** 

## **Section 7 - Methods for Handling Waste**

Waste type: DRILLING

Waste content description: Drilling fluids and produced oil land water while drilling and completion operations

Amount of waste: 6000 barrels

Waste disposal frequency: One Time Only

Safe containment description: All drilling waste will be stored safely and disposed of properly

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

Safe containment attachment:

**FACILITY** 

Disposal type description:

Disposal location description: Trucked to an approved disposal facility

Waste type: SEWAGE

Waste content description: Human waste and gray water

Amount of waste: 1000 gallons

Waste disposal frequency: One Time Only

Safe containment description: Waste will be properly contained and disposed of properly at a state approved disposal

facility.

Safe containment attachment:

Waste disposal type: HAUL TO COMMERCIAL Disposal location ownership: PRIVATE

**FACILITY** 

Disposal type description:

Disposal location description: Trucked to an approved disposal facility

Waste type: GARBAGE

Waste content description: Garbage and trash produced during drilling and completion operations.

**Amount of waste:** 500 pounds

Waste disposal frequency: One Time Only

Safe containment description: Garbage and trash produced during drilling and completion operations will be collected in a

trash container and disposed of properly at a state approved disposal facility

Safe containmant attachment:

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

**FACILITY** 

Disposal type description:

**Disposal location description:** Trucked to an approved disposal facility.

#### **Reserve Pit**

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit? NO

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

Reserve pit depth (ft.)

Reserve pit volume (cu. yd.)

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

Reserve pit liner

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

Reserve pit liner specifications and installation description

## **Cuttings Area**

Cuttings Area being used? NO

Are you storing cuttings on location? Y

Description of cuttings location Roll off cutting containers on tracks

**Cuttings area length (ft.)** 

Cuttings area width (ft.)

Cuttings area depth (ft.)

Cuttings area volume (cu. yd.)

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

**WCuttings** area liner

Cuttings area liner specifications and installation description

## **Section 8 - Ancillary Facilities**

Are you requesting any Ancillary Facilities?: N

**Ancillary Facilities attachment:** 

Comments: Gas Capture Plan attached

## **Section 9 - Well Site Layout**

**Well Site Layout Diagram:** 

COG\_Tomahawk\_705H\_Layout\_20200326170807.pdf

**Comments:** 

## **Section 10 - Plans for Surface Reclamation**

Type of disturbance: New Surface Disturbance Multiple Well Pad Name: Tomahawk Federal Unit

Multiple Well Pad Number: 703H, 704H and 705H

**Recontouring attachment:** 

COG\_Tomahawk\_705H\_RECLAMATION\_20200326170829.pdf

**Drainage/Erosion control construction:** Proper erosion control methods will be used at the well site to control erosion, runoff, and siltation of the surrounding area. Straw waddles will be used as necessary at the well site to reduce sediment impacts to fragile/sensitive soils.

**Drainage/Erosion control reclamation:** The interim reclamation will be monitored periodically to ensure that vegetation has re-established and that erosion is controlled.

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

Well pad proposed disturbance

(acres): 3.67

Road proposed disturbance (acres):

Powerline proposed disturbance

(acres): 2.62

Pipeline proposed disturbance

(acres): 1.44

Other proposed disturbance (acres):

5.74

Total proposed disturbance: 13.89

Well pad interim reclamation (acres):

Powerline interim reclamation (acres):

Pipeline interim reclamation (acres):

1.44

Other interim reclamation (acres): 5.74

10.280000000000001

**Total interim reclamation:** 

Well pad long term disturbance

(acres): 3.21

Road interim reclamation (acres): 0.42 Road long term disturbance (acres):

Powerline long term disturbance

(acres): 2.62

Pipeline long term disturbance

(acres): 1.44

Other long term disturbance (acres):

5.74

Total long term disturbance: 13.43

**Disturbance Comments:** 

Reconstruction method: If needed, portions of the pad not needed for production operations will be re-contoured to its original state as much as possible. The caliche that is removed will be reused. The stockpiled topsoil will be spread out over reclaimed area and reseeded with BLM approved seed mixture.

Topsoil redistribution: North

Soil treatment: None

Existing Vegetation at the well pad: Shinnery Oak/Mesquite grassland

**Existing Vegetation at the well pad attachment:** 

Existing Vegetation Community at the road: Shinnery Oak/Mesquite grassland

**Existing Vegetation Community at the road attachment:** 

Existing Vegetation Community at the pipeline: Shinnery Oak/Mesquite grassland

**Existing Vegetation Community at the pipeline attachment:** 

Existing Vegetation Community at other disturbances: N/A

**Existing Vegetation Community at other disturbances attachment:** 

Non native seed used? N

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? N

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? N

Seed harvest description:

Seed harvest description attachment:

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

## **Seed Management**

**Seed Table** 

**Seed Summary** 

Total pounds/Acre:

**Seed Type** 

Pounds/Acre

Seed reclamation attachment:

**Operator Contact/Responsible Official Contact Info** 

First Name: Last Name:

Phone: Email:

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? N

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: N/A

Weed treatment plan attachment:

Monitoring plan description: N/A

Monitoring plan attachment:

Success standards: N/A

Pit closure description: N/A

Pit closure attachment:

COG\_Tomahawk\_705H\_Closed\_Loop\_20200326170846.pdf

**Section 11 - Surface Ownership** 

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

Disturbance type: WELL PAD

Describe:

Surface Owner: PRIVATE OWNERSHIP

Other surface owner description:

**BIA Local Office:** 

**BOR Local Office:** 

**COE Local Office:** 

**DOD Local Office:** 

**NPS Local Office:** 

**State Local Office:** 

**Military Local Office:** 

**USFWS Local Office:** 

Other Local Office:

**USFS** Region:

**USFS Forest/Grassland:** 

**USFS** Ranger District:

Fee Owner: Pecos Valley Artesian Conservancy

District

Phone: (575)622-7000

Fee Owner Address: P.O. Box 1346

Email:

Surface use plan certification: NO

Surface use plan certification document:

Surface access agreement or bond: AGREEMENT

Surface Access Agreement Need description: Surface Use Agreement in progress.

**Surface Access Bond BLM or Forest Service:** 

**BLM Surface Access Bond number:** 

**USFS Surface access bond number:** 

**Section 12 - Other Information** 

Right of Way needed? N

Use APD as ROW?

ROW Type(s):

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Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

## **ROW Applications**

**SUPO Additional Information:** Surface Use & Operating Plan. Attached On-site was done by Gerald Herrera (COG); Zane Kirsch (BLM); on February 13th, 2020. **Use a previously conducted onsite?** N

**Previous Onsite information:** 

## **Other SUPO Attachment**

COG\_Tomahawk\_Federal\_Unit\_20\_O\_CTB\_Schematic\_20200325152424.pdf

COG\_Tomahawk\_705H\_C102\_20200326170928.pdf

COG\_Tomahawk\_705H\_CTB\_Flowline\_Powerline\_20200326170955.pdf

COG\_Tomahawk\_705H\_Road\_Plat\_Maps\_20200326171010.pdf

COG\_Tomahawk\_705H\_SUP\_20200326171028.pdf

**PWD** 

## **Section 1 - General**

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

## **Section 2 - Lined Pits**

Would you like to utilize Lined Pit PWD options? N

**Produced Water Disposal (PWD) Location:** 

Lined pit PWD on or off channel:

PWD disturbance (acres):

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

PWD surface owner:

Approval Date: 07/24/2020 Page 18 of 23

Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

Pit liner manufacturers information:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

**Lined pit Monitor description:** 

**Lined pit Monitor attachment:** 

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

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

## **Section 3 - Unlined Pits**

Would you like to utilize Unlined Pit PWD options? N

**Produced Water Disposal (PWD) Location:** 

PWD disturbance (acres): PWD surface owner:

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

**Unlined pit Monitor description:** 

Approval Date: 07/24/2020 Page 19 of 23

Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

**Unlined pit Monitor attachment:** 

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

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

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

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

**Unlined Produced Water Pit Estimated percolation:** 

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

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

**Section 4 - Injection** 

Would you like to utilize Injection PWD options? N

**Produced Water Disposal (PWD) Location:** 

PWD surface owner: PWD disturbance (acres):

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number: Injection well name:

Assigned injection well API number? Injection well API number:

Injection well new surface disturbance (acres):

Minerals protection information:

**Mineral protection attachment:** 

**Underground Injection Control (UIC) Permit?** 

**UIC Permit attachment:** 

**Section 5 - Surface Discharge** 

Would you like to utilize Surface Discharge PWD options? N

Approval Date: 07/24/2020 Page 20 of 23

Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

**Produced Water Disposal (PWD) Location:** 

PWD surface owner: PWD disturbance (acres):

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

**Surface Discharge NPDES Permit attachment:** 

Surface Discharge site facilities information:

Surface discharge site facilities map:

**Section 6 - Other** 

Would you like to utilize Other PWD options? N

**Produced Water Disposal (PWD) Location:** 

PWD surface owner: PWD disturbance (acres):

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

**Bond Info** 

## **Bond Information**

Federal/Indian APD: FED

**BLM Bond number: NMB000215** 

**BIA Bond number:** 

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

**BLM** reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

**Reclamation bond amount:** 

**Reclamation bond rider amount:** 

Additional reclamation bond information attachment:

Approval Date: 07/24/2020 Page 21 of 23

Well Name: TOMAHAWK FEDERAL UNIT Well Number: 705H

## **Operator Certification**

## **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: 03/25/2020

Title: Regulatory Analyst

Street Address: 2208 West Main Street

City: Artesia State: NM Zip: 88210

Phone: (575)748-6940

Email address: MREYES1@CONCHO.COM

## Field Representative

Representative Name: Gerald Herrera

Street Address: 2208 West Main Street

City: Artesia State: NM Zip: 88210

Phone: (575)748-6940

Email address: gherrera@concho.com

#### Payment Info

## **Payment**

**APD Fee Payment Method:** PAY.GOV pay.gov Tracking ID: 260FS324

Approval Date: 07/24/2020 Page 22 of 23



DISTRICT I 1625 N. FRENCH DR., HOBBS, NM 88240 Phone: (575) 393-8161 Fax: (575) 393-0720

State of New Mexico Energy, Minerals & Natural Resources Department

CONSERVATION DIVISION

DISTRICT II 811 S. FIRST ST., ARTESIA, NM 88210 Phone: (575) 748-1263 Fax: (575) 748-9720 DISTRICT III 1000 RIO BRAZOS RD., AZTEC, NM 87410

1220 SOUTH ST. FRANCIS DR. Santa Fe, New Mexico 87505

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

Phone: (505) 334-6178 Fax: (505) 334-6170 DISTRICT IV 1220 S. ST. FRANCIS DR., SANTA FE, NM 87505 Phone: (505) 476-3460 Fax: (505) 476-3462

☐ AMENDED REPORT

WEIT	LOCATION	AND	ACREAGE	DEDICATION	PLAT
AA B. E.E.	LICE ALLEYIN	HIVI	AUMINATIO	DESTRUCTION	E ELECT E

		HOMESTER DESCRIPTION THE		
API Number	98220 Pool Code	Pool Name		
30-015- 47309	98220	Purple Sage; Wolfcamp		
Property Code 328919	Property Name		Well Number	
328919	TOMAHAWK	TOMAHAWK FEDERAL UNIT		
OGRID No.	Oper	ator Name	Elevation	
229137	COG OPE	RATING, LLC	3047.9'	

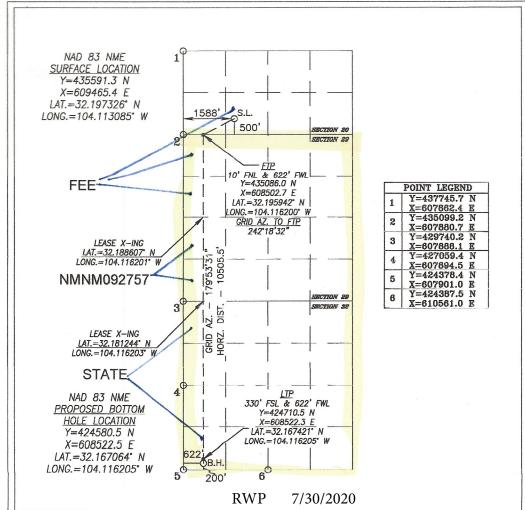
#### Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	20	24-S	28-E		500	SOUTH	1588	WEST	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
М	32	24-S	28-E		200	SOUTH	622	WEST	EDDY
Dedicated Acre	Joint o	r Infill Co	nsolidation (	lation Code Order No.			,		
1280									

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



#### OPERATOR CERTIFICATION

I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land or unlessed mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

-20-207 Signature Date

Mayte Reyes

Printed Name

mreyes1@concho.com

E-mail Address

#### SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

JANUARY 30, 2020

Date of Survey

Signature & Seal of Professional Surveyor



Certificate No. CHAD HARCROW W.O. # 20-368F

17777 DRAWN BY: AH

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

## State of New Mexico Energy, Minerals and Natural Resources Department

Submit Original to Appropriate District Office

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505

#### GAS CAPTURE PLAN

Date: 3/12/2020	
□ Original	Operator & OGRID No.: COG Operating LLC, OGRID 229137
☐ Amended - Reason for Amendment:	

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomplete to new zone, re-frac) activity.

Note: Form C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule (Subsection A of 19.15.18.12 NMAC).

#### Well(s)/Production Facility – Name of facility

The well(s) that will be located at the production facility are shown in the table below.

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
Tomahawk Federal Unit 705H	30-015-	N-20-24S-28E	500' FSL & 1588' FWL	3,677 MCFD		Gas will connect on well pad.

#### **Gathering System and Pipeline Notification**

#### Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on <u>Gas Transporter</u> system at that time. Based on current information, it is <u>Operator's</u> belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

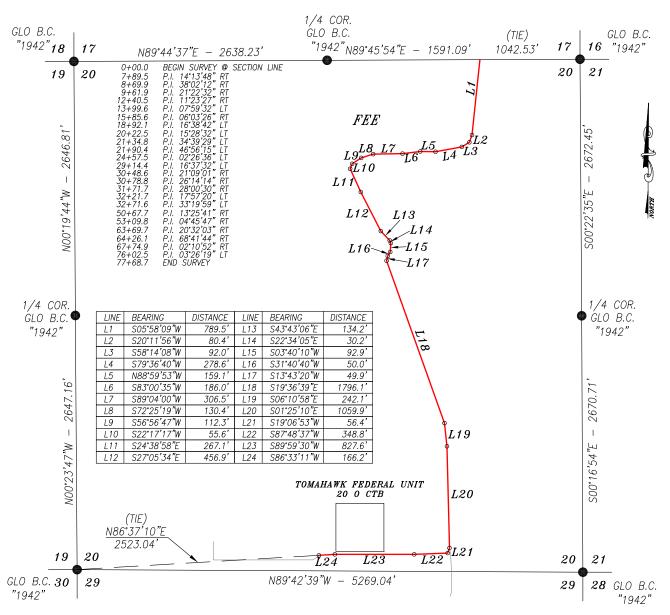
#### **Alternatives to Reduce Flaring**

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation On lease
  - o Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas On lease
  - o Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal On lease
  - o Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines

## ROAD PLAT COG OPERATING, LLC.

AN EXISTING ACCESS ROAD TO "TOMAHAWK FEDERAL UNIT" IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



## DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 7768.7 FEET OR 470.83 RODS OR 1.471 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

## BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.



## HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158 c.harcrow@harcrowsurveying.com

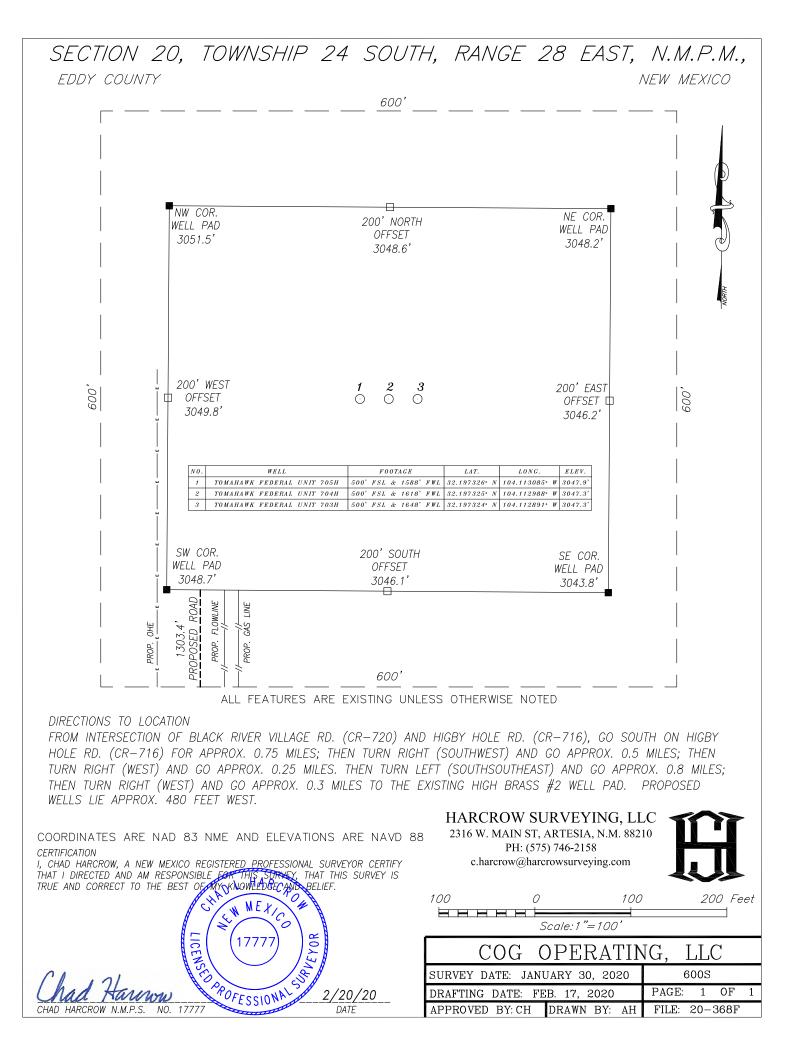


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	SCALE:	1"=1000'		

## COG OPERATING, LLC.

SURVEY OF AN EXISITNG ROAD LOCATED IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

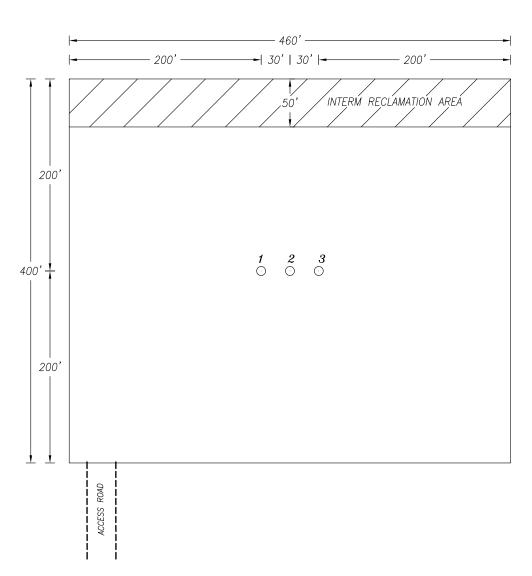
SURVEY DATE: FEB. 6, 2020	ROAD
DRAFTING DATE: FEB. 14, 2020	PAGE 1 OF 1
APPROVED BY: CH DRAWN BY: WN	FILE: 20-368



RECLAMATION AND FACILITY DIAGRAM — PRODUCTION FACILITIES DIAGRAM

COG OPERATING, LLC

SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



	NO.	WELL	FOOTAGE	LAT.	LONG.	ELEV.
	1	TOMAHAWK FEDERAL UNIT 705H	500' FSL & 1588' FWL	32.197326° N	104.113085° W	3047.9
ſ	2	TOMAHAWK FEDERAL UNIT 704H	500' FSL & 1618' FWL	32.197325° N	104.112988° W	3047.3
ĺ	3	TOMAHAWK FEDERAL UNIT 703H	500' FSL & 1648' FWL	32.197324° N	104.112891° W	3047.3

#### HARCROW SURVEYING, LLC

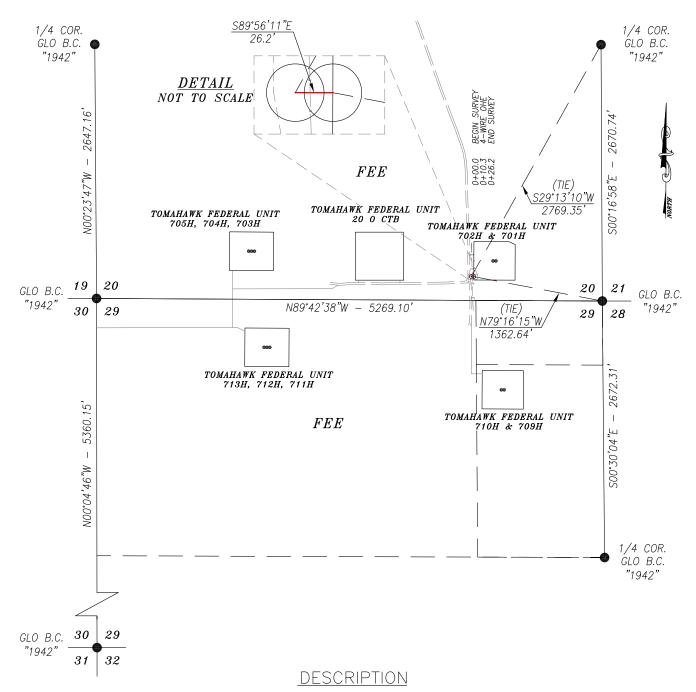
2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158 c.harcrow@harcrowsurveying.com



100	0	100	200	Feet
	Scale:1	"= 100 '		

COG OPERATING, LLC						
SURVEY DATE: JAN. 30	), 2020	RECLA	MAT	rion		
DRAFTING DATE: MAR.	19, 2020	PAGE:	1	OF	1	
APPROVED BY: CH DR	AWN BY: WN	FILE:	20-	-368	F	

A PROPOSED ACCESS ROAD TO THE "TOMAHAWK FEDERAL UNIT 702H, 701H" WELLPAD IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



A STRIP OF LAND 30.0 FEET WIDE AND 26.2 FEET OR 1.59 RODS OR 0.005 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

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#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158 c.harcrow@harcrowsurveying.com



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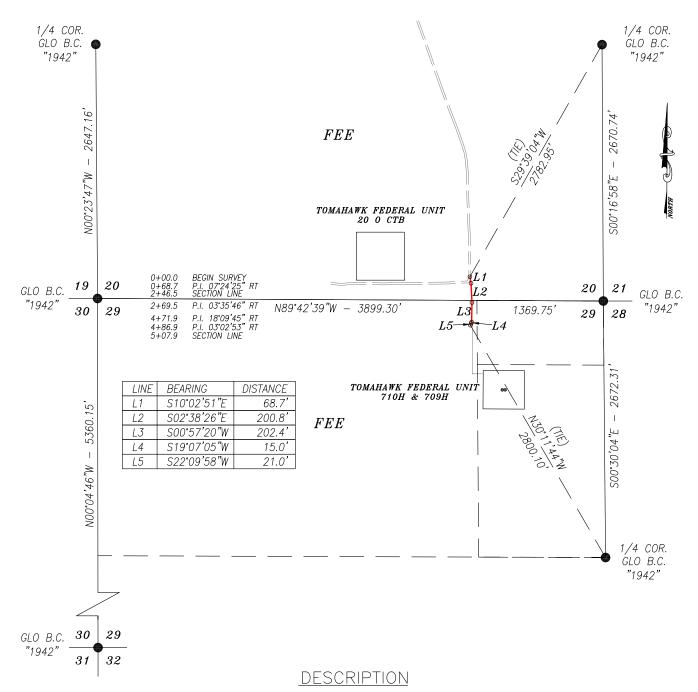
SCALE: 1"=1000'

# COG OPERATING, LLC

SURVEY OF A PROPOSED ROAD LOCATED IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: F	FEB. 6, 2020	ROAD 3
DRAFTING DATE:	FEB. 13, 2020	PAGE 1 OF 1
APPROVED BY: CH	DRAWN BY: WN	FILE: 20-368

AN EXISTING ACCESS ROAD TO "TOMAHAWK FEDERAL UNIT" IN SECTIONS 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



A STRIP OF LAND 30.0 FEET WIDE AND 507.9 FEET OR 30.78 RODS OR 0.096 MILES IN LENGTH CROSSING FEE LAND IN SECTIONS 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

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#### CERTIFICATION

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# Chad Harway Paression Date

#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158

c.harcrow@harcrowsurveying.com



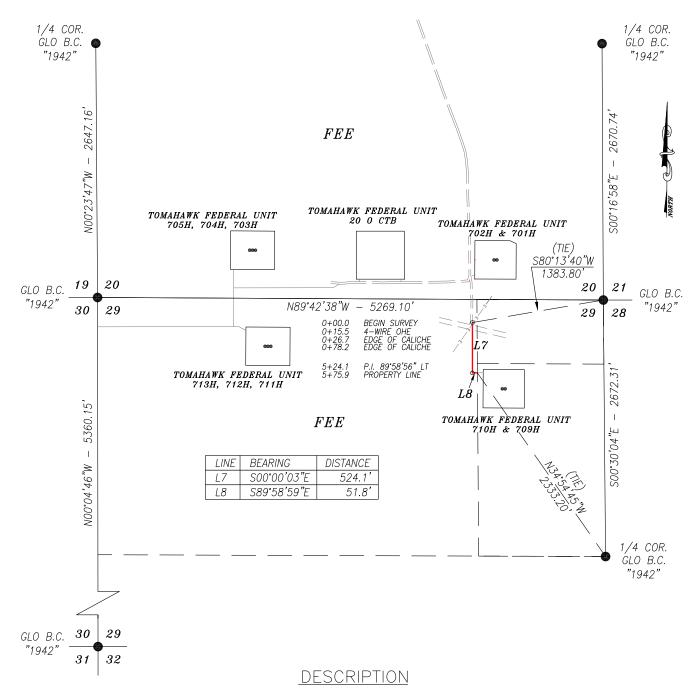
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# COG OPERATING, LLC

SURVEY OF AN EXISTING ROAD LOCATED IN SECTIONS 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: I	FEB. 6, 2020	ROAD
DRAFTING DATE:	FEB. 14, 2020	PAGE 1 OF 1
APPROVED BY: CH	DRAWN BY: WN	FILE: 20-368

A PROPOSED ACCESS ROAD TO THE "TOMAHAWK FEDERAL UNIT 710H, 709H" WELLPAD IN  $SECTION\ 29$ ,  $TOWNSHIP\ 24\ SOUTH$ ,  $RANGE\ 28\ EAST$ , N.M.P.M., EDDY COUNTY, NEW MEXICO.



A STRIP OF LAND 30.0 FEET WIDE AND 575.9 FEET OR 34.90 RODS OR 0.109 MILES IN LENGTH CROSSING USA LAND IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS

# FOR SURVEYING IN NEW MEXICO. HARCAD MEXICO POFESSIONA 2/21/20 CHAD HARCROW N.M.P.S. NO. 177777 DATE

#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158 c.harcrow@harcrowsurveying.com



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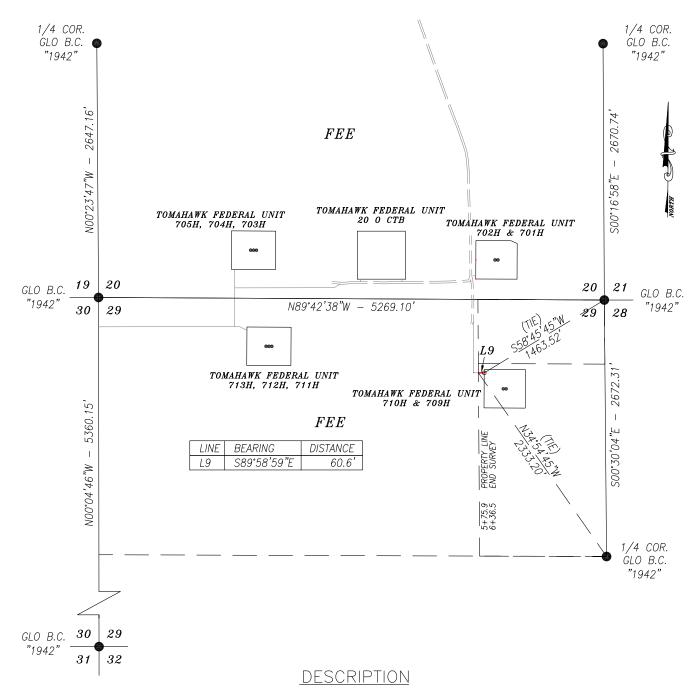
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# COG OPERATING, LLC

SURVEY OF A PROPOSED ROAD LOCATED IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: FEB. 6, 2020	ROAD 4
DRAFTING DATE: FEB. 13, 2020	PAGE 1 OF 2
APPROVED BY: CH DRAWN BY: WN	FILE: 20-368

A PROPOSED ACCESS ROAD TO THE "TOMAHAWK FEDERAL UNIT 710H, 709H" WELLPAD IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



A STRIP OF LAND 30.0 FEET WIDE AND 60.6 FEET OR 3.67 RODS OR 0.011 MILES IN LENGTH CROSSING USA LAND IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

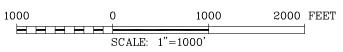
I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS



#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158



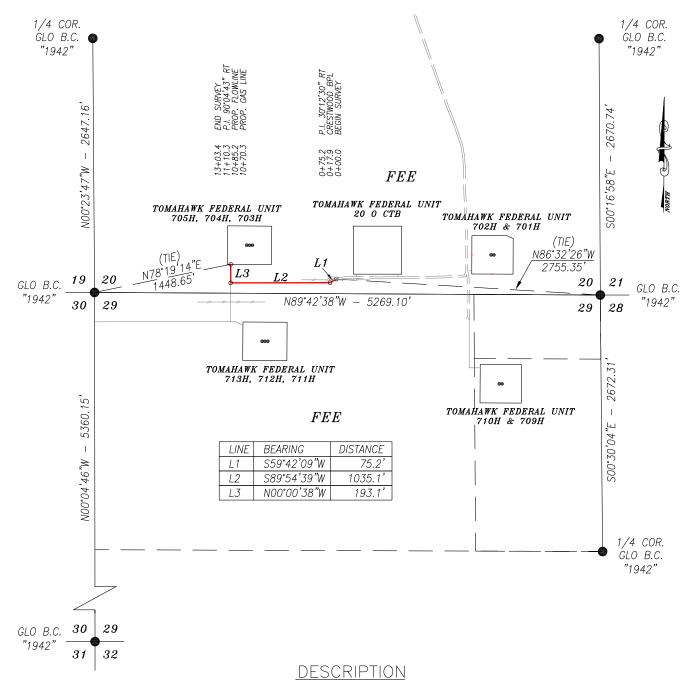


# COG OPERATING, LLC

SURVEY OF A PROPOSED ROAD LOCATED IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: F	EB. 6, 2020	ROAD 4
DRAFTING DATE:	FEB. 13, 2020	PAGE 2 OF 2
APPROVED BY: CH	DRAWN BY: WN	FILE: 20-368

A PROPOSED ACCESS ROAD TO THE "TOMAHAWK FEDERAL UNIT 705H, 704H, 703H" WELLPAD IN  $SECTION\ 20,\ TOWNSHIP\ 24\ SOUTH,\ RANGE\ 28\ EAST,\ N.M.P.M.,$  EDDY COUNTY, NEW MEXICO.



A STRIP OF LAND 30.0 FEET WIDE AND 1303.4 FEET OR 78.99 RODS OR 0.247 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

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#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158

c.harcrow@harcrowsurveying.com



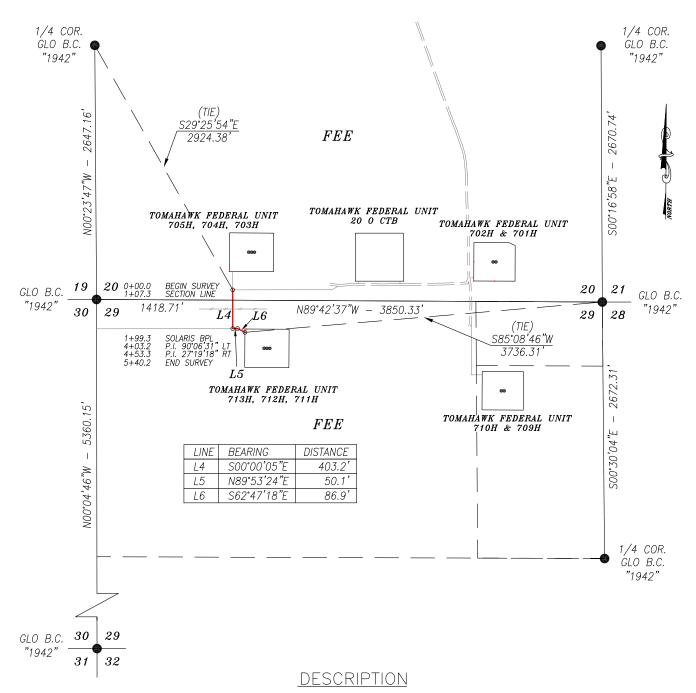
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# COG OPERATING, LLC

SURVEY OF A PROPOSED ROAD LOCATED IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: I	FEB. 6, 2020	ROAD 1
DRAFTING DATE:	FEB. 13, 2020	PAGE 1 OF 1
APPROVED BY: CH	DRAWN BY: WN	FILE: 20-368

A PROPOSED ACCESS ROAD TO THE "TOMAHAWK FEDERAL UNIT 713H, 712H, 711H" WELLPAD IN  $SECTIONS\ 20\ \&\ 29\ ,\ TOWNSHIP\ 24\ SOUTH,\ RANGE\ 28\ EAST,\ N.M.P.M.,$  EDDY COUNTY, NEW MEXICO.



A STRIP OF LAND 30.0 FEET WIDE AND 540.2 FEET OR 32.74 RODS OR 0.102 MILES IN LENGTH CROSSING FEE LAND IN SECTIONS 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS

# Chad Harcrow N.M.P.S. NO. 17777 L. HARCROW N.M.P.S. NO. 17777 L. HARCROW N.M.P.S. NO. 17777 DATE L. HARCROW N.M.P.S. NO. 17777 DATE

#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158

c.harcrow@harcrowsurveying.com



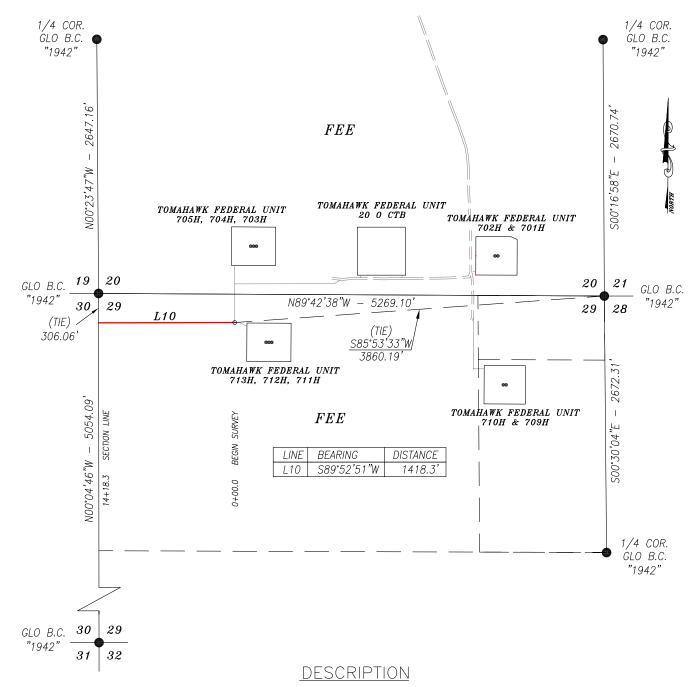
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	SCALE:	1"=1000'		

# COG OPERATING, LLC

SURVEY OF A PROPOSED ROAD LOCATED IN SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: I	FEB. 6, 2020	ROAD 2
DRAFTING DATE:	FEB. 13, 2020	PAGE 1 OF 1
APPROVED BY: CH	DRAWN BY: WN	FILE: 20-368

A PROPOSED ACCESS ROAD TO THE "TOMAHAWK FEDERAL UNIT 708H, 707H, 706H" WELLPAD IN  $SECTION\ 29,\ TOWNSHIP\ 24\ SOUTH,\ RANGE\ 28\ EAST,\ N.M.P.M.,$  EDDY COUNTY, NEW MEXICO.



A STRIP OF LAND 30.0 FEET WIDE AND 1418.3 FEET OR 85.96 RODS OR 0.269 MILES IN LENGTH CROSSING FEE LAND IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS



#### HARCROW SURVEYING, LLC

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SCALE: 1"=1000'

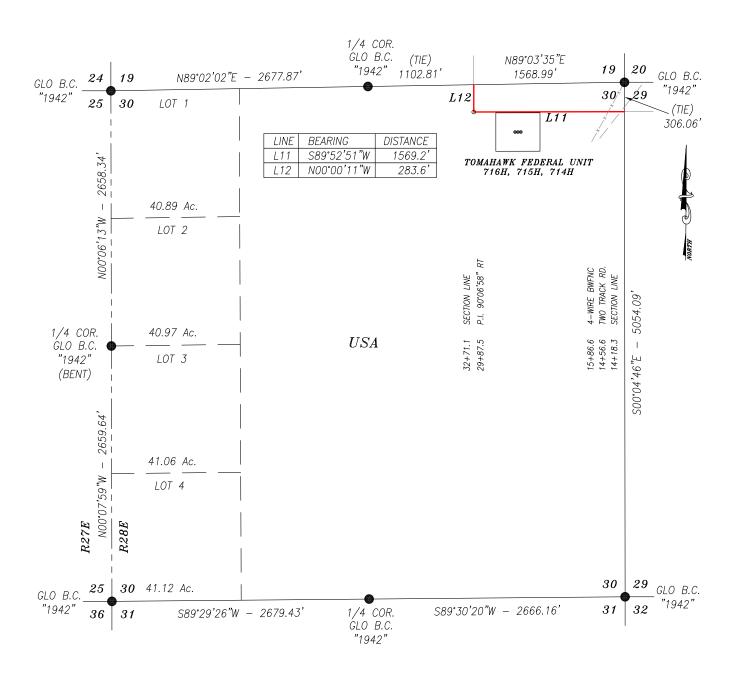
# COG OPERATING, LLC

SURVEY OF A PROPOSED ROAD LOCATED IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: FEB. 6, 2020	ROAD 5
DRAFTING DATE: FEB. 13, 2020	PAGE 1 OF 3
APPROVED BY: CH DRAWN BY: WN	FILE: 20-368

A PROPOSED ACCESS ROAD TO THE "TOMAHAWK FEDERAL UNIT 708H, 707H, 706H" WELLPAD IN SECTION 30, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY,

NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 1852.8 FEET OR 112.29 RODS OR 0.351 MILES IN LENGTH CROSSING USA LAND IN SECTION 30, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS



#### HARCROW SURVEYING, LLC

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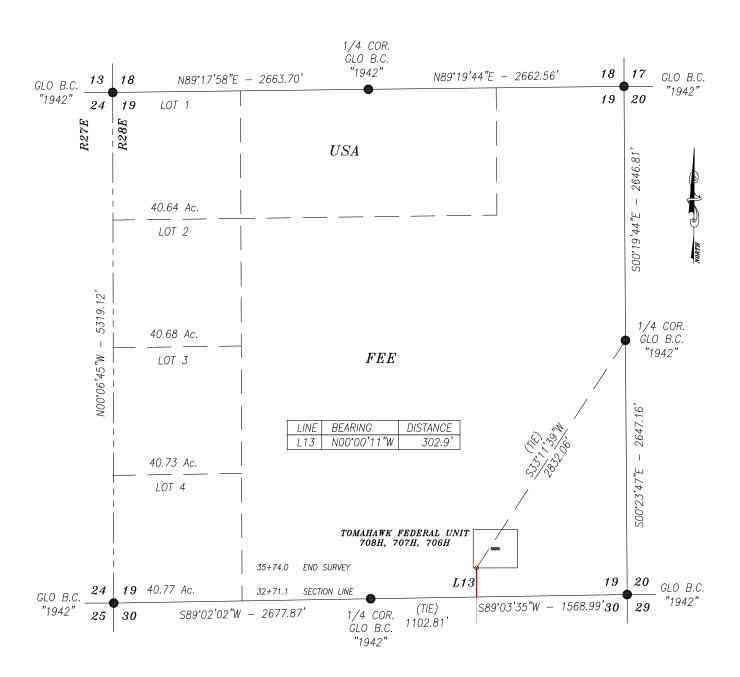
SCALE: 1"=1000'

# COG OPERATING, LLC

SURVEY OF A PROPOSED ROAD LOCATED IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: FEB. 6, 2020	ROAD 5
DRAFTING DATE: FEB. 13, 2020	PAGE 2 OF 3
APPROVED BY: CH DRAWN BY: WN	FILE: 20-368

A PROPOSED ACCESS ROAD TO THE "TOMAHAWK FEDERAL UNIT 708H, 707H, 706H" WELLPAD IN SECTION 19, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 302.9 FEET OR 18.36 RODS OR 0.057 MILES IN LENGTH CROSSING FEE LAND IN SECTION 19, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS



#### HARCROW SURVEYING, LLC

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SCALE: 1"=1000'

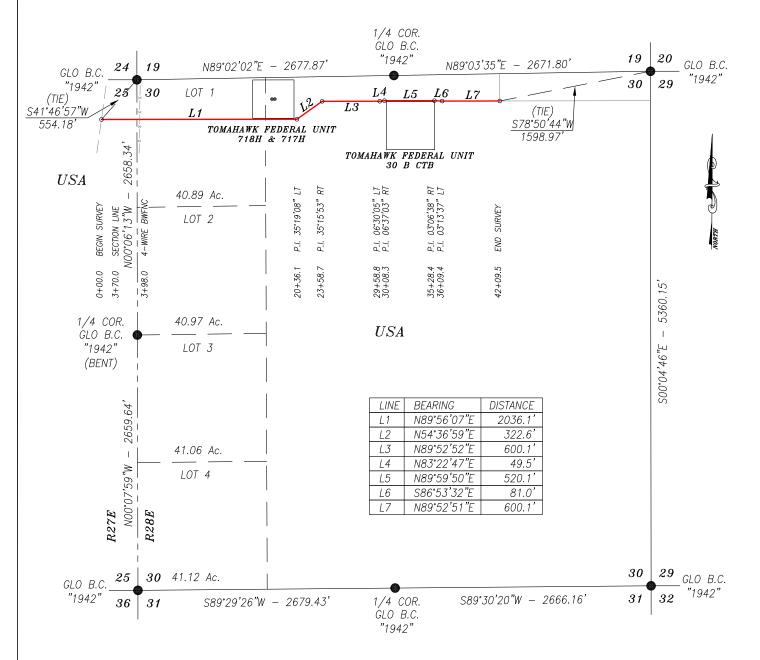
# COG OPERATING, LLC

SURVEY OF A PROPOSED ROAD LOCATED IN SECTION 19, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: FEB. 6, 2020	ROAD 5
DRAFTING DATE: FEB. 13, 2020	PAGE 3 OF 3
APPROVED BY: CH DRAWN BY: WN	FILE: 20-368

A PROPOSED ACCESS ROAD TO THE "TOMAHAWK FEDERAL UNIT 718H, 717H" & "TOMAHAWK FEDERAL UNIT 30 B CTB" IN

SECTIONS 25 & 30, TOWNSHIP 24 SOUTH, RANGE 27 & 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 4209.5 FEET OR 255.12 RODS OR 0.797 MILES IN LENGTH CROSSING USA LAND IN SECTIONS 25 & 30, TOWNSHIP 24 SOUTH, RANGES 27 & 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS

# Chad Harway POFESSIONE 2/21/20 CHAD HARCROW N.M.P.S. NO. 177777 DATE

#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158 c.harcrow@harcrowsurveying.com



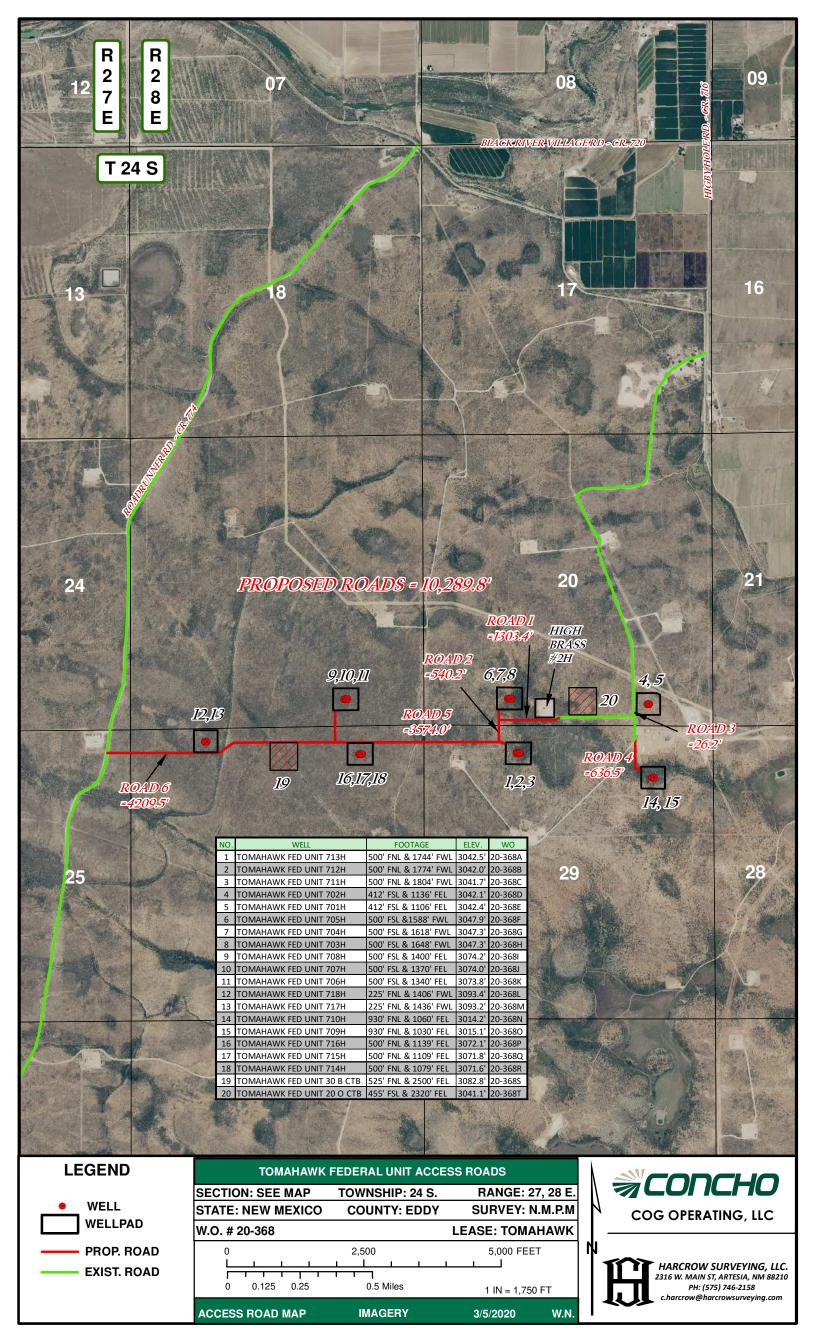
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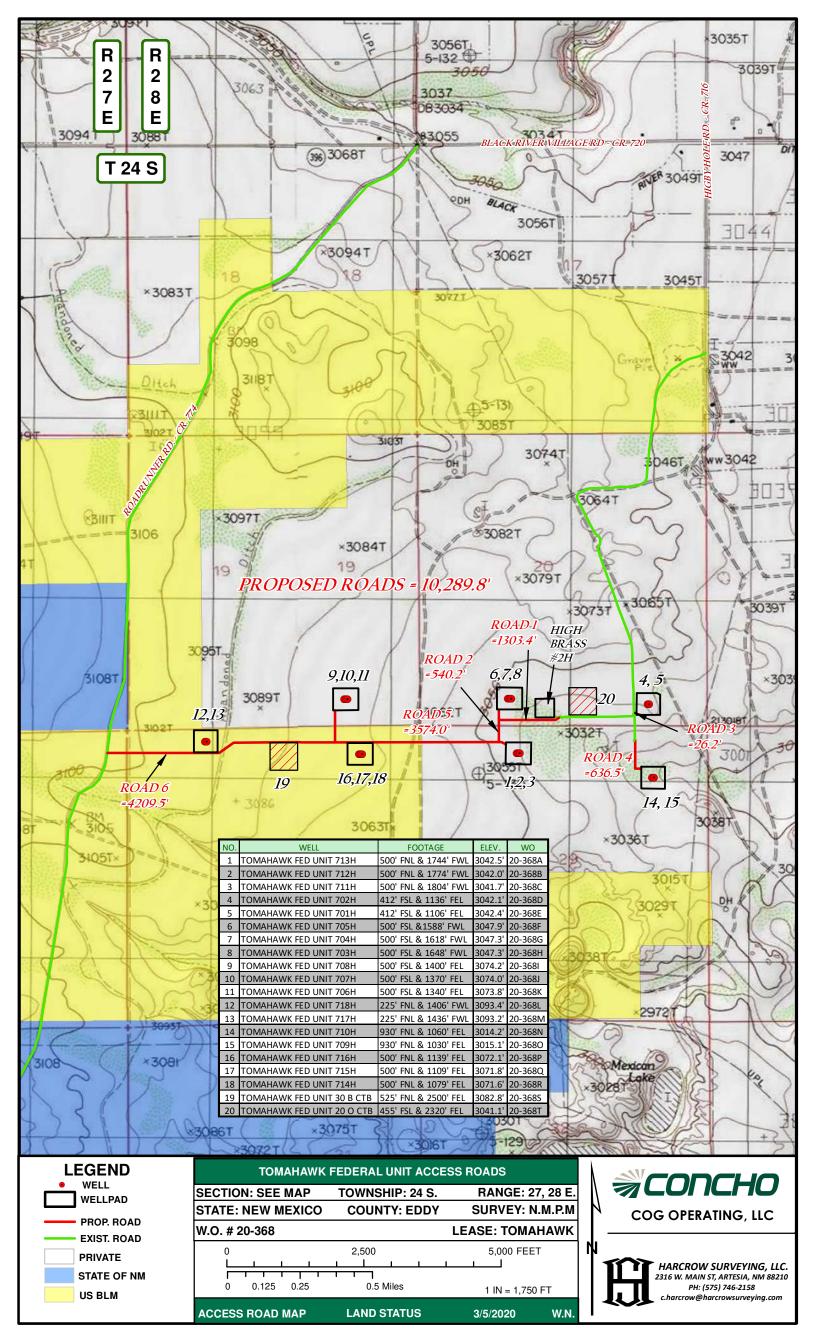
SCALE: 1"=1000'

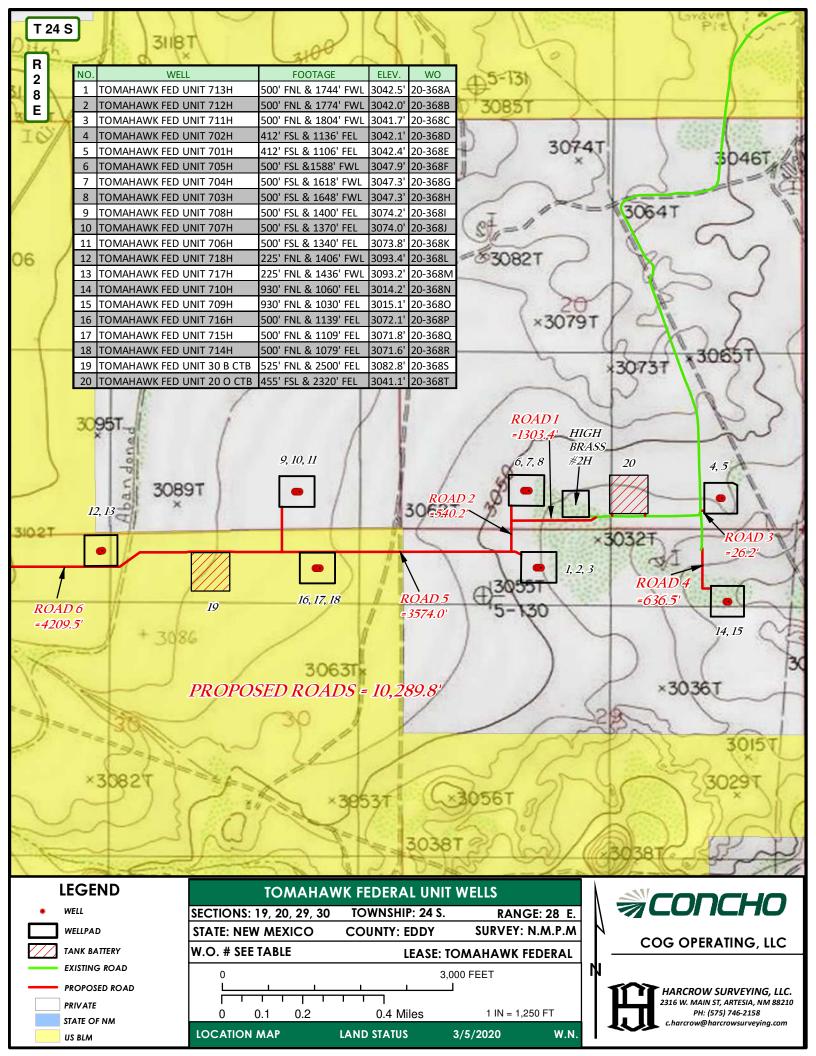
# COG OPERATING, LLC

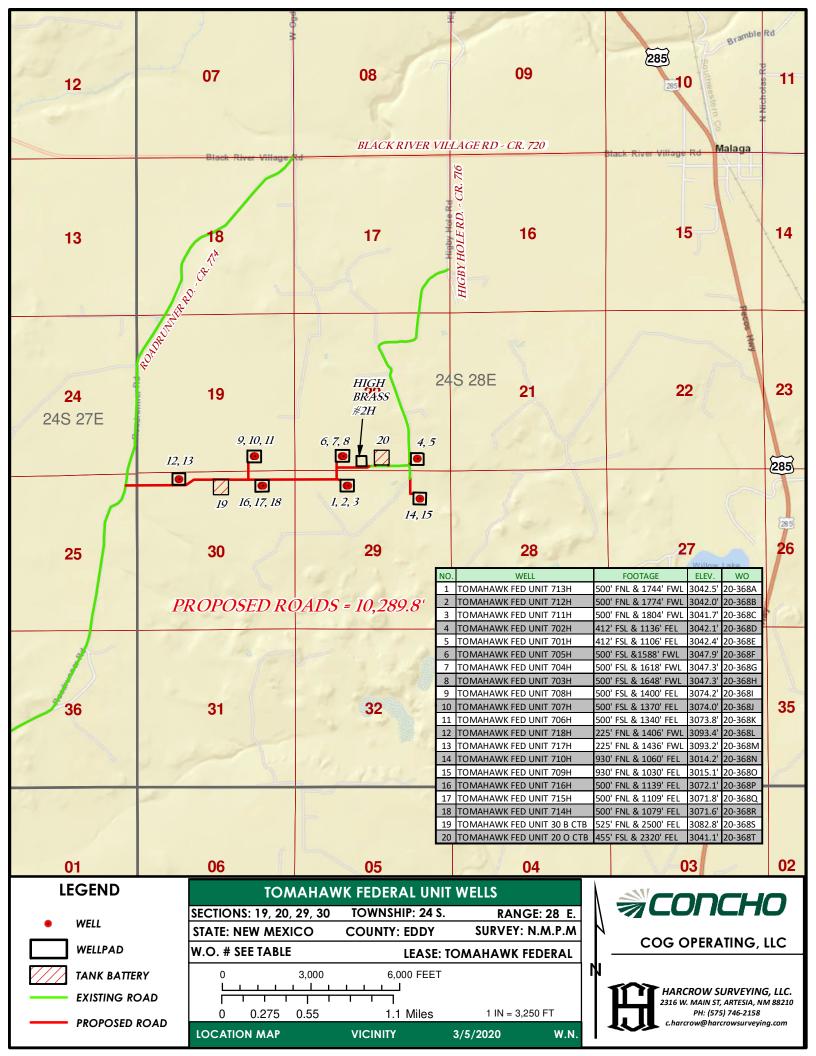
SURVEY OF A PROPOSED ROAD LOCATED IN SECTIONS 25 & 30, TOWNSHIP 24 SOUTH, RANGES 27 & 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

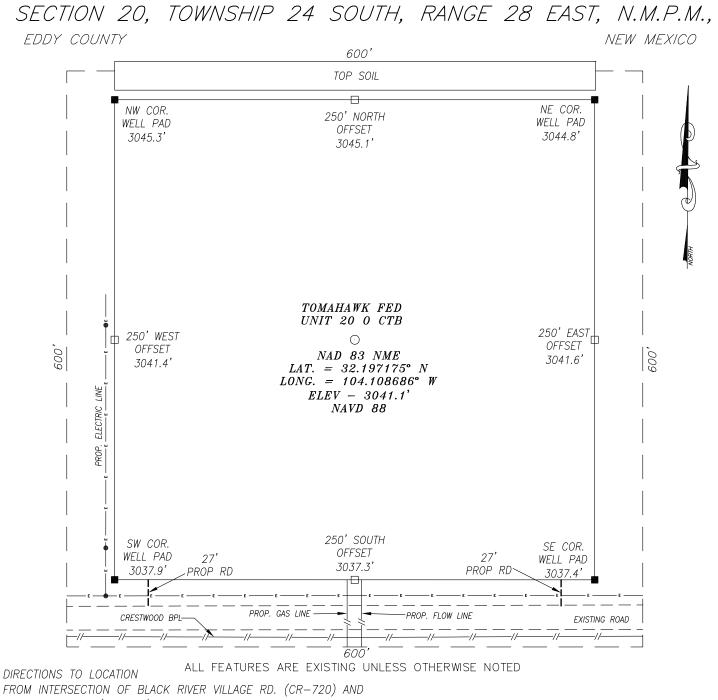
SURVEY DATE: FEB. 14, 2020	ROAD 6
DRAFTING DATE: FEB. 17, 2020	PAGE 1 OF 1
APPROVED BY: CH DRAWN BY: WN	FILE: 20-368











FROM INTERSECTION OF BLACK RIVER VILLAGE RD. (CR-720) AND HIGBY HOLE RD. (CR-716), GO SOUTH ON HIGBY HOLE RD. (CR-716) FOR APPROX. 0.75 MILES; THEN TURN RIGHT (SOUTHWEST) AND GO APPROX. 0.5 MILES; THEN TURN RIGHT (WEST) AND GO APPROX. 0.25 MILES. THEN TURN LEFT (SOUTHSOUTHEAST) AND GO APPROX. 0.8 MILES; THEN TURN RIGHT (WEST) AND GO APPROX. 0.2 MILES. PROPOSED CTB LIES APPROX. 260 FEET RIGHT (NORTH).

#### CERTIFICATION

CLIVITIOATION.

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY
THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY IS
TRUE AND CORRECT TO THE BEST OF MIX KNOWLEDGE AND BELIEF.

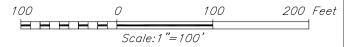


## HARCROW SURVEYING, LLC

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c.harcrow@harcrowsurveying.com





#### COG OPERATING, LLC

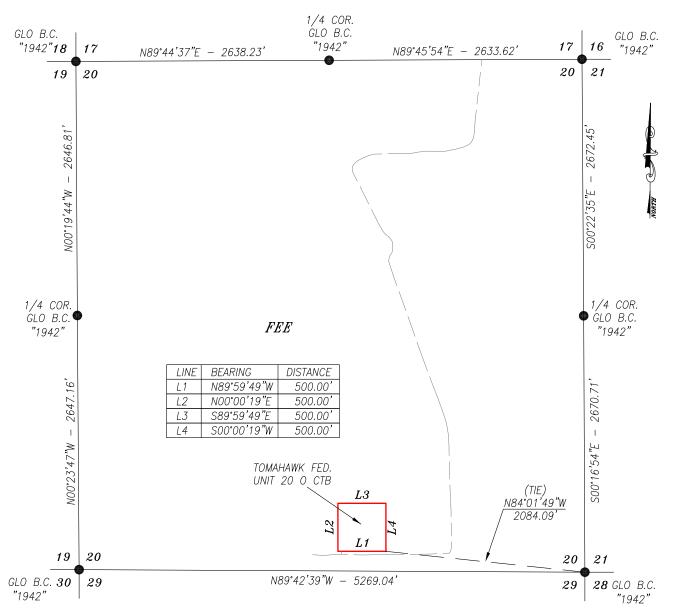
CTB

LOCATED 455 FEET FROM THE SOUTH LINE AND 2320 FEET FROM THE EAST LINE OF SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

SURVEY DATE: FEB.	6	00S			
DRAFTING DATE: FE	PAGE:	1	OF	1	
APPROVED BY: CH	DRAWN BY: AH	FILE:	20-	189	

#### CTB PLAT COG OPERATING. LLC.

A PROPOSED PAD NAMED "TOMAHAWK FEDERAL UNIT 20 0 CTB" SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A PROPOSED PAD LOCATED WITHIN FEE LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER OF THE PROPOSED PAD, WHICH LIES N84°01'49"W 2084.09 FEET FROM THE SOUTHEAST CORNER OF SAID SECTION; THEN N89°59'49"W 500.00 FEET; THEN N00°00'19"E 500.00 FEET; THEN S89°59'49"E 500.00 FEET; THEN S00°00'19" 500.00 FEET TO THE POINT OF BEGINNING.

SAID PAD CONTAINS 5.739 ACRES.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS

# Chad Harcrow N.M.P.S. NO. 17777 Date

#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158 c.harcrow@harcrowsurveying.com



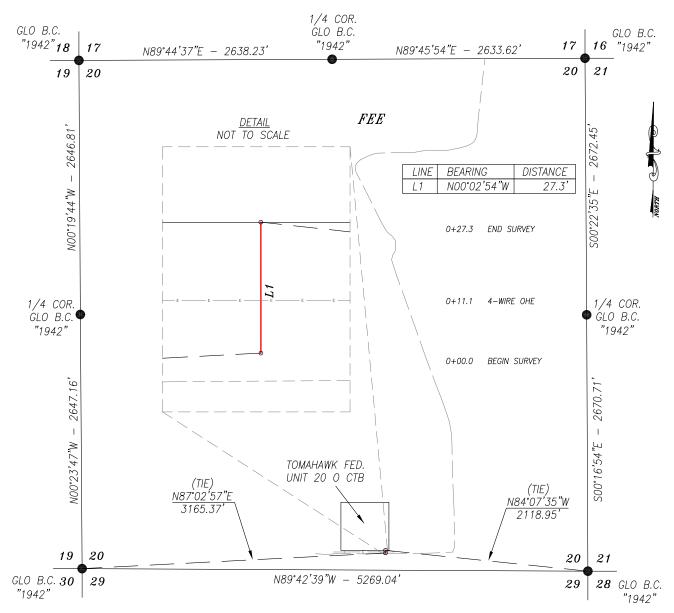
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# COG OPERATING, LLC.

SURVEY OF A PROPOSED CTB LOCATED IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: FEB. 6, 2020	CTB PAD
DRAFTING DATE: FEB. 12, 2020	PAGE 1 OF 1
APPROVED BY: CH DRAWN BY: AH	FILE: 20-368T

A PROPOSED ROAD TO "TOMAHAWK FEDERAL UNIT 20 O CTB"  $SECTION\ 20$ ,  $TOWNSHIP\ 24\ SOUTH$ ,  $RANGE\ 28\ EAST$ , N.M.P.M., EDDY COUNTY, NEW MEXICO.



#### **DESCRIPTION**

A STRIP OF LAND 30.0 FEET WIDE AND 27.3 FEET OR 1.65 RODS OR 0.005 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS



#### HARCROW SURVEYING, LLC

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c.harcrow@harcrowsurveying.com



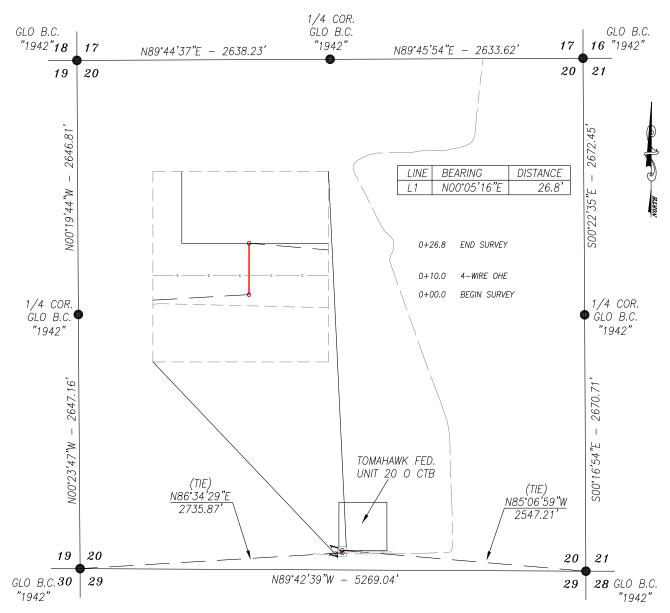
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	SCALE:	1"=1000'			

# COG OPERATING, LLC.

SURVEY OF A PROPOSED ROAD LOCATED IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: I	FEB. 6, 2020	ROAD 1
DRAFTING DATE:	FEB. 12, 2020	PAGE 1 OF 1
APPROVED BY: CH	DRAWN BY: AH	FILE: 20-368T

A PROPOSED ROAD TO "TOMAHAWK FEDERAL UNIT 20 O CTB"  $SECTION\ 20$ ,  $TOWNSHIP\ 24\ SOUTH$ ,  $RANGE\ 28\ EAST$ , N.M.P.M., EDDY COUNTY, NEW MEXICO.



#### **DESCRIPTION**

A STRIP OF LAND 30.0 FEET WIDE AND 26.8 FEET OR 1.62 RODS OR 0.005 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS



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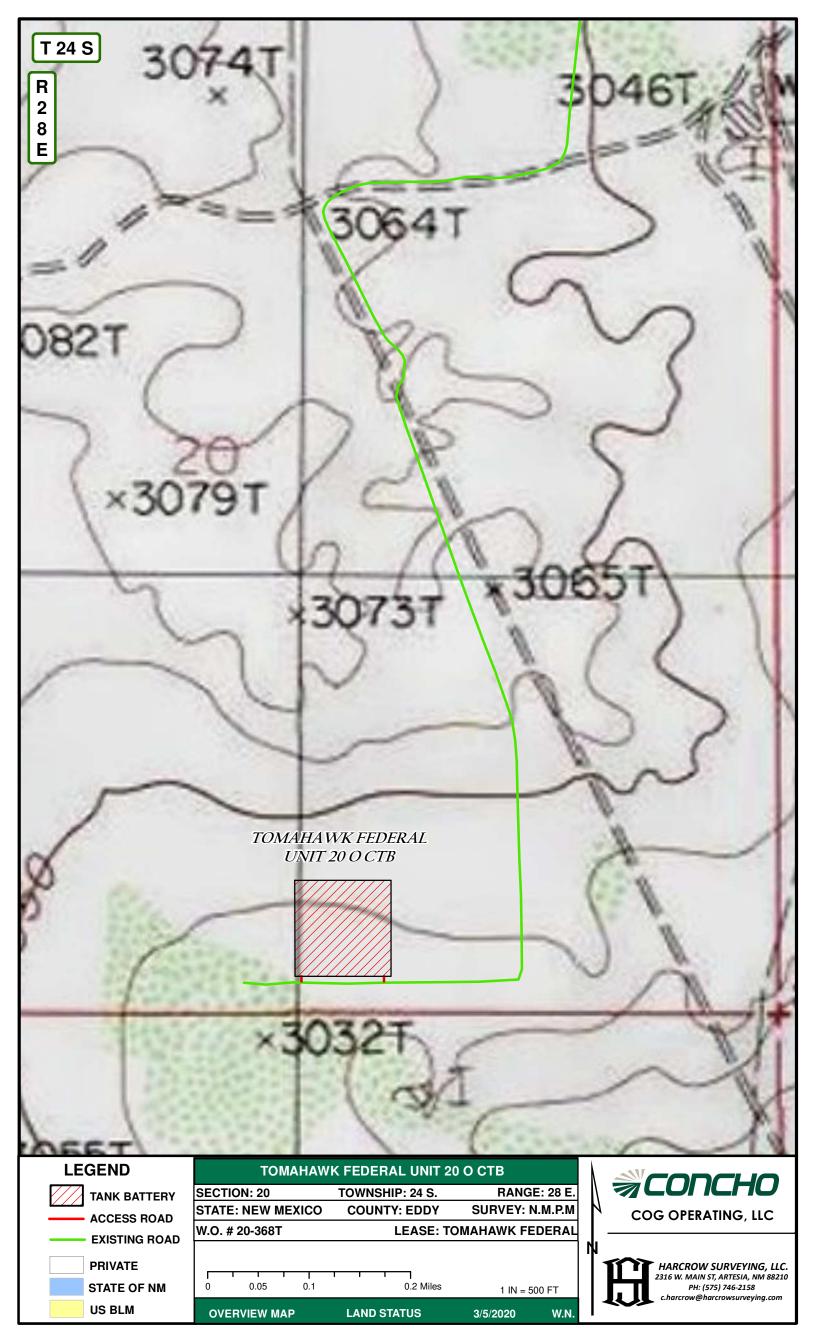
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	SCALE:	1"=1000'		1

# COG OPERATING, LLC.

SURVEY OF A PROPOSED ROAD LOCATED IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

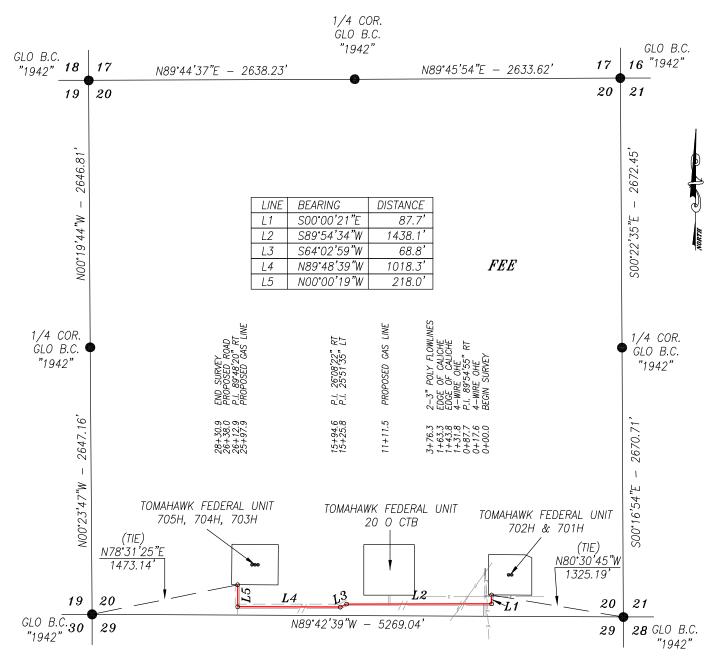
SURVEY DATE: I	FEB. 6, 2020	ROAD 2
DRAFTING DATE:	FEB. 12, 2020	PAGE 1 OF 1
APPROVED BY: CH	DRAWN BY: AH	FILE: 20-368T





A PROPOSED FLOWLINE FOR THE "TOMAHAWK FEDERAL UNIT 705H, 704H, 703H" AND "TOMAHAWK FEDERAL UNIT 702H & 701H"

SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 2830.9 FEET OR 171.57 RODS OR 0.536 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

CHAD HARCROW N.M.P.S.

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

17777

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<u>/21/20</u>

# 1000 0 1000 2000 FEET SCALE: 1"=1000'

HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210

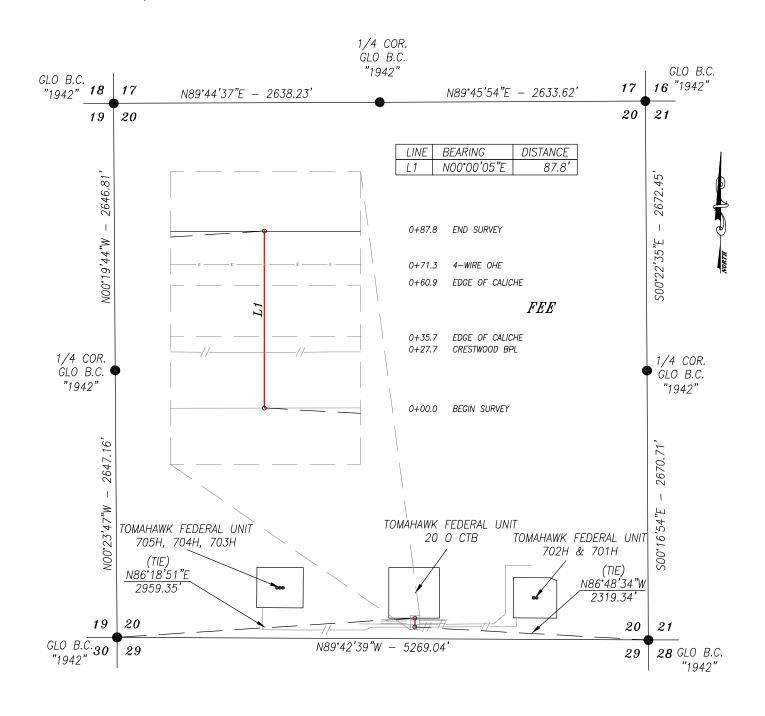
PH: (575) 746-2158 c.harcrow@harcrowsurveying.com

# COG OPERATING, LLC.

SURVEY OF A PROPOSED FLOWLINE LOCATED IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: 1	FEB. 7, 2020	FLOWLINE 2
DRAFTING DATE:	FEB. 13, 2020	PAGE 1 OF 1
APPROVED BY: CH	DRAWN BY: AH	FILE: 20-368

A PROPOSED FLOWLINE TO THE "TOMAHAWK FEDERAL UNIT 20 O CTB" SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY. NEW MEXICO.



#### **DESCRIPTION**

A STRIP OF LAND 30.0 FEET WIDE AND 87.8 FEET OR 5.32 RODS OR 0.017 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

CHAD HARCROW N.M.P.S.

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO. AD L. HARCAL

17777

MEXIC

POFESSIONA

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<u>/21/20</u>

#### 1000 1000 2000 FEET SCALE: 1"=1000"

HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210

PH: (575) 746-2158 c.harcrow@harcrowsurveying.com

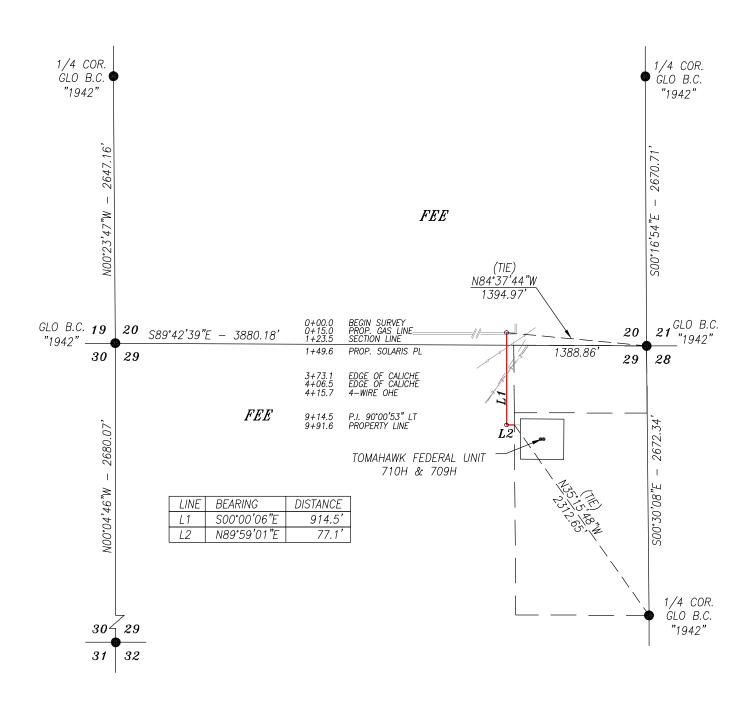
# COG OPERATING, LLC.

SURVEY OF A PROPOSED FLOWLINE LOCATED IN SECTION 20. TOWNSHIP 24 SOUTH. RANGE 28 EAST. NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: I	FEB. 7, 2020	FLOWLINE 2A
DRAFTING DATE:	FEB. 13, 2020	PAGE 1 OF 1
APPROVED BY: CH	DRAWN BY: AH	FILE: 20-368

A PROPOSED FLOWLINE TO THE "TOMAHAWK FEDERAL UNIT 710H, 709H"  $SECTION\ 20\ \&\ 29\ ,\ TOWNSHIP\ 24\ SOUTH,\ RANGE\ 28\ EAST, N.\,M.\,P.\,M.\,,$ 

EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 991.6 FEET OR 60.10 RODS OR 0.188 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

<u>/20/20</u>

#### BASIS OF BEARING:

CHAD HARCROW N.M.P.S.

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

17777

MEXIC

POFESSIONA

# 1000 0 1000 2000 FEET SCALE: 1"=1000'

HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158 c.harcrow@harcrowsurveying.com

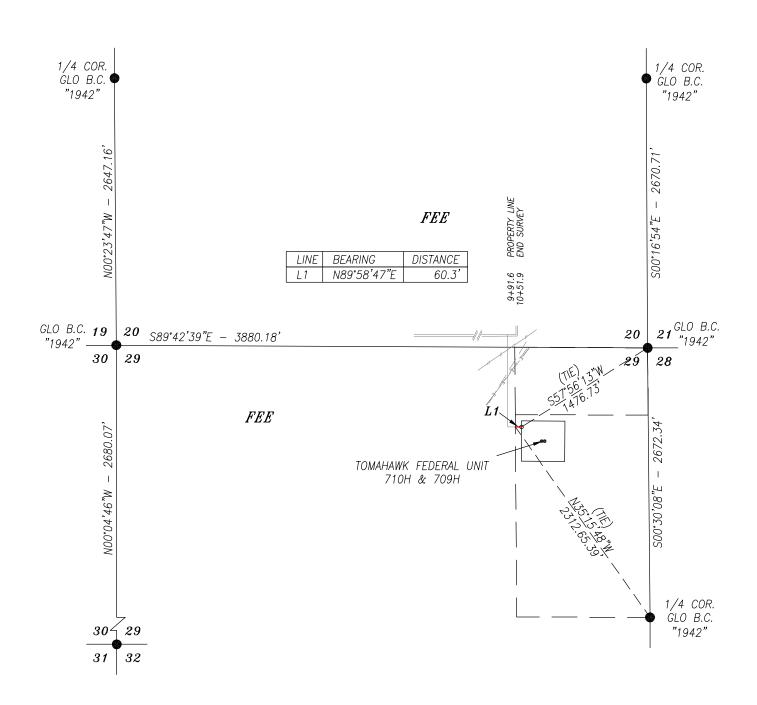
# COG OPERATING, LLC.

SURVEY OF A PROPOSED FLOWLINE LOCATED IN SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: FEB. 7, 2020	FLOWLINE 1A
DRAFTING DATE: FEB. 14, 2020	PAGE 1 OF 2
APPROVED BY: CH DRAWN BY: AH	FILE: 20-368

A PROPOSED FLOWLINE TO THE "TOMAHAWK FEDERAL UNIT 710H, 709H"  $SECTION\ 20\ \&\ 29\ ,\ TOWNSHIP\ 24\ SOUTH,\ RANGE\ 28\ EAST, N.\,M.\,P.\,M.\,,$ 

EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 60.3 FEET OR 3.65 RODS OR 0.011 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

CHAD HARCROW N.M.P.S.

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

MEXZ

POFESSIONA



c.harcrow@harcrowsurveying.com

1000 2000 FEET

1000 0 1000 SCALE: 1"=1000'

HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158

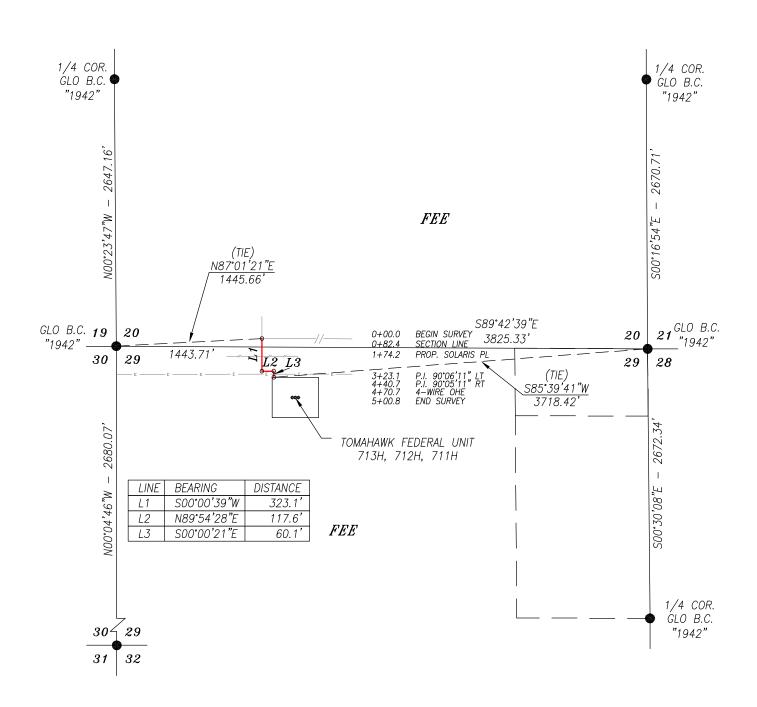
# COG OPERATING, LLC.

SURVEY OF A PROPOSED FLOWLINE LOCATED IN SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: I	FEB. 7, 2020	FLOWLINE 1A
DRAFTING DATE:	FEB. 14, 2020	PAGE 2 OF 2
APPROVED BY: CH	DRAWN BY: AH	FILE: 20-368

A PROPOSED FLOWLINE TO THE "TOMAHAWK FEDERAL UNIT 713H, 712H, 711H"  $SECTION\ 20\ \&\ 29$ ,  $TOWNSHIP\ 24\ SOUTH$ ,  $RANGE\ 28\ EAST$ ,  $N.\ M.\ P.\ M.$  ,

EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 500.8 FEET OR 30.35 RODS OR 0.095 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

<u>/20/20</u>

#### BASIS OF BEARING:

CHAD HARCROW N.M.P.S.

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

17777

MEXIC

POFESSIONA

# 1000 0 1000 2000 FEET SCALE: 1"=1000'

HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158 c.harcrow@harcrowsurveying.com

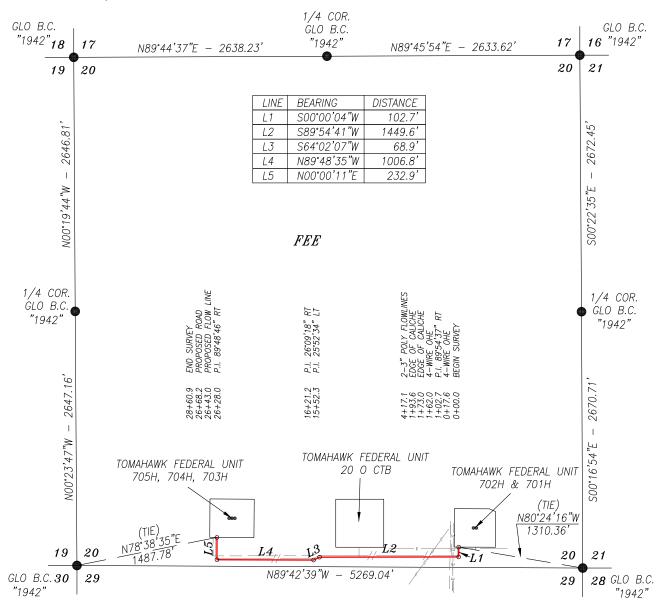
# COG OPERATING, LLC.

SURVEY OF A PROPOSED FLOWLINE LOCATED IN SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: I	FEB. 7, 2020	FLOWLINE 1
DRAFTING DATE:	FEB. 13, 2020	PAGE 1 OF 1
APPROVED BY: CH	DRAWN BY: AH	FILE: 20-368

A PROPOSED GAS LINE FOR THE "TOMAHAWK FEDERAL UNIT 705H, 704H, 703H" AND "TOMAHAWK FEDERAL UNIT 702H, 701H"

SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 2860.9 FEET OR 173.39 RODS OR 0.542 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

# Chad Harrow N.M.P.S. NO. 17777 HARCAPULA HARCAPULA MEXICO. 17777 EMPLICATION MEXICO. 17777 DATE DATE

# HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158

c.harcrow@harcrowsurveying.com



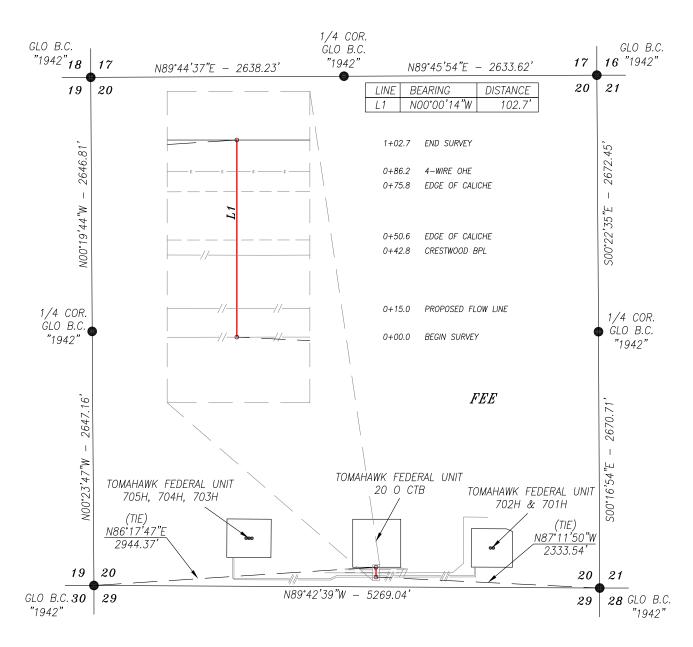
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	SCALE:	1"=1000'		

# COG OPERATING, LLC.

SURVEY OF A PROPOSED GAS LINE LOCATED IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: FEB. 7, 2020	GAS LINE 2
DRAFTING DATE: FEB. 13, 2020	PAGE 1 OF 2
APPROVED BY: CH DRAWN BY: AH	FILE: 20-368

A PROPOSED GAS LINE THE TO THE "TOMAHAWK FEDERAL UNIT 20 O CTB" SECTION~20, TOWNSHIP~24~SOUTH, RANGE~28~EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 102.7 FEET OR 6.22 RODS OR 0.019 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS



#### HARCROW SURVEYING, LLC

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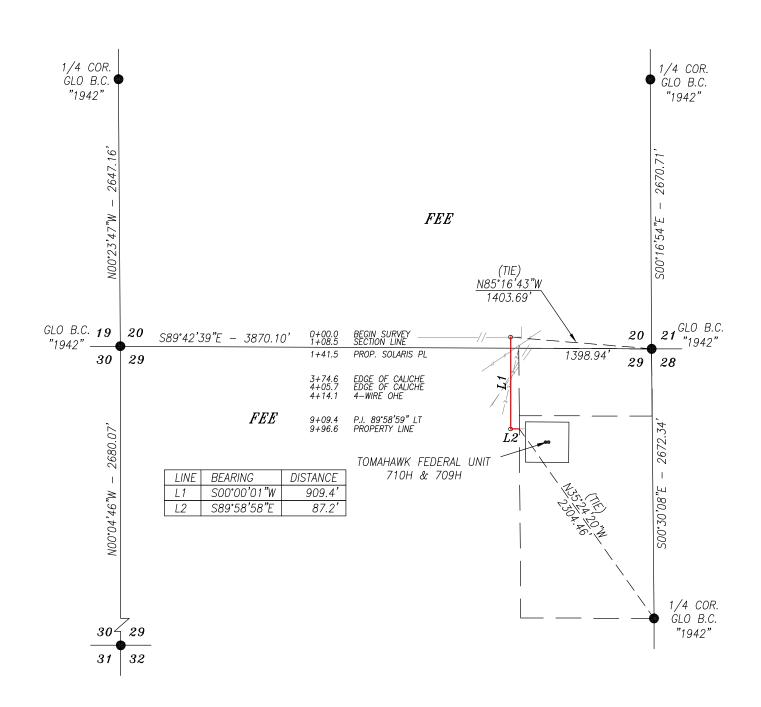
SCALE: 1"=1000'

# COG OPERATING, LLC.

SURVEY OF A PROPOSED GAS LINE LOCATED IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: I	EB. 7, 2020	GAS LINE 2A
DRAFTING DATE:	FEB. 13, 2020	PAGE 2 OF 2
APPROVED BY: CH	DRAWN BY: AH	FILE: 20-368

A PROPOSED GAS LINE TO THE "TOMAHAWK FEDERAL UNIT 710H & 709H" SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY. NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 996.6 FEET OR 60.40 RODS OR 0.189 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

CHAD HARCROW N.M.P.S.

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO. AD L. HARCA

17777

MEXIC

POFESSIONA

#### 1000 1000 2000 FEET SCALE: 1"=1000"

HARCROW SURVEYING, LLC

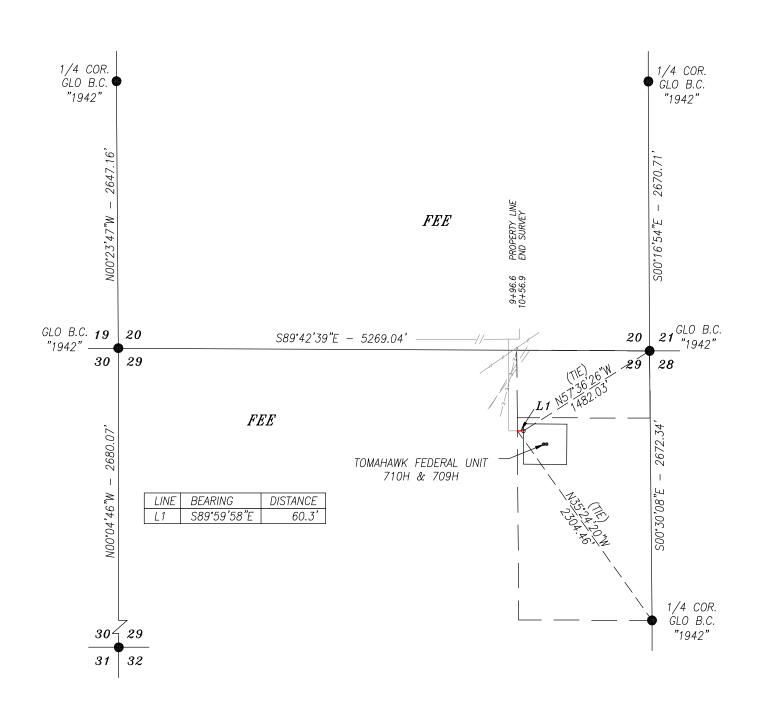
2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158 c.harcrow@harcrowsurveying.com

# COG OPERATING, LLC.

SURVEY OF A PROPOSED GAS LINE LOCATED IN SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: FEB. 7, 2020	GAS LINE 1A
DRAFTING DATE: FEB. 14, 2020	PAGE 1 OF 2
APPROVED BY: CH DRAWN BY: AH	FILE: 20-368

A PROPOSED GAS LINE TO THE "TOMAHAWK FEDERAL UNIT 710H & 709H" SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY. NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 60.3 FEET OR 3.65 RODS OR 0.011 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

CHAD HARCROW N.M.P.S.

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO. AD L. HARCA

17777

MEXIC

POFESSIONA

#### 1000 1000 2000 FEET SCALE: 1"=1000'

HARCROW SURVEYING, LLC

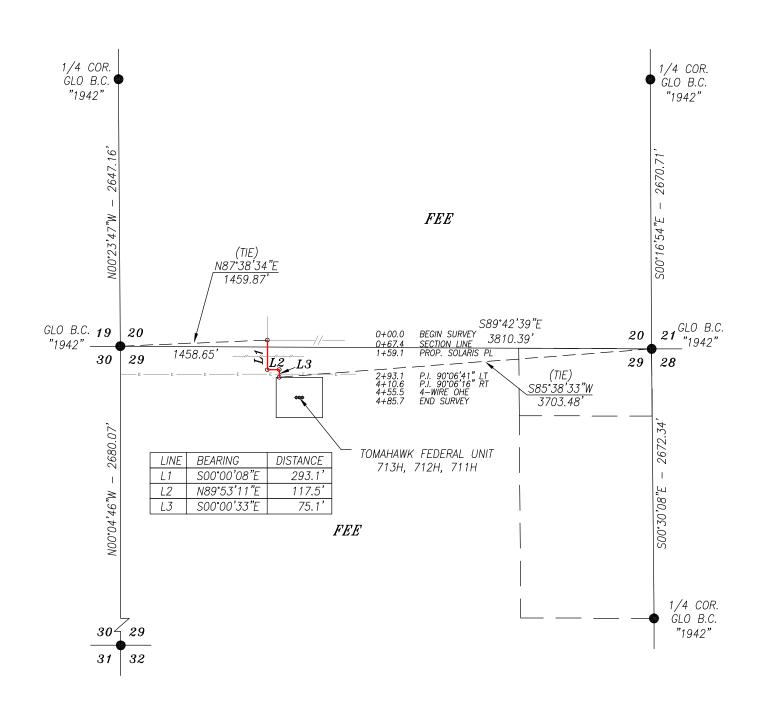
2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158 c.harcrow@harcrowsurveying.com

# COG OPERATING, LLC.

SURVEY OF A PROPOSED GAS LINE LOCATED IN SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: I	FEB. 7, 2020	GAS LINE 1A
DRAFTING DATE:	FEB. 14, 2020	PAGE 2 OF 2
APPROVED BY: CH	DRAWN BY: AH	FILE: 20-368

A PROPOSED GAS LINE TO THE "TOMAHAWK FEDERAL UNIT 713H, 712H, 711H" SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY. NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 485.7 FEET OR 29.44 RODS OR 0.092 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

1000

#### BASIS OF BEARING:

CHAD HARCROW N.M.P.S.

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO. AD L. HARCAL

17777

MEXIC

POFESSIONA

# SCALE: 1"=1000" COG OPERATING, LLC. SURVEY OF A PROPOSED GAS LINE LOCATED IN SECTION 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO SURVEY DATE: FEB. 7, 2020

DRAFTING DATE: FEB. 14, 2020

APPROVED BY: CH DRAWN BY: AH

HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210

PH: (575) 746-2158 c.harcrow@harcrowsurveying.com

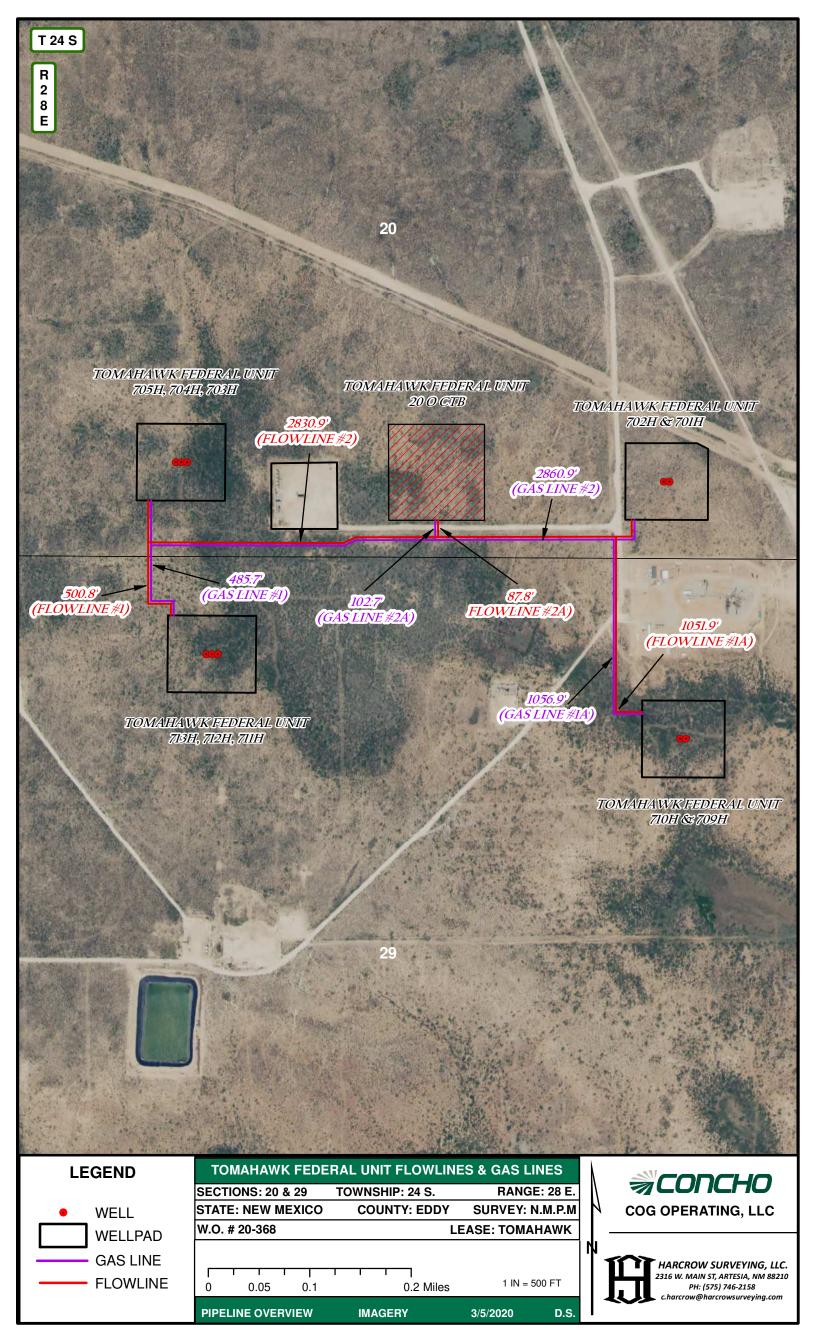
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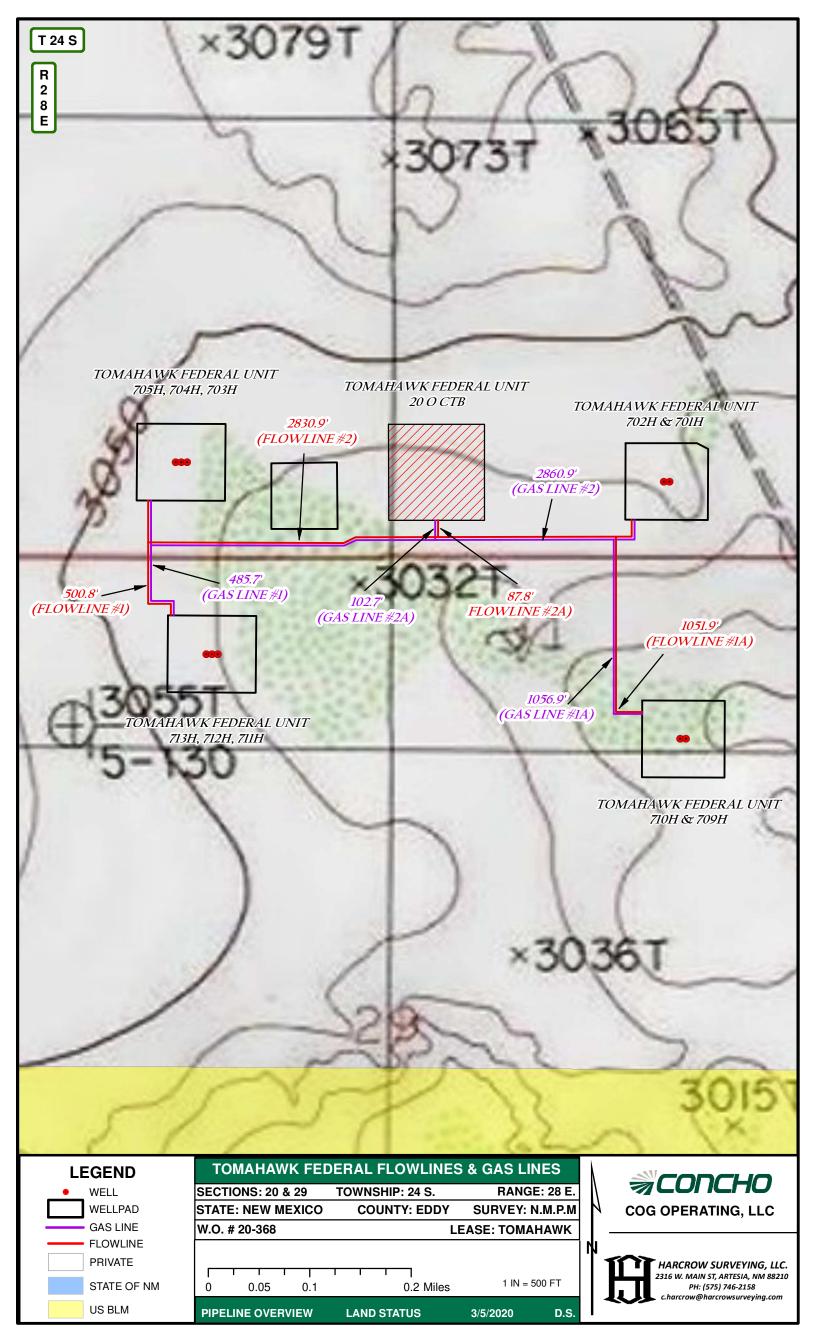
2000 FEET

GAS LINE 1

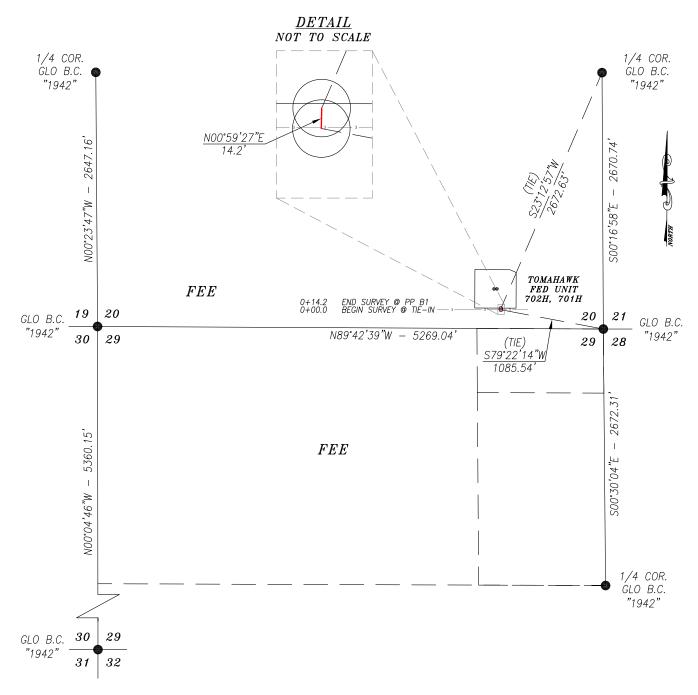
PAGE 1 OF 1

FILE: 20-368





A PROPOSED POWERLINE TO THE "TOMAHAWK FED UNIT 702H, 701H" WELLPAD IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 14.2 FEET OR 0.86 RODS OR 0.003 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS



#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158 c.harcrow@harcrowsurveying.com



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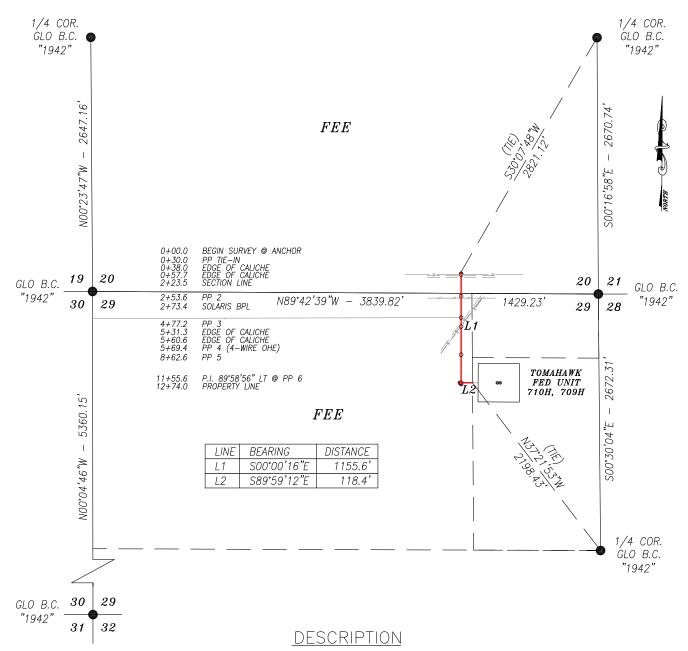
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# COG OPERATING, LLC

SURVEY OF A PROPOSED POWERLINE LOCATED IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: I	FEB. 6, 2020	LINE B
DRAFTING DATE:	FEB. 14, 2020	PAGE 1 OF 1
APPROVED BY: CH	DRAWN BY: WN	FILE: 20-368

A PROPOSED POWERLINE TO THE "TOMAHAWK FED UNIT 710H, 709H" WELLPAD IN SECTIONS 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



A STRIP OF LAND 30.0 FEET WIDE AND 1308.0 FEET OR 79.27 RODS OR 0.248 MILES IN LENGTH CROSSING FEE LAND IN SECTIONS 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY; WITH ANCHORS EXTENDING OUTSIDE THE CENTERLINE SURVEY 17 FEET SOUTH AND 17 FEET WEST AT POLE 6; WHICH HAVE BEEN ACCOUNTED FOR IN FOOTAGES, RODS, AND MILES.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.



#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158

c.harcrow@harcrowsurveying.com



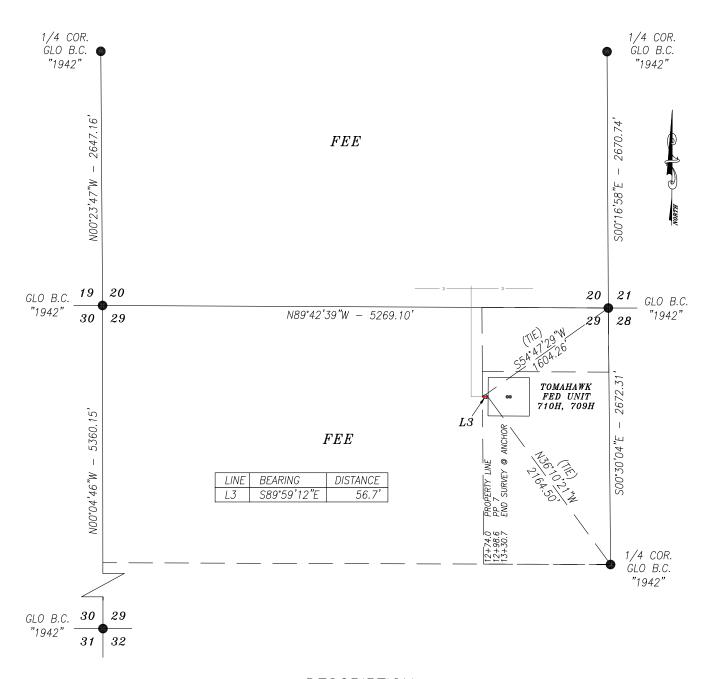
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	SCALE:	1"=1000'		

# COG OPERATING, LLC

SURVEY OF A PROPOSED POWERLINE LOCATED IN SECTIONS 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: FEB. 8, 2020	LINE 1
DRAFTING DATE: FEB. 17, 2020	PAGE 1 OF 2
APPROVED BY: CH DRAWN BY: WN	FILE: 20-368

A PROPOSED POWERLINE TO THE "TOMAHAWK FED UNIT 710H, 709H" WELLPAD IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 56.7 FEET OR 3.44 RODS OR 0.011 MILES IN LENGTH CROSSING FEE LAND IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS



#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158



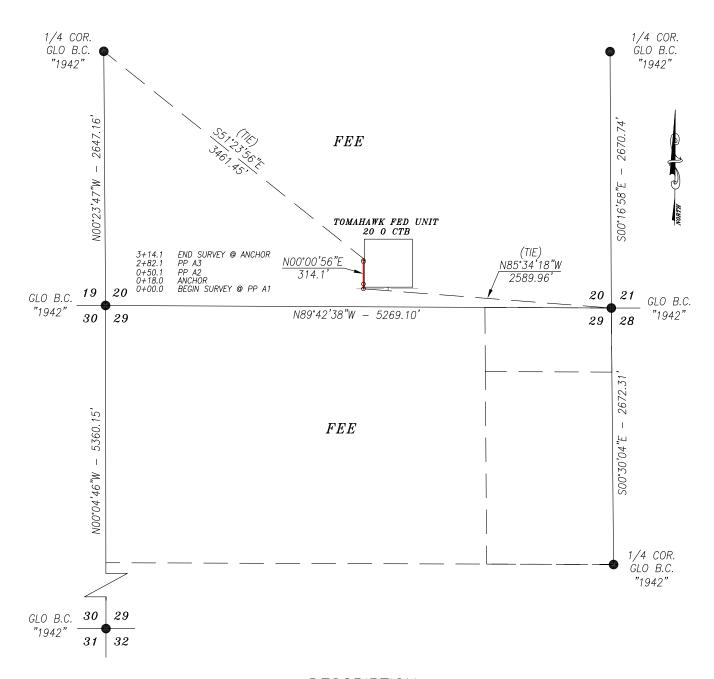
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# COG OPERATING, LLC

SURVEY OF A PROPOSED POWERLINE LOCATED IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: FEB. 8, 2020	LINE 1
DRAFTING DATE: FEB. 17, 2020	PAGE 2 OF 2
APPROVED BY: CH DRAWN BY: WN	FILE: 20-368

A PROPOSED POWERLINE TO THE "TOMAHAWK FED UNIT 20 O CTB" IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 314.1 FEET OR 19.04 RODS OR 0.059 MILES IN LENGTH CROSSING FEE LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

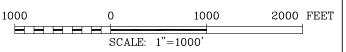
I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS

# L. HARCA FOR SURVEYING IN NEW MEXICO. MEXIC POFESSIONA <u> /21/20</u> NO. 17777

#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158

c.harcrow@harcrowsurveying.com

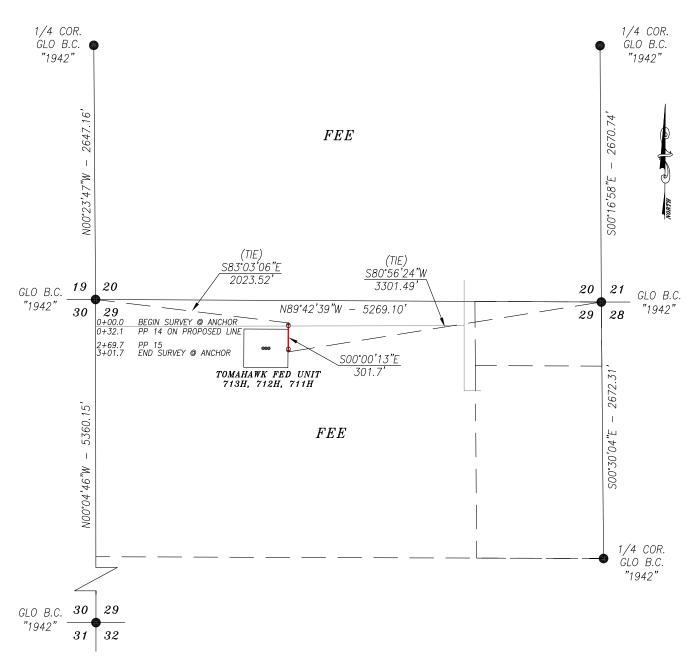


# COG OPERATING, LLC

SURVEY OF A PROPOSED POWERLINE LOCATED IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: FEB. 6, 2020	LINE A
DRAFTING DATE: FEB. 14, 2020	PAGE 1 OF 1
APPROVED BY: CH DRAWN BY: WN	FILE: 20-368

A PROPOSED POWERLINE TO THE "TOMAHAWK FED UNIT 713H, 712H, 711H" WELLPAD IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 301.7 FEET OR 18.28 RODS OR 0.057 MILES IN LENGTH CROSSING FEE LAND IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS

# ADL. HARCA FOR SURVEYING IN NEW MEXICO. MEXIC POFESSIONA /21/20 NO. 17777

#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158



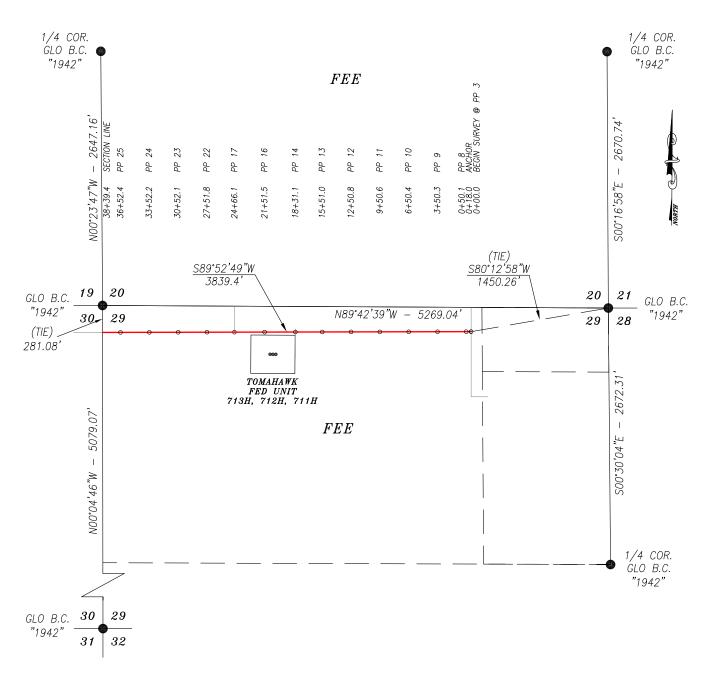
1000 1000 2000 FEET SCALE: 1"=1000'

# COG OPERATING, LLC

SURVEY OF A PROPOSED POWERLINE LOCATED IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: I	FEB. 8, 2020	LINE 3
DRAFTING DATE:	FEB. 18, 2020	PAGE 1 OF 1
APPROVED BY: CH	DRAWN BY: WN	FILE: 20-368

A PROPOSED POWERLINE TO THE "TOMAHAWK FED UNIT 708H, 707H, 706H" WELLPAD IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 3839.4 FEET OR 232.69 RODS OR 0.727 MILES IN LENGTH CROSSING FEE LAND IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

# AD L. HARCA MEXIC POFESSIONA <u> 21/20</u> NO. 17777

#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158



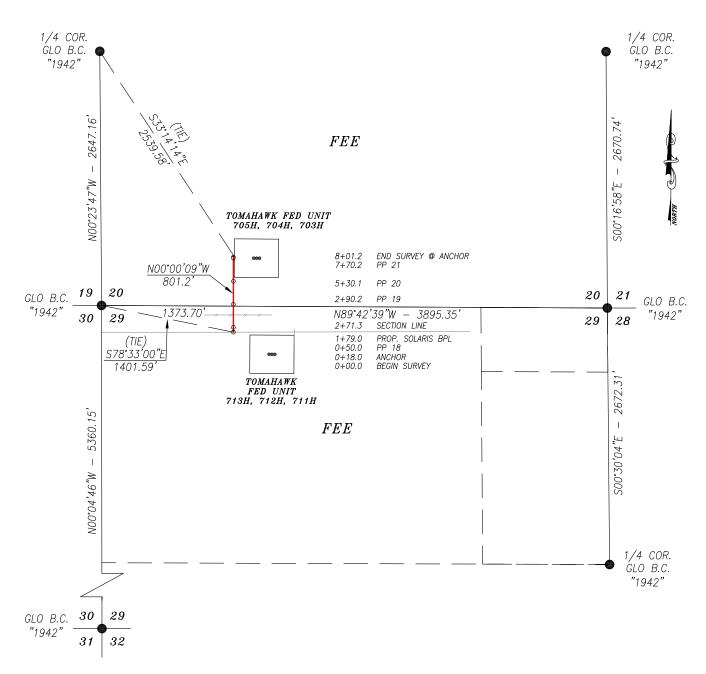
1000 1000 2000 FEET SCALE: 1"=1000'

# COG OPERATING, LLC

SURVEY OF A PROPOSED POWERLINE LOCATED IN SECTION 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

SURVEY DATE: I	FEB. 8, 2020	LINE 2
DRAFTING DATE:	FEB. 18, 2020	PAGE 1 OF 3
APPROVED BY: CH	DRAWN BY: WN	FILE: 20-368

A PROPOSED POWERLINE TO THE "TOMAHAWK FED UNIT 705H, 704H, 703H" WELLPAD IN SECTIONS 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.



#### DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE AND 801.2 FEET OR 48.56 RODS OR 0.152 MILES IN LENGTH CROSSING FEE LAND IN SECTIONS 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

#### BASIS OF BEARING:

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

#### CERTIFICATION

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS

# Chad Harcrow N.M.P.S. NO. 17777 DATE

#### HARCROW SURVEYING, LLC

2316 W. MAIN ST, ARTESIA, N.M. 88210 PH: (575) 746-2158 c.harcrow@harcrowsurveying.com



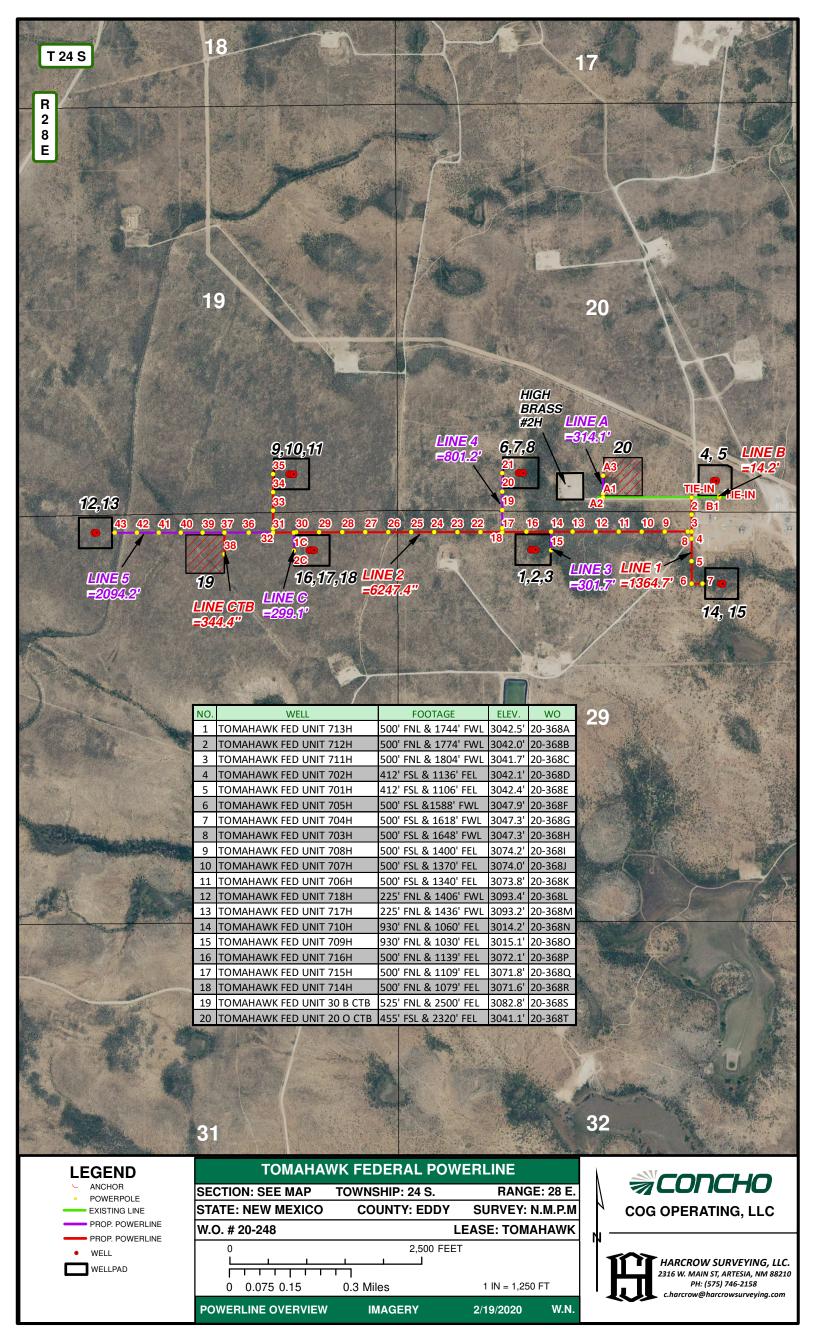
1000 0 1000 2000 FEET

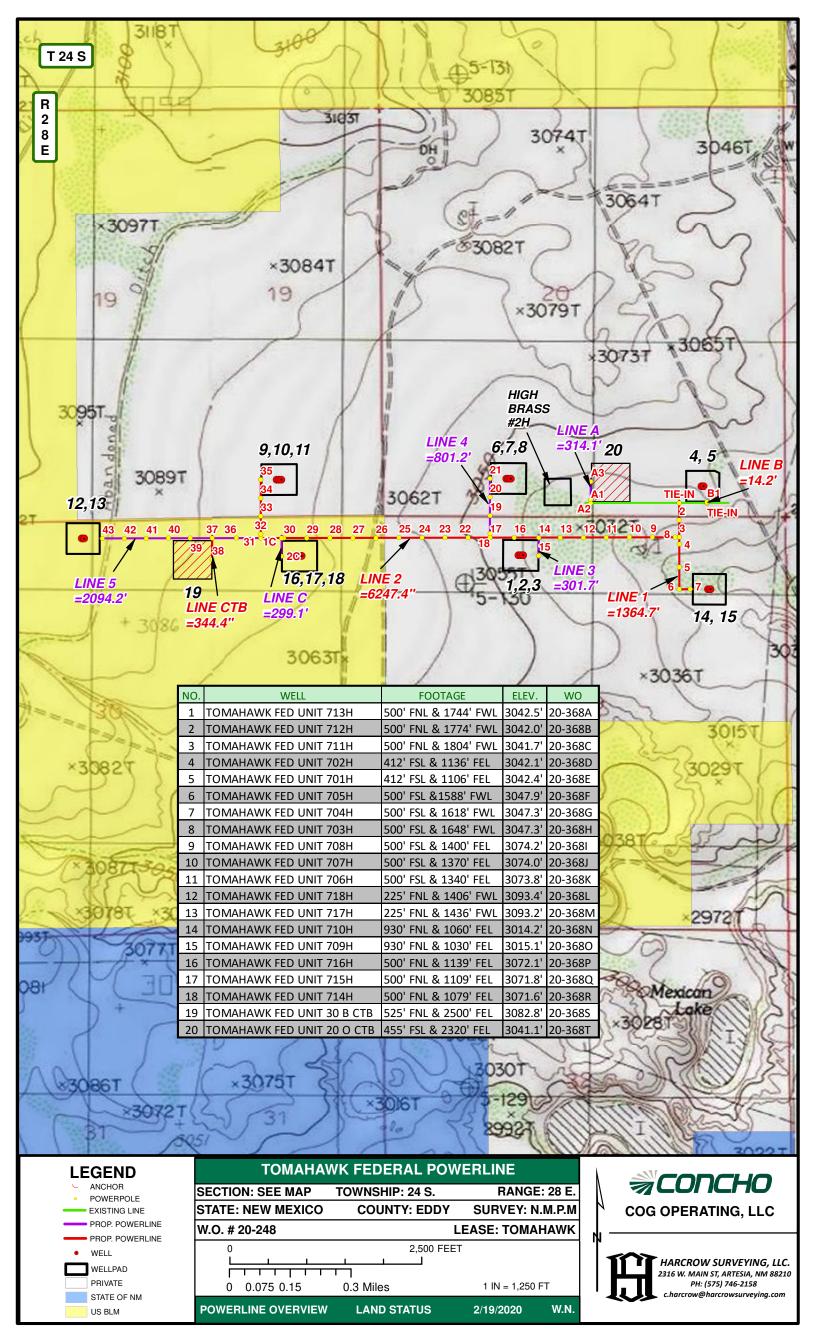
SCALE: 1"=1000'

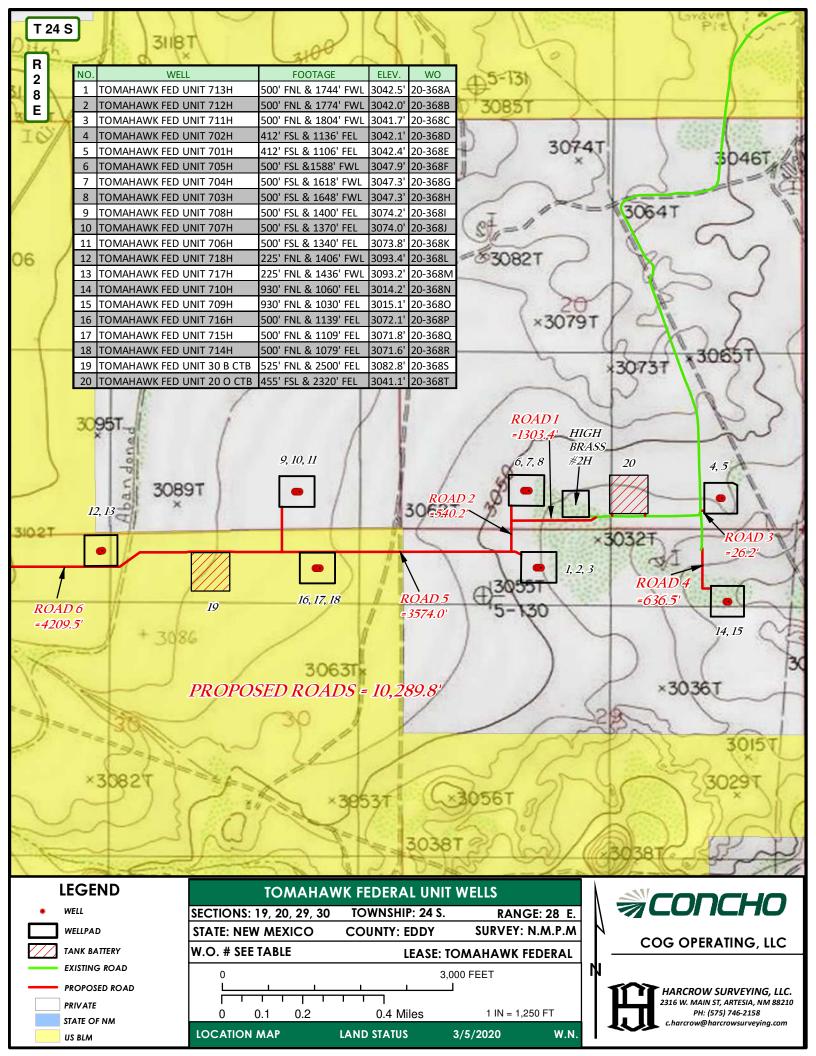
# COG OPERATING, LLC

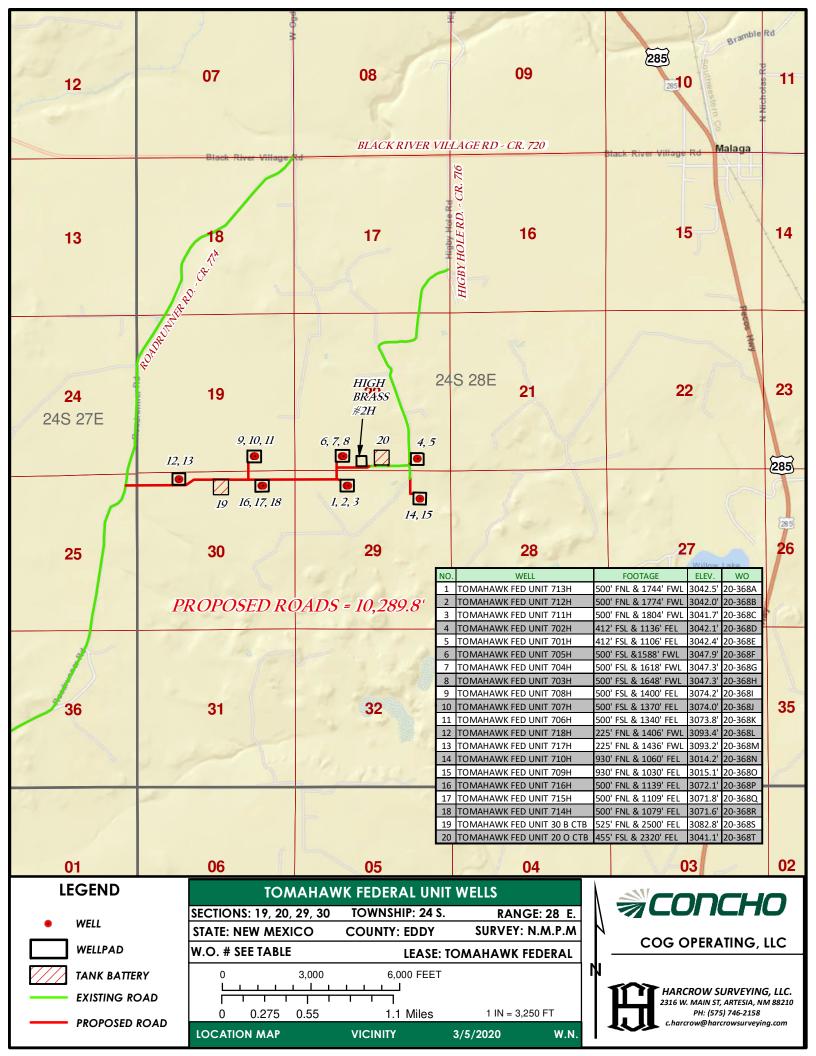
SURVEY OF A PROPOSED POWERLINE LOCATED IN SECTIONS 20 & 29, TOWNSHIP 24 SOUTH, RANGE 28 EAST, NMPM, EDDY COUNTY, NEW MEXICO

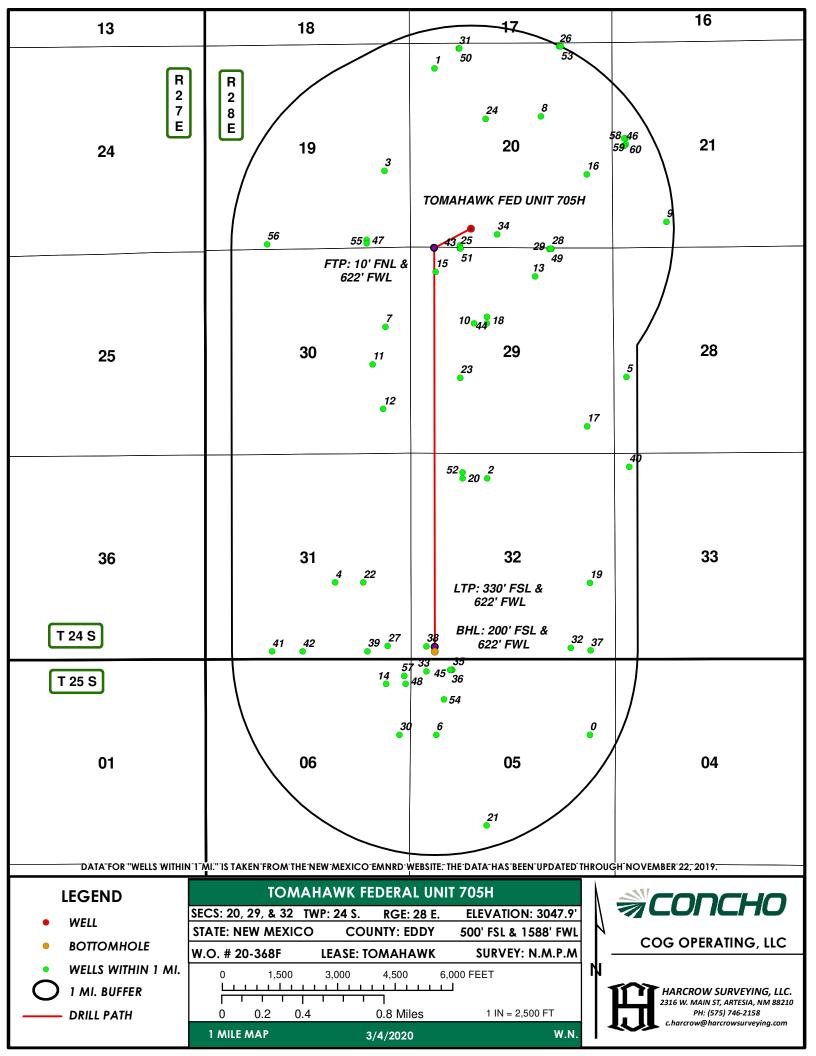
SURVEY DATE: FE	EB. 6, 2020	LINE 4
DRAFTING DATE: F	EB. 14, 2020	PAGE 1 OF 1
APPROVED BY: CH	DRAWN BY: WN	FILE: 20-368











DEMILY ADMINISTRATE   PROPERTY OF THE PROPER		TOMAHAWK F	EDERAL UNIT 7	05H_1 MILE DATA (	(20-368F)				
1 PABOLE FRANKS 2001   NINC FOSSIL RUITS CO   2001-22173   20 2 AG   28	FID WELL_NAME	OPERATOR	API :	SECTION TOWNSH	IIP RANGE	FTG_NS NS_	CD FTG_EW EW_CD	LATITUDE	LONGITUDE COMPL_STAT
2 HURSEN PARTONE SOCIAL SERSINA MATURE AGE SILL MITTED PARTNERSHEN PARTONE STATE COME 100 1 SERSINA MATURE AGE SILL MITTED PARTNERSHEN PARTONE STATE COME 100 1 SERSINA MATURE AGE SILL MITTED PARTNERSHEN PARTNE	0 RICHARDSON ; BA 001	BURGETT EVERETT	3001502511	5 25.0\$	28E	1980 N	660 E	32.161123	-104.103156 Plugged
PARIDE SI COM COI	1 PARDUE FARMS 20 001	HNG FOSSIL FUELS CO	3001522173	20 24.0\$	28E	660 N	660 W	32.208789	-104.116134 Plugged
AMOUS STATE COLD   MAX WILSON INC   0001529667   31 A A05   28   1980 S   33 0W   2.116698   1.016007 Pugged   6 COLT STATE COLD   1.016007 ATUREA (ASE ILLIMITED PARTINESIN)   0001539567   7.5 Z. 6.5 Z. 82   1980 N   600 W   2.11617   10.110077 Pugged   1.016007	2 HUBER STATE 001	DINERO OPERATING CO	3001523881	32 24.0S	28E	660 N	1980 W	32.179479	-104.111753 Plugged
5   5   5   5   5   6   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7   5   7	3 PARDUE 19 COM 001	LEGEND NATURAL GAS III LIMITED PARTNERSHIP	3001524013	19 24.0S	28E	1980 S	660 E	32.201468	-104.120375 Active
COUNTEMP TECHNALOSI   MORECO INC   MORECO	4 AMOCO STATE 001	MAX WILSON INC	3001525613	31 24.05	28E	1980 S	1980 E	32.172048	-104.124602 Plugged
SOURCINIST FEDRAL (01)   MOREXO INC   3001535509   30 2 4.05   28   28   28   28   28   28   28   2	5 FEDERAL 28 001	ROBERT N ENFIELD	3001520956	28 24.0\$	28E	1980 S	330 W	32.186696	-104.100017 Plugged
SMILECUM LARE OF EPERAL (O)   MORESCO INC   S0013343373   Co. 2 A 6.6 N	6 COLT STATE 001	LEGEND NATURAL GAS III LIMITED PARTNERSHIP	3001535557	5 25.0\$	28E	1980 N	660 W	32.161147	-104.116097 Active
O STATE PETERAL DOIL   O CCIDENTAL PERMIAN ITD   SOUTHWAY SOUTH   SOUTHWAY SOUTH   SOUTHWAY SOUTH   SOUTHWAY SOUTH   SOUTHWAY SOUTH   SOUTHWAY SOUTH   SOUTHWAY SOU	7 GOODNIGHT FEDERAL 001	MOREXCO INC	3001535601	30 24.0\$	28E	2080 N	660 E	32.190307	-104.120334 Active
10 PARDUE FARM\$ 29 001   10 CONDININET FEDERAL (1002   10 CONDININET FEDERAL (1002   10 CONDININET FEDRAL (1002   10 CONDININET FE	8 WILLOW LAKE 20 FEDERAL 001	MOREXCO INC	3001533209	20 24.0\$	28E	1910 N	1838 E	32.205367	-104.107179 Active
15 GOODNIGHT FEDRAL (001 CORSCOURCES) NC 3001358017 30 2-0.55 28E 210 5 5 70 E 21.8164 10-11.0756 Active 12 DAKKTO 30 DEFERRAL COM 101 COENTIAL PERMAN SERVICE 13 PAROUE FRAMES 29 001 LEGENO NATURAL GAS IN LIMITED PARTNERSHIP 15 PAROUE FRAMES 29 001 MORENCO INC 10 MORENCO INC	9 OXY STENT FEDERAL 001	OCCIDENTAL PERMIAN LTD	3001534333	21 24.0\$	28E	660 S	1400 W	32.197789	-104.096628 Active
12 DAKTS 30 FERRAL COIL   SON RESOURCES INC   SOLUTION   Solutio	10 PARDUE FARMS 29 002	MOREXCO INC	3001534366	29 24.0\$	28E	1980 N	1650 W	32.190572	-104.112831 Active
12 PARCH 3 OFTERFAL COLD   COR RESOURCES INC   SO 01350017,   30 d. 40.5   28E   114 b 5   70.6 E   32.1844   -104.10505 Active   18 PARDUE FARMES 5001   COCIDENTAL PERMANITO   5001353017   20 d. 50.5   28E   75.4 N   70.18 E   32.1849   -104.10588 Active   18 PARDUE FARMES 5003   MORECO INC   5001353193   20 d. 50.5   28E   660 N   660 W   32.16973   -104.10333 Active   10.1858   -104.10333	11 GOODNIGHT FEDERAL 002	MOREXCO INC	3001536015	30 24.0\$	28E	2310 S	990 E	32.187652	-104.121405 Active
14 FULR RECOVERY OIL   10 FORD NATURAL GAS III MITTED PARTNERSHIP   10 FORD NATURAL GAS III MITTED PARTNERSHI	12 DAKOTA 30 FEDERAL 001	EOG RESOURCES INC		30 24.0\$	28E	1140 S	720 E	32.18444	-104.120526 Active
15 PARDUE FARMS 29 003   MOREXCO INC   MOR					28E	754 N	2013 E		
15 PARDUE FARMS 29 003   MOREXCO NC   300134858   29 24.05   28E   560 N   600 W   32,19422   104.116048 Active   105 NORTHING   105 NORTHI	14 FULL RECOVERY 001	OCCIDENTAL PERMIAN LTD	3001536149	6 25.0S	28E	660 N	660 E	32.164783	-104.120332 New (Not drilled or compl)
16 NEW MANY FEDERAL COM 001   EGEND NATURAL CAS II LUMITED PARTNESSHIP   300153392   29 24 05   28   190 N   32,9055   03,2119055   104,111759 Active   18 FKS FEE 001   EGEND NATURAL CAS II LUMITED PARTNESSHIP   3001533967   29 24 05   28   190 N   1980 W   32,19055   104,111759 Active   190 N   190									
1.5 SECOND CHANCE FEDERAL COM 001   EGEND NATURAL CAS III LIMITED PARTNERSHIP   3001533907   29 24 05   28E   1980 N   1980 N   23.193184   104.103333 Active   1980 N   1980 N   23.193184   104.10333 Active   1980 N   1980 N   23.193184   104.10343 Active   1980 N   23.193184 Active					28E				
18 EKG FE GOL   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   300153392   32 92 05   28E   1980 N   1980 W   32.19656   104.111790 Active   1990 N   1990 W   32.19656   104.111790 Active   1990 N   32.19657   104.111790 Active   1990 N   32.19657   104.11382 Active   1990 N   32.19658   104.111790 Active   1990 N   32.19658   104.111790 Active   104.11823 Active   104.11									
19 HORSESHOEL LAKE STATE 001   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001538278   32 24.05   28E   660 N   1340 W   32.179487   10113832 Active   22 BUCKSHOT STATE COM 001   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001538268   31 24.05   28E   1980 S   1250 E   32.172044   104.12231 Active   22 BUCKSHOT STATE COM 001   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001538268   31 24.05   28E   1980 S   1250 E   32.172044   104.12231 Active   22 BUCKSHOT STATE COM 001   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001538366   32 24.05   28E   1980 S   1250 E   32.172044   104.12231 Active   22 BUCKSHOT STATE COM 001   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001538268   29 24.05   28E   1980 S   1250 E   32.172044   104.12231 Active   22 BUCKSHOT STATE COM 004H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001538268   20 24.05   28E   1980 S   1250 E   32.172044   104.12231 Active   22 BUCKSHOT STATE COM 004H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   300154243   20 24.05   28E   45 N   1350 E   32.125959   104.114002 Unknown   22 BUCKSHOT STATE COM 002H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   300154243   20 24.05   28E   45 N   1550 E   32.125959   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.10004   104.100									
20 FULCHORK COM 001   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001535372   32 24.05   28E   660 N   1340 W   32.179487   30.113838 Active   22 BUCKSHOT STATE COM 001   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001535366   31 24.05   28E   1980 S   125 D   32.17044   -10.112934   Archive   23 SECOND CHANCE FEDERAL COM 002   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001535366   31 24.05   28E   1980 S   125 D   32.17044   -10.122931   Archive   24 HIGH BRASS FEE 001   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001538260   27 24.05   28E   1980 S   125 D   32.18569   -10.11398 New (Not drilled or compl)   24 HIGH BRASS FEE 001   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   300154242   29 24.05   28E   1980 N   1980 W   32.205157   -104.110623   Archive   25 PARDUE 29 FEDERAL COM 006H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   300154244   20 24.05   28E   110 N   135 D E   32.210317   -104.105615   Unknown   27 BUCKSHOT STATE COM 002H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   300154244   29 24.05   28E   45 N   1500 E   32.210317   -104.105615   Unknown   29 PARDUE 29 FEDERAL COM 007H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   300154244   29 24.05   28E   45 N   1500 E   32.195584   -104.10029   Unknown   29 PARDUE 29 FEDERAL COM 009H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   300154244   29 24.05   28E   45 N   1500 E   32.195584   -104.10029   Unknown   29 PARDUE 29 FEDERAL COM 009H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   300154244   29 24.05   28E   45 N   1500 E   32.195584   -104.10029   Unknown   29 PARDUE 29 FEDERAL COM 009H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   300154244   20 24.05   28E   150 N   20 0 W   32.15153   -104.10049   Unknown   20 0 E									
1 MINCHESTER STATE COM 001   LEGEND NATURAL GAS II ILLMITED PARTNERSHIP   201535342   5 25.05   28E   190 S   1250 E   21.1704   104.122231 Active   23 SECOND CHANCE FEDERAL COM 002   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001536866   29 24.05   28E   190 S   1250 W   32.18669   104.11399 New (Not drilled or compl)   24 MIGH BRASS FEE 001   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   300154242   29 24.05   28E   190 S   1290 W   32.18669   104.11399 New (Not drilled or compl)   24 MIGH BRASS FEE 001   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   300154242   29 24.05   28E   190 N   1350 E   32.10317   104.105615 Unknown   27 BUCKSHOT STATE COM 009H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   300154243   20 24.05   28E   130 N   1350 E   32.10317   104.105615 Unknown   28 PARDUZ 39 PEDERAL COM 009H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   300154243   29 24.05   28E   45 N   1500 E   32.10570 + 104.12017   104.10690   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000   104.0000									
22 SECOND CHANCE FEDERAL COM 0021 23 SECOND CHANCE FEDERAL COM 0021 24 HIGH BRASS FEE 001 25 PARDUE 29 FEDERAL COM 0041 16 LEGEND NATURAL GAS III LIMITED PARTNERSHIP 26 SHOWNING FEDERAL COM 0061 26 SHOWNING FEDERAL COM 0061 27 BUCKSHOT STATE COM 0021 28 PRADUE 29 FEDERAL COM 0061 29 PARDUE 29 FEDERAL COM 0061 29 PARDUE 29 FEDERAL COM 0061 20 LEGEND NATURAL GAS III LIMITED PARTNERSHIP 20 SHOWNING FEDERAL COM 0061 20 SHOWNING FEDERAL COM 0061 20 SHOWNING FEDERAL COM 0061 21 SHOWNING FEDERAL COM 0061 22 SHOWNING FEDERAL COM 0061 23 SHOWNING FEDERAL COM 0061 24 SHOWNING FEDERAL COM 0061 25 SHOWNING FEDERAL COM 0061 26 SHOWNING FEDERAL COM 0061 26 SHOWNING FEDERAL COM 0061 26 SHOWNING FEDERAL COM 0061 27 SHOWNING FEDERAL COM 0061 28 SHOWNING FEDERAL COM 0061 29 PARDUE 29 FEDERAL COM 0061 29 PARDUE 29 FEDERAL COM 0061 20 SHOWNING FEDERAL COM 0061 21 SHOWNING FEDERAL COM 0061 22 SHOWNING FEDERAL COM 0061 23 SHOWNING FEDERAL COM 0061 24 SHOWNING FEDERAL COM 0061 25 SHOWNING FEDERAL COM 0061 26 S									
23 SECOND CHANCE FEDERAL COM 0024  24 HIGH BRASS FEE 001  16 EEGND NATURAL GAS III LIMITED PARTNESHIP POINTS AND SEE 20 24 0S 2E 1980 N 1980 M 32.015697 - 104.113938 Active PARTNESHIP POINTS AND SEE 20 24 0S 2E 18 N 1290 W 32.195899 - 104.12002 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 18 N 1290 W 32.195899 - 104.12002 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 18 N 1290 W 32.195899 - 104.12002 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 18 N 1290 W 32.195899 - 104.12002 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 18 N 1290 W 32.195899 - 104.12002 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 18 N 1290 W 32.195899 - 104.12002 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 18 N 1290 W 32.195899 - 104.12002 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 1980 N 1350 E 32.19517 - 104.12002 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 1980 N 1580 E 32.19589 - 104.10699 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 1980 N 1580 E 32.19589 - 104.10699 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 1980 N 1580 E 32.19589 - 104.10699 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 1980 N 1580 E 32.19589 - 104.10699 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 1980 N 1580 E 32.19589 - 104.10699 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 1980 N 1580 E 32.19589 - 104.10699 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 1980 N 300 E 32.16153 - 104.10699 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 1980 N 30 E 32.16153 - 104.10699 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 28 S 1165 E 32.16738 - 104.10763 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 28 S 1165 E 32.16738 - 104.10763 Unknown PARTNESHIP POINTS AND SEE 20 24 0S 2E 30 S 1165 E 32.16759 - 104.114762 Unknown PARTNESHIP POINTS AND SEE 20 25 S 25 S 2E 28 S 30 S 25 S W 32.16619 - 104.114762 Unknown PARTNESHIP POINTS AND SEE 20 24 S 2E 28 S 30 S 25 S W 32.16759 - 104.114762 Unknown PARTNESHIP POINTS AND SEE 20 24 S 2E 28 S 30 S 1165 E 32.16759 - 104.114762 Unknown PARTNESHIP POINTS AND SEE 20 24 S 2E 28 S 30 S 1165 E 32.16759 - 104.114762 Unknown PARTNESH									
24 HIGH BRASS FEE 001   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   2001533952   22 4.05   28E   45 N   1990 W   32.195699   104.114002 Unknown   25 PARDUE 29 FEDERAL COM 006H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   200154243   20 24.05   28E   110 N   1350 E   32.210317   104.105515 Unknown   27 BUCKSHOT STATE COM 002H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   200154243   20 24.05   28E   330 S   620 E   32.167594   104.120377 Unknown   29 PARDUE 29 FEDERAL COM 007H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   200154243   20 24.05   28E   45 N   1640 E   32.195894   104.100399 Unknown   29 PARDUE 29 FEDERAL COM 008H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   200154243   29 24.05   28E   45 N   1640 E   32.195894   104.100399 Unknown   20 PARDUE 29 FEDERAL COM 008H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   200154244   29 24.05   28E   45 N   1640 E   32.195894   104.100399 Unknown   20 PARDUE 29 FEDERAL COM 008H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   200154245   29 24.05   28E   150 N   120 W   32.120594   104.110699 Unknown   20 PARDUE 29 FEDERAL COM 002H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   200154241   20 24.05   28E   150 N   120 W   32.120594   104.110699 Unknown   20 PARDUE 29 P									
25 PARDUE 29 FEDERAL COM 006H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   2001542424   29 24.05   28E   45 N   1290 W   32.195899 -104.11400512 Unknown   27 BUCKSHOT STATE COM 002H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   2001541931   31 24.05   28E   330 S   620 E   32.167504 -104.120177 Unknown   28 PARDUE 29 FEDERAL COM 007H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   2001542424   29 24.05   28E   45 N   1580 E   32.19584   104.106299 Unknown   27 BUCKSHOT STATE COM 007H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   2001542424   29 24.05   28E   45 N   1580 E   32.19584   104.106299 Unknown   27 BUCKSHOT STATE COM 007H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   2001542424   29 24.05   28E   45 N   1580 E   32.19584   104.106299 Unknown   27 BUCKSHOT STATE COM 007H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   2001542424   29 24.05   28E   45 N   1580 E   32.19584   104.106299 Unknown   27 BUCKSHOT STATE COM 007H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   200154241   20 24.05   28E   1980 N   300 E   32.16153   104.119214 Unknown   28 PURL CHOKE FEDERAL COM 004H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   2001540862   25 E   280 S   1165 E   32.16733   104.1104961 Unknown   28 PURL CHOKE FEDERAL COM 004H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   2001540862   25 25.05   28E   280 S   165 E   32.16733   104.104763 Unknown   28 PURL CHOKE FEDERAL COM 005H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   2001540862   25 25.05   28E   290 N   1600 W   32.16579   104.1104731 Unknown   28 PURL CHOKE FEDERAL COM 005H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   200154097   32 24.05   28E   330 S   380 W   32.167348   104.1104991 Unknown   28 PURL CHOKE FEDERAL COM 005H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   200154097   32 24.05   28E   290 N   1600 W   32.16579   104.114399 Unknown   28 PURL CHOKE FEDERAL COM 005H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   200154256   31 24.05   28E   316 S   32.05 S   32									
26 BROWNING FEDERAL COM 006H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   2001542443   20 24.05   28E   310 N   350 E   32.126347 - 104.125015 Unknown   27 BUCKSHOT STATE COM 007H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   2001542424   29 24.05   28E   45 N   1580 E   32.19584 - 104.106299 Unknown   29 PARDUE 29 FEDERAL COM 008H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001542424   29 24.05   28E   45 N   1640 E   32.19584 - 104.106299 Unknown   29 PARDUE 29 FEDERAL COM 008H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001542421   20 24.05   28E   150 N   1290 W   32.21019   104.114096 Unknown   20 PARDUE 29 PARTNERSHIP   20 PA									
27 BUCKSHOT STATE COM 002H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   200154123   29 24.05   28									
28 PARDUE 29 FEDERAL COM 007H         LEGEND NATURAL GAS III LIMITED PARTNERSHIP 29 PARDUE 29 EDERAL COM 008H         301542824         29 24.05         28E         45 N         1580 E         32.19588         -104.106299 Unknown           29 PARDUE 29 FEDERAL COM 008H         LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542831         62 5.05         28E         45 N         1640 E         32.19588         -104.106299 Unknown           31 ROWNING FEDERAL COM 002H         LEGEND NATURAL GAS III LIMITED PARTNERSHIP 32 FULL CHOKE FEDERAL COM 004H         LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542831         32 24.05         28E         150 N         1290 W         32.210194         -104.114096 Unknown           33 COLT STATE COM 002H         LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001540865         20 24.05         28E         330 N         380 W         32.165684         -104.116941 Unknown           34 HIGH BRASS 002H         LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001540865         20 24.05         28E         330 S         2256 W         32.16579         -104.116941 Unknown           36 FULL CHOKE FEDERAL COM 006H         LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542577         52 5.05         28E         290 N         1030 W         32.16579         -104.116941 Unknown           37 FULL CHOKE COM 003H         LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542577         31 24.05         28E									
29 PARDUE 29 FEDERAL COM 008H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001542931   6 25.05   28E   1980 N   300 E   32.15153   -104.11094 Unknown   3001542931   6 25.05   28E   1980 N   300 E   32.15153   -104.11094 Unknown   3001542931   6 25.05   28E   1980 N   300 E   32.161153   -104.112094 Unknown   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   3001542931   30									
10 DEVON 6 FEE 002H   CICIDENTAL PERMIAN LTD   CICIDENTAL PERMIAN LTD   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001542583   32 24.05   28E   150 N   1290 W   32.161133   -104.119214 Unknown   32 FULL CHOKE FEDERAL COM 004H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001542583   32 24.05   28E   280 S   1165 E   32.167338   -104.11969 Unknown   33 CULT STATE COM 002H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001542583   32 24.05   28E   330 N   380 W   32.165684   -104.116941 Unknown   34 HIGH BRASS 002H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001542587   5 25.05   28E   290 N   1060 W   32.16579   -104.114732 Unknown   35 FULL CHOKE FEDERAL COM 006H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001542576   5 25.05   28E   290 N   1060 W   32.16579   -104.114732 Unknown   37 FULL CHOKE COM 003H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001540967   32 24.05   28E   290 N   1030 W   32.16579   -104.114732 Unknown   37 FULL CHOKE COM 003H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001540967   32 24.05   28E   290 N   1030 W   32.16579   -104.114732 Unknown   38 FULL CHOKE COM 002H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001540967   32 24.05   28E   330 S   380 W   32.167498   -104.11693 Unknown   39 BUCKSHOT STATE COM 005H   LEGEND NATURAL GAS III LIMITED PARTNERSHIP   3001542663   33 24.05   28E   380 N   380 W   32.180768   -104.11938 Unknown   3001542667   31 24.05   28E   380 N   380 W   32.180768   -104.11938 Unknown   3001542667   31 24.05   28E   380 N   380 W   32.180768   -104.11938 Unknown   3001542669   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   32 24.05   3									
31 BROWNING FEDERAL COM 002H									
32 FULL CHOKE FEDERAL COM 004H  126END NATURAL GAS III LIMITED PARTNERSHIP  3001540865  30 CUT STATE COM 002H  126END NATURAL GAS III LIMITED PARTNERSHIP  3001540865  30 CUT STATE COM 002H  126END NATURAL GAS III LIMITED PARTNERSHIP  3001540865  30 CUT STATE COM 002H  126END NATURAL GAS III LIMITED PARTNERSHIP  3001540865  30 CUT STATE COM 006H  126END NATURAL GAS III LIMITED PARTNERSHIP  3001540865  30 CUT STATE COM 006H  126END NATURAL GAS III LIMITED PARTNERSHIP  300154087  3001542577  30 S 25.05  32 E 29 N 1030 W 32.16579  104.114732 Unknown  36 FULL CHOKE FEDERAL COM 005H  126END NATURAL GAS III LIMITED PARTNERSHIP  3001540907  37 FULL CHOKE COM 003H  126END NATURAL GAS III LIMITED PARTNERSHIP  3001540907  37 FULL CHOKE COM 003H  126END NATURAL GAS III LIMITED PARTNERSHIP  3001540907  30 S 24.05  32 E 216 S 654 E 32.67159  104.114829 Unknown  38 FULL CHOKE COM 003H  126END NATURAL GAS III LIMITED PARTNERSHIP  3001540906  32 24.05  32 E 330 S 380 W 32.16579  104.114732 Unknown  38 FULL CHOKE COM 003H  126END NATURAL GAS III LIMITED PARTNERSHIP  3001540906  32 24.05  32 E 330 S 380 W 32.16579  104.114829 Unknown  38 FULL CHOKE COM 003H  126END NATURAL GAS III LIMITED PARTNERSHIP  3001540906  32 24.05  32 E 330 S 380 W 32.16579  104.114829 Unknown  38 FULL CHOKE COM 003H  126END NATURAL GAS III LIMITED PARTNERSHIP  3001542066  31 24.05  32 E 38 S S S S S S S S S S S S S S S S S S									
33 COLT STATE COM 002H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001540862 5 25.05 28E 330 N 380 W 32.165684 -104.116941 Unknown 34 HIGH BRASS 002H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001540865 7 20 24.05 28E 330 S 2256 W 32.19691 -104.110869 Unknown 35 FULL CHOKE FEDERAL COM 005H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001540865 7 5 25.05 28E 290 N 1050 W 32.16579 -104.114732 Unknown 37 FULL CHOKE FEDERAL COM 005H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001540507 32 24.05 28E 290 N 1030 W 32.16579 -104.114732 Unknown 37 FULL CHOKE COM 003H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001540907 32 24.05 28E 216 S 654 E 32.167159 -104.103103 Unknown 38 FULL CHOKE COM 003H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001540906 32 24.05 28E 330 S 380 W 32.16798 -104.116941 Unknown 39 BUCKSHOT STATE COM 004H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542067 31 24.05 28E 31 24.05 28E 330 S 380 W 32.16798 -104.116941 Unknown 39 BUCKSHOT STATE COM 005H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542663 33 24.05 28E 360 N 380 W 32.167136 -104.121882 Unknown 40 REALLY SCARY FEDERAL 006H CGG OPERATING LLC 3001542266 31 24.05 28E 360 N 380 W 32.167136 -104.121882 Unknown 41 BUCKSHOT STATE COM 005H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542266 31 24.05 28E 181 S 1706 W 32.167131 -104.129164 Unknown 42 BUCKSHOT STATE COM 005H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542266 31 24.05 28E 181 S 1290 W 32.167108 -104.127364 Unknown 42 BUCKSHOT STATE COM 005H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542266 20 24.05 28E 45 S 1290 W 32.167108 -104.114002 Unknown 45 COLT STATE COM 005H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542266 20 24.05 28E 45 S 1290 W 32.167108 -104.114002 Unknown 45 COLT STATE COM 003H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542266 20 24.05 28E 45 S 1290 W 32.167108 -104.114002 Unknown 45 COLT STATE COM 003H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542266 20 24.05 28E 265 N 360 W 32.203333 -104.111750 Unknown 45 COLT STATE COM 003H LEGEND NATURAL									
34 HIGH BRASS 002H  15 FULL CHOKE FEDERAL COM 006H  15 EGEND NATURAL GAS III LIMITED PARTNERSHIP  15 FULL CHOKE FEDERAL COM 005H  15 FULL CHOKE FEDERAL COM 005H  15 FULL CHOKE COM 003H  16 FULL CHOKE COM 003H  16 FULL CHOKE COM 003H  17 FULL CHOKE COM 003H  18 FULL CHOKE COM 003H  18 FULL CHOKE COM 003H  19 FULL CHOKE COM 003H  19 FULL CHOKE COM 003H  10 FULL CHOKE COM 003H  10 FULL CHOKE COM 003H  10 FULL CHOKE COM 004H  10 FULL CHOKE COM 004H  11 FULL CHOKE COM 004H  12 FULL CHOKE COM 004H  13 FULL CHOKE COM 004H  14 FULL CHOKE COM 004H  15 FULL CHOKE COM 004H  16 FULL CHOKE COM 004H  16 FULL CHOKE COM 004H  17 FULL CHOKE COM 004H  18 FULL CHOKE COM 004H  18 FULL CHOKE COM 004H  18 FULL CHOKE COM 004H  19 FULL CHOKE COM 004H  19 FULL CHOKE COM 004H  10 FULL CHOKE COM 004H  11 FULL CHOKE COM 005H  11 FULL CHOKE COM 005H  12 FULL CHOKE COM 005H  13 FULL CHOKE COM 005H  14 FULL CHOKE COM 005H  15 FULL CHOKE COM 005H  16 FULL CHOKE COM 005H  16 FULL CHOKE COM 005H  17 FULL CHOKE COM 005H  17 FULL CHOKE COM 005H  17 FULL CHOKE COM 005H  18 FULL CHOK									
35 FULL CHOKE FEDERAL COM 005H LEGEND NATURAL GAS III LIMITED PARTNERSHIP SU01542576 5 25.0S 28E 290 N 1030 W 32.16579 -104.114732 Unknown 32 FULL CHOKE FEDERAL COM 005H LEGEND NATURAL GAS III LIMITED PARTNERSHIP SU01542576 5 25.0S 28E 290 N 1030 W 32.16579 -104.114829 Unknown 32 FULL CHOKE COM 003H LEGEND NATURAL GAS III LIMITED PARTNERSHIP SU0154097 32 24.0S 28E 216 S 654 E 32.167159 -104.1103103 Unknown 38 FULL CHOKE COM 002H LEGEND NATURAL GAS III LIMITED PARTNERSHIP SU0154097 32 24.0S 28E 330 S 380 W 32.167498 -104.1103103 Unknown 39 BUCKSHOT STATE COM 004H LEGEND NATURAL GAS III LIMITED PARTNERSHIP SU0154267 31 24.0S 28E 360 N 380 W 32.167136 -104.12982 Unknown 40 REALLY SCARY FEDERAL 006H COG OPERATING LLC 3001542663 33 24.0S 28E 360 N 380 W 32.180265 -104.099804 Unknown 41 BUCKSHOT STATE COM 005H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542268 31 24.0S 28E 181 S 1706 W 32.16713 -104.129916 Unknown 42 BUCKSHOT STATE COM 006H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542266 31 24.0S 28E 181 S 1706 W 32.16713 -104.129916 Unknown 43 HIGH BRASS 003H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542266 31 24.0S 28E 181 S 1706 W 32.16713 -104.129916 Unknown 44 EKG SWD 001 LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542267 29 24.0S 28E 181 S 190 W 32.196147 -104.114002 Unknown 45 COLT STATE COM 003H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 300154227 29 24.0S 28E 181 S 190 W 32.196147 -104.114002 Unknown 45 COLT STATE COM 003H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 300154207 29 24.0S 28E 181 S 190 S 1140 E 32.19652 -104.114926 Unknown 48 DEVON 6 FEE 001H OCCIDENTAL PERMIAN LTD 300154207 29 24.0S 28E 180 N 150 E 32.16478 -104.118675 Unknown 49 PARDUE 29 FEDERAL COM 003H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 300154279 29 24.0S 28E 45 N 1610 E 32.12679 -104.114064 Unknown 49 PARDUE 29 FEDERAL COM 003H LEGEND NATURAL GAS III LIMITED PARTNERSHIP 300154279 29 24.0S 28E 45 N 1610 E 32.12679 -104.113947 Unknown 50.164791 C 50.16479 C 50.16479 C 50.16479 C 50.16479 C 50.16479 C 50.16479 C 50.164									
36 FULL CHOKE FEDERAL COM 005H  LEGEND NATURAL GAS III LIMITED PARTNERSHIP 37 FULL CHOKE COM 003H  LEGEND NATURAL GAS III LIMITED PARTNERSHIP 38 FULL CHOKE COM 002H  LEGEND NATURAL GAS III LIMITED PARTNERSHIP 38 BUCKSHOT STATE COM 004H  LEGEND NATURAL GAS III LIMITED PARTNERSHIP 40 REALLY SCARY FEDERAL 006H  COG OPERATING LLC  3001542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663  301542663									
37 FULL CHOKE COM 003H									
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52 FULL CHOKE SWD 007 LEGEND NATURAL GAS III LIMITED PARTNERSHIP 3001542796 32 24.0S 28E 510 N 1340 W 32.179899 -104.113832 Unknown									
	52 FULL CHOKE SWD 007	LEGEND NATURAL GAS III LIMITED PARTNERSHIP	3001542796	32 24.0S	28E	510 N	1340 W	32.179899	-104.113832 Unknown

53 BROWNING FEDERAL COM 004H	LEGEND NATURAL GAS III LIMITED PARTNERSHIP	3001542791	20 24.05	28E	110 N	1307 E	32.210317 -104.105476 Unknown
54 COLT STATE SWD 004	LEGEND NATURAL GAS III LIMITED PARTNERSHIP	3001541401	5 25.0S	28E	1066 N	850 W	32.163658 -104.115444 Unknown
55 PARDUE 19 COM 003H	LEGEND NATURAL GAS III LIMITED PARTNERSHIP	3001541405	19 24.0S	28E	100 S	1140 E	32.196282 -104.121897 Unknown
56 PARDUE 19 FEDERAL COM 004H	COG OPERATING LLC	3001543214	19 24.0S	28E	110 S	1600 W	32.196209 -104.130286 Unknown
57 DEVON 6 W2AD FEE 001H	MEWBOURNE OIL CO	3001543661	6 25.0S	28E	440 N	185 E	32.16537 -104.118806 Unknown
58 CREEDENCE 21 16 WOED STATE COM 002H	MEWBOURNE OIL CO	3001544871	21 24.0S	28E	2435 N	360 W	32.203767 -104.10007 Unknown
59 CREEDENCE 21 16 W2ED STATE COM 001H	MEWBOURNE OIL CO	3001544887	21 24.0S	28E	2435 N	330 W	32.203767 -104.100168 Unknown
60 KANSAS 21 28 W2LM FEDERAL COM 001H	MEWBOURNE OIL CO	3001545763	21 24.0S	28E	2635 N	330 W	32.203217 -104.100165 Unknown

#### 1. Geologic Formations

TVD of target	9,362' EOL	Pilot hole depth	NA
MD at TD:	20,267'	Deepest expected fresh water:	50'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	400	Water	
Top of Salt	926	Salt	
Base of Salt	2246	Salt	
Lamar	2453	Salt Water	
Bell Canyon	2489	Salt Water	
Cherry Canyon	3271	Oil/Gas	
Brushy Canyon	4468	Oil/Gas	
Bone Spring Lime	5985	Oil/Gas	
U. Avalon Shale	6178	Oil/Gas	
L. Avalon Shale	6560	Oil/Gas	
1st Bone Spring Sand	6943	Oil/Gas	
2nd Bone Spring Sand	7687	Oil/Gas	
3rd Bone Spring Sand	8863	Oil/Gas	
Wolfcamp	9255	Target Oil/Gas	

#### 2. Casing Program

Hole Size	Casin	g Interval	Csg. Size	Weight	Weight Grade Conn.		SF	SF Burst	SF
Hole Size	From	То	Csg. Size	(lbs)	Grade	Collii.	Collapse	or burst	Tension
14.75	0	815	10.75	45.5	J55	STC	5.73	11.30	13.29
9.875	0	8715	7.625	29.7	HCL80	втс	2.04	1.51	2.79
6.75	0	20,267	5.5"	23	P110	SF Torq	2.49	2.96	3.05
	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

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Υ
Does casing meet API specifications? If no, attach casing specification sheet.	Υ
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Υ
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary?	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3 <sup>rd</sup> string cement tied back	
500' into previous casing?	
Is well to cote the D. 444. D. and OODAO	N.
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2 <sup>nd</sup> string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

#### 3. Cementing Program

Casing	# Sks	Wt. lb/ gal	Yld ft3/	H₂0 gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	300	13.5	1.75	9	12	Lead: Class C + 4% Gel
Sull.	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl2
Inter.	1400	11	2.8	19	48	Lead: NeoCem
iiilei.	300	16.4	1.1	5	8	Tail: Class H
5.5 Prod	750	12.7	2	10.6	16	Lead: 35:65:6 H Blend
5.5 P100	1200	14.4	1.24	5.7	19	Tail: 50:50:2 Class H Blend

Volumes Subject to Observed Hole Conditions and/or Fluid Caliper Results Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
Surface	0'	50%
1 <sup>st</sup> Intermediate	0'	50%
Production	8,215'	35%

#### 4. Pressure Control Equipment

A variance is requested for the use of a diverter on the surface casing. See attached for schematic.

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Туре		x	Tested to:
			Ann	ular	Х	2500 psi
	13-5/8"		Blind Ram			3M
12-1/4"		3M	Pipe Ram		Χ	
			Double	e Ram	Х	SIVI
			Other*			
			5M Aı	nnular	Χ	2500 psi
		5M	Blind Ram			
8 1/2"	13-5/8"		Pipe	Ram	Χ	5N/
			Double Ram		Х	5M
			Other*			

BOP and BOPE will be installed per Onshore Order #2 requirements prior to drilling below the surface casing and will be rated to the above pressure rating or greater, see attached diagrams. Required safety valves, with appropriate wrenches and subs for the drill string being utilized, will be in the open position and accessible on the rig floor. BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

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

	Formation integrity test will be performed per Onshore Order #2.
Y	On Exploratory wells or 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. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
Y	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
	N Are anchors required by manufacturer?
Y	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

#### 5. Mud Program

Depth		Type	Weight	Viscosity	Water Loss	
From	То	Type (ppg)		Viscosity		
0	Surf. Shoe	FW Gel	8.4 - 8.6	28-29	N/C	
Surf csg	Int shoe	Diesel Brine Emul	8.6 - 9.4	30-40	N/C	
Int shoe	Lateral TD	OBM	10.5 - 12	30-40	20	

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring

#### 6. Logging and Testing Procedures

Logging, Coring and Testing.	
Y	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
N	Are Logs are planned based on well control or offset log information.
N	Drill stem test? If yes, explain.
N	Coring? If yes, explain.

Additional logs planned		Interval				
N	Resistivity	Pilot Hole TD to ICP				
N	Density	Pilot Hole TD to ICP				
Υ	CBL	Production casing (If cement not circulated to surface)				
Υ	Mud log	Intermediate shoe to TD				
N	PEX					

#### 7. Drilling Conditions

Condition	Specify what type and where?			
BH Pressure at deepest TVD	5845 psi at 9362' 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?
Y	Is casing pre-set?

×	H2S Plan.
х	BOP & Choke Schematics.
x	Directional Plan
X	5M Annular Variance

# NORTHERN DELAWARE BASIN

EDDY COUNTY, NM ATLAS TOMAHAWK FEDERAL UNIT #705H

OWB PWP1

# **Anticollision Report**

17 March, 2020

#### **Anticollision Report**

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Reference Site: ATLAS Site Error: 0.0 usft

Reference Well: TOMAHAWK FEDERAL UNIT #705H

Well Error: 3.0 usft
Reference Wellbore OWB
Reference Design: PWP1

OMANIANAWA EEDEDAN NINUT WZOSIN

Survey Calculation Method: Output errors are at Database:

TVD Reference:

MD Reference:

North Reference:

Offset TVD Reference:

Local Co-ordinate Reference:

Well TOMAHAWK FEDERAL UNIT #705H

KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

1B Z→ @ 00 2rid

Minimum Curvature

2.00 sigma edm

Offset Datum

**ISCWSA** 

Reference PWP1

Filter type: NO GLOBAL FILTER: Using user defined selection & filtering criteria

Interpolation Method: Stations Error Model:

**Depth Range:** Unlimited **Scan Method:** Closest Approach 3D

Results Limited by: Maximum ellipse separation of 1,000.0 usft Error Surface: Pedal Curve Warning Levels Evaluated at: 2.00 Sigma Casing Method: Not applied

Survey Tool Program Date 3/17/2020

From To

(usft) (usft) Survey (Wellbore) Tool Name Description

0.0 8,843.8 PWP1 (OWB) Standard Keeper 104 Standard Wireline Keeper ver 1.0.4
8,843.8 20,267.3 PWP1 (OWB) MWD+IFR1+FDIR OWSG MWD + IFR1 + FDIR Correction

Summary						
Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Dista Between Centres (usft)	ance Between Ellipses (usft)	Separation Factor	Warning
ATLAS						
TOMAHAWK FEDERAL UNIT #703H - OWB - PWP1	5,500.0	5,499.4	60.0	50.3	6.200	CC, ES, SF
TOMAHAWK FEDERAL UNIT #704H - OWB - PWP1	5,500.0	5,499.4	29.9	5.3	1.217	Shut in Produces, CC, ES
TOMAHAWK FEDERAL UNIT 711H - OWB - PWP1						Out of range
TOMAHAWK FEDERAL UNIT 712H - OWB - PWP1	8,800.0	10,132.7	867.5	841.1	32.781	SF
TOMAHAWK FEDERAL UNIT 712H - OWB - PWP1	9,150.0	10,065.3	747.8	727.6	37.142	ES
TOMAHAWK FEDERAL UNIT 712H - OWB - PWP1	9,161.4	10,060.0	747.6	727.7	37.454	CC
TOMAHAWK FEDERAL UNIT 713H - OWB - PWP1	9,434.6	10,016.4	83.5	45.1	2.174	CC, ES
TOMAHAWK FEDERAL UNIT 713H - OWB - PWP1	9,450.0	10,007.7	84.7	45.3	2.149	SF

Offset D	esign	ATLAS	- TOMA	HAWK FE	DERAL	UNIT #703	BH - OWB - P	WP1					Offset Site Error:	0.0 usft
Survey Pro	gram: 0-S	Standard Keep	er 104, 886	3-MWD+IFR1	+FDIR								Offset Well Error:	3.0 usft
Refer		Offs		Semi Majo	r Axis				Dista	ance				
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbo +N/-S	re Centre +E/-W	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)			
0.0	0.0	0.0	0.0	3.0	3.0	90.38	-0.4	60.0	60.0					
100.0	100.0	99.4	99.4	3.0	3.0	90.38	-0.4	60.0	60.0	54.0	6.00	10.000		
200.0	200.0	199.4	199.4	3.0	3.0	90.38	-0.4	60.0	60.0	54.0	6.00	9.995		
300.0	300.0	299.4	299.4	3.0	3.0	90.38	-0.4	60.0	60.0	54.0	6.01	9.985		
400.0	400.0	399.4	399.4	3.0	3.0	90.38	-0.4	60.0	60.0	54.0	6.02	9.969		
500.0	500.0	499.4	499.4	3.1	3.1	90.38	-0.4	60.0	60.0	54.0	6.03	9.949		
600.0	600.0	599.4	599.4	3.1	3.1	90.38	-0.4	60.0	60.0	54.0	6.05	9.923		
700.0	700.0	699.4	699.4	3.1	3.1	90.38	-0.4	60.0	60.0	53.9	6.07	9.892		
800.0	800.0	799.4	799.4	3.2	3.2	90.38	-0.4	60.0	60.0	53.9	6.09	9.856		
900.0	900.0	899.4	899.4	3.2	3.2	90.38	-0.4	60.0	60.0	53.9	6.11	9.815		
1,000.0	1,000.0	999.4	999.4	3.2	3.2	90.38	-0.4	60.0	60.0	53.9	6.14	9.770		
1,100.0	1,100.0	1,099.4	1,099.4	3.3	3.3	90.38	-0.4	60.0	60.0	53.8	6.17	9.721		
1,200.0	1,200.0	1,199.4	1,199.4	3.4	3.4	90.38	-0.4	60.0	60.0	53.8	6.21	9.667		
1,300.0	1,300.0	1,299.4	1,299.4	3.4	3.4	90.38	-0.4	60.0	60.0	53.8	6.24	9.610		
1,400.0	1,400.0	1,399.4	1,399.4	3.5	3.5	90.38	-0.4	60.0	60.0	53.7	6.28	9.548		
1,500.0	1,500.0	1,499.4	1,499.4	3.5	3.5	90.38	-0.4	60.0	60.0	53.7	6.33	9.483		
1,600.0	1,600.0	1,599.4	1,599.4	3.6	3.6	90.38	-0.4	60.0	60.0	53.6	6.37	9.415		
1,700.0	1,700.0	1,699.4	1,699.4	3.7	3.7	90.38	-0.4	60.0	60.0	53.6	6.42	9.345		

#### **Anticollision Report**

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Reference Site: ATLAS Site Error: 0.0 usft

Reference Well: TOMAHAWK FEDERAL UNIT #705H

Well Error: 3.0 usft
Reference Wellbore OWB
Reference Design: PWP1

Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference: KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Well TOMAHAWK FEDERAL UNIT #705H

Grid

Survey Calculation Method: Minimum Curvature

Output errors are at Database:

2.00 sigma edm

Offset TVD Reference:

Offset D	-					UNIT #703	3H - OWB - P	WP1					Offset Site Error:	0.0 usf
-	_			3-MWD+IFR1									Offset Well Error:	3.0 us
Refer		Offs		Semi Major		IIIb.a.lala	0554 18/-111	0		ance		0		
leasured Depth (usft)	Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbo +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)	Separation Factor	Warning	
1,800.0	1,800.0	1,799.4	1,799.4	3.8	3.8	90.38	-0.4	60.0	60.0	53.5	6.47	9.271		
1,900.0	1,900.0	1,899.4	1,899.4	3.9	3.9	90.38	-0.4	60.0	60.0	53.5	6.53	9.195		
2,000.0	2,000.0	1,999.4	1,999.4	3.9	3.9	90.38	-0.4	60.0	60.0	53.4	6.58	9.116		
2,100.0	2,100.0	2,099.4	2,099.4	4.0	4.0	90.38	-0.4	60.0	60.0	53.4	6.64	9.036		
2,200.0	2,200.0	2,199.4	2,199.4	4.1	4.1	90.38	-0.4	60.0	60.0	53.3	6.70	8.953		
2,300.0	2,300.0	2,299.4	2,299.4	4.2	4.2	90.38	-0.4	60.0	60.0			8.870		
2,400.0	2,400.0	2,399.4	2,399.4	4.3	4.3	90.38	-0.4	60.0	60.0			8.784		
2,500.0	2,500.0	2,499.4	2,499.4	4.4	4.4	90.38	-0.4	60.0	60.0		6.90	8.698		
2,600.0	2,600.0	2,599.4	2,599.4	4.5	4.5	90.38	-0.4	60.0	60.0			8.611		
2,700.0	2,700.0	2,699.4	2,699.4	4.6	4.6	90.38	-0.4	60.0	60.0			8.523		
2,800.0	2,800.0	2,799.4	2,799.4	4.7	4.7	90.38	-0.4	60.0	60.0	52.9	7.11	8.434		
2,900.0	2,900.0	2,899.4	2,899.4	4.8	4.8	90.38	-0.4	60.0	60.0			8.345		
3,000.0	3,000.0	2,999.4	2,999.4	4.9	4.9	90.38	-0.4	60.0	60.0			8.255		
3,100.0	3,100.0	3,099.4	3,099.4	5.0	5.0	90.38	-0.4	60.0	60.0			8.166		
3,200.0	3,200.0	3,199.4	3,199.4	5.1	5.1	90.38	-0.4	60.0	60.0			8.076		
3,300.0	3,300.0	3,299.4	3,299.4	5.2	5.2	90.38	-0.4	60.0	60.0			7.987		
3,400.0	3,400.0	3,399.4	3,399.4	5.3	5.3	90.38	-0.4	60.0	60.0			7.898		
3,500.0	3,500.0	3,499.4	3,499.4	5.4	5.4	90.38	-0.4	60.0	60.0			7.809		
3,600.0	3,600.0	3,599.4	3,599.4	5.5	5.5	90.38	-0.4	60.0	60.0			7.720		
3,700.0	3,700.0	3,699.4	3,699.4	5.7	5.7	90.38	-0.4	60.0	60.0		7.86	7.632		
3,800.0	3,800.0	3,799.4	3,799.4	5.8	5.8	90.38	-0.4	60.0	60.0	52.0	7.95	7.545		
3,900.0	3,900.0	3,899.4	3,899.4	5.9	5.9	90.38	-0.4	60.0	60.0			7.459		
4,000.0	4,000.0	3,999.4	3,999.4	6.0	6.0	90.38	-0.4	60.0	60.0	51.9	8.14	7.373		
4,100.0	4,100.0	4,099.4	4,099.4	6.1	6.1	90.38	-0.4	60.0	60.0	51.8		7.288		
4,200.0	4,200.0	4,199.4	4,199.4	6.2	6.2	90.38	-0.4	60.0	60.0					
4,300.0	4,300.0	4,299.4	4,299.4	6.3	6.3	90.38	-0.4	60.0	60.0	51.6	8.43	7.120		
4,400.0	4,400.0	4,399.4	4,399.4	6.5	6.5	90.38	-0.4	60.0	60.0			7.038		
4,500.0	4,500.0	4,499.4	4,499.4	6.6	6.6	90.38	-0.4	60.0	60.0			6.956		
4,600.0	4,600.0	4,599.4	4,599.4	6.7	6.7	90.38	-0.4	60.0	60.0			6.876		
4,700.0	4,700.0	4,699.4	4,699.4	6.8	6.8	90.38	-0.4	60.0	60.0			6.797		
4,800.0	4,800.0	4,799.4	4,799.4	6.9	6.9	90.38	-0.4	60.0	60.0	51.1	8.93	6.718		
4,900.0	4,900.0	4,899.4	4,899.4	7.0	7.0	90.38	-0.4	60.0	60.0	51.0	9.03	6.641		
5,000.0	5,000.0	4,999.4	4,999.4	7.2	7.2	90.38	-0.4	60.0	60.0	50.9	9.14	6.565		
5,100.0	5,100.0	5,099.4	5,099.4	7.3	7.3	90.38	-0.4	60.0	60.0			6.490		
5,200.0	5,200.0	5,199.4	5,199.4	7.4	7.4	90.38	-0.4	60.0	60.0			6.416		
5,300.0	5,300.0	5,299.4	5,299.4	7.5	7.5	90.38	-0.4	60.0	60.0	50.5	9.46	6.343		
5,400.0	5,400.0	5,399.4	5,399.4	7.7	7.6	90.38	-0.4	60.0	60.0			6.271	20 50 05	
5,500.0	5,500.0	5,499.4	5,499.4	7.8	7.8	90.38	-0.4	60.0	60.0				CC, ES, SF	
5,600.0	5,600.0	5,597.2	5,597.2	7.9	7.8	-179.64	-0.4	61.7	63.4					
5,700.0 5,800.0	5,699.8 5,799.5	5,694.4 5,791.4	5,694.2 5,791.0	7.9 7.9	7.9 7.9	-179.69 -179.74	-0.4 -0.4	66.6 74.5	73.7 90.6					
5,900.0	5,898.7	5,889.2	5,888.4	8.0	8.0	-179.79	-0.4	83.0	111.3	101.1	10.21	10.904		
6,000.0	5,997.7	5,986.7	5,985.5	8.0	8.0	-179.82	-0.4	91.5	133.8			12.940		
6,100.0	6,096.8	6,084.1	6,082.5	8.1	8.0	-179.85	-0.4	100.0	156.3					
6,200.0	6,195.8	6,181.6	6,179.6	8.1	8.1	-179.87	-0.4	108.5	178.8					
6,300.0	6,294.8	6,279.0	6,276.7	8.1	8.1	-179.88	-0.4	117.0	201.3			18.698		
6,400.0	6,393.8	6,376.4	6,373.7	8.2	8.2	-179.89	-0.4	125.5	223.8	212.9	10.92	20.501		
6,500.0	6,492.9	6,473.9	6,470.8	8.3	8.2	-179.90	-0.4	134.0	246.3	235.2	11.07	22.247		
6,600.0	6,591.9	6,571.3	6,567.9	8.3	8.3	-179.91	-0.4	142.5	268.8	257.6	11.23	23.936		
6,700.0	6,690.9	6,668.7	6,664.9	8.4	8.3	-179.92	-0.4	151.0	291.3	279.9	11.39	25.570		
6,800.0	6,789.9	6,766.2	6,762.0	8.4	8.4	-179.93	-0.4	159.5	313.8	302.2	11.56	27.149		
6,900.0	6,889.0	6,863.6	6,859.1	8.5	8.5	-179.93	-0.4	168.0	336.3	324.6	11.73	28.674		

#### **Anticollision Report**

Database:

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Reference Site: ATLAS Site Error: 0.0 usft

Reference Well: TOMAHAWK FEDERAL UNIT #705H

Well Error: 3.0 usft
Reference Wellbore OWB
Reference Design: PWP1

Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference:

Output errors are at

KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Well TOMAHAWK FEDERAL UNIT #705H

Grid

Survey Calculation Method: Minimum Curvature

2.00 sigma edm

Offset TVD Reference: Offset Datum

Offset D	esign	ATLAS	- TOMA	AHAWK FE	DERAL	UNIT #703	3H - OWB - P	WP1					Offset Site Error:	0.0 us
		tandard Keep	er 104, 886	3-MWD+IFR1	+FDIR								Offset Well Error:	3.0 us
Refer	ence	Offs	et	Semi Major	Axis				Dista	ance				
leasured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbo +N/-S (usft)	re Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
	, ,		` ′	` ′	` '		` '	, ,	` '	` '	` '			
7,000.0	6,988.0	6,961.1	6,956.1	8.6	8.5	-179.93	-0.4	176.5	358.8	346.9	11.90	30.148		
7,100.0	7,087.0	7,058.5	7,053.2	8.6	8.6	-179.94	-0.4	184.9	381.3	369.2		31.570		
7,200.0	7,186.0	7,155.9	7,150.3	8.7	8.6	-179.94	-0.4	193.4	403.8	391.5		32.943		
7,300.0	7,285.1	7,253.4	7,247.3	8.8	8.7	-179.94	-0.4	201.9	426.3	413.8	12.44	34.268		
7,400.0	7,384.1	7,350.8	7,344.4	8.8	8.8	-179.95	-0.4	210.4	448.8	436.1	12.62	35.547		
7,500.0	7,483.1	7,448.2	7,441.5	8.9	8.8	-179.95	-0.4	218.9	471.3	458.4	12.81	36.781		
7,600.0	7,582.2	7,545.7	7,538.5	9.0	8.9	-179.95	-0.4	227.4	493.8	480.8	13.00	37.970		
7,700.0	7,681.2	7,643.1	7,635.6	9.1	9.0	-179.95	-0.4	235.9	516.3	503.1	13.20	39.118		
7,800.0	7,780.2	7,740.5	7,732.7	9.1	9.0	-179.96	-0.4	244.4	538.7	525.4	13.39	40.225		
7,900.0	7,879.2	7,838.0	7,829.7	9.2	9.1	-179.96	-0.4	252.9	561.2	547.7	13.59	41.293		
8,000.0	7,978.3	7,935.4	7,926.8	9.3	9.2	-179.96	-0.4	261.4	583.7	569.9	13.79	42.323		
8,100.0	8,077.3	8,032.9	8,023.9	9.4	9.3	-179.96	-0.4	269.9	606.2	592.2	14.00	43.316		
8,200.0	8,176.3	8,130.3	8,120.9	9.5	9.3	-179.96	-0.4	278.4	628.7	614.5	14.20	44.274		
8,300.0	8,275.3	8,227.7	8.218.0	9.6	9.4	-179.96	-0.4	286.9	651.2	636.8	14.41	45.198		
8,400.0	8,374.4	8,325.2	8,315.1	9.7	9.5	-179.97	-0.4	295.3	673.7	659.1	14.62	46.090		
8,500.0	8,473.4	8,422.6	8,412.1	9.8	9.6	-179.97	-0.4	303.8	696.2	681.4	14.83	46.951		
0,000.0	0,470.4	0,422.0	0,412.1	0.0	0.0	170.07	0.4	000.0	000.2	001.4	14.00	40.001		
8,600.0	8,572.4	8,520.0	8,509.2	9.9	9.7	-179.97	-0.4	312.3	718.7	703.7	15.04	47.781		
8,700.0	8,671.5	8,617.5	8,606.3	10.0	9.7	-179.97	-0.4	320.8	741.2	725.9	15.26	48.582		
8,800.0	8,770.5	8,714.9	8,703.3	10.0	9.8	-179.97	-0.4	329.3	763.7	748.2	15.47	49.356		
8,855.1	8,825.0	8,768.6	8,756.8	10.1	9.9	-179.97	-0.4	334.0	776.1	760.0	16.05	48.364		
8,900.0	8,869.4	8,812.2	8,800.2	10.1	9.9	-156.26	-0.4	337.8	786.9	770.7	16.11	48.845		
8,950.0	8,918.2	8,860.0	8.847.8	10.1	10.0	-141.75	-0.4	342.0	800.4	784.2	16.16	49.516		
9,000.0	8,966.0	8,889.2	8,876.9	10.2	10.0	-133.14	-0.9	344.8	815.9	799.6	16.33	49.958		
9,050.0	9,012.6	8,916.4	8,903.8	10.2	10.0	-127.22	-2.5	348.1	834.0	817.5	16.54	50.438		
9,100.0	9,057.4	8,950.0	8,936.9	10.2	10.0	-122.75	-6.1	353.0	854.6	837.9	16.69	51.200		
9,150.0	9,100.3	8,968.0	8,954.4	10.2	10.0	-118.64	-8.7	356.0	877.3	860.3	17.00	51.620		
9,200.0	9,140.8	9.000.0	8.985.3	10.3	10.0	-115.21	-14.5	362.0	902.1	885.0	17.16	52.574		
9,250.0	9,178.7	9,015.6	9,000.2	10.3	10.0	-111.48	-17.9	365.2	928.7	911.2		53.137		
9,300.0	9,213.7	9,037.8	9,021.2	10.3	10.0	-107.97	-23.4	370.1	957.0	939.2		54.031		
9,350.0	9,245.5	9,050.0	9,032.6	10.4	10.0	-107.97	-26.7	373.0	986.7	968.7	18.02	54.747		

#### **Anticollision Report**

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Reference Site: ATLAS Site Error: 0.0 usft

Reference Well: TOMAHAWK FEDERAL UNIT #705H

Well Error: 3.0 usft
Reference Wellbore OWB
Reference Design: PWP1

Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference: KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Well TOMAHAWK FEDERAL UNIT #705H

Grid

Survey Calculation Method: Minimum Curvature

Output errors are at 2.00 sigma
Database: edm

Database: edm
Offset TVD Reference: Offset Datum

Offset D	esign	ATLAS	- TOMA	HAWK FE	DERAL	UNIT #704	1H - OWB - P	WP1					Offset Site Error:	0.0 usft
		1WD+IFR1+FI	DIR										Offset Well Error:	3.0 usft
	rence	Offs		Semi Major						ance				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbo +N/-S (usft)	re Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Warning	
0.0	0.0	0.0	0.0	3.0	3.0	90.38	-0.2	29.9	29.9					
100.0	100.0	99.4	99.4	3.0	3.0	90.38	-0.2	29.9	29.9	23.9	6.00	4.981		
200.0	200.0	199.4	199.4	3.0	3.0	90.38	-0.2	29.9	29.9	23.9	6.04	4.949		
300.0	300.0	299.4	299.4	3.0	3.1	90.38	-0.2	29.9	29.9	23.8	6.12	4.883		
400.0	400.0	399.4	399.4	3.0	3.2	90.38	-0.2	29.9	29.9	23.7	6.24	4.789		
500.0	500.0	499.4	499.4	3.1	3.4	90.38	-0.2	29.9	29.9	23.5	6.40	4.672		
600.0	600.0	599.4	599.4	3.1	3.6	90.38	-0.2	29.9	29.9	23.3	6.59	4.538		
700.0	700.0	699.4	699.4	3.1	3.8	90.38	-0.2	29.9	29.9	23.1	6.80	4.395		
800.0	800.0	799.4	799.4	3.2	4.0	90.38	-0.2	29.9	29.9	22.9	7.04	4.246		
900.0	900.0	899.4	899.4	3.2	4.2	90.38	-0.2	29.9	29.9	22.6	7.30	4.096		
1,000.0	1,000.0	999.4	999.4	3.2	4.5	90.38	-0.2	29.9	29.9	22.3	7.58	3.947		
1,100.0	1,100.0	1,099.4	1,099.4	3.3	4.8	90.38	-0.2	29.9	29.9	22.0	7.86	3.802		
1,200.0	1,200.0	1,199.4	1,199.4	3.4	5.1	90.38	-0.2	29.9	29.9	21.7	8.17	3.662		
1,300.0	1,300.0	1,299.4	1,299.4	3.4	5.4	90.38	-0.2	29.9	29.9	21.4	8.48	3.527		
1,400.0	1,400.0	1,399.4	1,399.4	3.5	5.7	90.38	-0.2	29.9	29.9	21.1	8.80	3.399		
1,500.0	1,500.0	1,499.4	1,499.4	3.5	6.0	90.38	-0.2	29.9	29.9	20.8	9.13	3.276		
1,600.0	1,600.0	1,599.4	1,599.4	3.6	6.3	90.38	-0.2	29.9	29.9	20.4	9.46	3.160		
1,700.0	1,700.0	1,699.4	1,699.4	3.7	6.6	90.38	-0.2	29.9	29.9	20.1	9.80	3.050		
1,800.0	1,800.0	1,799.4	1,799.4	3.8	6.9	90.38	-0.2	29.9	29.9	19.8	10.15	2.946		
1,900.0	1,900.0	1,899.4	1,899.4	3.9	7.2	90.38	-0.2	29.9	29.9	19.4	10.50	2.848		
2,000.0	2,000.0	1,999.4	1,999.4	3.9	7.6	90.38	-0.2	29.9	29.9	19.0	10.86	2.754		
2,100.0	2,100.0	2,099.4	2,099.4	4.0	7.9	90.38	-0.2	29.9	29.9	18.7	11.22	2.666		
2,200.0	2,200.0	2,199.4	2,199.4	4.1	8.2	90.38	-0.2	29.9	29.9	18.3	11.58	2.582		
2,300.0	2,300.0	2,299.4	2,299.4	4.2	8.6	90.38	-0.2	29.9	29.9	18.0	11.95	2.503		
2,400.0	2,400.0	2,399.4	2,399.4	4.3	8.9	90.38	-0.2	29.9	29.9	17.6	12.32	2.428		
2,500.0	2,500.0	2,499.4	2,499.4	4.4	9.2	90.38	-0.2	29.9	29.9	17.2	12.69	2.357		
2,600.0	2,600.0	2,599.4	2,599.4	4.5	9.6	90.38	-0.2	29.9	29.9	16.8	13.06	2.289		
2,700.0	2,700.0	2,699.4	2,699.4	4.6	9.9	90.38	-0.2	29.9	29.9	16.5	13.44	2.225		
2,800.0	2,800.0	2,799.4	2,799.4	4.7	10.3	90.38	-0.2	29.9	29.9	16.1	13.82	2.164		
2,900.0	2,900.0	2,899.4	2,899.4	4.8	10.6	90.38	-0.2	29.9	29.9	15.7	14.20	2.106		
3,000.0	3,000.0	2,999.4	2,999.4	4.9	10.9	90.38	-0.2	29.9	29.9	15.3	14.58	2.050		
3,100.0	3,100.0	3,099.4	3,099.4	5.0	11.3	90.38	-0.2	29.9	29.9	14.9	14.97	1.998 /	Advise and Monitor	
3,200.0	3,200.0	3,199.4	3,199.4	5.1	11.6	90.38	-0.2	29.9	29.9	14.5	15.35	1.947 /	Advise and Monitor	
3,300.0	3,300.0	3,299.4	3,299.4	5.2	12.0	90.38	-0.2	29.9	29.9	14.2	15.74		Advise and Monitor	
3,400.0	3,400.0	3,399.4	3,399.4	5.3	12.3	90.38	-0.2	29.9	29.9	13.8	16.13		Advise and Monitor	
3,500.0	3,500.0	3,499.4	3,499.4	5.4	12.7	90.38	-0.2	29.9	29.9	13.4	16.52	1.810 /	Advise and Monitor	
3,600.0	3,600.0	3,599.4	3,599.4	5.5	13.0	90.38	-0.2	29.9	29.9	13.0	16.92		Advise and Monitor	
3,700.0	3,700.0	3,699.4	3,699.4	5.7	13.4	90.38	-0.2	29.9	29.9	12.6	17.31		Advise and Monitor	
3,800.0	3,800.0	3,799.4	3,799.4	5.8	13.7	90.38	-0.2	29.9	29.9	12.2	17.71		Advise and Monitor	
3,900.0	3,900.0	3,899.4	3,899.4	5.9	14.1	90.38	-0.2	29.9	29.9	11.8	18.10		Advise and Monitor	
4,000.0	4,000.0	3,999.4	3,999.4	6.0	14.4	90.38	-0.2	29.9	29.9	11.4	18.50	1.616 /	Advise and Monitor	
4,100.0		4,099.4	4,099.4	6.1	14.8	90.38	-0.2	29.9	29.9	11.0	18.90	1.582 /	Advise and Monitor	
4,200.0	4,200.0	4,199.4	4,199.4	6.2	15.1	90.38	-0.2	29.9	29.9	10.6	19.30		Advise and Monitor	
4,300.0	4,300.0	4,299.4	4,299.4	6.3	15.5	90.38	-0.2	29.9	29.9				Advise and Monitor	
4,400.0	4,400.0	4,399.4	4,399.4	6.5	15.8	90.38	-0.2	29.9	29.9	9.8	20.10		Shut in Produces	
4,500.0	4,500.0	4,499.4	4,499.4	6.6	16.2	90.38	-0.2	29.9	29.9	9.4	20.50	1.459 \$	Shut in Produces	
4,600.0	4,600.0	4,599.4	4,599.4	6.7	16.5	90.38	-0.2	29.9	29.9	9.0	20.90	1.430 \$	Shut in Produces	
4,700.0		4,699.4	4,699.4	6.8	16.9	90.38	-0.2	29.9	29.9	8.6	21.31	1.403 \$	Shut in Produces	
4,800.0		4,799.4	4,799.4	6.9	17.2	90.38	-0.2	29.9	29.9				Shut in Produces	
4,900.0		4,899.4	4,899.4	7.0	17.6	90.38	-0.2	29.9	29.9	7.8	22.12		Shut in Produces	
5,000.0	5,000.0	4,999.4	4,999.4	7.2	18.0	90.38	-0.2	29.9	29.9	7.4	22.52	1.328 \$	Shut in Produces	
5,100.0	5,100.0	5,099.4	5,099.4	7.3	18.3	90.38	-0.2	29.9	29.9	7.0	22.93	1.304 \$	Shut in Produces	

#### **Anticollision Report**

Database:

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Reference Site: **ATLAS** Site Error: 0.0 usft

Reference Well: TOMAHAWK FEDERAL UNIT #705H

Well Error: 3.0 usft Reference Wellbore OWB Reference Design: PWP1

Local Co-ordinate Reference:

**Survey Calculation Method:** 

TVD Reference: MD Reference: North Reference:

Output errors are at

Well TOMAHAWK FEDERAL UNIT #705H KB=24' @ 3071.9usft (E 155)

KB=24' @ 3071.9usft (E 155)

Minimum Curvature

2.00 sigma edm

Offset TVD Reference: Offset Datum

Offset D	esian	ATLAS	- TOMA	AHAWK FE	DERAL	UNIT #704	H - OWB - P	WP1					Offset Site Error:	0.0 usft
		/(TE/(C				,,, 0	5775 1						Offset Well Error:	3.0 usft
Refer		Offs		Semi Major						ance				
Measured Depth	Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbor +N/-S	e Centre +E/-W	Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)			
5,200.0	5,200.0	5,199.4	5,199.4	7.4	18.7	90.38	-0.2	29.9	29.9	6.6			nut in Produces	
5,300.0	5,300.0	5,299.4	5,299.4	7.5	19.0	90.38	-0.2	29.9	29.9				nut in Produces	
5,400.0	5,400.0 5,500.0	5,399.4 5,499.4	5,399.4 5,499.4	7.7 7.8	19.4 19.7	90.38 90.38	-0.2 -0.2	29.9 29.9	29.9 29.9	5.7 5.3	24.15 24.56		nut in Produces	9 9E
5,500.0 5,600.0	5,600.0	5,499.4	5,499.4	7.6 7.9	20.1	-179.64	-0.2 -0.2	29.9	31.6	5.3 6.7	24.56		nut in Produces, CC, E nut in Produces	0, 01
5,700.0	5,699.8	5,699.2	5,699.2	7.9	20.4	-179.69	-0.2	29.9	36.9	11.5	25.38		nut in Produces	
	F 700 -													
5,800.0	5,799.5	5,798.9	5,798.9	7.9	20.8	-179.75	-0.2	29.9	45.6	19.8	25.80		dvise and Monitor	
5,900.0 6,000.0	5,898.7 5,997.7	5,898.1 5,997.1	5,898.1 5,997.1	8.0 8.0	21.1 21.5	-179.80 -179.84	-0.2 -0.2	29.9 29.9	57.8 71.7	31.6 45.1	26.21 26.63	2.205 2.693		
6,100.0	6,096.8	6,096.2	6,096.2	8.1	21.8	-179.86	-0.2	29.9	85.6	58.6	27.04	3.166		
6,200.0	6,195.8	6,195.2	6,195.2	8.1	22.2	-179.88	-0.2	29.9	99.5	72.1	27.47	3.624		
6,300.0 6,400.0	6,294.8 6,393.8	6,294.2 6,393.2	6,294.2 6,393.2	8.1 8.2	22.5 22.9	-179.90 -179.91	-0.2 -0.2	29.9 29.9	113.4 127.4	85.6 99.1	27.89 28.31	4.068 4.498		
6,500.0	6,393.8	6,492.3	6,393.2	8.2	23.2	-179.91 -179.92	-0.2 -0.2	29.9	141.3	112.5	28.31	4.498 4.915		
6,600.0	6,591.9	6,591.3	6,591.3	8.3	23.6	-179.92	-0.2	29.9	155.2	126.0	29.17	5.320		
6,700.0	6,690.9	6,690.3	6,690.3	8.4	23.9	-179.93	-0.2	29.9	169.1	139.5	29.60	5.713		
6,800.0	6,789.9	6,789.3	6,789.3	8.4	24.3	-179.94 170.04	-0.2	29.9	183.0	153.0	30.04	6.093		
6,900.0 7,000.0	6,889.0 6,988.0	6,888.4 6,987.4	6,888.4 6,987.4	8.5 8.6	24.7 25.0	-179.94 -179.95	-0.2 -0.2	29.9 29.9	197.0 210.9	166.5 180.0	30.48 30.91	6.463 6.821		
7,000.0	7,087.0	7,086.4	7,086.4	8.6	25.0 25.4	-179.95 -179.95	-0.2 -0.2	29.9	210.9	193.4	31.35	7.170		
7,100.0	7,186.0	7,000.4	7,185.4	8.7	25.7	-179.95	-0.2	29.9	238.7	206.9	31.79	7.508		
7,300.0	7,285.1	7,284.5	7,284.5	8.8	26.1	-179.95	-0.2	29.9	252.6	220.4	32.24	7.836		
7,400.0	7,384.1	7,383.5	7,383.5	8.8	26.4	-179.96	-0.2	29.9	266.5	233.9	32.68	8.156		
7,500.0 7,600.0	7,483.1 7,582.2	7,482.5 7,581.6	7,482.5 7,581.6	8.9 9.0	26.8 27.1	-179.96 -179.96	-0.2 -0.2	29.9 29.9	280.5 294.4	247.3 260.8	33.13 33.57	8.466 8.768		
7,700.0	7,681.2	7,680.6	7,680.6	9.1	27.5	-179.96	-0.2	29.9	308.3	274.3	34.02	9.061		
7,800.0	7,780.2	7,779.6	7,779.6	9.1	27.8	-179.96	-0.2	29.9	322.2	287.7	34.47	9.347		
7,900.0 8,000.0	7,879.2 7,978.3	7,878.6 7,977.7	7,878.6 7,977.7	9.2 9.3	28.2 28.5	-179.97 -179.97	-0.2 -0.2	29.9 29.9	336.1 350.0	301.2	34.93 35.38	9.624 9.894		
8,000.0	7,978.3 8,077.3	7,977.7 8,076.7	8,076.7	9.3 9.4	28.5	-179.97 -179.97	-0.2 -0.2	29.9	350.0 364.0	314.7 328.1	35.38	9.894 10.158		
8,200.0	8,176.3	8,175.7	8,175.7	9.5	29.2	-179.97	-0.2	29.9	377.9	341.6	36.29	10.136		
8,300.0	8,275.3	8,274.7	8,274.7	9.6	29.6	-179.97	-0.2	29.9	391.8	355.1	36.74	10.663		
8,400.0	8,374.4	8,373.8	8,373.8	9.7	29.9	-179.97 170.07	-0.2	29.9	405.7	368.5	37.20	10.906		
8,500.0 8,600.0	8,473.4 8,572.4	8,472.8 8,571.8	8,472.8 8,571.8	9.8 9.9	30.3 30.7	-179.97 -179.97	-0.2 -0.2	29.9 29.9	419.6 433.5	382.0 395.4	37.66 38.12	11.143 11.374		
8,700.0	8,671.5	8,670.9	8,670.9	10.0	31.0	-179.97 -179.97	-0.2 -0.2	29.9	433.5 447.5	395.4 408.9	38.58	11.574		
8,800.0	8,770.5	8,769.9	8,769.9	10.0	31.4	-179.97	-0.2	29.9	461.4	422.3	39.04	11.819		
8,855.1	8,825.0	8,824.3	8,824.3	10.1	31.6	-179.95	-0.4	29.9	469.0	429.5	39.57	11.853		
8,900.0	8,869.4	8,868.4	8,868.3	10.1	31.7	-156.33	-3.4 10.6	29.9	476.0	436.3	39.74	11.979		
8,950.0 9,000.0	8,918.2 8,966.0	8,917.1 8,965.3	8,916.4 8,963.3	10.1 10.2	31.8 32.0	-141.64 -132.93	-10.6 -21.7	30.0 30.0	485.3 496.2	445.4 456.1	39.92 40.11	12.157 12.371		
3,000.0	0,300.0	0,300.3	0,000.0	10.2	32.0	-102.30	-21.7	30.0	430.2	450.1	40.11	12.011		
9,050.0	9,012.6	9,013.0	9,008.6	10.2	32.1	-127.01	-36.5	30.1	508.6	468.3	40.30	12.620		
9,100.0	9,057.4	9,060.1	9,052.1	10.2	32.3	-122.49	-54.8	30.2	522.4	481.9	40.50	12.901		
9,150.0	9,100.3	9,106.8	9,093.5	10.2	32.4	-118.76	-76.4	30.3	537.6	496.9	40.69	13.211		
9,200.0		9,153.0	9,132.6	10.3	32.5	-115.50	-101.0	30.4	553.9 571.2	513.0 530.1	40.89	13.546		
9,250.0	9,178.7	9,198.8	9,169.2	10.3	32.6	-112.53	-128.4	30.6	571.2	530.1	41.09	13.902		
9,300.0	9,213.7	9,244.2	9,203.3	10.4	32.8	-109.75	-158.4	30.7	589.5	548.2	41.29	14.277		
9,350.0	9,245.5	9,289.3	9,234.7	10.5	32.9	-107.13	-190.8	30.9	608.6	567.1	41.49	14.667		
9,400.0	9,273.8	9,334.2	9,263.3	10.6	33.0	-104.63	-225.3	31.1	628.3	586.6	41.70	15.066		
9,450.0	9,298.5	9,379.0	9,289.1	10.7	33.1	-102.24	-261.9	31.3	648.5	606.6	41.91	15.473		
9,500.0	9,319.3	9,423.8	9,311.9	10.8	33.1	-99.95	-300.4	31.5	669.0	626.9	42.12	15.882		
9,550.0	9,336.2	9,468.6	9,331.7	10.9	33.2	-97.76	-340.7	31.7	689.7	647.4	42.34	16.290		
	-		-											

#### **Anticollision Report**

Database:

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Reference Site: ATLAS Site Error: 0.0 usft

Reference Well: TOMAHAWK FEDERAL UNIT #705H

Well Error: 3.0 usft
Reference Wellbore OWB
Reference Design: PWP1

Local Co-ordinate Reference:

TVD Reference:
MD Reference:
North Reference:

KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Well TOMAHAWK FEDERAL UNIT #705H

Grid

Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma

2.00 sigma edm

Offset TVD Reference: Offset Datum

Offset D	esian	ATLAS	S - TOMA	AHAWK FE	DERAL	UNIT #704	IH - OWB - P	WP1					Offset Site Error:	0.0 usft
		/WD+IFR1+F											Offset Well Error:	3.0 usft
	rence	Offs		Semi Major						ance				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbo +N/-S (usft)	re Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
9,600.0	9,348.9	9,513.7	9,348.3	11.0	33.3	-95.69	-382.6	31.9	710.5	668.0	42.56	16.693		
9,650.0		9,559.2	9,361.7	11.2	33.4	-93.75	-426.0	32.1	731.2		42.79	17.089		
9,700.0	9,361.6	9,605.1	9,371.7	11.3	33.4	-91.94	-470.8	32.4	751.6	708.6	43.01	17.474		
9,722.2		9,625.7	9,375.1	11.4	33.5	-91.18	-491.1	32.5	760.6		43.11	17.641		
9,800.0		9,699.4	9,380.9	11.6	33.6	-91.56	-564.5	32.9	790.8		43.51	18.175		
9,900.0	9,362.5	9,795.7	9,381.2	12.0	33.7	-91.47	-660.9	33.1	826.4	782.3	44.11	18.736		
10,000.0	9,362.7	9,890.4	9,381.4	12.5	33.8	-91.40	-755.5	33.3	858.6	813.8	44.75	19.186		
10,100.0	9,363.0	9,986.1	9,381.6	13.0	34.0	-91.33	-851.3	33.4	887.5	842.0	45.45	19.525		
10,200.0	9,363.2	10,082.8	9,381.9	13.5	34.1	-91.28	-947.9	33.6	913.0	866.8	46.21	19.758		
10,300.0		10,180.3	9,382.1	14.0	34.3	-91.23	-1,045.4	33.8	935.2		47.01	19.891		
10,400.0	9,363.7	10,278.5	9,382.3	14.6	34.5	-91.20	-1,143.7	34.0	953.9	906.1	47.86	19.930		
10,500.0	9,363.9	10,377.3	9,382.6	15.2	34.8	-91.17	-1,242.5	34.2	969.2	920.5	48.75	19.880		
10,600.0		10,476.6	9,382.8	15.8	35.0	-91.14	-1,341.8	34.4	981.1		49.68	19.747		
10,700.0	9,364.4	10,576.3	9,383.0	16.4	35.3	-91.12	-1,441.4	34.6	989.4	938.8	50.64	19.538		
10,800.0		10,676.1	9,383.3	17.1	35.6	-91.11	-1,541.3	34.8	994.3		51.63	19.257		
10,890.0	9,364.9	10,766.2	9,383.5	17.6	35.9	-91.11	-1,631.3	34.9	995.8	943.2	52.55	18.948		
10,900.0	9,364.9	10,776.1	9,383.5	17.7	35.9	-91.11	-1,641.3	35.0	995.8	943.1	52.65	18.912		
11,000.0		10,876.1	9,383.8	18.4	36.2	-91.11	-1,741.3	35.1	995.8		53.70	18.542		
11,100.0		10,976.1	9,384.0	19.0	36.6	-91.11	-1,841.3	35.3	995.8		54.78	18.177		
11,200.0	9,365.6	11,076.1	9,384.2	19.7	36.9	-91.11	-1,941.3	35.5	995.8	939.9	55.89	17.817		
11,300.0	9,365.9	11,176.1	9,384.5	20.4	37.3	-91.11	-2,041.3	35.7	995.8	938.7	57.02	17.462		
11,400.0	9,366.1	11,276.1	9,384.7	21.1	37.7	-91.11	-2,141.3	35.9	995.8	937.6	58.18	17.115		
11,500.0		11,376.1	9,385.0	21.9	38.1	-91.11	-2,241.3	36.1	995.8	936.4	59.36	16.774		
11,600.0	9,366.6	11,476.1	9,385.2	22.6	38.6	-91.11	-2,341.3	36.3	995.8	935.2	60.57	16.441		
11,700.0	9,366.8	11,576.1	9,385.4	23.4	39.0	-91.11	-2,441.3	36.5	995.8	934.0	61.79	16.115		
11,800.0	9,367.0	11,676.1	9,385.7	24.1	39.4	-91.11	-2,541.3	36.7	995.8	932.8	63.03	15.798		
11,900.0	9,367.3	11,776.1	9,385.9	24.9	39.9	-91.11	-2,641.3	36.9	995.8	931.5	64.30	15.487		
12,000.0		11,876.1	9,386.2	25.7	40.4	-91.11	-2,741.3	37.1	995.8		65.58	15.185		
12,100.0	9,367.7	11,976.1	9,386.4	26.4	40.9	-91.11	-2,841.3	37.3	995.8	928.9	66.87	14.891		
12,200.0	9,368.0	12,076.1	9,386.6	27.2	41.4	-91.11	-2,941.3	37.4	995.8	927.6	68.19	14.604		
12,300.0	9,368.2	12,176.1	9,386.9	28.0	41.9	-91.11	-3,041.3	37.6	995.8	926.3	69.51	14.326		
12,400.0	9,368.4	12,276.1	9,387.1	28.8	42.4	-91.11	-3,141.3	37.8	995.8	925.0	70.86	14.054		
12,500.0		12,376.1	9,387.4	29.6	43.0	-91.11	-3,241.3	38.0	995.8		72.21	13.791		
12,600.0		12,476.1	9,387.6	30.4	43.5	-91.11	-3,341.3	38.2	995.8	922.3	73.58	13.534		
12,700.0	9,369.2	12,576.1	9,387.8	31.2	44.1	-91.11	-3,441.3	38.4	995.8	920.9	74.96	13.285		
12,800.0	9,369.4	12,676.1	9,388.1	32.0	44.7	-91.11	-3,541.3	38.6	995.8	919.5	76.35	13.042		
12,900.0	9,369.6	12,776.1	9,388.3	32.8	45.2	-91.11	-3,641.3	38.8	995.8	918.1	77.76	12.807		
13,000.0		12,876.1	9,388.6	33.7	45.8	-91.11	-3,741.3	39.0	995.9		79.17	12.578		
13,100.0		12,976.1	9,388.8	34.5	46.4	-91.11	-3,841.3	39.2	995.9		80.60	12.356		
13,200.0		13,076.1	9,389.0	35.3	47.0	-91.11	-3,941.3	39.4	995.9		82.03	12.139		
13,300.0	9,370.6	13,176.1	9,389.3	36.1	47.7	-91.11	-4,041.3	39.6	995.9	912.4	83.48	11.929		
13,400.0	9,370.8	13,276.1	9,389.5	36.9	48.3	-91.11	-4,141.3	39.7	995.9	910.9	84.93	11.725		
13,500.0			9,389.8	37.8	48.9	-91.11	-4,241.3	39.9	995.9		86.40			
13,600.0			9,390.0	38.6	49.5	-91.11	-4,341.3	40.1	995.9		87.87			
13,700.0			9,390.2	39.4	50.2	-91.11	-4,441.3	40.3	995.9		89.35	11.146		
13,800.0	9,371.7	13,676.1	9,390.5	40.3	50.8	-91.11	-4,541.3	40.5	995.9	905.1	90.83			
13,900.0	9,372.0	13,776.1	9,390.7	41.1	51.5	-91.11	-4,641.3	40.7	995.9	903.6	92.33	10.786		
14,000.0			9,391.0	41.9	52.1	-91.11	-4,741.3	40.9	995.9		93.83			
14,100.0			9,391.2	42.8	52.8	-91.11	-4,841.3	41.1	995.9		95.34			
14,200.0			9,391.4	43.6	53.5	-91.11	-4,941.3	41.3	995.9		96.85	10.283		
14,300.0			9,391.7	44.4	54.2	-91.11	-5,041.3	41.5	995.9		98.37			
14,400.0	9,373.2	14,276.1	9,391.9	45.3	54.8	-91.11	-5,141.3	41.7	995.9	896.0	99.90	9.969		
14,400.0	9,313.2	14,270.1	9,391.9	45.3	D4.6	-91.11	-0, 141.3	41.7	995.9	090.0	99.90	9.909		

#### **Anticollision Report**

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Reference Site: **ATLAS** Site Error: 0.0 usft

Reference Well: TOMAHAWK FEDERAL UNIT #705H

Well Error: 3.0 usft Reference Wellbore OWB Reference Design: PWP1

Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference: KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Well TOMAHAWK FEDERAL UNIT #705H

**Survey Calculation Method:** Minimum Curvature

Output errors are at

Database: edm

Offset TVD Reference:

2.00 sigma

Offset D	_			ADAWK FE	DERAL	UNII #104	IH - OWB - P	VVPI					Offset Site Error:	0.0 usf
Survey Pro Refer	_	/WD+IFR1+FI Offs		Semi Major	Avie				Dista	anco			Offset Well Error:	3.0 usf
Refer leasured	Vertical	Measured	eા Vertical	Reference	Offset	Highside	Offset Wellbo	re Centre	Between	Between	Minimum	Separation	Warning	
Depth (usft)	Depth (usft)	Depth (usft)	Depth (usft)	(usft)	(usft)	Toolface (°)	+N/-S (usft)	+E/-W (usft)	Centres (usft)	Ellipses (usft)	Separation (usft)		···u····ig	
14,500.0	9,373.4		9,392.2	46.1	55.5	-91.11	-5,241.3	41.9	995.9	894.5	101.43	9.819		
14,600.0	9,373.4		9,392.2	46.1	56.2	-91.11 -91.11	-5,241.3 -5,341.3	42.0	995.9	893.0	101.43	9.672		
14,700.0	9,373.9	14,576.1	9,392.4	47.8	56.9	-91.11	-5,441.3	42.2	995.9	891.4	104.51	9.529		
14,800.0	9,374.1	14,676.1	9,392.9	48.6	57.6	-91.11	-5,541.3	42.4	995.9	889.9	106.06	9.390		
14,900.0	9,374.3	14,776.1	9,393.1	49.5	58.3	-91.12	-5,641.3	42.6	995.9	888.3	107.62	9.255		
15,000.0	9,374.6	14,876.1	9,393.4	50.3	59.0	-91.12	-5,741.3	42.8	995.9	886.8	109.17	9.123		
15,100.0	9,374.8	14,976.1	9,393.6	51.2	59.8	-91.12	-5,841.3	43.0	996.0	885.2	110.74	8.994		
15,200.0	9,375.0	15,076.1	9,393.8	52.0	60.5	-91.12	-5,941.3	43.2	996.0	883.7	112.30	8.869		
15,300.0	9,375.3	15,176.1	9,394.1	52.8	61.2	-91.12	-6,041.3	43.4	996.0	882.1	113.87	8.746		
15,400.0	9,375.5 9,375.8	15,276.1 15,376.1	9,394.3	53.7 54.5	61.9 62.7	-91.12 -91.12	-6,141.3 6.241.3	43.6 43.8	996.0 996.0	880.5 878.9	115.45 117.03	8.627 8.511		
15,500.0	9,373.0	15,376.1	9,394.6	54.5	02.7	-91.12	-6,241.3	43.0	990.0	0/0.9	117.03	8.511		
15,600.0	9,376.0	15,476.1	9,394.8	55.4	63.4	-91.12	-6,341.3	44.0	996.0	877.4	118.61	8.397		
15,700.0	9,376.2		9,395.0	56.2	64.1	-91.12	-6,441.3	44.2	996.0	875.8	120.20	8.286		
15,800.0	9,376.5	15,676.1	9,395.3	57.1	64.9	-91.12	-6,541.3	44.3	996.0	874.2	121.79	8.178		
15,900.0	9,376.7	15,776.1	9,395.5	57.9	65.6	-91.12	-6,641.3	44.5	996.0	872.6	123.38	8.072		
16,000.0	9,376.9	15,876.1	9,395.8	58.8	66.3	-91.12	-6,741.3	44.7	996.0	871.0	124.98	7.969		
16 100 0	0.277.0	15.076.4	0.206.0	E0.0	67.4	04.40	6.044.0	44.0	000.0	000.4	100.50	7.000		
16,100.0	9,377.2	15,976.1	9,396.0	59.6	67.1	-91.12	-6,841.3	44.9	996.0	869.4	126.58	7.869		
16,200.0 16,300.0	9,377.4 9,377.6	16,076.1 16,176.1	9,396.2 9,396.5	60.5 61.3	67.8 68.6	-91.12 -91.12	-6,941.3 -7,041.3	45.1 45.3	996.0 996.0	867.8 866.2	128.18 129.79	7.770 7.674		
16,400.0	9,377.0	16,176.1	9,396.7	62.2	69.4	-91.12 -91.12	-7,041.3 -7,141.3	45.5	996.0	864.6	131.39	7.580		
16,500.0	9,378.1	16,376.1	9,397.0	63.0	70.1	-91.12	-7,141.3	45.7	996.0	863.0	133.01	7.489		
10,000.0	3,370.1	10,070.1	3,337.0	00.0	70.1	-31.12	-7,241.5	45.7	330.0	000.0	155.01	7.403		
16,600.0	9,378.4	16,476.1	9,397.2	63.9	70.9	-91.12	-7,341.2	45.9	996.0	861.4	134.62	7.399		
16,700.0	9,378.6	16,576.1	9,397.4	64.7	71.6	-91.12	-7,441.2	46.1	996.0	859.8	136.24	7.311		
16,800.0	9,378.8	16,676.1	9,397.7	65.6	72.4	-91.12	-7,541.2	46.3	996.0	858.2	137.86	7.225		
16,900.0	9,379.1	16,776.1	9,397.9	66.4	73.2	-91.12	-7,641.2	46.5	996.0	856.6	139.48	7.141		
17,000.0	9,379.3	16,876.1	9,398.2	67.3	73.9	-91.12	-7,741.2	46.6	996.0	854.9	141.10	7.059		
17,100.0	9,379.5	16,976.1	9,398.4	68.1	74.7	-91.12	-7,841.2	46.8	996.0	853.3	142.73	6.979		
17,100.0	9,379.8	17,076.1	9,398.6	69.0	75.5	-91.12	-7,941.2	47.0	996.1	851.7	144.36	6.900		
17,300.0	9,380.0	17,176.1	9,398.9	69.8	76.3	-91.12	-8,041.2	47.2	996.1	850.1	145.99	6.823		
17,400.0	9,380.2	17,276.1	9,399.1	70.7	77.0	-91.12	-8,141.2	47.4	996.1	848.4	147.62	6.747		
17,500.0	9,380.5	17,376.1	9,399.4	71.6	77.8	-91.12	-8,241.2	47.6	996.1	846.8	149.25	6.674		
17,600.0	9,380.7	17,476.1	9,399.6	72.4	78.6	-91.12	-8,341.2	47.8	996.1	845.2	150.89	6.601		
17,700.0	9,380.9	17,576.1	9,399.8	73.3	79.4	-91.12	-8,441.2	48.0	996.1	843.5	152.53	6.530		
17,800.0	9,381.2		9,400.1	74.1	80.2	-91.12	-8,541.2	48.2	996.1	841.9	154.17	6.461		
17,900.0	9,381.4	17,776.1	9,400.3	75.0	81.0	-91.12 01.12	-8,641.2	48.4	996.1	840.3	155.81	6.393		
18,000.0	9,381.7	17,876.1	9,400.6	75.8	81.7	-91.12	-8,741.2	48.6	996.1	838.6	157.46	6.326		
18,100.0	9,381.9	17,976.1	9,400.8	76.7	82.5	-91.12	-8,841.2	48.8	996.1	837.0	159.10	6.261		
18,200.0	9,382.1	18,076.1	9,401.0	77.5	83.3	-91.12	-8,941.2	48.9	996.1	835.4	160.75	6.197		
18,300.0	9,382.4	18,176.1	9,401.3	78.4	84.1	-91.12	-9,041.2	49.1	996.1	833.7	162.40	6.134		
18,400.0	9,382.6	18,276.1	9,401.5	79.2	84.9	-91.12	-9,141.2	49.3	996.1	832.1	164.05	6.072		
18,500.0	9,382.8		9,401.8	80.1	85.7	-91.12	-9,241.2	49.5	996.1	830.4	165.70	6.012		
10.000	0.000	10 : :	0.455.5											
18,600.0	9,383.1	18,476.1	9,402.0	81.0	86.5	-91.12	-9,341.2	49.7	996.1	828.8	167.35	5.952		
18,700.0	9,383.3		9,402.2	81.8	87.3	-91.12	-9,441.2	49.9	996.1	827.1	169.01	5.894		
18,800.0	9,383.5		9,402.5	82.7	88.1	-91.12	-9,541.2	50.1	996.1	825.5	170.66	5.837		
18,900.0	9,383.8		9,402.7	83.5	88.9 80.7	-91.12	-9,641.2 9,741.2	50.3 50.5	996.1	823.8	172.32	5.781 5.726		
19,000.0	9,384.0	18,876.1	9,403.0	84.4	89.7	-91.12	-9,741.2	50.5	996.1	822.2	173.98	5.726		
19,100.0	9,384.2	18,976.1	9,403.2	85.2	90.5	-91.12	-9,841.2	50.7	996.1	820.5	175.64	5.672		
19,200.0	9,384.5		9,403.4	86.1	91.3	-91.13	-9,941.2	50.9	996.1	818.8	177.30	5.618		
19,300.0	9,384.7	19,176.1	9,403.7	87.0	92.1	-91.13	-10,041.2	51.0	996.2	817.2	178.96	5.566		
19,400.0	9,385.0	19,276.1	9,403.9	87.8	92.9	-91.13	-10,141.2	51.2	996.2	815.5	180.62	5.515		
19,500.0	9,385.2	19,376.1	9,404.2	88.7	93.7	-91.13	-10,241.2	51.4	996.2	813.9	182.29	5.465		
40.000.5	0.005 :	40 470 :	0.404 :	20 -	015	01.10	40.044.5		202 -	040.5	400.0-	E 115		
19,600.0	9,385.4	19,476.1	9,404.4	89.5	94.5	-91.13	-10,341.2	51.6	996.2	812.2	183.95	5.415		

#### **Anticollision Report**

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Reference Site: ATLAS Site Error: 0.0 usft

Reference Well: TOMAHAWK FEDERAL UNIT #705H

Well Error: 3.0 usft
Reference Wellbore OWB
Reference Design: PWP1

Local Co-ordinate Reference:

TVD Reference:
MD Reference:

North Reference: Survey Calculation Method:

Output errors are at

Database:

Offset TVD Reference:

Well TOMAHAWK FEDERAL UNIT #705H

KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Grid

Minimum Curvature

2.00 sigma edm

Offset D	esign	ATLAS	- TOMA	HAWK FE	DERAL	UNIT #704	4H - OWB - F	WP1					Offset Site Error:	0.0 usf
Survey Pro	gram: 0-M	1WD+IFR1+FI	DIR										Offset Well Error:	3.0 usf
Refer	ence	Offs	et	Semi Major	r Axis				Dist	ance				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbo +N/-S (usft)	re Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,700.0	9,385.7	19,576.1	9,404.6	90.4	95.3	-91.13	-10,441.2	51.8	996.2	810.6	185.62	5.367		
19,800.0	9,385.9	19,676.1	9,404.9	91.2	96.1	-91.13	-10,541.2	52.0	996.2	808.9	187.29	5.319		
19,900.0	9,386.1	19,776.1	9,405.1	92.1	96.9	-91.13	-10,641.2	52.2	996.2	807.2	188.96	5.272		
20,000.0	9,386.4	19,876.1	9,405.4	93.0	97.8	-91.13	-10,741.2	52.4	996.2	805.6	190.63	5.226		
20,100.0	9,386.6	19,976.1	9,405.6	93.8	98.6	-91.13	-10,841.2	52.6	996.2	803.9	192.30	5.180		
20,200.0	9,386.8	20,076.1	9,405.8	94.7	99.4	-91.13	-10,941.2	52.8	996.2	802.2	193.97	5.136		
20,205.8	9,386.9	20,082.0	9,405.9	94.7	99.4	-91.13	-10,947.1	52.8	996.2	802.1	194.07	5.133		
20,267.3	9,387.0	20,142.0	9,406.0	95.2	99.8	-91.13	-11,007.1	52.9	996.2	801.2	194.98	5.109		
20,267.9	9,387.0	20,142.0	9,406.0	95.3	99.8	-91.13	-11,007.1	52.9	996.2	801.2	194.98	5.109		

#### **Anticollision Report**

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Reference Site: ATLAS Site Error: 0.0 usft

Reference Well: TOMAHAWK FEDERAL UNIT #705H

Well Error: 3.0 usft
Reference Wellbore OWB
Reference Design: PWP1

Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference: KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Well TOMAHAWK FEDERAL UNIT #705H

Grid

Survey Calculation Method: Minimum Curvature

Output errors are at Database:
Offset TVD Reference:

2.00 sigma edm

Offset D	esign	ATLAS	- TOMA	HAWK FE	DERAL	UNIT 712I	H - OWB - PV	VP1					Offset Site Error:	0.0 usft
	•	tandard Keep	er 104, 880	3-MWD+IFR1	+FDIR								Offset Well Error:	3.0 usft
Refer	ence	Offs	et	Semi Majo	r Axis				Dist	ance			• <u>-</u>	
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbo	re Centre	Between	Between	Minimum	Separation	Warning	
Depth	Depth	Depth	Depth			Toolface	+N/-S	+E/-W	Centres		Separation	Factor	ŭ	
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)			
8,600.0	8,572.4	10,132.3	9,376.7	9.9	12.8	179.92	1.0	186.2	999.8	971.4	28.33	35.294		
8,700.0	8,671.5	10,132.5	9,376.7	10.0	12.8	179.90	1.2	186.2	930.6	903.1	27.52	33.818		
8,800.0	8,770.5	10,132.7	9,376.7	10.0	12.8	179.88	1.5	186.2	867.5	841.1	26.46	32.781 5	SF.	
8,855.1	8,825.0	10,132.9	9,376.7	10.1	12.8	179.87	1.6	186.2	835.9	810.7	25.14	33.243		
8,900.0	8,869.4	10,131.3	9,376.7	10.1	12.8	-159.70	0.1	186.2	812.5	788.0	24.47	33.201		
8,950.0	8,918.2	10,125.9	9,376.7	10.1	12.8	-147.87	-5.4	186.3	790.3	766.7	23.64	33.432		
9,000.0	8,966.0	10,116.4	9,376.7	10.2	12.8	-141.36	-14.8	186.3	772.5	749.8	22.75	33.960		
9,050.0	9,012.6	10,103.1	9,376.7	10.2	12.8	-137.03	-28.1	186.4	759.4	737.6	21.83	34.782		
9,100.0	9,057.4	10,086.0	9,376.6	10.2	12.8	-133.54	-45.2	186.4	751.2	730.2	20.95	35.860		
9,150.0	9,100.3	10,065.3	9,376.6	10.2	12.8	-130.31	-66.0	186.5	747.8	727.6	20.13	37.142 E	S	
9,161.4	9,109.8	10,060.0	9,376.6	10.2	12.8	-129.57	-71.2	186.5	747.6	727.7	19.96	37.454 0	CC	
9,200.0	9,140.8	10,041.0	9,376.5	10.3	12.8	-127.05	-90.2	186.6	749.0	729.5	19.43	38.552		
9,250.0	9,178.7	10,013.5	9,376.5	10.3	12.7	-123.65	-117.7	186.7	754.4	735.6	18.86	40.012		
9,300.0	9,213.7	9,982.9	9,376.4	10.4	12.7	-120.05	-148.4	186.8	763.7	745.3	18.43	41.446		
9,350.0	9,245.5	9,949.4	9,376.4	10.5	12.7	-116.29	-181.9	187.0	776.2	758.1	18.13	42.816		
9,400.0	9,273.8	9,913.2	9,376.3	10.6	12.7	-112.42	-218.0	187.1	791.3	773.4	17.93	44.127		
9,450.0	9,298.5	9,874.8	9,376.3	10.7	12.7	-108.53	-256.5	187.3	808.5	790.6	17.82	45.365		
9,500.0	9,319.3	9,834.3	9,376.2	10.8	12.7	-104.73	-297.0	187.5	827.1	809.4	17.76	46.561		
9,550.0	9,336.2	9,792.1	9,376.1	10.9	12.7	-101.12	-339.2	187.6	846.8	829.0	17.74	47.740		
9,600.0	9,348.9	9,748.4	9,376.0	11.0	12.7	-97.79	-382.8	187.8	866.9	849.2	17.74	48.879		
9,650.0	9,357.4	9,703.7	9,376.0	11.2	12.6	-94.80	-427.6	188.0	887.3	869.6	17.73	50.032		
9,700.0	9,361.6	9,656.4	9,374.1	11.3	12.6	-92.08	-474.8	188.2	907.5	889.7	17.75	51.121		
9,722.2	9,362.0	9,635.7	9,372.0	11.4	12.6	-90.94	-495.4	188.2	916.3	898.5	17.76	51.581		
9,800.0	9,362.2	9,564.3	9,359.2	11.6	12.6	-90.05	-565.6	188.5	946.2	928.3	17.87	52.958		
9,900.0	9,362.5	9,477.7	9,332.2	12.0	12.5	-88.35	-647.7	188.8	982.3	964.2	18.14	54.151		

#### **Anticollision Report**

Database:

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Reference Site: ATLAS Site Error: 0.0 usft

Reference Well: TOMAHAWK FEDERAL UNIT #705H

Well Error: 3.0 usft
Reference Wellbore OWB
Reference Design: PWP1

Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference:

Output errors are at

KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Well TOMAHAWK FEDERAL UNIT #705H

Grid

Survey Calculation Method: Minimum Curvature

2.00 sigma edm

Offset TVD Reference: Offset Datum

Offset D	esign	ATLAS	- TOMA	HAWK FE	DERAL	<b>UNIT 713</b> I	H - OWB - PV	VP1					Offset Site Error:	0.0 us
•	•	IWD+IFR1+FI											Offset Well Error:	3.0 us
Refer		Offs		Semi Major		I II ada a tala	065	0		ance	Minimum	0		
leasured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbo +N/-S (usft)	re Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,500.0	8,473.4	10,174.4	9,356.9	9.8	34.5	-37.54	-81.3	-621.0	919.2	885.4	33.80	27.198		
8,600.0	8,572.4	10,179.5	9,356.9	9.9	34.5	-35.43	-76.4	-622.7	820.4	786.2	34.20	23.991		
8,700.0	8,671.5	10,184.6	9,356.9	10.0	34.5	-33.30	-71.6	-624.3	721.8	687.2	34.64	20.841		
8,800.0	8,770.5	10,189.6	9,356.9	10.0	34.5	-31.14	-66.8	-625.9	623.7	588.6	35.14	17.750		
8,855.1	8,825.0	10,192.4	9,356.9	10.1	34.5	-29.95	-64.2	-626.8	570.0	534.1	35.91	15.873		
8,900.0	8,869.4	10,193.2	9,356.9	10.1	34.5	8.24	-63.5	-627.1	526.0	489.8	36.19	14.534		
8,950.0	8,918.2	10,190.8	9,356.9	10.1	34.5	45.64	-65.8	-626.3	476.8	440.3	36.48	13.069		
9,000.0	8,966.0	10,184.9	9,356.9	10.2	34.5	79.20	-71.3	-624.4	427.5	390.7	36.74	11.636		
9,050.0	9,012.6	10,175.7	9,356.9	10.2	34.5	104.76	-80.0	-621.5	378.4	341.4	36.94	10.243		
9,100.0	9,057.4	10,163.4	9,356.9	10.2	34.5	122.58	-91.6	-617.4	329.8	292.7	37.06	8.898		
9,150.0	9,100.3	10,148.1	9,356.9	10.2	34.4	135.61	-106.1	-612.4	282.0	245.0	37.08	7.607		
9,200.0	9,140.8	10,130.0	9,356.8	10.3	34.4	146.24	-123.1	-606.3	235.6	198.7	36.92	6.381		
9,250.0	9,178.7	10,109.4	9,356.8	10.3	34.3	156.07	-142.4	-599.2	191.0	154.5	36.49	5.235		
9,300.0	9,213.7	10,086.6	9,356.7	10.4	34.3	166.29	-163.8	-591.3	149.6	113.9	35.71	4.189		
9,350.0	9,245.5	10,061.9	9,356.7	10.5	34.2	177.92	-186.9	-582.4	113.7	78.9	34.83	3.265		
9,400.0	9,273.8	10,035.5	9,356.6	10.6	34.2	-168.33	-211.5	-572.7	89.2	53.2	35.92	2.482		
9,434.6	9,291.3	10,016.4	9,356.6	10.6	34.1	-157.55	-229.2	-565.6	83.5	45.1	38.42	2.174 0	CC, ES	
9,450.0	9,298.5	10,007.7	9,356.6	10.7	34.1	-152.49	-237.3	-562.3	84.7	45.3	39.40	2.149 5	SF.	
9,500.0	9,319.3	9,978.8	9,356.5	10.8	34.1	-135.94	-263.9	-551.2	101.7	60.7	40.98	2.481		
9,550.0	9,336.2	9,949.1	9,356.5	10.9	34.0	-120.79	-291.2	-539.5	131.2	89.4	41.72	3.144		
9,600.0	9,348.9	9,919.0	9,356.4	11.0	33.9	-108.40	-318.8	-527.4	165.9	123.7	42.20	3.932		
9,650.0	9,357.4	9,888.5	9,356.4	11.2	33.9	-98.85	-346.5	-514.8	202.7	160.3	42.47	4.774		
9,700.0	9,361.6	9,858.1	9,356.3	11.3	33.8	-91.64	-374.1	-502.0	240.3	197.6	42.60	5.639		
9,722.2	9,362.0	9,844.7	9,356.3	11.4	33.8	-89.02	-386.2	-496.2	256.9	214.3	42.63	6.027		
9,800.0	9,362.2	9,800.0	9,356.2	11.6	33.7	-89.16	-426.4	-476.6	315.2	272.5	42.72	7.379		
9,900.0	9,362.5	9,738.0	9,356.1	12.0	33.6	-89.28	-481.6	-448.4	389.3	346.4	42.87	9.080		
10,000.0	9,362.7	9,677.1	9,355.7	12.5	33.5	-89.31	-535.2	-419.6	462.4	419.3	43.05	10.740		
10,100.0	9,363.0	9,612.7	9,349.9	13.0	33.4	-88.52	-591.4	-388.5	533.9	490.6	43.28	12.336		
10,200.0	9,363.2	9,550.0	9,337.4	13.5	33.3	-87.04	-644.8	-358.4	604.0	560.4	43.54	13.872		
10,300.0	9,363.5	9,488.3	9,318.7	14.0	33.2	-85.17	-695.7	-329.1	672.8	629.0	43.80	15.362		
10,400.0	9,363.7	9,431.2	9,295.8	14.6	33.1	-83.21	-740.8	-302.6	741.0	696.9	44.03	16.829		
10,500.0	9,363.9	9,378.5	9,270.2	15.2	32.9	-81.29	-780.3	-278.9	808.7	764.5	44.23	18.287		
10,600.0	9,364.2	9,330.6	9,243.3	15.8	32.8	-79.52	-814.1	-258.1	876.6	832.2	44.39	19.748		
10,700.0	9,364.4	9,287.5	9,216.4	16.4	32.7	-77.94	-842.6	-240.3	944.7	900.2	44.52	21.222		

#### **Anticollision Report**

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Reference Site: ATLAS Site Error: 0.0 usft

Reference Well: TOMAHAWK FEDERAL UNIT #705H

Well Error: 3.0 usft
Reference Wellbore OWB
Reference Design: PWP1

Local Co-ordinate Reference:

TVD Reference:
MD Reference:
North Reference:

KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Well TOMAHAWK FEDERAL UNIT #705H

Grid

Survey Calculation Method: Minimum Curvature

Output errors are at 2.00 sigma edm

Offset TVD Reference: Offset Datum

Reference Depths are relative to KB=24' @ 3071.9usft (E 155)

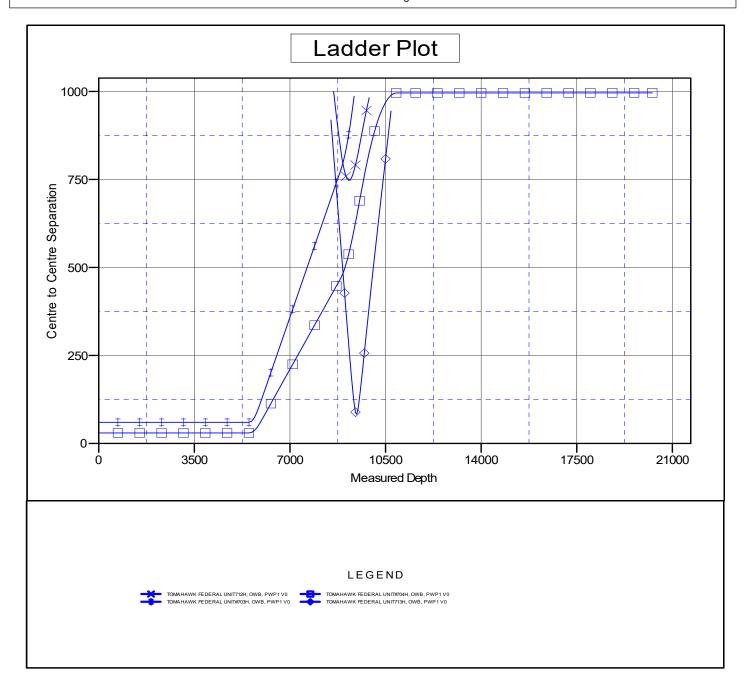
Offset Depths are relative to Offset Datum

Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: TOMAHAWK FEDERAL UNIT #705H

Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30

Grid Convergence at Surface is: 0.12°



#### **Anticollision Report**

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Reference Site: **ATLAS** Site Error: 0.0 usft

**Reference Well:** TOMAHAWK FEDERAL UNIT #705H

Well Error: 3.0 usft Reference Wellbore OWB Reference Design: PWP1

Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference: KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Well TOMAHAWK FEDERAL UNIT #705H

**Survey Calculation Method:** Minimum Curvature

Output errors are at 2.00 sigma Database:

edm

Offset TVD Reference: Offset Datum

Reference Depths are relative to KB=24' @ 3071.9usft (E 155)

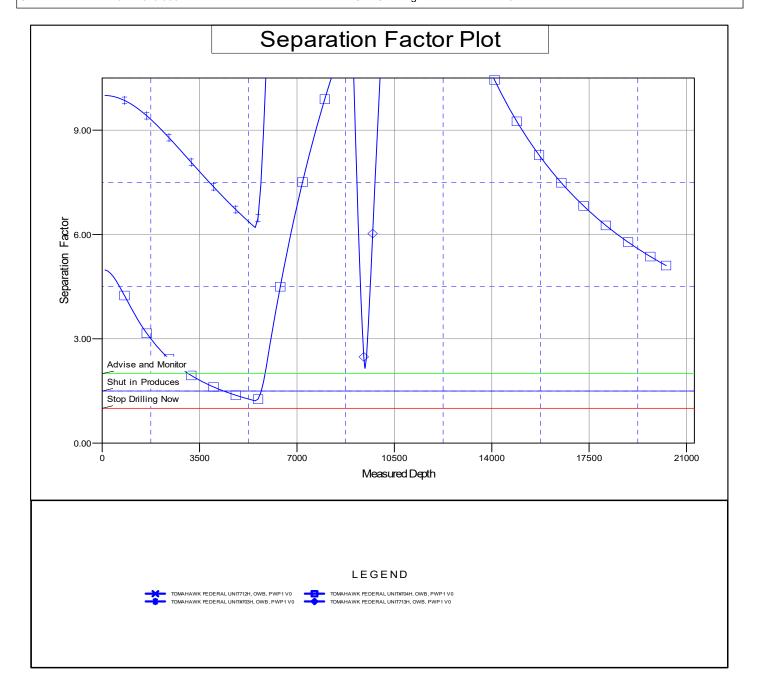
Offset Depths are relative to Offset Datum

Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: TOMAHAWK FEDERAL UNIT #705H

Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30

Grid Convergence at Surface is: 0.12°



# **NORTHERN DELAWARE BASIN**

EDDY COUNTY, NM ATLAS TOMAHAWK FEDERAL UNIT #705H

**OWB** 

Plan: PWP1

# **Standard Survey Report**

17 March, 2020

Survey Report

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Site: ATLAS

Well: TOMAHAWK FEDERAL UNIT #705H

Wellbore: OWB

Design: PWP1

Local Co-ordinate Reference:

TVD Reference:
MD Reference:

North Reference:

System Datum:

**Survey Calculation Method:** 

Database:

Well TOMAHAWK FEDERAL UNIT #705H

KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Grid

Minimum Curvature

Mean Sea Level

edm

Project EDDY COUNTY, NM

Map System: US State Plane 1927 (Exact solution)

Geo Datum: NAD 1927 (NADCON CONUS)

Map Zone: New Mexico East 3001

TOMAHAWK FEDERAL UNIT #705H

**Well Position** +N/-S 0.0 usft Northing: 435,533.00 usfl Latitude: 32° 11' 49.937 N

**+E/-W** 0.0 usft **Easting**: 568,282.00 usft **Longitude**: 104° 6' 45.329 W

Position Uncertainty 3.0 usft Wellhead Elevation: usfl Ground Level: 3.047.9 usfl

Wellbore OWB

 Magnetics
 Model Name
 Sample Date
 Declination (°)
 Dip Angle (°)
 Field Strength (nT)

 IGRF2015
 3/16/2020
 6.91
 59.92
 47,585,79599553

Design PWP1

**Audit Notes:** 

Well

Version: Phase: PLAN Tie On Depth: 0.0

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

0.0 0.0 0.0 184.90

Survey Tool Program Date 3/17/2020

From To
(usft) (usft) Survey (Wellbore) Tool Name Description

0.0 8,843.8 PWP1 (OWB) Standard Keeper 104 Standard Wireline Keeper ver 1.0.4

8,843.8 20,267.3 PWP1 (OWB) MWD+IFR1+FDIR OWSG MWD + IFR1 + FDIR Correction

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

Survey Report

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Site: **ATLAS** 

Well: TOMAHAWK FEDERAL UNIT #705H

Wellbore: OWB

Design: PWP1 Local Co-ordinate Reference:

TVD Reference: MD Reference:

North Reference:

**Survey Calculation Method:** 

Database:

Well TOMAHAWK FEDERAL UNIT #705H

KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Minimum Curvature

edm

Design:	1 44	P1			Database	<b>.</b>		eam		
Planned	l Survey									
N	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)
	4.500.0	0.00	0.00	4.500.0	0.0	0.0	0.0	0.00	0.00	0.00
	1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
	1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
	1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
	1,800.0	0.00 0.00	0.00 0.00	1,800.0	0.0	0.0 0.0	0.0 0.0	0.00 0.00	0.00	0.00
	1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
	2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
	2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
	2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
	2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
	2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
	2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
	2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
	2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
	2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
	2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
	3,000.0	0.00	0.00	3.000.0	0.0	0.0	0.0	0.00	0.00	0.00
	3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
	3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
	3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
	3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
	0.500.0	0.00	2.22	0.500.0	0.0	0.0	0.0	0.00	0.00	2.22
	3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
	3,600.0	0.00	0.00	3,600.0 3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
	3,700.0 3,800.0	0.00 0.00	0.00 0.00	3,800.0	0.0 0.0	0.0 0.0	0.0 0.0	0.00 0.00	0.00 0.00	0.00 0.00
	3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
	3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
	4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
	4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
	4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
	4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
	4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
	4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
	4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
	4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
	4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
	4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
	F 000 0	0.00	0.00	F 000 0	0.0	0.0	0.0	0.00	0.00	0.00
	5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
	5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
	5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
	5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00
	5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
	5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
	Start Build	2.00								
	5,600.0	2.00	270.00	5,600.0	0.0	-1.7	0.1	2.00	2.00	0.00

Survey Report

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Site: ATLAS

Well: TOMAHAWK FEDERAL UNIT #705H

Wellbore: OWB

Design: PWP1

Local Co-ordinate Reference:

TVD Reference:
MD Reference:

North Reference:

**Survey Calculation Method:** 

Database:

Well TOMAHAWK FEDERAL UNIT #705H

KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Grid

Minimum Curvature

edm

gn:	F V	/P1			Database	<b>9</b> :		eam		
ned Su	rvey									
De	sured pth sft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5	,700.0	4.00	270.00	5,699.8	0.0	-7.0	0.6	2.00	2.00	0.00
	,800.0	6.00	270.00	5,799.5	0.0	-15.7	1.3	2.00	2.00	0.00
5	,900.0	8.00	270.00	5,898.7	0.0	-27.9	2.4	2.00	2.00	0.00
Sta	rt 2955.	1 hold at 5900	.0 MD							
6	0.000,	8.00	270.00	5,997.7	0.0	-41.8	3.6	0.00	0.00	0.00
	5,100.0	8.00	270.00	6,096.8	0.0	-55.7	4.8	0.00	0.00	0.00
	5,200.0	8.00	270.00	6,195.8	0.0	-69.6	5.9	0.00	0.00	0.00
	5,300.0	8.00	270.00	6,294.8	0.0	-83.5	7.1	0.00	0.00	0.00
	5,400.0	8.00	270.00	6,393.8	0.0	-97.5	8.3	0.00	0.00	0.00
			070.00			444.4		2.22		
	5,500.0	8.00	270.00	6,492.9	0.0	-111.4	9.5	0.00	0.00	0.00
	5,600.0	8.00	270.00	6,591.9	0.0	-125.3	10.7	0.00	0.00	0.00
	5,700.0	8.00	270.00	6,690.9	0.0	-139.2	11.9	0.00	0.00	0.00
	0.008,	8.00	270.00	6,789.9	0.0	-153.1	13.1	0.00	0.00	0.00
6	5,900.0	8.00	270.00	6,889.0	0.0	-167.1	14.3	0.00	0.00	0.00
	,000.0	8.00	270.00	6,988.0	0.0	-181.0	15.4	0.00	0.00	0.00
	,100.0	8.00	270.00	7,087.0	0.0	-194.9	16.6	0.00	0.00	0.00
	,200.0	8.00	270.00	7,186.0	0.0	-208.8	17.8	0.00	0.00	0.00
7	,300.0	8.00	270.00	7,285.1	0.0	-222.7	19.0	0.00	0.00	0.00
7	,400.0	8.00	270.00	7,384.1	0.0	-236.6	20.2	0.00	0.00	0.00
7	,500.0	8.00	270.00	7,483.1	0.0	-250.6	21.4	0.00	0.00	0.00
7	,600.0	8.00	270.00	7,582.2	0.0	-264.5	22.6	0.00	0.00	0.00
7	,700.0	8.00	270.00	7,681.2	0.0	-278.4	23.8	0.00	0.00	0.00
7	,800.0	8.00	270.00	7,780.2	0.0	-292.3	24.9	0.00	0.00	0.00
7	,900.0	8.00	270.00	7,879.2	0.0	-306.2	26.1	0.00	0.00	0.00
8	3,000.0	8.00	270.00	7,978.3	0.0	-320.1	27.3	0.00	0.00	0.00
	3,100.0	8.00	270.00	8,077.3	0.0	-334.1	28.5	0.00	0.00	0.00
	3,200.0	8.00	270.00	8,176.3	0.0	-348.0	29.7	0.00	0.00	0.00
	3,300.0	8.00	270.00	8,275.3	0.0	-361.9	30.9	0.00	0.00	0.00
	3,400.0	8.00	270.00	8,374.4	0.0	-375.8	32.1	0.00	0.00	0.00
Ω	3,500.0	8.00	270.00	8,473.4	0.0	-389.7	33.3	0.00	0.00	0.00
	3,600.0	8.00	270.00	8,572.4	0.0	-403.6	34.4	0.00	0.00	0.00
	3,700.0	8.00	270.00	8,671.5	0.0	-403.6 -417.6	35.6	0.00	0.00	0.00
	3,800.0	8.00	270.00	8,770.5	0.0	-417.6 -431.5	36.8	0.00	0.00	0.00
	3,855.1	8.00	270.00	8,825.0	0.0	-431.5 -439.1	37.5	0.00	0.00	0.00
		0.00 1 <b>0.00 TFO</b> -66.		0,023.0	0.0	- <del>-</del> 133. I	31.3	0.00	0.00	0.00
	3,900.0	10.59	246.90	8,869.4	-1.6	-446.1	39.7	10.00	5.77	-51.39
	0.000,0	19.07	225.17	8,966.0	-16.8	-466.2	56.5	10.00	8.48	-21.73
	,100.0	28.53	216.97	9,057.4	-47.5	-492.2	89.3	10.00	9.46	-8.19
	,200.0	38.25	212.66	9,140.8	-92.7	-523.3	137.0	10.00	9.72	-4.31
9	,300.0	48.07	209.89	9,213.7	-151.2	-558.7	198.3	10.00	9.82	-2.77
9	,400.0	57.94	207.87	9,273.8	-221.1	-597.1	271.2	10.00	9.87	-2.02
	,500.0	67.84	206.25	9,319.3	-300.2	-637.5	353.6	10.00	9.90	-1.62
	,600.0	77.74	204.84	9,348.9	-386.3	-678.6	442.8	10.00	9.91	-1.41
	,700.0	87.66	203.53	9,361.6	-476.7	-719.2	536.3	10.00	9.92	-1.31

Survey Report

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Site: ATLAS

Well: TOMAHAWK FEDERAL UNIT #705H

Wellbore: OWB

Design: PWP1

Local Co-ordinate Reference:

TVD Reference: MD Reference: North Reference:

**Survey Calculation Method:** 

Database:

Well TOMAHAWK FEDERAL UNIT #705H

KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Grid

Minimum Curvature

edm

ed Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,722.2	89.86	203.25	9,362.0	-497.1	-728.0	557.4	10.00	9.92	-1.28
Start DLS	2.00 TFO -90.0	2							
9,800.0	89.86	201.69	9,362.2	-569.0	-757.7	631.6	2.00	0.00	-2.00
9,900.0	89.86	199.69	9,362.5	-662.5	-793.1	727.8	2.00	0.00	-2.00
10,000.0	89.86	197.69	9,362.7	-757.2	-825.1	824.9	2.00	0.00	-2.00
10.100.0	89.86	195.69	9,363.0	-853.0	-853.8	922.8	2.00	0.00	-2.00
10,200.0	89.86	193.69	9,363.2	-949.7	-879.2	1,021.3	2.00	0.00	-2.00
10,300.0	89.86	191.69	9,363.5	-1,047.3	-901.2	1,120.4	2.00	0.00	-2.00
10,300.0	89.86	189.69	9,363.7	-1,145.5	-919.7	1,219.9	2.00	0.00	-2.00 -2.00
10,400.0	89.86	187.69	9,363.9	-1,145.5 -1,244.4	-919.7 -934.8	1,319.6	2.00	0.00	-2.00 -2.00
10,500.0	89.86	185.69	9,364.2	-1,244.4 -1,343.7	-934.6 -946.5	1,419.6	2.00	0.00	-2.00 -2.00
10,800.0	89.86	183.69	9,364.2	-1,343. <i>1</i> -1,443.4	-946.5 -954.7	1,419.6	2.00	0.00	-2.00 -2.00
						,			
10,800.0	89.86	181.69	9,364.7	-1,543.2	-959.4	1,619.5	2.00	0.00	-2.00
10,890.0	89.86	179.89	9,364.9	-1,633.3	-960.6	1,709.3	2.00	0.00	-2.00
	.3 hold at 1089								
10,900.0	89.86	179.89	9,364.9	-1,643.2	-960.6	1,719.2	0.00	0.00	0.00
11,000.0	89.86	179.89	9,365.1	-1,743.2	-960.4	1,818.8	0.00	0.00	0.00
11,100.0	89.86	179.89	9,365.4	-1,843.2	-960.2	1,918.5	0.00	0.00	0.00
11,200.0	89.86	179.89	9,365.6	-1,943.2	-960.0	2,018.1	0.00	0.00	0.00
11,300.0	89.86	179.89	9,365.9	-2,043.2	<b>-</b> 959.9	2,117.7	0.00	0.00	0.00
11,400.0	89.86	179.89	9,366.1	-2,143.2	-959.7	2,217.3	0.00	0.00	0.00
11,500.0	89.86	179.89	9,366.3	-2,243.2	-959.5	2,316.9	0.00	0.00	0.00
11,600.0	89.86	179.89	9,366.6	-2,343.2	-959.3	2,416.5	0.00	0.00	0.00
11,700.0	89.86	179.89	9,366.8	-2,443.2	-959.1	2,516.2	0.00	0.00	0.00
11,800.0	89.86	179.89	9,367.0	-2,543.2	-958.9	2,615.8	0.00	0.00	0.00
11,900.0	89.86	179.89	9,367.3	-2,643.2	-958.7	2,715.4	0.00	0.00	0.00
12,000.0	89.86	179.89	9,367.5	-2,743.2	-958.6	2,815.0	0.00	0.00	0.00
12,100.0	89.86	179.89	9,367.7	-2,843.2	-958.4	2,914.6	0.00	0.00	0.00
12,200.0	89.86	179.89	9,368.0	-2,943.2	-958.2	3,014.3	0.00	0.00	0.00
12,300.0	89.86	179.89	9,368.2	-3,043.2	-958.0	3,113.9	0.00	0.00	0.00
12,400.0	89.86	179.89	9.368.4	-3,143.2	-957.8	3,213.5	0.00	0.00	0.00
12,500.0	89.86	179.89	9,368.7	-3,243.2	-957.6	3,313.1	0.00	0.00	0.00
12,600.0	89.86	179.89	9,368.9	-3,343.2	-957.4	3,412.7	0.00	0.00	0.00
12,700.0	89.86	179.89	9,369.2	-3,443.2	-957.2	3,512.4	0.00	0.00	0.00
12,800.0	89.86	179.89	9,369.4	-3,543.2	-957.1	3,612.0	0.00	0.00	0.00
12,900.0	89.86	179.89	9,369.6	-3,643.2	-956.9	3,711.6	0.00	0.00	0.00
13,000.0	89.86	179.89	9,369.9	-3,743.2	-956.7	3,811.2	0.00	0.00	0.00
13,100.0	89.86	179.89	9,370.1	-3,843.2	-956.5	3,910.8	0.00	0.00	0.00
13,200.0	89.86	179.89	9,370.3	-3,943.2	-956.3	4,010.4	0.00	0.00	0.00
13,300.0	89.86	179.89	9,370.6	-4,043.2	-956.1	4,110.1	0.00	0.00	0.00
13,400.0	89.86	179.89	9,370.8	-4,143.2	-955.9	4,209.7	0.00	0.00	0.00
13,500.0	89.86	179.89	9,371.0	-4,243.2	-955.7	4,309.3	0.00	0.00	0.00
13,600.0	89.86	179.89	9,371.3	-4,343.2	-955.6	4,408.9	0.00	0.00	0.00

### **Concho Resources LLC**

Survey Report

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Site: ATLAS

Well: TOMAHAWK FEDERAL UNIT #705H

Wellbore: OWB

Design: PWP1

Local Co-ordinate Reference:

TVD Reference:

North Reference: Survey Calculation Method:

Datahase:

Well TOMAHAWK FEDERAL UNIT #705H

KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Grid

Minimum Curvature

edm

Design:	PWP1 Database				se: edm				
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)
13,700.		179.89	9,371.5	-4,443.2	-955.4	4,508.5	0.00	0.00	0.00
13,800.		179.89	9,371.7	-4,543.2	-955.2	4,608.2	0.00	0.00	0.00
13,900.		179.89	9,372.0	-4,643.2	-955.0	4,707.8	0.00	0.00	0.00
14,000.		179.89	9,372.2	-4,743.2	-954.8	4,807.4	0.00	0.00	0.00
14,100.	0 89.86	179.89	9,372.5	-4,843.2	-954.6	4,907.0	0.00	0.00	0.00
14,200.		179.89	9,372.7	-4,943.2	-954.4	5,006.6	0.00	0.00	0.00
14,300.		179.89	9,372.9	-5,043.2	-954.3	5,106.3	0.00	0.00	0.00
14,400.		179.89	9,373.2	-5,143.2	-954.1	5,205.9	0.00	0.00	0.00
14,500.		179.89	9,373.4	-5,243.2	-953.9	5,305.5	0.00	0.00	0.00
14,600.	0 89.86	179.89	9,373.6	-5,343.2	-953.7	5,405.1	0.00	0.00	0.00
14,700.		179.89	9,373.9	-5,443.2	-953.5	5,504.7	0.00	0.00	0.00
14,800.		179.89	9,374.1	-5,543.2	-953.3	5,604.3	0.00	0.00	0.00
14,900.		179.89	9,374.3	-5,643.2	-953.1	5,704.0	0.00	0.00	0.00
15,000.		179.89	9,374.6	-5,743.2	-952.9	5,803.6	0.00	0.00	0.00
15,100.	0 89.86	179.89	9,374.8	-5,843.2	-952.8	5,903.2	0.00	0.00	0.00
15,200.	0 89.86	179.89	9,375.0	-5,943.2	-952.6	6,002.8	0.00	0.00	0.00
15,300.	0 89.86	179.89	9,375.3	-6,043.2	-952.4	6,102.4	0.00	0.00	0.00
15,400.	0 89.86	179.89	9,375.5	-6,143.2	-952.2	6,202.1	0.00	0.00	0.00
15,500.	0 89.86	179.89	9,375.8	-6,243.2	-952.0	6,301.7	0.00	0.00	0.00
15,600.	0 89.86	179.89	9,376.0	-6,343.2	-951.8	6,401.3	0.00	0.00	0.00
15,700.	0 89.86	179.89	9,376.2	-6,443.2	-951.6	6,500.9	0.00	0.00	0.00
15,800.	0 89.86	179.89	9,376.5	-6,543.2	-951.4	6,600.5	0.00	0.00	0.00
15,900.		179.89	9,376.7	-6,643.2	-951.3	6,700.2	0.00	0.00	0.00
16,000.		179.89	9,376.9	-6,743.2	-951.1	6,799.8	0.00	0.00	0.00
16,100.	0 89.86	179.89	9,377.2	-6,843.2	-950.9	6,899.4	0.00	0.00	0.00
16,200.		179.89	9,377.4	-6,943.2	-950.7	6,999.0	0.00	0.00	0.00
16,300.		179.89	9,377.6	-7,043.2	-950.5	7,098.6	0.00	0.00	0.00
16,400.		179.89	9,377.9	-7,143.2	-950.3	7,198.2	0.00	0.00	0.00
16,500.		179.89	9,378.1	-7,243.2	-950.1	7,297.9	0.00	0.00	0.00
16,600.	0 89.86	179.89	9,378.4	-7,343.2	-950.0	7,397.5	0.00	0.00	0.00
16,700.		179.89	9,378.6	-7,443.2	-949.8	7,497.1	0.00	0.00	0.00
16,800.		179.89	9,378.8	-7,543.2	-949.6	7,596.7	0.00	0.00	0.00
16,900.		179.89	9,379.1	-7,643.2	-949.4	7,696.3	0.00	0.00	0.00
17,000.		179.89	9,379.3	-7,743.2	-949.2	7,796.0	0.00	0.00	0.00
17,100.	0 89.86	179.89	9,379.5	-7,843.2	-949.0	7,895.6	0.00	0.00	0.00
17,200.		179.89	9,379.8	-7,943.2	-948.8	7,995.2	0.00	0.00	0.00
17,300.		179.89	9,380.0	-8,043.2	-948.6	8,094.8	0.00	0.00	0.00
17,400.		179.89	9,380.2	-8,143.2	-948.5	8,194.4	0.00	0.00	0.00
17,500.		179.89	9,380.5	-8,243.2	-948.3	8,294.1	0.00	0.00	0.00
17,600.	0 89.86	179.89	9,380.7	-8,343.2	-948.1	8,393.7	0.00	0.00	0.00
17,700.		179.89	9,380.9	-8,443.2	-947.9	8,493.3	0.00	0.00	0.00
17,800.		179.89	9,381.2	-8,543.2	-947.7	8,592.9	0.00	0.00	0.00
17,900.		179.89	9,381.4	-8,643.2	-947.5	8,692.5	0.00	0.00	0.00
18,000.	0 89.86	179.89	9,381.7	-8,743.2	-947.3	8,792.1	0.00	0.00	0.00

### **Concho Resources LLC**

Survey Report

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Site: ATLAS

Well: TOMAHAWK FEDERAL UNIT #705H

Wellbore: OWB

Design: PWP1

Local Co-ordinate Reference:

TVD Reference:
MD Reference:
North Reference:

**Survey Calculation Method:** 

Database:

Well TOMAHAWK FEDERAL UNIT #705H

KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Grid

Minimum Curvature

edm

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)
18,100.0	89.86	179.89	9,381.9	-8,843.2	-947.2	8,891.8	0.00	0.00	0.00
18,200.0	89.86	179.89	9,382.1	-8,943.2	-947.0	8,991.4	0.00	0.00	0.00
18,300.0	89.86	179.89	9,382.4	-9,043.2	-946.8	9,091.0	0.00	0.00	0.00
18,400.0	89.86	179.89	9,382.6	-9,143.2	-946.6	9,190.6	0.00	0.00	0.00
18,500.0	89.86	179.89	9,382.8	-9,243.2	-946.4	9,290.2	0.00	0.00	0.00
18,600.0	89.86	179.89	9,383.1	-9,343.2	-946.2	9,389.9	0.00	0.00	0.00
18,700.0	89.86	179.89	9,383.3	-9,443.2	-946.0	9,489.5	0.00	0.00	0.00
18,800.0	89.86	179.89	9,383.5	-9,543.2	-945.8	9,589.1	0.00	0.00	0.00
18,900.0	89.86	179.89	9,383.8	-9,643.2	-945.7	9,688.7	0.00	0.00	0.00
19,000.0	89.86	179.89	9,384.0	-9,743.2	-945.5	9,788.3	0.00	0.00	0.00
19,100.0	89.86	179.89	9,384.2	-9,843.2	-945.3	9,888.0	0.00	0.00	0.00
19,200.0	89.86	179.89	9,384.5	-9,943.2	-945.1	9,987.6	0.00	0.00	0.00
19,300.0	89.86	179.89	9,384.7	-10,043.2	-944.9	10,087.2	0.00	0.00	0.00
19,400.0	89.86	179.89	9,385.0	-10,143.2	-944.7	10,186.8	0.00	0.00	0.00
19,500.0	89.86	179.89	9,385.2	-10,243.2	-944.5	10,286.4	0.00	0.00	0.00
19,600.0	89.86	179.89	9,385.4	-10,343.2	-944.3	10,386.0	0.00	0.00	0.00
19,700.0	89.86	179.89	9,385.7	-10,443.2	-944.2	10,485.7	0.00	0.00	0.00
19,800.0	89.86	179.89	9,385.9	-10,543.2	-944.0	10,585.3	0.00	0.00	0.00
19,900.0	89.86	179.89	9,386.1	-10,643.2	-943.8	10,684.9	0.00	0.00	0.00
20,000.0	89.86	179.89	9,386.4	-10,743.2	-943.6	10,784.5	0.00	0.00	0.00
20,100.0	89.86	179.89	9,386.6	-10,843.2	-943.4	10,884.1	0.00	0.00	0.00
20,200.0	89.86	179.89	9,386.8	-10,943.2	-943.2	10,983.8	0.00	0.00	0.00
20,267.3	89.86	179.89	9,387.0	-11,010.5	-943.1	11,050.8	0.00	0.00	0.00

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
FTP (TOMAHAWK F - plan misses targ - Circle (radius 50	get center by		9,362.0 t 9812.8usf	-505.2 ft MD (9362.3	-962.7 3 TVD, -580.	435,027.80 8 N, -762.4 E)	567,319.30	32° 11' 44.956 N	104° 6' 56.545 W
LTP (TOMAHAWK FI - plan misses targ - Point			9,387.0 0137.3usft	-10,880.5 MD (9386.7	-943.3 TVD, -10880	424,652.50 0.5 N, -943.3 E)	567,338.70	32° 10' 2.278 N	104° 6' 56.564 W
PBHL (TOMAHAWK - plan hits target - Rectangle (side	center		9,387.0 0.0)	-11,010.5	-943.1	424,522.50	567,338.90	32° 10' 0.992 N	104° 6' 56.565 W

### **Concho Resources LLC**

Survey Report

Company: NORTHERN DELAWARE BASIN

Project: EDDY COUNTY, NM

Site: ATLAS

Well: TOMAHAWK FEDERAL UNIT #705H

Wellbore: OWB

Design: PWP1

Local Co-ordinate Reference:

TVD Reference:
MD Reference:

North Reference:

**Survey Calculation Method:** 

Database:

Well TOMAHAWK FEDERAL UNIT #705H

KB=24' @ 3071.9usft (E 155) KB=24' @ 3071.9usft (E 155)

Grid

Minimum Curvature

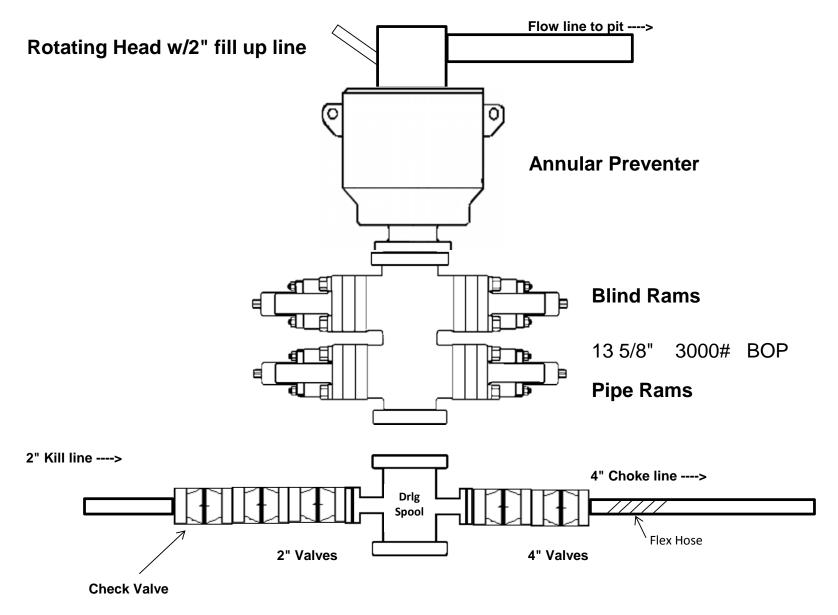
edm

Plan Annotation	ons				
	Measured	Vertical	Local Coor	dinates	
	Depth (usft)	Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
	5500	5500	0	0	Start Build 2.00
	5900	5899	0	-28	Start 2955.1 hold at 5900.0 MD
	8855	8825	0	-439	Start DLS 10.00 TFO -66.97
	9722	9362	-497	-728	Start DLS 2.00 TFO -90.02
	10,890	9365	-1633	-961	Start 9377.3 hold at 10890.0 MD
	20,267	9387	-11,011	-943	TD at 20267.3

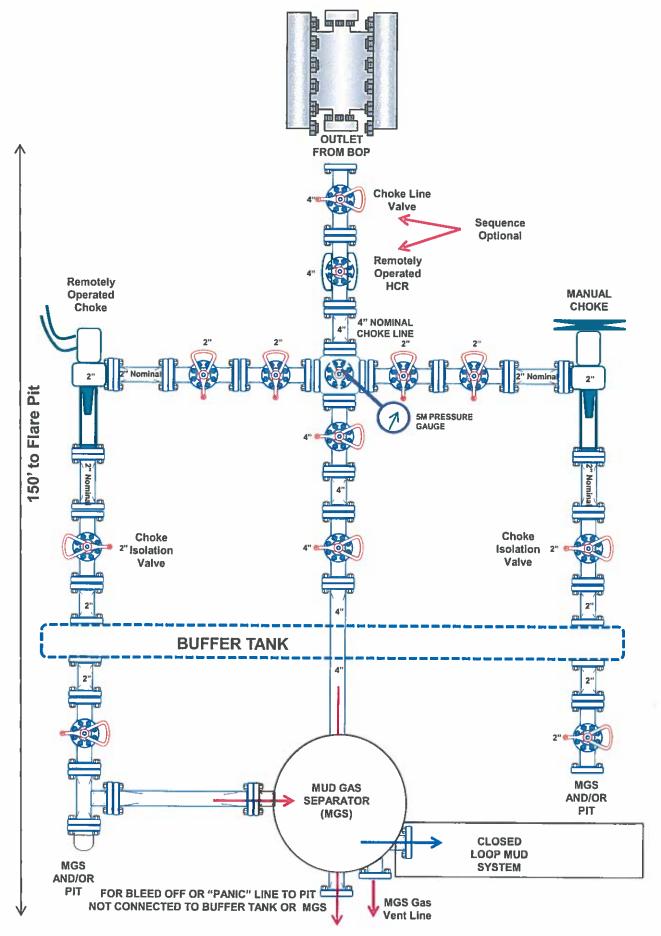
Checked By: Date:	
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**Project: EDDY COUNTY, NM** Site: ATLAS Well: TOMAHAWK FEDERAL UNIT #705H Wellbore: OWB TOMAHAWK FEDERAL UNIT 712H/PWP1 TOMAHAWK FEDERAL UNIT 713H/PWP1 TOMAHAWK FEDERAL UNIT 711H/PWI CONCHO Design: PWP1 GL: 3047.9 Start 2955.1 hold at 5900.0 MD KB=24' @ 3071.9usft (E 155) Start DLS 10.00 TFO -66.97 WELL DETAILS: TOMAHAWK FEDERAL UNIT #705H Start DLS 2.00 TFO -90.02 -175-Longitude 104° 6' 45.329 W **Easting** 435533.00 568282.00 0.0 32° 11' 49.937 N FTP (TOMAHAWK FEDERAL #705H) -350-LEASE LINE -525 HARD LINE: 10' FNL -700 **DESIGN TARGET DETAILS** -875 Longitude +E/-W Northing **Easting** Latitude 567319.30 104° 6' 56.545 W FTP (TOMAHAWK FEDERAL #705H) -962.7 435027.80 32° 11' 44.956 N 9362.0 LTP (TOMAHAWK FEDERAL #705H) 567338.70 32° 10' 2.278 N 104° 6' 56.564 W 9387.0 -10880.5 -943.3 424652.50 -1050-PBHL (TOMAHAWK 29 32 FED #705H) 9387.0 -11010.5 104° 6' 56.565 W -943.1 424522.50 567338.90 32° 10' 0.992 N -1225-10.00 -1400-Start 9377.3 hold at 10890.0 MD Start DLS 10.00 TFO -66.97 -1575 8820 8825.0 -1750--1925--2100--2275 -2450 **Measured Depth** -2625 -2800 -2975 -3325-Annotation <sup>⊨</sup>9118− -4725 Start Build 2.00 Start 2955.1 hold at 5900.0 MD Start DLS 10.00 TFO -66.97 10.00 -66.97 Start DLS 2.00 TFO -90.02 -497.1 89.86 179.89 9364.9 -1633.3 2.00 -90.02 1709.3 Start 9377.3 hold at 10890.0 MD 0.00 11050.8 TD at 20267.3 **Azimuths to Grid Nort** True North: -0.12 Magnetic North: 6.79° Magnetic Field Strength: 47585.8n Dip Angle: 59.92° Date: 3/16/2020 Model: IGRF20<sup>2</sup> -6300 Start DLS 2.00 TFO -90.02 -7000 FTP (TOMAHAWK FEDERAL #705H) -7350 -18 0 18 35 53 70 88 105 123 140 158 175 193 210 228 245 263 280 298 315 333 350 368 385 403 420 438 455 473 490 508 525 543 560 578 595 613 630 648 665 683 Vertical Section at 184.90° (35 usft/in) 5500.0 Start Build 2.00 -7875 TOMAHAWK FEDERAL UNIT 713H/PWP1 **5850** 5898.7 -8225 TOMAHAWK FEDERAL INIT #703H/PWP1 Start 2955.1 hold at 5900.0 MD -9825 -8400 -9900 -8575 Start DLS 10.00 TFO -66.97 Start Build 2.00 -9975 -10050 -8925 Start 2955.1 hold at 5900.0 MD -10125 -9100 -375 FTP (TOMAHAWK FEDERAL #705H) -10200 -9275 Start DLS 2.00 TFO -90.02 -10275 -9450 LEASE LINE **⋚**-10350− -9625 HARD LINE: 10' g-10425 -9800 **-**10500 -9975 ₹-10575<u>-</u> -825 5-10650 -10325 -10725 LTP (TOMAHAWK FEDERAL #705H) LTP (TOMAHAWK FEDERAL #705H) -10800 -10675 HARD LINE: 330' FSL HARD LINE: 330' FSL -1050 -10875 PBHL (TOMAHAWK 29 32 FED #705H TOMAHAWK FEDERAL UNIT 711H/PWF -1125 -10950-PBHL (TOMAHAWK 29 32 FED #705H) -11025 TD at 20267.3 -11200 -11025 TD at 20267. LEASE LINE TOMAHAWK FEDERAL UNIT #703 -1275 -11375 -11100 TOMAHAWK FEDERAL UNIT #705H/PWP TOMAHAWK FEDERAL UNIT #704H/PM OMAHAWK FEDERAL UNIT #704H/PWP1 TOMAHAWK FEDERAL UNIT #705H/PWP -1350--11175 -1925-1750-1575-1400-1225-1050 -875 -700 -525 -350 -175 0 175 350 525 700 875 1050 1225 1400 West(-)/East(+) (350 usft/in) LEASE LINE -11250 -450 -300 -150 0 150 300 450 Vertical Section at 184.90° (300 usft/in) -1500-1425-1350-1275-1200-1125-1050 -975 -900 -825 -750 -675 -600 -525 -450 -375 -300 -225 -150 -75 0 75 150 225 300 Start DLS 10.00 TFO -66.97 -1200-1125-1050 -975 -900 -825 -750 -675 -600 -525 -450 -375 -300 -225 -150 -75 0 75 150 225 300 375 West(-)/East(+) (150 usft/in) West(-)/East(+) (150 usft/in) TOMAHAWK FEDERAL UNIT #705H/PWP1 TOMAHAWK FEDERAL UNIT #704H/PW <del>ම</del>9200− LTP (TOMAHAWK FEDERAL #705H) PBHL (TOMAHAWK 29 32 FED #705H) Start DLS 2.00 TFO -90.02 Start 9377.3 hold at 10890.0 MD TRGT WNDW: .<u></u>9300-TD at 20267.3 9400-FTP (TOMAHAWK FEDERAL #705H) TOMAHAWK FEDERAL UNIT #705H/PWP Vertical Section at 184.90° (300 usft/in)

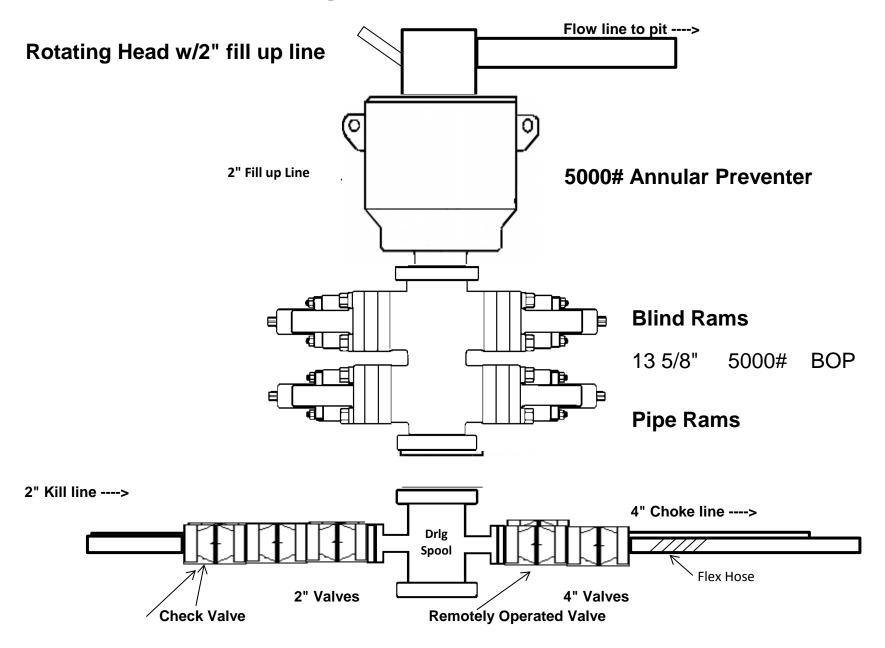
### 3,000 psi BOP Schematic



### 3M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)

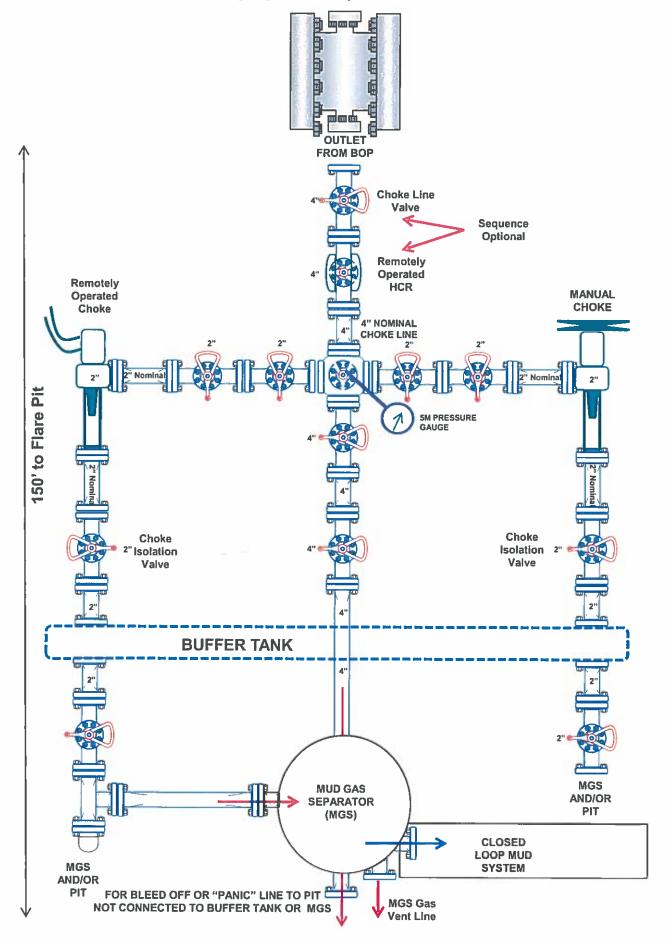


### 5,000 psi BOP Schematic



•			

### 5M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)





#### ContiTech

QUALITY CONTROL	No.: QC-DB- 351 / 2016				
2	Page: 1 / 88				
Hose No.:	Revision: 0				
72879	Date: 05. September 2016.				
	Prepared by : Nohut Vi Eolo				
	Appr. by:				

# CHOKE AND KILL HOSE

id.: 3" 69 MPa x 13,72 m (45 ft)

# DATA BOOK

Purchaser: SCANDRILL

Purchaser Order No.: 143799

ContiTech Rubber Order No.: 543951

ContiTech Oil & Marine Corp. Order No.: 4500795683 COM880841

NOT DESIGNED FOR WELL TESTING



CONTITECH RUBBER Industrial Kft.

No: QC-DB- 351 / 2016

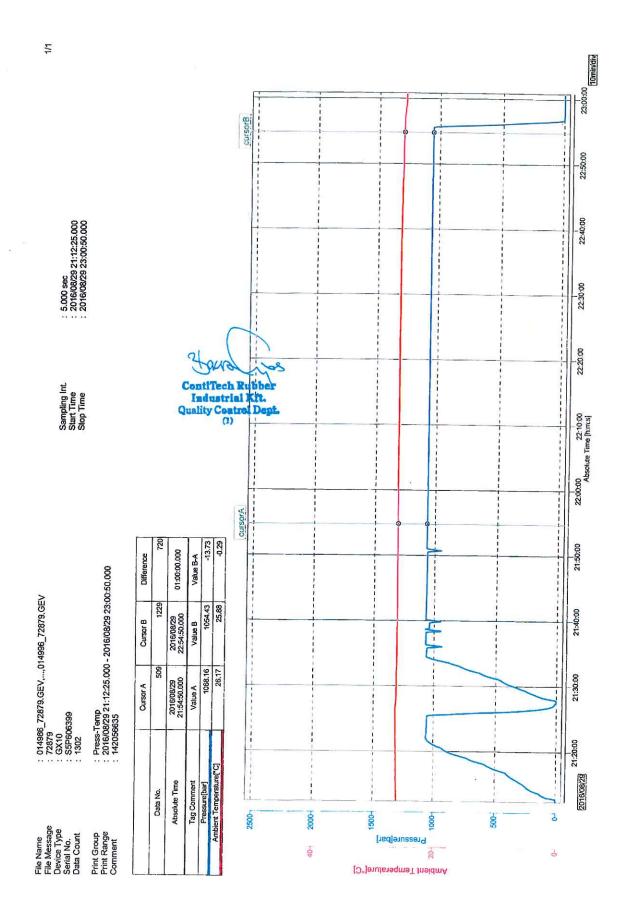
Page: 5 / 88

### ContiTech

X				·	-14				
QUAL INSPECTION	ITY CON		<b>TE</b>	CERT. N	<b>1</b> °:	1050			
PURCHASER:	ContiTech	Oil & Marine Co	orp.	P.O. N°:		4500795683			
CONTITECH RUBBER order N°	543951	HOSE TYPE:	3" ID		Choke and	d Kill Hose			
HOSE SERIAL N°:	72879	NOMINAL / ACTO	JAL LENGT	H:	13,72 m	n / 13,80 m			
W.P. 69,0 MPa 10	0000 psi	T.P. 103,5	MPa 150	000 psi	Duration:	60	min.		
Pressure test with water at ambient temperature  See attachment (1 page)									
COUPLINGS Typ	e	Serial N	0	Qu	ality	Heat N°			
3" coupling with	)	2587		AISI	4130	J5251			
3 1/16" 10K API Swivel F	lange end			AISI 4130		036809			
Hub				AISI 4130		J6433			
3" coupling with	1	2584		AISI 4130		J5251			
3 1/16" 10K API b.w. Fla	ange end			AISI	AISI 4130				
Not Designed For Well Testing  API Spec 16 C 2 <sup>nd</sup> Edition- FSL2  Temperature rate:"B"									
All metal parts are flawless  WE CERTIFY THAT THE ABOVE INSPECTED AND PRESSURE TO	HOSE HAS BE	EN MANUFACTURI	ED IN ACCOR	DANCE WIT	H THE TERM	S OF THE ORDER			
INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.  STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.  COUNTRY OF ORIGIN HUNGARY/EU									
Date:    Contilect Rubber Industrial Kr. Quality Control Dept. (1)   Part of the Police (1)   Pa						<b>~</b>			

ATTACHMENT OF QUALITY CONTROL INSPECTION AND TEST CERTIFICATE No: 1050

CONTITECH RUBBER No: QC-DB- 351 / 2016 Industrial Kft. Page: 6 / 88





CONTITECH RUBBER Industrial Kft.

No: QC-DB- 351 / 2016

Page:

7/88

ContiTech

### **Hose Data Sheet**

CRI Order No.	543951
Customer	ContiTech Oil & Marine Corp.
Customer Order No	4500795683 COM880841
Item No.	1
Hose Type	Flexible Hose
Standard	API SPEC 16C 2ND EDITION FSL2
Inside dia in inches	3
Length	45 ft
Type of coupling one end	FLANGE 3.1/16" 10K API SPEC 6A TYPE 6BX, BUTT WELDED, BX154ST.ST. LINED R.GR. SOUR
Type of coupling other end	FLANGE 3.1/16" 10K API SPEC 17D SV SWIVEL FLANGE, BX154 ST.ST. LINED R.GR. SOUR
H2S service NACE MR0175	Yes
Working Pressure	10 000 psi
Design Pressure	10 000 psi
Test Pressure	15 000 psi
Safety Factor	2,25
Marking	CONTINENTAL CONTITECH
Cover	NOT FIRE RESISTANT
Outside protection	St.steel outer wrap
Internal stripwound tube	No
Lining	OIL + GAS RESISTANT SOUR
Safety clamp	Yes
Lifting collar	Yes
Element C	Yes
Safety chain	Yes
Safety wire rope	No
Max.design temperature [°C]	100
Min.design temperature [°C]	-20
Min. Bend Radius operating [m]	0,90
Min. Bend Radius storage [m]	0,90
Electrical continuity	The Hose is electrically continuous
Type of packing	WOODEN CRATE ISPM-15

ontiTech Rubber Industrial Kft. QC 2

Printed: TIRETECH2\SzaboS1 - 2016.08.16 09:18:43



### ContiTech Fluid Technology

ContiTech Oil & Marine Corp. # 11535	Brittmoore Park Dr., Houston, TX 77041-6916 USA	Delivery Note			
Offit ect Off & Marine Corp. # 11000		Document No.	83352143		
ScanDrill Inc.		Document Date	10/05/2016		
9395 HWY 2767		<b>Customer Number</b>	15483		
TYLER TX 75708		Customer VAT No.			
		Supplier Number	/ / 0 0 0 0 0 0 0		
		N° EORI:	FR41027953300021		
		Purchase Order No.			
- (D.) Chi		Purchase Order Date			
Transport-Details - Ship	oping	Sales Order Number			
		Sales Order Date	07/05/2016		
		Unloading Point			
Conditions		Page 1 of 3			
Shipping Conditions	0 days				
Inco Terms	EXW Houston, TX	-Weights (Gross / Net)			
11100 1011110	Ex Works	Total Weight	2,323 LB		
		Net Weight	1,643 LB		

Buyer: Joe Ward

E-mail: jward@scandrill.com

Tel: 903.597.5368

Payment Terms:

50% Due at order Placement 50% Due Prior to Dispatch

Rev 01 - 092116 - Sales Tax added to the order.

Item	Material/Description	Qu	antity	Weig	ht
10	HCK3FA45IPSIVS	1	PC	1,643	LB
	3" x 45ft, Choke and Kill Hose, WP 10K				
	End A: 3.1/16" 10K Flange, API Spec. 6A Type 6BX, Butt Welded, BX154				
	Stainless Steel 316 Lined Ring Groove - Sour				
	End B: 3.1/16" 10K Flange, API Spec 17D SV Swivel Flange, BX154				
	Stainless Steel 316 Lined Ring Groove - Sour				
	Standard: API SPEC 16C 2ND EDITION FSL2 - Monogrammed				
	Working Pressure: 10000 psi				
	Test Pressure: 15000 psi				
	Fire Rated: No				
	Armoured: Yes - Stainless Steel 316L Interlock				
	Design Temperature: -20 to 100°C				
	High Temperature Exposure / Survival @ 177 Deg C (internal in a kick				
	situation) As Per API 16C B.12.5!				

# **Ontinental**

#### **ContiTech Fluid Technology**

Conditions

**Shipping Conditions** 

Inco Terms

0 days

EXW Houston, TX

Ex Works

**Delivery Note** 

Document No.

83352143

**Document Date** 

10/05/2016

Page 2 of 3

Brand Name: Continental ContiTech

serial no:72879

Supplied with:

2 x Safety Clamps

2 x Lifting Collars Double Eyed

2 x Safety Chains c/w Shackles Each End x 8ft

Packing to ISPM-15 Heat Treated Packing type: Wooden Crate, Gross weight: 1056 kg / 2323 lbs

Dimensions: 2870 x 640 x 2800 mm (L x W x H)

113 x 25.2 x 110.2 inch

To be handled/shipped in a vertical position

HTS# 4009.42.0050 ECCN: EAR99 COO: Hungary

20 00TAX-SALES

SALES TAX %8.25

Buyer: Joe Ward

E-mail: jward@scandrill.com

Tel: 903.597.5368

Payment Terms:

50% Due at order Placement 50% Due Prior to Dispatch

Rev 01 - 092116 - Sales Tax added to the order.

Order/Item 880841/20 07/05/2016

Customer's PO no./item 143799

Inner packages

1 PC

0 LB



### ContiTech Fluid Technology

	Delivery Note			
0 days EXW Houston, TX Ex Works	Document No. Document Date Page 3 o	83352143 10/05/2016 of 3		
	EXW Houston, TX	0 days EXW Houston, TX Document No. Document Date		

Quantity Packaging Material Charge
1 113 X 25.2 X 110.2 INCH -Wooden crate HCK3FA45IPSIVS 1

Package number 118448718

(3) Delivery note no. 83352143  (8) Supplier ref. no.	(4) Vendor address (short name, plant, ZiP, city) Contilech Oil & Marine Corp. 11535 Brittmoore Park Drive Houston TX 77041-6916
(9) Quantity SM: 72879	(5) Not weight 1,643 LB (6) Gross weight 2,323 LB (7) Number of packages (10) Description of delivery, service
	(13) Packing date (14) Engineering change status 10/07/16
(15) Package no. 118448718	(16) Customer Po no. 143799

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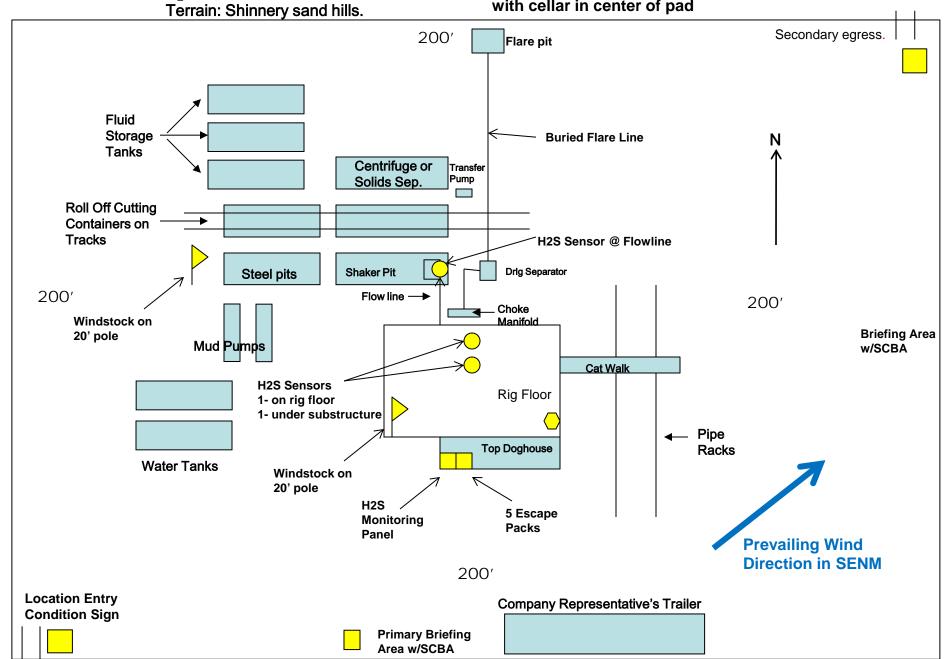
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COG Operating LLC
H<sub>2</sub>S Equipment Schematic
Terrain: Shippery sand hills

Well pad will be 400' x 400' with cellar in center of pad



### COG OPERATING LLC HYDROGEN SULFIDE DRILLING OPERATIONS PLAN

### 1. <u>HYDROGEN SULFIDE TRAINING</u>

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<sub>2</sub>S).
- b. The proper use and maintenance of personal protective equipment and life support systems.
- c. The proper use of H<sub>2</sub>S 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<sub>2</sub>S 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. <u>H<sub>2</sub>S SAFETY EQUIPMENT AND SYSTEMS</u>

Note: All H<sub>2</sub>S 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<sub>2</sub>S 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

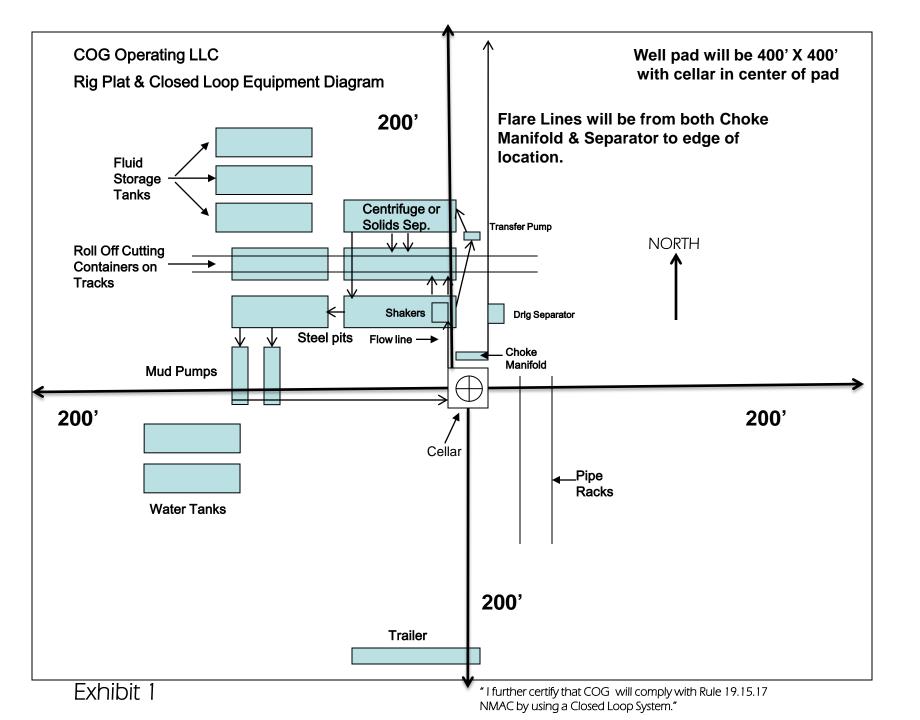
1-575-748-6940

### **EMERGENCY CALL LIST**

	<u>OFFICE</u>	<u>MOBILE</u>
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**

	<u>OFFICE</u>
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



Surface Use Plan COG Operating LLC Tomahawk Federal Unit 705H SHL: 500' FSL & 1588' FWL

Section 20, T24S, R28E BHL: 200' FSL & 622' FWL

Section 32, T24S, R28E Eddy County, New Mexico UL N

UL M

# **Surface Use & Operating Plan**

### Tomahawk Federal Unit 705H

- Surface Owner: Pecos Valley Artesian Conservancy District, whose address is P.O. Box 1346, Roswell, NM 88202-1346
- Bureau of Land Management
- New Road: 1303.4'
- Flow Line: 4471.4'
- Gas Line: 4506.2'
- Power Line: 3810.3'
- Tank Battery Facilities: Will utilize the Tomahawk Federal Unit 20 O CTB located in Section 20. T24S. R28E.
- Well Pad: Multiple. Tomahawk Federal Unit 703H, 704H and 705H share a well pad.

### **Well Site Information**

- V Door: East
- Topsoil: North
- Interim Reclamation: North

SHL: 500' FSL & 1588' FWL UL N

Section 20, T24S, R28E

BHL: 200' FSL & 622' FWL UL M

Section 32, T24S, R28E Eddy County, New Mexico

### **Attachments**

- C102
- Closed Loop System
- Layout
- CTB Layout and Flowlines
- Brine H20
- Fresh H2O
- Existing Roads
- 1Mile Map and Data
- Maps and Plats
- Well Site Layout
- Reclamation

### Notes

**Onsite**: On-site was done by Gerald Herrera (COG); Zane Kirsch (BLM); on February 13<sup>th</sup>, 2020.

SHL: 500' FSL & 1588' FWL UL N

Section 20, T24S, R28E

BHL: 200' FSL & 622' FWL UL M

Section 32, T24S, R28E Eddy County, New Mexico

### SURFACE USE AND OPERATING PLAN

### 1. Existing & Proposed Access Roads

- A. The well site survey and elevation plat for the proposed well is attached with this application. It was staked by Harcrow Surveying, Artesia, NM.
- B. All roads to the location are shown on the maps and road plats. The existing lease roads are illustrated and are adequate for travel during drilling and production operations. Upgrading existing roads prior to drilling the well will be done where necessary. The road route to the well site is depicted in well layout map. The road shown in the well layout will be used to access the well.
- C. Directions to location: See 600 x 600 plat
- D. Based on current road maintenance performed on other roads serving existing wells, we anticipate maintaining the lease roads leading to the proposed well pad at least once a year on dry conditions and twice a year in wetter conditions.

### 2. Proposed Access Road:

The Location Verification Map shows that 1303.4' of new road will be required for this location. If any road is required, it will be constructed as follows:

The maximum width of the running surface will be 14'. The road will be crowned, ditched and constructed of 6" rolled and compacted caliche. Ditches will be at 3:1 slope and 4 feet wide. Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns.

- A. The average grade will be less than 1%.
- B. No turnouts are planned.
- C. No cattleguard, culvert, gates, low water crossings or fence cuts are necessary.
- D. Surfacing material will consist of native caliche. Caliche will be obtained from the actual well site if available. If not available onsite, caliche will be obtained from Hayhurst caliche pit located in Section 32, T24S, R28E.

SHL: 500' FSL & 1588' FWL UL N

Section 20, T24S, R28E

BHL: 200' FSL & 622' FWL UL M

Section 32, T24S, R28E Eddy County, New Mexico

### 3. Location of Existing Well:

The One-Mile Radius Map shows existing wells within a one-mile radius of the proposed wellbore.

#### 4. Location of Existing and/or Proposed Facilities:

- A. COG Operating LLC does not operate an oil production facility on this lease.
  - 1) The new Tomahawk Fed Unit 20 O Central Tank Battery (CTB) proposed in Sec. 20, T24S, R28E will be utilized for the production of 10 Wolfcamp wells. Each well head will be connected to a buried 4" FP 601HT that will be used to carry oil, water and gas production from each wellhead to the inlet manifold of the CTB; the route for these flowlines will follow the flowline corridor route as shown in the exhibit drawing and in the attached plats. Additionally, each well pad will have one buried 6" FP 150 line for gas lift supply from the CTB; the route for this gas lift line will start on the CTB pad where designated by "gas line" in the exhibit drawing and then following the flowline corridor in the attached plats.
  - 2) The tank battery and facilities including all flow lines and piping will be installed according to API specifications.
  - 3) Any additional caliche will be obtained from the actual well site. If caliche does not exist or is not plentiful from the well site, caliche will be obtained from Hayhurst caliche pit located in Section 32 T24S, R28E. Any additional construction materials will be purchased from contractors.
  - 4) It will be necessary to run electric power if this well is productive. Power will be provided by Xcel Energy and they will submit a separate plan and ROW for service to the well location.
  - 5) If the well is productive, rehabilitation plans will include the following:
  - The original topsoil from the well site will be returned to the location, and the site will be re-contoured as close as possible to the original site.

SHL: 500' FSL & 1588' FWL UL N

Section 20, T24S, R28E

BHL: 200' FSL & 622' FWL UL M

Section 32, T24S, R28E Eddy County, New Mexico

### 5. Location and Type of Water Supply:

The well will be drilled with combination brine and fresh water mud system as outlined in the drilling program. Fresh water will be obtained from the Bongo Frac Pond located in Section 13. T24S. R28E. Brine water will be obtained from the Malaga I Brine station in Section 2. T21S. R25E., or if necessary commercial water stations in the area and hauled to location by transport truck over the existing and proposed access roads shown in road maps. If a commercial fresh water source is nearby, fast line may be laid along existing road ROW's and fresh water pumped to the well. No water well will be drilled on the location.

#### 6. Source of Construction Materials and Location "Turn-Over" Procedure:

Obtaining caliche: One primary way of obtaining caliche to build locations and roads will be by "turning over" the location. This means, caliche will be obtained from the actual well site. Amount will vary for each pad. The procedure below has been approved by BLM personnel:

- A. The top 6 inches of topsoil is pushed off and stockpiled along the side of the location.
- B. An approximate 160' X 160' area is used within the proposed well site to remove caliche.
- C. Subsoil is removed and stockpiled within the surveyed well pad.
- D. When caliche is found, material will be stock piled within the pad site to build the location and road.
- E. Then subsoil is pushed back in the hole and caliche is spread accordingly across entire location and road.
- F. Once well is drilled, the stock piled top soil will be used for interim reclamation and spread along areas where caliche is picked up and the location size is reduced.
- G. Neither caliche, nor subsoil will be stock piled outside of the well pad. Topsoil will be stockpiled along the edge of the pad as depicted in the Well Site Layout or survey plat.

In the event that no caliche is found onsite, the caliche will be caliche will be obtained from Hayhurst caliche pit located in Section 32, T24S, R28E.

SHL: 500' FSL & 1588' FWL UL N

Section 20, T24S, R28E

BHL: 200' FSL & 622' FWL UL M

Section 32, T24S, R28E Eddy County, New Mexico

### H. Methods of Handling Water Disposal:

- A. The well will be drilled utilizing a closed loop mud system. Drill cuttings will be held in roll-off style mud boxes and taken to R360's disposal site.
- B. Drilling fluids will be contained in steel mud pits.
- C. Water produced from the well during completion will be held temporarily in steel tanks and then taken to an NMOCD approved commercial disposal facility.
- D. It is anticipated that the disposal of produced water will be trucked to the turquoise 30 Federal 1 SWD Section 30, T24S, R32E., or Gold Coast 26 Federal SWD #1 Section 26, T24S, R32E. Might also be trucked to unspecified commercial SWD wells in this area.
- E. Garbage and trash produced during drilling or completion operations will be collected in a trash bin and hauled to an approved landfill. No toxic waste or hazardous chemicals will be produced by this operation.
- F. Human waste and grey water will need to be properly contained and disposed of. Proper disposal and elimination of waste and grey water may include but are not limited to portable septic systems and/or portable waste gathering systems (i.e. portable toilets).
- G. After the rig is moved out and the well is either completed or abandoned, all waste materials will be cleaned up within 30 days. In the event of a dry hole only a dry hole marker will remain.

#### 7. Ancillary Facilities:

No airstrip, campsite or other facilities will be built as a result of the operation on this well.

#### 8. Well Site Layout:

- A. The drill pad layout, with elevations staked by Harcrow Surveying, is shown in the Elevation Plat. Dimensions of the pad and pits are shown on the Rig Layout. V door direction is East. Topsoil, if available, will be stockpiled per BLM specifications. Because the pad is almost level no major cuts will be required.
- B. The Rig Layout Closed-Loop exhibit shows the proposed orientation of closed loop system and access road. No permanent living facilities are planned, but a temporary foreman/toolpusher's trailer will be on location during the drilling operations.

SHL: 500' FSL & 1588' FWL UL N

Section 20, T24S, R28E

BHL: 200' FSL & 622' FWL UL M

Section 32, T24S, R28E Eddy County, New Mexico

#### 9. Plans for Restoration of the Surface:

A. Interim Reclamation will take place after the well has been completed. The pad will be downsized by reclaiming the areas not needed for production operations. The portions of the pad that are not needed for production operations will be re-contoured to its original state as much as possible. The caliche that is removed will be reused to either build another pad site or for road repairs within the lease. The stockpiled topsoil will then be spread out reclaimed area and reseeded with a BLM approved seed mixture. In the event that the well must be worked over or maintained, it may be necessary to drive, park, and/or operate machinery on reclaimed land. This area will be repaired or reclaimed after work is complete.

#### 10. Sedimentation and Erosion Control

Immediately following construction, straw waddles will be placed as necessary at the well site to reduce sediment impacts to fragile/sensitive soils.

B. Final Reclamation: Upon plugging and abandoning the well all caliche for well pad and lease road will be removed and surface will be recountoured to reflect its surroundings as much as possible. Caliche will be recycled for road repair or reused for another well pad within the lease. If any topsoil remains, it will be spread out and the area will be reseded with a BLM approved mixture and re-vegetated as per BLM orders. When required by BLM, the well pad site will be restored to match pre-construction grades.

### 11. Surface Ownership:

The surface is owned by the Pecos Valley Artesian Conservancy District, whose address is P.O. Box 1346, Roswell, NM 88202-1346.. The surface is multiple uses with the primary uses of the region for grazing of livestock and the production of oil and gas. The surface owner was notified before staking this well.

A. The proposed road routes and surface location will be restored as directed by the BLM.

#### 12. Other Information:

A. The area around the well site is grassland and the topsoil is sandy. The vegetation is moderately sparse with native prairie grasses, some mesquite and shinnery oak. No wildlife was observed but it is likely that mule deer, rabbits, coyotes and rodents traverse the area.

SHL: 500' FSL & 1588' FWL UL N

Section 20, T24S, R28E

BHL: 200' FSL & 622' FWL UL M

Section 32, T24S, R28E Eddy County, New Mexico

- B. There is no permanent or live water in the immediate area.
- C. There are no dwellings within 2 miles of this location.
- D. If needed, a Cultural Resources Examination is being prepared by Boone Arch Services of NM, LLC., 2030 North Canal, Carlsbad, New Mexico, 88220, phone number 575-885-1352 and the results will be forwarded to your office in the near future. Otherwise, COG will be participating in the Permian Basin MOA Program.

### 13. Bond Coverage:

Seth Wild

Bond Coverage is Statewide Bonds # NMB000740 and NMB000215

### 14. Lessee's and Operator's Representative:

The COG Operating LLC representative responsible for assuring compliance with the surface use plan is as follows:

Ray Peterson

Drilling Superintendent

COG Operating LLC

One Concho Center

600 W Illinois Ave

Midland, TX 79701

(432) 221-0414 (office)

(432) 525-3633(cell)

Drilling Manager

COG Operating LLC

One Concho Center

600 W Illinois Ave

Midland, TX 79701

Midland, TX 79701

Phone (432) 685-4304 (office)

(432) 818-2254 (business)