

**EOG RESOURCES, INC.**  
**NAUTILUS 16 FED COM NO. 701H**

**1. GEOLOGIC NAME OF SURFACE FORMATION:**

Permian

**2. ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:**

Rustler	670'
Top of Salt	1,260'
Base of Salt / Top Anhydrite	5,110'
Base Anhydrite	5,325'
Lamar	5,325'
Bell Canyon	5,358'
Cherry Canyon	6,395'
Brushy Canyon	8,104'
Bone Spring Lime	9,604'
1 <sup>st</sup> Bone Spring Sand	10,598'
2 <sup>nd</sup> Bone Spring Shale	10,785'
2 <sup>nd</sup> Bone Spring Sand	11,121'
3 <sup>rd</sup> Bone Spring Carb	11,585'
3 <sup>rd</sup> Bone Spring Sand	12,190'
Wolfcamp	12,617'
TD	12,785'

**3. ESTIMATED DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS:**

Upper Permian Sands	0- 400'	Fresh Water
Cherry Canyon	6,395'	Oil
Brushy Canyon	8,104'	Oil
1 <sup>st</sup> Bone Spring Sand	10,598'	Oil
2 <sup>nd</sup> Bone Spring Shale	10,785'	Oil
2 <sup>nd</sup> Bone Spring Sand	11,121'	Oil
3 <sup>rd</sup> Bone Spring Carb	11,585'	Oil
3 <sup>rd</sup> Bone Spring Sand	12,190'	Oil
Wolfcamp	12,617'	Oil

No other Formations are expected to give up oil, gas or fresh water in measurable quantities. Surface fresh water sands will be protected by setting 10.75" casing at 695' and circulating cement back to surface.

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**4. CASING PROGRAM - NEW**

Hole Size	Interval	Csg OD	Weight	Grade	Conn	DF <sub>min</sub> Collapse	DF <sub>min</sub> Burst	DF <sub>min</sub> Tension
14.75"	0 – 695'	10.75"	40.5#	J55	STC	1.125	1.25	1.60
9.875"	0 – 1,000'	7.625"	29.7#	HCP-110	LTC	1.125	1.25	1.60
9.875"	1,000' – 3,000'	7.625"	29.7#	P-110EC	SLIJ II	1.125	1.25	1.60
8.75"	3,000' – 11,700'	7.625"	29.7#	HCP-110	FlushMax III	1.125	1.25	1.60
6.75"	0' – 11,200'	5.5"	20#	P-110EC	DWC/C-IS MS	1.125	1.25	1.60
6.75"	11,200'–20,243'	5.5"	20#	P-110EC	VAM SFC	1.125	1.25	1.60

Variance is requested to wave the centralizer requirements for the 7-5/8" FJ casing in the 8-3/4" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 8-3/4" hole interval to maximize cement bond and zonal isolation.

Variance is also requested to wave any centralizer requirements for the 5-1/2" FJ casing in the 6-3/4" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 6-3/4" hole interval to maximize cement bond and zonal isolation.

**Cementing Program:**

Depth	No. Sacks	Wt. ppg	Yld Ft <sup>3</sup> /ft	Mix Water Gal/sk	Slurry Description
10-3/4" 695'	325	13.5	1.73	9.13	Class C + 4.0% Bentonite + 0.6% CD-32 + 0.5% CaCl <sub>2</sub> + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	200	14.8	1.34	6.34	Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate
7-5/8" 11,700'	250	14.8	1.38	6.48	Class C + 5% Gypsum + 3% CaCl <sub>2</sub> pumped via Bradenhead (TOC @ Surface)
	2000	14.8	1.38	6.48	Class C + 5% Gypsum + 3% CaCl <sub>2</sub> pumped via Bradenhead
	550	14.4	1.20	4.81	50:50 Class H:Poz + 0.25% CPT20A + 0.40% CPT49 + 0.20% CPT35 + 0.80% CPT16A + 0.25% CPT503P pumped Conventionally
5-1/2" 20,243'	850	14.1	1.26	5.80	Class H + 0.1% C-20 + 0.05% CSA-1000 + 0.20% C-49 + 0.40% C-17 (TOC @ 11,200')

Note: Cement volumes based on bit size plus at least 25% excess in the open hole plus 10% excess in the cased-hole overlap section.

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**5. MINIMUM SPECIFICATIONS FOR PRESSURE CONTROL:**

Variance is requested to use a co-flex line between the BOP and choke manifold (instead of using a 4" OD steel line).

The minimum blowout preventer equipment (BOPE) shown in Exhibit #1 will consist of a single ram, mud cross and double ram-type (10,000 psi WP) preventer and an annular preventer (5000-psi WP). Both units will be hydraulically operated and the ram-type will be equipped with blind rams on bottom and drill pipe rams on top. All BOPE will be tested in accordance with Onshore Oil & Gas order No. 2.

Before drilling out of the surface casing, the ram-type BOP and accessory equipment will be tested to 5000/ 250 psig and the annular preventer to 3500/ 250 psig. The surface casing will be tested to 1500 psi for 30 minutes.

Before drilling out of the intermediate casing, the ram-type BOP and accessory equipment will be tested to 5000/ 250 psig and the annular preventer to 3500/ 250 psig. The intermediate casing will be tested to 2000 psi for 30 minutes.

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.

A hydraulically operated choke will be installed prior to drilling out of the intermediate casing shoe.

**6. TYPES AND CHARACTERISTICS OF THE PROPOSED MUD SYSTEM:**

During this procedure we plan to use a Closed-Loop System and haul contents to the required disposal.

The applicable depths and properties of the drilling fluid systems are as follows.

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0 – 695'	Fresh - Gel	8.6-8.8	28-34	N/c
695' – 11,700'	Brine	8.8-10.0	28-34	N/c
11,700' – 20,243' Lateral	Oil Base	10.0-14.0	58-68	3 - 6

The highest mud weight needed to balance formation is expected to be 11.5 ppg. In order to maintain hole stability, mud weights up to 14.0 ppg may be utilized.

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An electronic pit volume totalizer (PVT) will be utilized on the circulating system, to monitor pit volume, flow rate, pump pressure and stroke rate.

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

**7. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT:**

- (A) A kelly cock will be kept in the drill string at all times.
- (B) A full opening drill pipe-stabbing valve (inside BOP) with proper drill pipe connections will be on the rig floor at all times.
- (C) H<sub>2</sub>S monitoring and detection equipment will be utilized from surface casing point to TD.

**8. LOGGING, TESTING AND CORING PROGRAM:**

Open-hole logs are not planned for this well.

GR-CCL Will be run in cased hole during completions phase of operations.

**9. ABNORMAL CONDITIONS, PRESSURES, TEMPERATURES AND POTENTIAL HAZARDS:**

The estimated bottom-hole temperature (BHT) at TD is 181 degrees F with an estimated maximum bottom-hole pressure (BHP) at TD of 7645 psig (based on 11.5 ppg MW). No hydrogen sulfide or other hazardous gases or fluids have been encountered, reported or are known to exist at this depth in this area. Severe loss circulation is expected from 7,300' to Intermediate casing point.

**10. ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS:**

The drilling operation should be finished in approximately one month. If the well is productive, an additional 60-90 days will be required for completion and testing before a decision is made to install permanent facilities.

- (A) EOG Resources requests the option to contract a Surface Rig to drill, set surface casing, and cement on the subject well. If the timing between rigs is such that EOG Resources would not be able to preset the surface, the Primary Rig will MIRU and drill the well in its entirety per the APD.

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**11. WELLHEAD:**

A multi-bowl wellhead system will be utilized.

After running the 10-3/4" surface casing, a 13-5/8" BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi pressure test. This pressure test will be repeated at least every 30 days, as per Onshore Order No. 2

The minimum working pressure of the BOP and related BOPE required for drilling below the surface casing shoe shall be 5000 psi.

The multi-bowl wellhead will be installed by vendor's representative(s). A copy of the installation instructions for the Stream Flo FBD100 Multi-Bowl WH system has been sent to the NM BLM office in Carlsbad, NM.

The wellhead will be installed by a third party welder while being monitored by WH vendor's representative.

All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type.

A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

Both the surface and intermediate casing strings will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater.

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Variance is also requested to wave any centralizer requirements for the 5-1/2" FJ casing in the 6-3/4" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 6-3/4" hole interval to maximize cement bond and zonal isolation.

**Cementing Program:**

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The multi-bowl wellhead will be installed by vendor's representative(s). A copy of the installation instructions for the Stream Flo FBD100 Multi-Bowl WH system has been sent to the NM BLM office in Carlsbad, NM.

The wellhead will be installed by a third party welder while being monitored by WH vendor's representative.

All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type.

A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

Both the surface and intermediate casing strings will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater.

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Variance is also requested to wave any centralizer requirements for the 5-1/2" FJ casing in the 6-3/4" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 6-3/4" hole interval to maximize cement bond and zonal isolation.

**Cementing Program:**

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- (C) H<sub>2</sub>S monitoring and detection equipment will be utilized from surface casing point to TD.

**8. LOGGING, TESTING AND CORING PROGRAM:**

Open-hole logs are not planned for this well.

GR-CCL Will be run in cased hole during completions phase of operations.

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**EOG RESOURCES, INC.**  
**NAUTILUS 16 FED COM NO. 701H**

**11. WELLHEAD:**

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The minimum working pressure of the BOP and related BOPE required for drilling below the surface casing shoe shall be 5000 psi.

The multi-bowl wellhead will be installed by vendor's representative(s). A copy of the installation instructions for the Stream Flo FBD100 Multi-Bowl WH system has been sent to the NM BLM office in Carlsbad, NM.

The wellhead will be installed by a third party welder while being monitored by WH vendor's representative.

All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type.

A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

Both the surface and intermediate casing strings will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater.



**EOG RESOURCES, INC.**  
**NAUTILUS 16 FED COM NO. 701H**

**1. GEOLOGIC NAME OF SURFACE FORMATION:**

Permian

**2. ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:**

Rustler	670'
Top of Salt	1,260'
Base of Salt / Top Anhydrite	5,110'
Base Anhydrite	5,325'
Lamar	5,325'
Bell Canyon	5,358'
Cherry Canyon	6,395'
Brushy Canyon	8,104'
Bone Spring Lime	9,604'
1 <sup>st</sup> Bone Spring Sand	10,598'
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2 <sup>nd</sup> Bone Spring Sand	11,121'
3 <sup>rd</sup> Bone Spring Carb	11,585'
3 <sup>rd</sup> Bone Spring Sand	12,190'
Wolfcamp	12,617'
TD	12,785'

**3. ESTIMATED DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS:**

Upper Permian Sands	0- 400'	Fresh Water
Cherry Canyon	6,395'	Oil
Brushy Canyon	8,104'	Oil
1 <sup>st</sup> Bone Spring Sand	10,598'	Oil
2 <sup>nd</sup> Bone Spring Shale	10,785'	Oil
2 <sup>nd</sup> Bone Spring Sand	11,121'	Oil
3 <sup>rd</sup> Bone Spring Carb	11,585'	Oil
3 <sup>rd</sup> Bone Spring Sand	12,190'	Oil
Wolfcamp	12,617'	Oil

No other Formations are expected to give up oil, gas or fresh water in measurable quantities. Surface fresh water sands will be protected by setting 10.75" casing at 695' and circulating cement back to surface.

**EOG RESOURCES, INC.**  
**NAUTILUS 16 FED COM NO. 701H**

**4. CASING PROGRAM - NEW**

Hole Size	Interval	Csg OD	Weight	Grade	Conn	DF <sub>min</sub> Collapse	DF <sub>min</sub> Burst	DF <sub>min</sub> Tension
14.75"	0 – 695'	10.75"	40.5#	J55	STC	1.125	1.25	1.60
9.875"	0 – 1,000'	7.625"	29.7#	HCP-110	LTC	1.125	1.25	1.60
9.875"	1,000' – 3,000'	7.625"	29.7#	P-110EC	SLIJ II	1.125	1.25	1.60
8.75"	3,000' – 11,700'	7.625"	29.7#	HCP-110	FlushMax III	1.125	1.25	1.60
6.75"	0' – 11,200'	5.5"	20#	P-110EC	DWC/C-IS MS	1.125	1.25	1.60
6.75"	11,200'-20,243'	5.5"	20#	P-110EC	VAM SFC	1.125	1.25	1.60

Variance is requested to wave the centralizer requirements for the 7-5/8" FJ casing in the 8-3/4" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 8-3/4" hole interval to maximize cement bond and zonal isolation.

Variance is also requested to wave any centralizer requirements for the 5-1/2" FJ casing in the 6-3/4" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 6-3/4" hole interval to maximize cement bond and zonal isolation.

**Cementing Program:**

Depth	No. Sacks	Wt. ppg	Yld Ft <sup>3</sup> /ft	Mix Water Gal/sk	Slurry Description
10-3/4" 695'	325	13.5	1.73	9.13	Class C + 4.0% Bentonite + 0.6% CD-32 + 0.5% CaCl <sub>2</sub> + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	200	14.8	1.34	6.34	Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate
7-5/8" 11,700'	250	14.8	1.38	6.48	Class C + 5% Gypsum + 3% CaCl <sub>2</sub> pumped via Bradenhead (TOC @ Surface)
	2000	14.8	1.38	6.48	Class C + 5% Gypsum + 3% CaCl <sub>2</sub> pumped via Bradenhead
	550	14.4	1.20	4.81	50:50 Class H:Poz + 0.25% CPT20A + 0.40% CPT49 + 0.20% CPT35 + 0.80% CPT16A + 0.25% CPT503P pumped Conventionally
5-1/2" 20,243'	850	14.1	1.26	5.80	Class H + 0.1% C-20 + 0.05% CSA-1000 + 0.20% C-49 + 0.40% C-17 (TOC @ 11,200')

Note: Cement volumes based on bit size plus at least 25% excess in the open hole plus 10% excess in the cased-hole overlap section.

**EOG RESOURCES, INC.**  
**NAUTILUS 16 FED COM NO. 701H**

**5. MINIMUM SPECIFICATIONS FOR PRESSURE CONTROL:**

Variance is requested to use a co-flex line between the BOP and choke manifold (instead of using a 4" OD steel line).

The minimum blowout preventer equipment (BOPE) shown in Exhibit #1 will consist of a single ram, mud cross and double ram-type (10,000 psi WP) preventer and an annular preventer (5000-psi WP). Both units will be hydraulically operated and the ram-type will be equipped with blind rams on bottom and drill pipe rams on top. All BOPE will be tested in accordance with Onshore Oil & Gas order No. 2.

Before drilling out of the surface casing, the ram-type BOP and accessory equipment will be tested to 5000/ 250 psig and the annular preventer to 3500/ 250 psig. The surface casing will be tested to 1500 psi for 30 minutes.

Before drilling out of the intermediate casing, the ram-type BOP and accessory equipment will be tested to 5000/ 250 psig and the annular preventer to 3500/ 250 psig. The intermediate casing will be tested to 2000 psi for 30 minutes.

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.

A hydraulically operated choke will be installed prior to drilling out of the intermediate casing shoe.

**6. TYPES AND CHARACTERISTICS OF THE PROPOSED MUD SYSTEM:**

During this procedure we plan to use a Closed-Loop System and haul contents to the required disposal.

The applicable depths and properties of the drilling fluid systems are as follows.

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0 - 695'	Fresh - Gel	8.6-8.8	28-34	N/c
695' - 11,700'	Brine	8.8-10.0	28-34	N/c
11,700' - 20,243' Lateral	Oil Base	10.0-14.0	58-68	3 - 6

The highest mud weight needed to balance formation is expected to be 11.5 ppg. In order to maintain hole stability, mud weights up to 14.0 ppg may be utilized.

**EOG RESOURCES, INC.**  
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An electronic pit volume totalizer (PVT) will be utilized on the circulating system, to monitor pit volume, flow rate, pump pressure and stroke rate.

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

**7. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT:**

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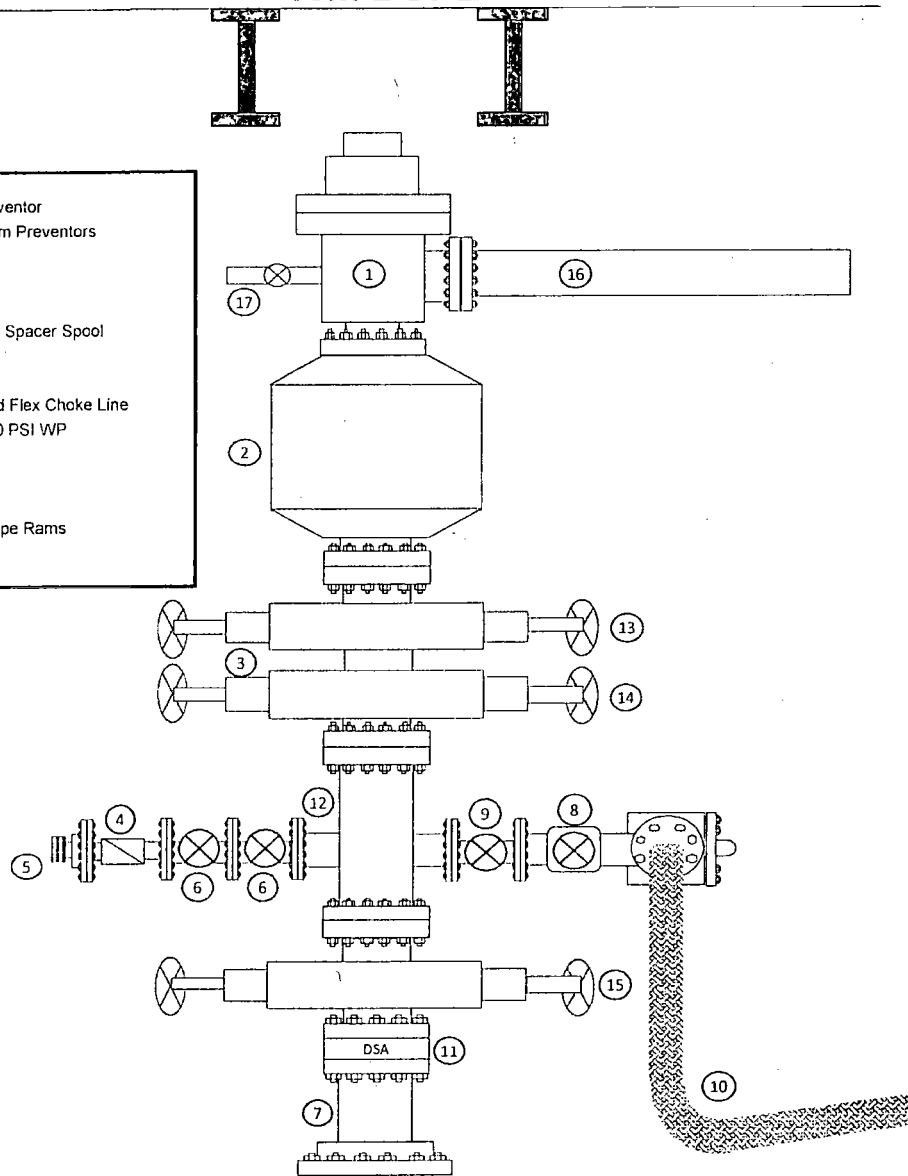
# Exhibit 1

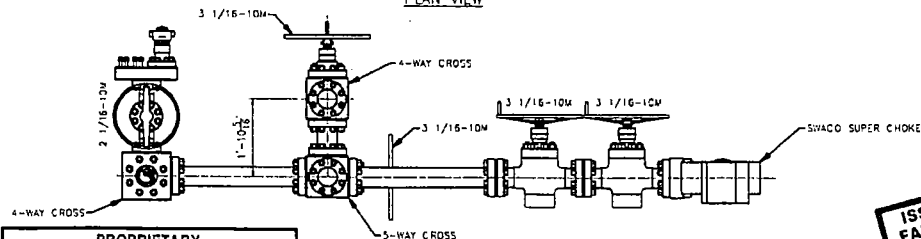
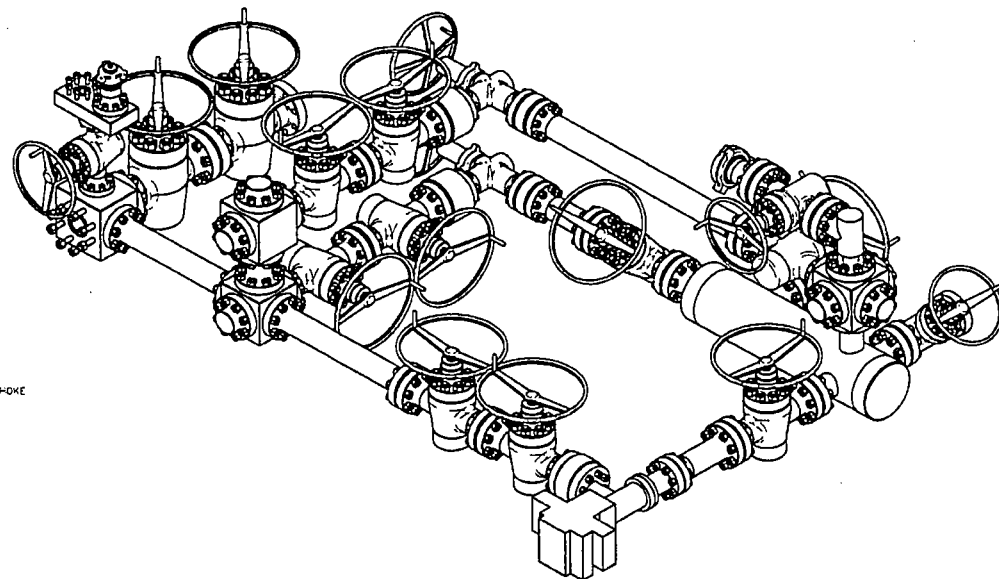
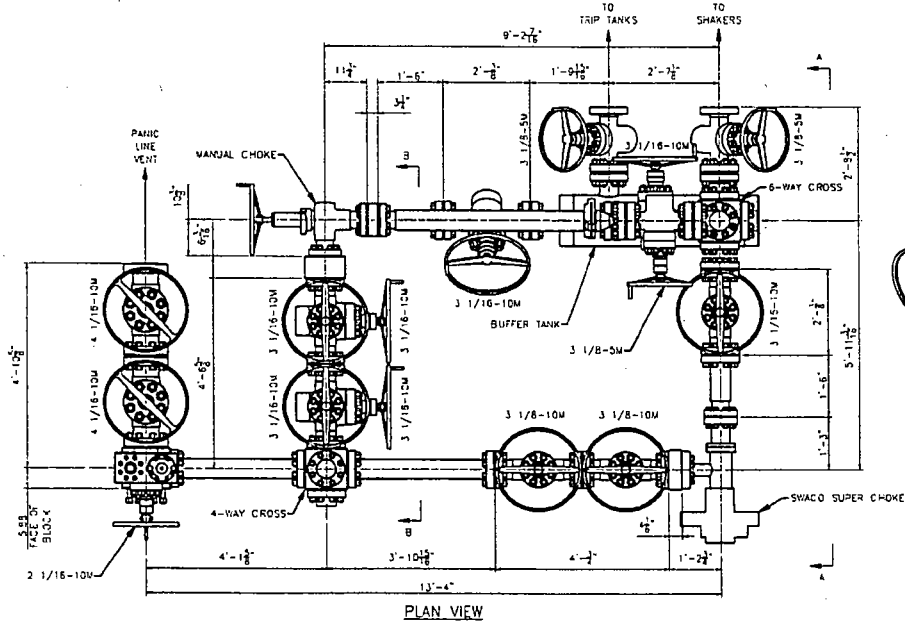
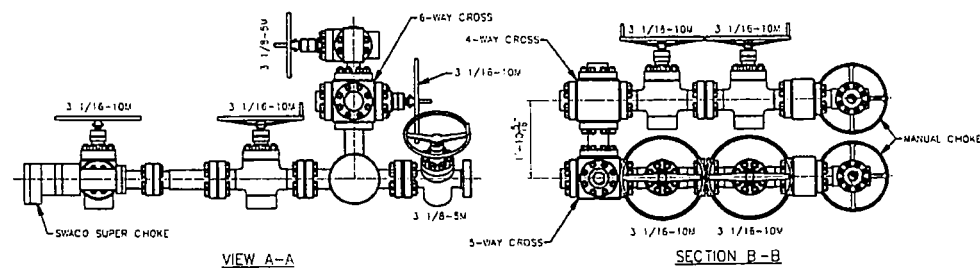
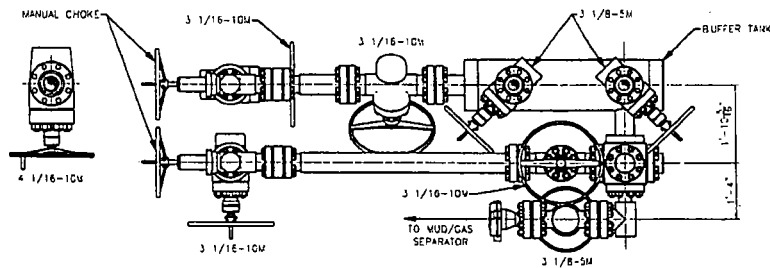
## EOG Resources

### 10M BOPE

Rig Floor

1. 13 5/8" Rotating Head
2. Hydril 13 5/8" 10,000 PSI WP GK Annular Preventor
3. 13 5/8" Cameron Type "U" 10,000 PSI WP Ram Preventors
4. 2 1/16" - 10,000 PSI WP Check Valve
5. 10,000 PSI WP - 1502 Union to kill line
6. 2 1/16" - 10,000 PSI WP Manual Valves
7. 13 5/8" 3,000 PSI WP x 13 5/8" 5,000 PSI WP Spacer Spool
8. 4 1/16" 10,000 PSI WP HCR Valve
9. 4 1/16" 10,000 PSI WP Manual Valve
10. 6" OD x 3" ID 10,000 PSI WP Steel Armoured Flex Choke Line
11. DSA - 13 5/8" 10,000 PSI WP x 13 5/8" 5,000 PSI WP
12. Mud Cross - 13 5/8" 10,000 PSI WP
13. Blind Rams
14. Pipe Rams
15. 13 5/8" Cameron Type "U" 10,000 PSI WP Pipe Rams
16. Flow Line
17. 2" Fill Line





**PROPRIETARY**  
THIS DRAWING AND THE IDEAS AND INFORMATION INCLUDED IN THIS DRAWING ARE PROPRIETARY AND ARE NOT TO BE REPRODUCED, DISTRIBUTED OR USED IN ANY MANNER WITHOUT THE WRITTEN CONSENT OF A DAILY AUTHORIZED OFFICER OF HELMERICH & PAYNE INTERNATIONAL DRILLING CO.

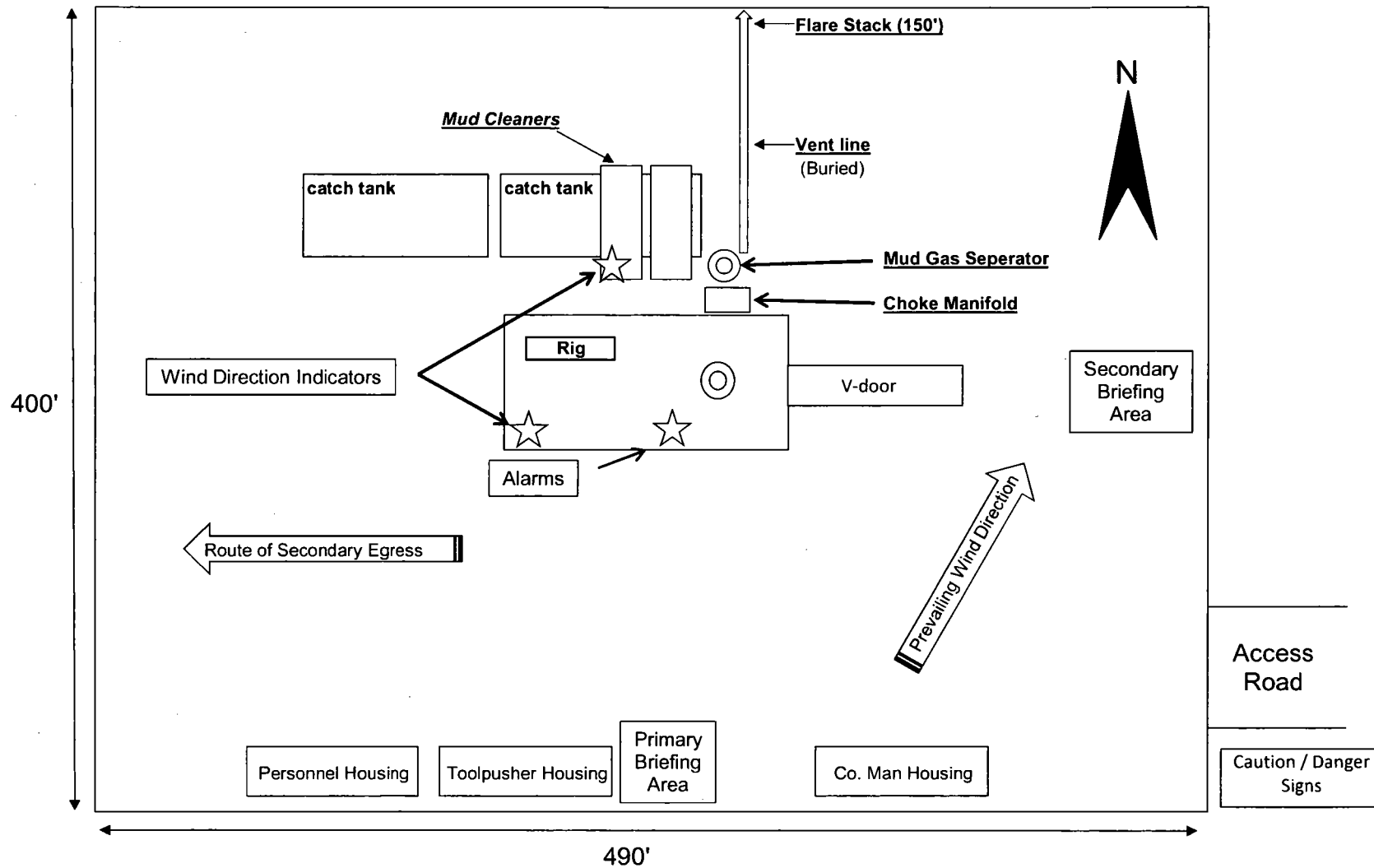
**ISSUED FOR FABRICATION**  
February-10-2014  
DRAFTSMAN *[Signature]*  
ENGINEER *[Signature]*

STANDARD TOLERANCES			
1. FABRICATION DIMENSIONS:		A. 1/16" TO 3/4"	
		3/4" TO 1 1/2"	
		1 1/2" TO 2 1/2"	
		2 1/2" TO 4"	
		4" TO 6"	
		6" TO 12"	
		12" TO 24"	
		24" TO 48"	
		48" TO 96"	
		96" TO 192"	
		192" TO 384"	
		384" TO 768"	
		768" TO 1536"	
		1536" TO 3072"	
		3072" TO 6144"	
		6144" TO 12288"	
		12288" TO 24576"	
		24576" TO 49152"	
		49152" TO 98304"	
		98304" TO 196608"	
		196608" TO 393216"	
		393216" TO 786432"	
		786432" TO 1572864"	
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		6291456" TO 12582912"	
		12582912" TO 25165824"	
		25165824" TO 50331648"	
		50331648" TO 100663296"	
		100663296" TO 201326592"	
		201326592" TO 402653184"	
		402653184" TO 805306368"	
		805306368" TO 1610612736"	
		1610612736" TO 3221225472"	
		3221225472" TO 6442450944"	
		6442450944" TO 12884901888"	
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		51539607552" TO 103079215104"	
		103079215104" TO 206158430208"	
		206158430208" TO 412316860416"	
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		6597069766656" TO 13194139533312"	
		13194139533312" TO 26388279066624"	
		26388279066624" TO 52776558133248"	
		52776558133248" TO 105553116266496"	
		105553116266496" TO 211106232532992"	
		211106232532992" TO 422212465065984"	
		422212465065984" TO 844424930131968"	
		844424930131968" TO 1688849860263936"	
		1688849860263936" TO 3377699720527872"	
		3377699720527872" TO 6755399441055744"	
		6755399441055744" TO 13510798882111488"	
		13510798882111488" TO 27021597764222976"	
		27021597764222976" TO 54043195528445952"	
		54043195528445952" TO 108086391056891904"	
		108086391056891904" TO 216172782113783808"	
		216172782113783808" TO 432345564227567616"	
		432345564227567616" TO 864691128455135232"	
		864691128455135232" TO 1729382256910270464"	
		1729382256910270464" TO 3458764513820540928"	
		3458764513820540928" TO 6917529027641081856"	
		6917529027641081856" TO 13835058055282163712"	
		13835058055282163712" TO 27670116110564327424"	
		27670116110564327424" TO 55340232221128654848"	
		55340232221128654848" TO 110680464422257309696"	
		110680464422257309696" TO 221360928844514619392"	
		221360928844514619392" TO 442721857689029238784"	
		442721857689029238784" TO 885443715378058477568"	
		885443715378058477568" TO 1770887430756116955136"	
		1770887430756116955136" TO 3541774861512233910272"	
		3541774861512233910272" TO 7083549723024467820544"	
		7083549723024467820544" TO 14167099446048936441088"	
		14167099446048936441088" TO 28334198892097872882176"	
		28334198892097872882176" TO 56668397784195745764352"	
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		380295179999749365187847216128" TO 760590359999498730375694432256"	
		760590359999498730375694432256" TO 1521180719998997460751388864512"	
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		535217884668020920050832067525369489024" TO 107043576933604184010166	

HELMERICH & PAYNE	
INTERNATIONAL DRILLING CO.	
TITLE:	3 CHOKE, 3 LEVEL, 10M CHOKE MANIFOLD G.A.
CUSTOMER:	H&P
PROJECT:	
DRAWN:	MVL
DATE:	2/10/2014
DWG NO.:	HP-D1254
SCALE:	3/4"=1'-0"
SHEET:	1 OF 1

Exhibit 4  
EOG Resources  
Nautilus 16 Fed Com #701H

Well Site Diagram





# United States Department of the Interior



BUREAU OF LAND MANAGEMENT  
CARLSBAD FIELD OFFICE

620 E. GREENE ST.

CARLSBAD, NM 88220

BLM\_NM\_CFO\_APD@BLM.GOV

In Reply To:

3160 (Office Code)

[ NMNM66927 ]

06/02/2017

Attn: STAN WAGNER  
EOG RESOURCES INC  
1111 BAGBY SKY LOBBY2  
HOUSTON, TX 77002

Re: Receipt and Acceptability of Application for Permit to Drill (APD)

**FEDERAL - NMNM66927**

Well Name / Number: **NAUTILUS 16 FED COM / 701H**

Legal Description: T26S, R34E, SEC 16, SESE

County, State: LEA, NM

Date APD Received: 03/24/2017

Dear Operator:

The BLM received your Application for Permit to Drill (APD), for the referenced well, on 03/24/2017. The BLM reviewed the APD package pursuant to part III.D of Onshore Oil and Gas Order No.1 and it is:

1. ☒ Incomplete/Deficient (*The BLM cannot process the APD until you submit the identified items within 45 calendar days of the date of this notice or the BLM will return your APD.*)

- ☐ Well Plat
- ☒ Drilling Plan
- ☐ Surface Use Plan of Operations (SUPO)
- ☐ Certification of Private Surface Owner Access Agreement
- ☐ Bonding
- ☐ Onsite (The BLM has scheduled the onsite to be on \_\_\_\_\_)  
This requirement is exempt of the 45-day timeframe to submit deficiencies. This requirement will be satisfied on the date of the onsite.
- ☒ Other

**[Please See Addendum for further clarification of deficiencies]**

2. ☐ Missing Necessary Information (*The BLM can start, but cannot complete the analysis until you submit the identified items. This is an early notice and the BLM will restate this in a 30-day deferral letter, if you have not submitted the information at that time. You will have two (2) years from the date of the deferral to submit this information or the BLM will deny your APD.*)

**[Please See Addendum for further clarification of deficiencies]**

NOTE: The BLM will return your APD package to you, unless you correct all deficiencies identified above (item 1) within 45 calendar days.

- The BLM will not refund an APD processing fee or apply it to another APD for any returned APD.

**Extension Requests:**

- If you know you will not be able to meet the 45-day timeframe for reasons beyond your control, you must submit a written request through email/standard mail for extension prior to the 45<sup>th</sup> calendar day from this notice, **07/17/2017**.
- The BLM will consider the extension request if you can demonstrate your diligence (providing reasons and examples of why the delay is occurring beyond your control) in attempting to correct the deficiencies and can provide a date by which you will correct the deficiencies. If the BLM determines that the request does not warrant an extension, the BLM will return the APD as incomplete after the 45 calendar days have elapsed.
  - The BLM will determine whether to grant an extension beyond the required 45 calendar days and will document this request in the well file. If you fail to submit deficiencies by the date defined in the extension request, the BLM will return the APD.

**APDs remaining Incomplete:**

- If the APD is still not complete, the BLM will notify you and allow 10 additional business days to submit a written request to the BLM for an extension. The request must describe how you will address all outstanding deficiencies and the timeframe you request to complete the deficiencies.
  - The BLM will consider the extension request if you can prove your diligence (providing reasons and examples of why the delay is occurring) in attempting to correct the deficiencies and you can provide a date by which you will correct the deficiencies. If the BLM determines that the request does not warrant an additional extension, the BLM will return the APD as incomplete.

If you have any questions, please contact

Sincerely,

cc:



## ADDENDUM - Incomplete/Deficient

## Clarifications

### ADDENDUM - Deficient

#### Engineering Comments

- BOP requirements are not met
  - 1. BOP Schematic must have a 10M Annular. Please resubmit with correction. ✓
- Engineering Review: Other identified drilling plan deficiencies
  - Not a deficiency but cannot approve APD without a waste minimization plan. Please attach state submitted gas capture plan (this will be a sufficient substitute for waste minimization plan). ✓

### ADDENDUM - Incomplete or Necessary Information

#### Adjudication Comments

- Adjudicator additional information:
  - Lease number listed on 3160-3 is incorrect. Should be MM66927. Must be corrected in Section 1 of the application data. *corrected*
  - SHL is on unleased Federal land (no Federal minerals are located in this area). Rights-of-Way will be required for all surface disturbance in the south half of Sec. 16 T26S R34E.

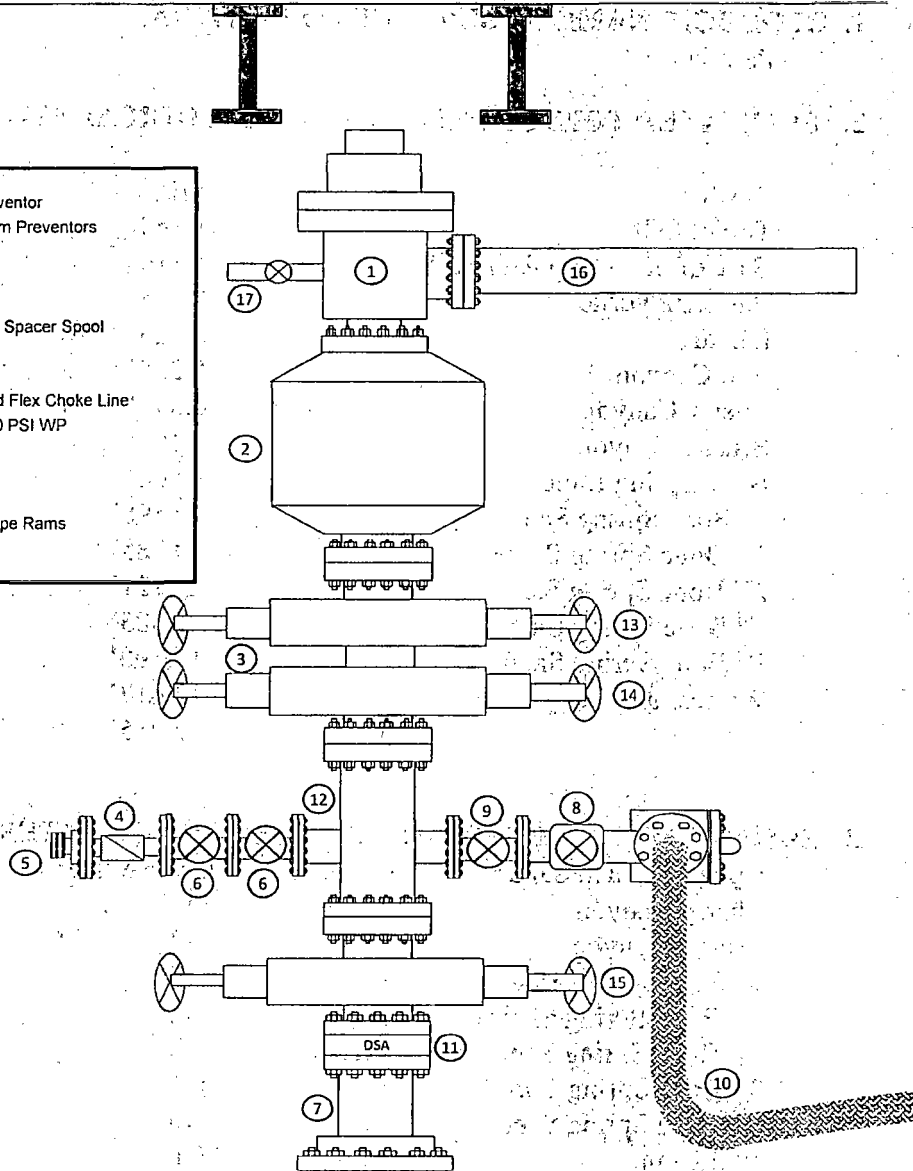
# Exhibit 1

## EOG Resources

### 10M BOPE

Rig Floor

1. 13 5/8" Rotating Head
2. Hydril 13 5/8" 10,000 PSI WP GK Annular Preventor
3. 13 5/8" Cameron Type "U" 10,000 PSI WP Ram Preventors
4. 2 1/16" - 10,000 PSI WP Check Valve
5. 10,000 PSI WP - 1502 Union to kill line
6. 2 1/16" - 10,000 PSI WP Manual Valves
7. 13 5/8" 3,000 PSI WP x 13 5/8" 5,000 PSI WP Spacer Spool
8. 4 1/16" 10,000 PSI WP HCR Valve
9. 4 1/16" 10,000 PSI WP Manual Valve
10. 6" OD x 3" ID 10,000 PSI WP Steel Armoured Flex Choke Line
11. DSA - 13 5/8" 10,000 PSI WP x 13 5/8" 5,000 PSI WP
12. Mud Cross - 13 5/8" 10,000 PSI WP
13. Blind Rams
14. Pipe Rams
15. 13 5/8" Cameron Type "U" 10,000 PSI WP Pipe Rams
16. Flow Line
17. 2" Fill Line



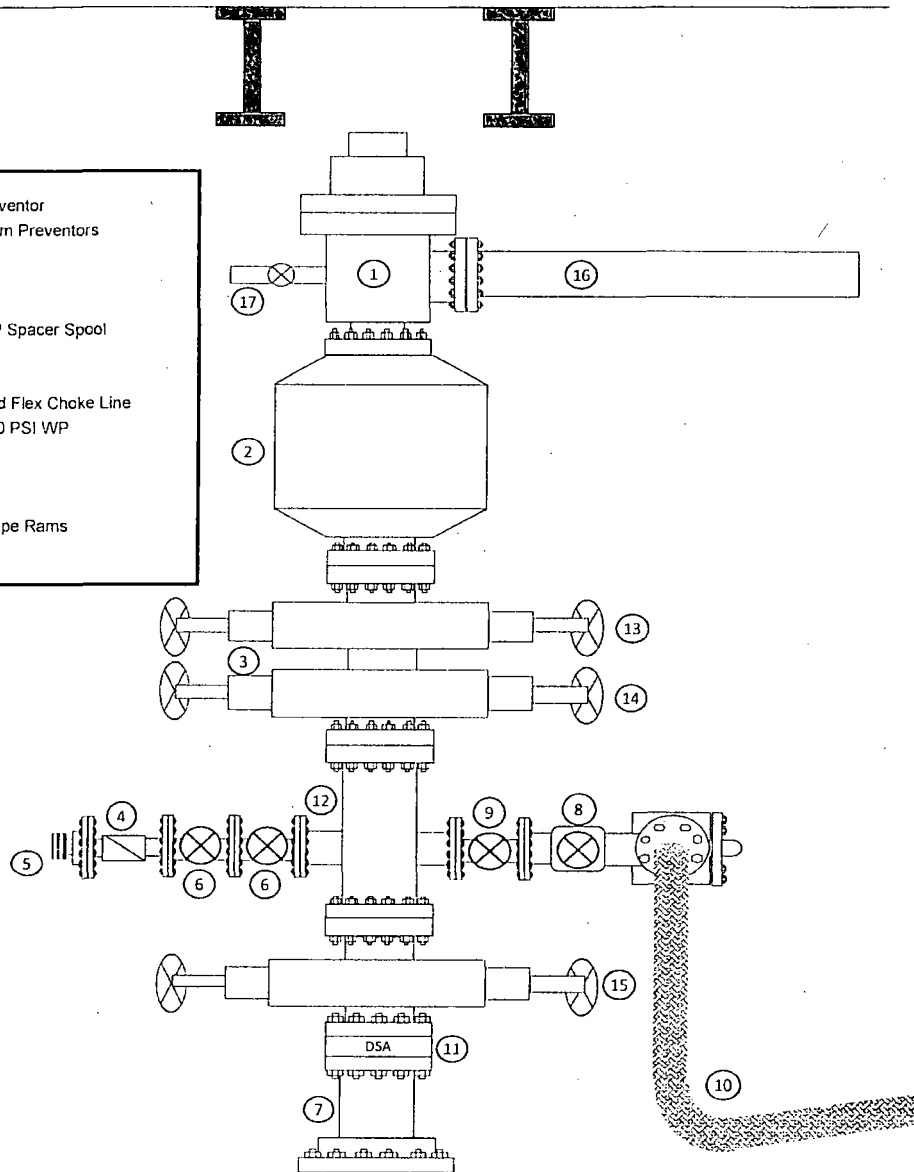
# Exhibit 1

## EOG Resources

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15. 13 5/8" Cameron Type "U" 10,000 PSI WP Pipe Rams
16. Flow Line
17. 2" Fill Line





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

Submit Original  
to Appropriate  
District Office

### GAS CAPTURE PLAN

Date: 06/05/2017

☒ Original Operator & OGRID No.: EOG Resources, Inc. 7377  
☐ 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, recomple 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
Nautilus 16 Fed Com 701H	30-015-***	P-16-26S-34E	280 FSL & 865 FEL	±3000	None Planned	APD Submission

#### Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility is dedicated to **Enterprise Field Services** and will be connected to **EOG Resources** low/high pressure gathering system located in Eddy/Lea County, New Mexico. It will require ±7880' of pipeline to connect the facility to low/high pressure gathering system. **EOG Resources** provides (periodically) to **Enterprise Field Services** a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, **EOG Resources** and **Enterprise Field Services** have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at **Enterprise Field Services** Processing Plant located in Lea County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

#### 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 **Enterprise Field Services** system at that time. Based on current information, it is **EOG Resources'** 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
  - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
  - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
  - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines

**Manufacturer: Midwest Hose & Specialty**

**Serial Number: SN#90067**

**Length: 35'**

**Size: OD = 8" ID = 4"**

**Ends: Flanges Size: 4-1/16"**

**WP Rating: 10,000 psi    Anchors required by manufacturer: No**

**M I D W E S T**  
**HOSE AND SPECIALTY INC.**

<b>INTERNAL HYDROSTATIC TEST REPORT</b>			
<b>Customer:</b> CACTUS		<b>P.O. Number:</b> RIG #123 Asset # M10761	
<b>HOSE SPECIFICATIONS</b>			
<b>Type:</b> CHOKER LINE		<b>Length:</b> 35'	
<b>I.D.</b> 4" INCHES		<b>O.D.</b> 8" INCHES	
<b>WORKING PRESSURE</b> 10,000 PSI	<b>TEST PRESSURE</b> 15,000 PSI		<b>BURST PRESSURE</b> PSI
<b>COUPLINGS</b>			
<b>Type of End Fitting</b> 4 1/16 10K FLANGE			
<b>Type of Coupling:</b> SWEDGED		<b>MANUFACTURED BY</b> MIDWEST HOSE & SPECIALTY	
<b>PROCEDURE</b>			
<i>Hose assembly pressure tested with water at ambient temperature.</i>			
<b>TIME HELD AT TEST PRESSURE</b> 1 MIN.		<b>ACTUAL BURST PRESSURE:</b> 0 PSI	
<b>COMMENTS:</b> SN#90087 M10761 Hose is covered with stainless steel armour cover and wrapped with fire resistant vermiculite coated fiberglass insulation rated for 1500 degrees complete with lifting eyes			
<b>Date:</b> 6/6/2011	<b>Tested By:</b> BOBBY FINK		<b>Approved:</b> MENDI JACKSON



Midwest Hose  
& Specialty, Inc.

## Internal Hydrostatic Test Graph

Customer: CACTUS

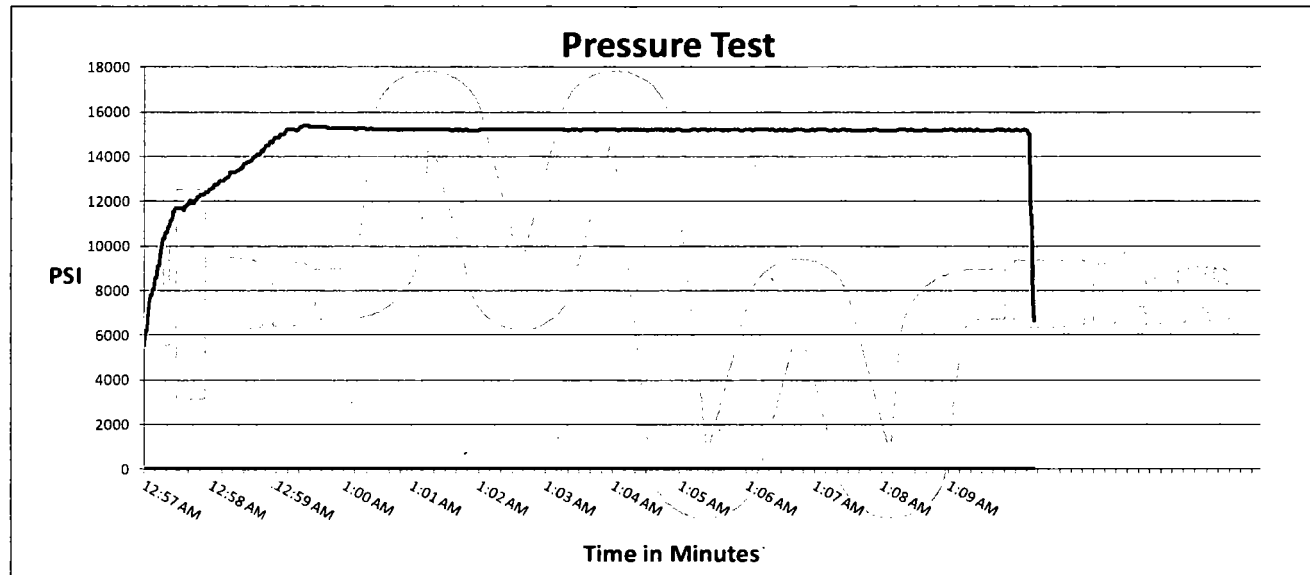
SALES ORDER# 90067

### Hose Specifications

<u>Hose Type</u>	<u>Length</u>
C & K	35'
<u>I.D.</u>	<u>O.D.</u>
4"	8"
<u>Working Pressure</u>	<u>Burst Pressure</u>
10000 PSI	Standard Safety Multiplier Applies

### Verification

<u>Type of Fitting</u>	<u>Coupling Method</u>
4 1/16 10K	Swage
<u>Die Size</u>	<u>Final O.D.</u>
6.62"	6.68"
<u>Hose Serial #</u>	<u>Hose Assembly Serial #</u>
	90067



Test Pressure  
15000 PSI

Time Held at Test Pressure  
11 1/4 Minutes

Actual Burst Pressure

Peak Pressure  
15439 PSI

**Comments:** Hose assembly pressure tested with water at ambient temperature.

**Tested By:** Bobby Fink

**Approved By:** Mendi Jackson

*Bobby Fink*

*Mendi Jackson*



OD	Weight	Wall Th.	Grade	API Drift	Connection
7 5/8 in.	29.70 lb/ft	0.375 in.	VM 110 HC	6.750 in.	VAM® SLIJ-II

PIPE PROPERTIES	
Nominal OD	7.625 in.
Nominal ID	6.875 in.
Nominal Cross Section Area	8.541 sqin.
Grade Type	High Collapse
Min. Yield Strength	110 ksi
Max. Yield Strength	140 ksi
Min. Ultimate Tensile Strength	125 ksi

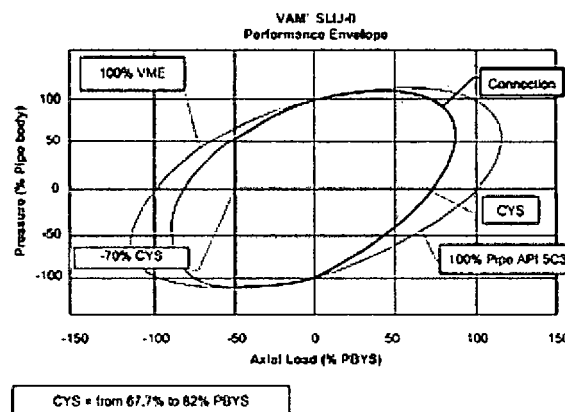
CONNECTION PROPERTIES	
Connection Type	Premium integral semi-flush
Connection OD (nom)	7.711 in.
Connection ID (nom)	6.820 in.
Make-up Loss	4.822 in.
Critical Cross Section	5.912 sqin.
Tension Efficiency	69.2 % of pipe
Compression Efficiency	48.5 % of pipe
Internal Pressure Efficiency	100 % of pipe
External Pressure Efficiency	100 % of pipe

CONNECTION PERFORMANCES	
Tensile Yield Strength	651 klb
Compression Resistance	455 klb
Internal Yield Pressure	9470 psi
Uniaxial Collapse Pressure	7890 psi
Max. Bending Capacity	TDB
Max Bending with Sealability	20 °/100 ft

FIELD TORQUE VALUES	
Min. Make-up torque	11300 ft.lb
Opti. Make-up torque	12600 ft.lb
Max. Make-up torque	13900 ft.lb

**VAM® SLIJ-II** is a semi-flush integral premium connection for all casing applications. It combines a near flush design with high performances in tension, compression and gas sealability.

VAM® SLIJ-II has been validated according to the most stringent tests protocols, and has an excellent performance history in the world's most prolific HPHT wells.



Do you need help on this product? - Remember no one knows VAM® like VAM

canada@vamfieldservice.com  
usa@vamfieldservice.com  
mexico@vamfieldservice.com  
brazil@vamfieldservice.com

uk@vamfieldservice.com  
dubai@vamfieldservice.com  
nigeria@vamfieldservice.com  
angola@vamfieldservice.com

china@vamfieldservice.com  
baku@vamfieldservice.com  
singapore@vamfieldservice.com  
australia@vamfieldservice.com

Over 140 VAM® Specialists available worldwide 24/7 for Rig Site Assistance

Other Connection Data Sheets are available at [www.vamservices.com](http://www.vamservices.com)

**Vallourec Group**



Metal One Metal One Corp	FLUSHMAX-III Connection Data Sheet		Page	44-U
			Date	1-Oct-15
			Rev.	N-0

The diagram illustrates a pipe connection with a threaded section. A horizontal line represents the pipe. A wavy line indicates the thread. Above the thread, a double-headed arrow labeled 'Make up loss' spans the length of the threaded section. Below the pipe, two vertical arrows point to the start and end of the thread, labeled 'Pin critical area' and 'Box critical area' respectively.

Pipe Body	Imperial		S.I.	
Grade	P110		P110	
Pipe OD ( D )	7 5/8	in	193.68	mm
Weight	29.7	lb/ft	44.25	kg/m
Actual weight	29.0	lb/ft	43.26	kg/m
Wall thickness ( t )	0.375	in	9.53	mm
Pipe ID ( d )	6.875	in	174.63	mm
Pipe body cross section	8.537	in <sup>2</sup>	5.508	mm <sup>2</sup>
Drift Dia.	6.750	in	171.45	mm

Connection				
Box OD ( W )	7.625	in	193.68	mm
PIN ID	6.875	in	174.63	mm
Pin critical area	4.420	in <sup>2</sup>	2,852	mm <sup>2</sup>
Box critical area	4.424	in <sup>2</sup>	2,854	mm <sup>2</sup>
Joint load efficiency	60	%	60	%
Make up loss	3.040	in	77.22	mm
Thread taper	1/16 ( 3/4 in per ft )			
Number of threads	5 thread per in.			

Connection Performance Properties				
Tensile Yield load	563.4	kips	2,506	kN
M.I.Y.P.	7,574	psi	52.2	MPa
Collapse strength	5,350	psi	36.9	MPa

Note  
M.I.Y.P. = Minimum Internal Yield Pressure of the connection

Torque Recommended				
Min.	8,700	ft-lb	11,700	N-m
Opti.	9,700	ft-lb	13,100	N-m
Max.	10,700	ft-lb	14,500	N-m
Operational Max.	23,600	ft-lb	32,000	N-m

Note : Operational Max. torque can be applied for high torque application

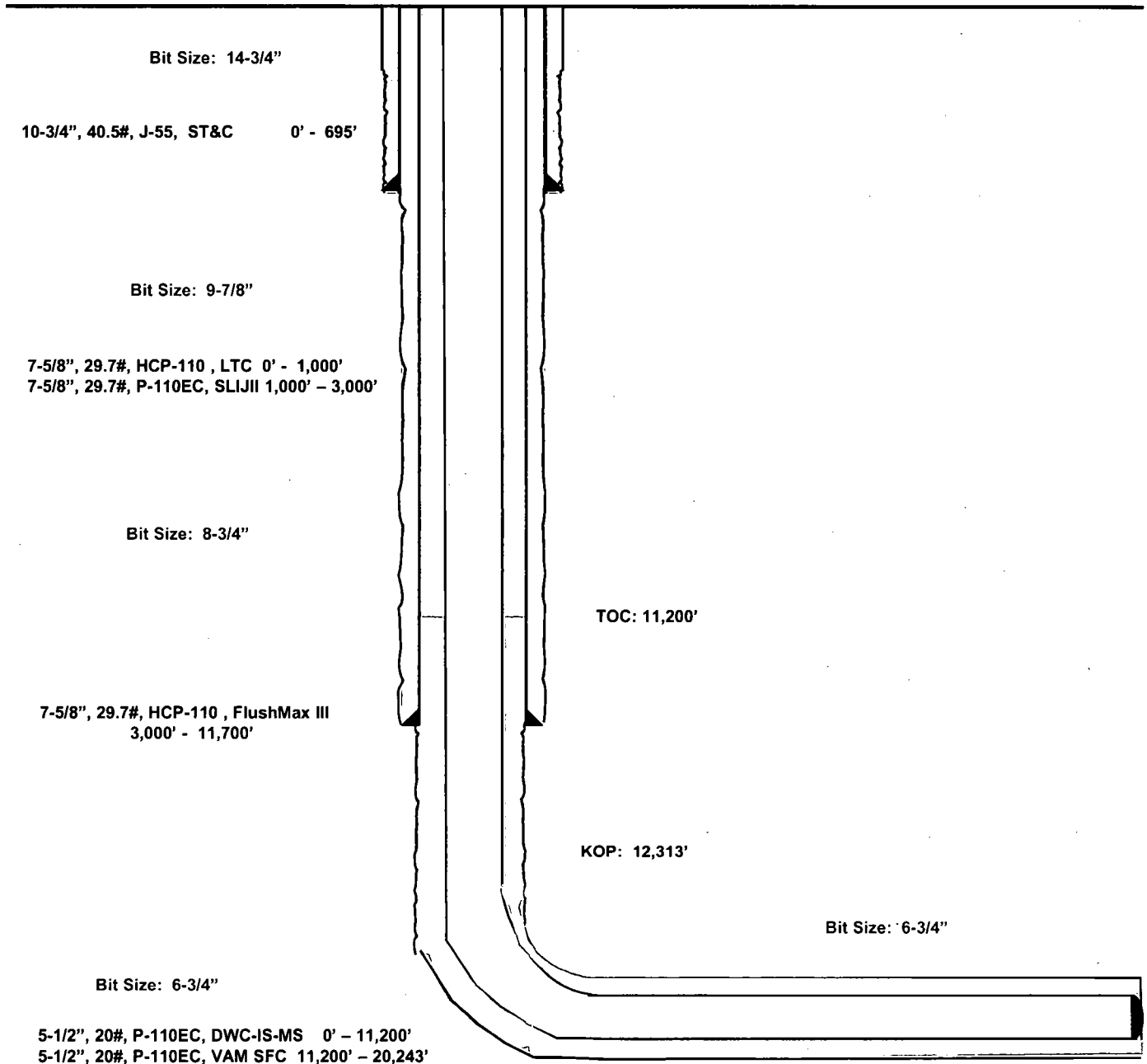
**Nautilus 16 Fed Com #701H**

**Lea County, New Mexico  
Proposed Wellbore**

**280' FSL  
865' FEL  
Section 16  
T-26-S, R-34-E**

**API: 30-025-\*\*\*\*\***

**KB: 3,336'  
GL: 3,311'**



**Lateral: 20,243' MD, 12,772' TVD  
Upper Most Perf:  
330' FSL & 330' FEL Sec. 16  
Lower Most Perf:  
2312' FSL & 330' FEL Sec. 9  
BH Location: 2412' FSL & 330' FEL  
Section 9  
T-26-S, R-34-E**



# United States Department of the Interior



BUREAU OF LAND MANAGEMENT  
CARLSBAD FIELD OFFICE

620 E. GREENE ST.

CARLSBAD, NM 88220

BLM\_NM\_CFO\_APD@BLM.GOV

In Reply To:

3160 (Office Code)

[ NMNM66927 ]

06/02/2017

Attn: STAN WAGNER

EOG RESOURCES INC

1111 BAGBY SKY LOBBY2

HOUSTON, TX 77002

Re: Receipt and Acceptability of Application for Permit to Drill (APD)

**FEDERAL - NMNM66927**

Well Name / Number: **NAUTILUS 16 FED COM / 701H**

Legal Description: T26S, R34E, SEC 16, SESE

County, State: LEA, NM

Date APD Received: 03/24/2017

Dear Operator:

The BLM received your Application for Permit to Drill (APD), for the referenced well, on 03/24/2017. The BLM reviewed the APD package pursuant to part III.D of Onshore Oil and Gas Order No.1 and it is:

1. ☒ Incomplete/Deficient (*The BLM cannot process the APD until you submit the identified items within 45 calendar days of the date of this notice or the BLM will return your APD.*)

- ☐ Well Plat
- ☒ Drilling Plan
- ☐ Surface Use Plan of Operations (SUPO)
- ☐ Certification of Private Surface Owner Access Agreement

- ☐ Bonding
- ☐ Onsite (The BLM has scheduled the onsite to be on \_\_\_\_\_)

This requirement is exempt of the 45-day timeframe to submit deficiencies. This requirement will be satisfied on the date of the onsite.

- ☒ Other

[Please See Addendum for further clarification of deficiencies]

NOTE: The BLM will return your APD package to you, unless you correct all deficiencies identified above (item 1) within 45 calendar days.

- The BLM will not refund an APD processing fee or apply it to another APD for any returned APD.

**Extension Requests:**

- If you know you will not be able to meet the 45-day timeframe for reasons beyond your control, you must submit a written request through email/standard mail for extension prior to the 45<sup>th</sup> calendar day from this notice, **07/17/2017**.
- The BLM will consider the extension request if you can demonstrate your diligence (providing reasons and examples of why the delay is occurring beyond your control) in attempting to correct the deficiencies and can provide a date by which you will correct the deficiencies. If the BLM determines that the request does not warrant an extension, the BLM will return the APD as incomplete after the 45 calendar days have elapsed.
  - The BLM will determine whether to grant an extension beyond the required 45 calendar days and will document this request in the well file. If you fail to submit deficiencies by the date defined in the extension request, the BLM will return the APD.

**APDs remaining Incomplete:**

- If the APD is still not complete, the BLM will notify you and allow 10 additional business days to submit a written request to the BLM for an extension. The request must describe how you will address all outstanding deficiencies and the timeframe you request to complete the deficiencies.
  - The BLM will consider the extension request if you can prove your diligence (providing reasons and examples of why the delay is occurring) in attempting to correct the deficiencies and you can provide a date by which you will correct the deficiencies. If the BLM determines that the request does not warrant an additional extension, the BLM will return the APD as incomplete.

If you have any questions, please contact

Sincerely,

cc:

## ADDENDUM - Incomplete/Deficient

## Clarifications

### ADDENDUM - Deficient

#### Engineering Comments

- BOP requirements are not met.
  - 1. BOP Schematic must have a 10M Annular. Please resubmit with correction. ✓
- Engineering Review: Other identified drilling plan deficiencies.
  - Not a deficiency but cannot approve APD without a waste minimization plan. Please attach state submitted gas capture plan (this will be a sufficient substitute for waste minimization plan). ✓

### ADDENDUM - Incomplete or Necessary Information

#### Adjudication Comments

- Adjudicator additional information:
  - Lease number listed on 3160-3 is incorrect. Should be MM66927. Must be corrected in Section 1 of the application data. *corrected*
  - SHL is on unleased Federal land (no Federal minerals are located in this area). Rights-of-Way will be required for all surface disturbance in the south half of Sec. 16 T26S R34E.