

Form 3160-3
(June 2015)FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER 1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other 1c. Type of Completion: ☐ Hydraulic Fracturing ☒ Single Zone ☐ Multiple Zone		5. Lease Serial No. NMNM132079 6. If Indian, Allottee or Tribe Name 7. If Unit or CA Agreement, Name and No. 8. Lease Name and Well No. UNCLE CHES 2116 FED COM 231H [326210] 9. API Well No. 30-025-48865
2. Name of Operator MATADOR PRODUCTION COMPANY [228937] 3a. Address 5400 LBJ Freeway, Suite 1500 Dallas TX 75240 3b. Phone No. (include area code) (972)371-5200		10. Field and Pool, or Exploratory [98346] purple sage; wolcamp (gas) / ANTELOPE 11. Sec., T. R. M. or Blk. and Survey or Area SEC 21 / T20S / R35E / NMP
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface SWSW / 260 FSL / 476 FWL / LAT 32.5521049 / LONG -103.4693334 At proposed prod. zone NWNW / 240 FNL / 330 FWL / LAT 32.579764 / LONG -103.4698083		12. County or Parish LEA 13. State NM
14. Distance in miles and direction from nearest town or post office* 12 miles		15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 260 feet 16. No of acres in lease 17. Spacing Unit dedicated to this well 640
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 30 feet 19. Proposed Depth 12309 feet / 22351 feet 20. BLM/BIA Bond No. in file FED: NMB001079		21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3719 feet 22. Approximate date work will start* 08/01/2019 23. Estimated duration 30 days
24. Attachments		

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

- | | |
|---|---|
| 1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification.
6. Such other site specific information and/or plans as may be requested by the BLM. |
|---|---|

25. Signature (Electronic Submission) Title	Name (Printed/Typed) Office CARLSBAD	Date 02/22/2019
Approved by (Signature) (Electronic Submission) Title Assistant Field Manager Lands & Minerals	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959 Office CARLSBAD	Date 04/16/2021

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.

GCP Rec 04/22/2021**SL**

(Continued on page 2)

APPROVED WITH CONDITIONS

Approval Date: 04/16/2021
KZ
05/13/2021

*(Instructions on page 2)

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Matador Production Company
LEASE NO.:	NMNM132079
WELL NAME & NO.:	Uncle Ches 2116 Fed Com 231H
SURFACE HOLE FOOTAGE:	260'/S & 476'/W
BOTTOM HOLE FOOTAGE:	240'/N & 330'/W
LOCATION:	Section 21, T.20 S., R.35 E., NMPM
COUNTY:	Lea County, New Mexico

COA

H2S	☐ Yes	☒ No	
Potash	☒ None	☐ Secretary	☐ R-111-P
Cave/Karst Potential	☒ Low	☐ Medium	☐ High
Cave/Karst Potential	☐ Critical		
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

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

Primary Casing Design:

1. The 13-3/8 inch surface casing shall be set at approximately **1284** feet (a minimum of **25 feet (Lea County)**) into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after

- completing the cement job.
- b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
- d. If cement falls back, remedial cementing will be done prior to drilling out that string.

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

2. The 9-5/8 inch intermediate casing shall be set at approximately **5900** feet. The minimum required fill of cement behind the 9-5/8 inch intermediate casing is:

Option 1 (Single Stage):

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

Option 2:

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

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
- b. Second stage above DV tool:
 - Cement to surface. If cement does not circulate, contact the appropriate BLM office.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.
- ❖ In **Capitan Reef Areas** if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.
- ❖ **Special Capitan Reef requirements.** If lost circulation (50% or greater) occurs below the Base of the Salt, the operator shall do the following:

- Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.
 - Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by 0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports. The daily drilling report should show mud volume per shift/tour. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.
3. The minimum required fill of cement behind the 7-5/8 inch 2nd intermediate casing is:

Option 1 (Single Stage):

- Cement should tie-back at least **50 feet** on top of Capitan Reef top **or 200 feet** into the previous casing, whichever is greater. If cement does not circulate see B.1.a, c-d above.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst, potash or capitan reef.

Option 2:

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

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
 - b. Second stage above DV tool:
 - Cement should tie-back at least **50 feet** on top of Capitan Reef top **or 200 feet** into the previous casing, whichever is greater. If cement does not circulate see B.1.a, c-d above.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst, potash or capitan reef.
4. The minimum required fill of cement behind the 5-1/2 X 4-1/2 inch production casing is:
- Cement should tie-back **200 feet** into the previous casing. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'
- 2.

Option 1:

- a. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M) psi**.
- b. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **10,000 (10M) psi. Variance is approved to use a 5000 (5M) Annular which shall be tested to 5000 (5M) psi.**

Option 2:

1. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **10,000 (10M) psi. Variance is approved to use a 5000 (5M) Annular which shall be tested to 5000 (5M) psi.**
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
 - e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Santa Fe Office, 301 Dinosaur Trail Santa Fe, New Mexico 87508, at least 90 days before the anticipated

date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.

- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

☒ Eddy County

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

☒ Lea County

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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
 - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
 - b. When the operator proposes to set surface casing with Spudder Rig
 - Notify the BLM when moving in and removing the Spudder Rig.
 - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
 - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a 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. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
 - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including

lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

- b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
- c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
- d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- e. The results of the test shall be reported to the appropriate BLM office.
- f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

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

NMK09132020



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

Application Data Report

04/22/2021

APD ID: 10400034376

Submission Date: 02/22/2019

Highlighted data
reflects the most
recent changes

Operator Name: MATADOR PRODUCTION COMPANY

Well Name: UNCLE CHES 2116 FED COM

Well Number: 231H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - General

APD ID: 10400034376

Tie to previous NOS? N

Submission Date: 02/22/2019

BLM Office: CARLSBAD

User:

Title:

Federal/Indian APD: FED

Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMNM132079

Lease Acres:

Surface access agreement in place?

Allotted?

Reservation:

Agreement in place? NO

Federal or Indian agreement:

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? YES

APD Operator: MATADOR PRODUCTION COMPANY

Operator letter of designation:

Operator Info

Operator Organization Name: MATADOR PRODUCTION COMPANY

Operator Address: 5400 LBJ FREEWAY, SUITE 1500

Zip: 75240

Operator PO Box:

Operator City: DALLAS

State: TX

Operator Phone: (972)371-5271

Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? NO

Master Development Plan name:

Well in Master SUPO? NO

Master SUPO name:

Well in Master Drilling Plan? NO

Master Drilling Plan name:

Well Name: UNCLE CHES 2116 FED COM

Well Number: 231H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: purple sage;
wolfcamp (gas)

Pool Name: ANTELOPE
RIDGE; BS, NORTH

Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL

Operator Name: MATADOR PRODUCTION COMPANY

Well Name: UNCLE CHES 2116 FED COM

Well Number: 231H

Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL

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

Type of Well Pad: MULTIPLE WELL

Multiple Well Pad Name: SLOT Number: 2

Well Class: HORIZONTAL

1
Number of Legs: 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: APPRAISAL

Describe sub-type:

Distance to town: 12 Miles

Distance to nearest well: 30 FT

Distance to lease line: 260 FT

Reservoir well spacing assigned acres Measurement: 640 Acres

Well plat: Matador_Uncle_Ches_231H_20181008142624.pdf

Well work start Date: 08/01/2019

Duration: 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number:

Reference Datum:

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	260	FSL	476	FW L	20S	35E	21	Aliquot SWS W	32.55210 49	- 103.4693 334	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 132079	371 9	0	0	
KOP Leg #1	260	FSL	476	FW L	20S	35E	21	Aliquot SWS W	32.55210 49	- 103.4693 334	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 132079	- 801 4	117 45	117 33	
PPP Leg #1-1	330	FSL	330	FW L	20S	35E	21	Aliquot SWS W	32.55229 7	- 103.4698 059	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 132079	- 859 0	126 54	123 09	

Operator Name: MATADOR PRODUCTION COMPANY

Well Name: UNCLE CHES 2116 FED COM

Well Number: 231H

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?
PPP Leg #1-2	1292	FSL	330	FWL	20S	35E	21	Aliquot SWS W	32.5549456	- 103.469806	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 137465	- 8590	13616	12309	
EXIT Leg #1	330	FNL	330	FWL	20S	35E	16	Aliquot NWN W	32.5795166	- 103.4698083	LEA	NEW MEXICO	NEW MEXICO	S	STATE	- 8590	22261	12309	
BHL Leg #1	240	FNL	330	FWL	20S	35E	16	Aliquot NWN W	32.579764	- 103.4698083	LEA	NEW MEXICO	NEW MEXICO	S	STATE	- 8590	22351	12309	



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

Drilling Plan Data Report

04/22/2021

APD ID: 10400034376

Submission Date: 02/22/2019

Highlighted data
reflects the most
recent changes

Operator Name: MATADOR PRODUCTION COMPANY

Well Name: UNCLE CHES 2116 FED COM

Well Number: 231H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
388980	RUSTLER	1779	1959	1959		NONE	N
388981	SALADO	-525	2304	2304		NONE	N
388982	DELAWARE	-4539	6318	6318		NATURAL GAS, OIL	N
388983	BRUSHY CANYON	-5572	7351	7351		NATURAL GAS, OIL	N
388984	BONE SPRING LIME	-6729	8508	8508		NATURAL GAS, OIL	N
388985	BONE SPRING 1ST	-7842	9621	9621		NATURAL GAS, OIL	N
388986	BONE SPRING 2ND	-8336	10115	10115		NATURAL GAS, OIL	N
388987	BONE SPRING 3RD	-9205	10984	10984		NATURAL GAS, OIL	N
388988	WOLFCAMP	-9958	11737	11737		NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 10M

Rating Depth: 15000

Equipment: A 10,000-psi BOP stack consisting of 3 rams with 2 pipe rams, 1 blind ram, and 1 annular preventer will be used below surface casing to TD. See attached BOP, choke manifold, co-flex hose, and speed head diagrams. An accumulator complying with Onshore Order 2 requirements for the BOP stack pressure rating will be present. Rotating head will be installed as needed. An accumulator complying with Onshore Order 2 requirements for the BOP stack pressure rating will be present. Rotating head will be installed as needed.

Requesting Variance? YES

Variance request: Matador requests a variance to drill this well using a co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. Manufacturer does not require the hose to be anchored. If the specific hose is not available, then one of equal or higher rating will be used. Matador is requesting a variance to use a speed head for setting the intermediate (9-5/8") casing. In the case of running a speed head with landing mandrel for 9-5/8" casing, BOP test pressures after setting surface casing will be 250 psi low and 10,000 psi high. Annular will be tested to 250 psi low and 5,000 psi high before drilling below the surface shoe. BOPE will 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 30 days. A diagram of the speed head is attached. Matador requests the option to run a DV tool with annular packer as contingency in the intermediate section on 9-5/8" casing if lost circulation is encountered. If losses occur the DV tool with packer will be placed

Operator Name: MATADOR PRODUCTION COMPANY**Well Name:** UNCLE CHES 2116 FED COM**Well Number:** 231H

at least 100' above the loss zone to give the option to pump cement as either a single stage or two stage.

Testing Procedure: Pressure tests will be conducted before drilling out from under all casing strings. BOP will be inspected and operated as required in Onshore Order 2. Kelly cock and sub equipped with a full opening valve sized to fit the drill pipe and collars will be available on the rig floor in the open position. A third party company will test the BOPs. After setting surface casing, and before drilling below the surface casing shoe, BOPE will be tested to 250 psi low and 2000 psi high. Annular will be tested to 250 psi low and 1000 psi high. After setting 9-5/8" casing, pressure tests will be made to 250 psi low and 5000 psi high. Annular will be tested to 250 psi low and 2500 psi high. After setting 7-5/8" x 7" Casing, pressure tests will be made to 250 psi low and 10,000 psi high. Annular will tested to 250 psi low and 5000 psi high.

Choke Diagram Attachment:

UncleChes231_10M_Choke_Manifold_Arrangement_20200630113435.pdf

BOP Diagram Attachment:

809_CoFlex_Certs___Uncle_Ches_Copy_20180919150000.pdf

UncleChes231_10M_BOP_20200630113509.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	Body SF
1	SURFACE	20	13.375	NEW	API	N	0	1984	0	1984			1984	J-55	54.5	OTHER - BTC	1.125	1.125	DRY	1.8	DRY	1.8
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	5900	0	5900			5900	J-55	40	OTHER - BTC	1.125	1.125	DRY	1.8	DRY	1.8
3	INTERMEDIATE	8.75	7.625	NEW	API	Y	0	12500	0	12300			12500	P-110	29.7	OTHER - VAM HTF-NR	1.125	1.125	DRY	1.8	DRY	1.8
4	PRODUCTION	6.125	4.5	NEW	API	Y	0	22350	0	12309			22350	P-110	13.5	OTHER - Tension XP	1.125	1.125	DRY	1.8	DRY	1.8

Casing Attachments

Operator Name: MATADOR PRODUCTION COMPANY**Well Name:** UNCLE CHES 2116 FED COM**Well Number:** 231H**Casing Attachments**

Casing ID: 1 **String Type:** SURFACE**Inspection Document:****Spec Document:****Tapered String Spec:**

7.625in_29.7__P110EC_VAM_HTF_NR_20190222105419.PDF

Casing Design Assumptions and Worksheet(s):BLM_Casing_Design_Assumptions_4_string_Wolfcamp_20181003133707.docx

Casing ID: 2 **String Type:** INTERMEDIATE**Inspection Document:****Spec Document:****Tapered String Spec:****Casing Design Assumptions and Worksheet(s):**BLM_Casing_Design_Assumptions_4_string_Wolfcamp_20181003133735.docx

Casing ID: 3 **String Type:** INTERMEDIATE**Inspection Document:****Spec Document:****Tapered String Spec:**

7.625in_29.7__P110EC_VAM_HTF_NR_20190222105544.PDF

Casing Design Assumptions and Worksheet(s):BLM_Casing_Design_Assumptions_4_string_Wolfcamp_20181003133753.docx

Operator Name: MATADOR PRODUCTION COMPANY**Well Name:** UNCLE CHES 2116 FED COM**Well Number:** 231H**Casing Attachments****Casing ID:** 4 **String Type:** PRODUCTION**Inspection Document:****Spec Document:****Tapered String Spec:**

4.5in_13.5__P110ICY_TXP_20190222105732.PDF

Casing Design Assumptions and Worksheet(s):

BLM_Casing_Design_Assumptions_4_string_Wolfcamp_20181003133818.docx

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	1984	2188	1.75	13.5	3829	100	C	3% NaCl + LCM
SURFACE	Tail				694	1.38	14.8	957	100	C	5% NaCl + LCM
INTERMEDIATE	Lead	2034	0	5900	1344	1.81	13.5	2433	100	C	Bentonite + 1% CaCL2 + 8% NaCl + LCM
INTERMEDIATE	Tail				536	1.38	14.8	740	100	C	5% NaCl + LCM
INTERMEDIATE	Lead		4900	12500	945	2.36	11.5	2230	35	TXI	Fluid Loss + Dispersant + Retarder + LCM
INTERMEDIATE	Tail				168	1.38	13.2	232	35	TXI	Fluid Loss + Dispersant + Retarder + LCM
PRODUCTION	Lead		11500	22350	814	1.38	15.8	1123	10	H	Fluid Loss + Dispersant + Retarder + LCM

Operator Name: MATADOR PRODUCTION COMPANY**Well Name:** UNCLE CHES 2116 FED COM**Well Number:** 231H**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:** All necessary mud products for weight addition and fluid loss control will be on location at all times. Mud program subject to change due to hole conditions.**Describe the mud monitoring system utilized:** An electronic Pason mud monitoring system complying with Onshore Order 1 will be used.**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)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	2235 0	OIL-BASED MUD	12	12							
0	1984	SPUD MUD	8.4	8.4							
0	5900	SALT SATURATED	10	10							
0	1250 0	OTHER : FW/Cut Brine	9	9							

Section 6 - Test, Logging, Coring**List of production tests including testing procedures, equipment and safety measures:**

No core or drill stem test is planned.

A 2-person mud logging program will be used from 1984' to TD.

No electric logs are planned at this time. GR will be collected through the MWD tools from Intermediate casing 1 to TD. CBL with CCL will be run as far as gravity will let it fall to top of curve.

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

CBL,DS,GR,MWD,MUDLOG

Operator Name: MATADOR PRODUCTION COMPANY**Well Name:** UNCLE CHES 2116 FED COM**Well Number:** 231H**Coring operation description for the well:**

NA

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 6154**Anticipated Surface Pressure:** 3446.02**Anticipated Bottom Hole Temperature(F):** 170**Anticipated abnormal pressures, temperatures, or potential geologic hazards?** NO**Describe:****Contingency Plans geohazards description:****Contingency Plans geohazards attachment:****Hydrogen Sulfide drilling operations plan required?** YES**Hydrogen sulfide drilling operations plan:**

MRC_Energy_Co__Drilling_Contingency_plan_20180919162507.doc

H2S_Emergency_Contacts_20180919162438.docx

Matador_Hydrogen_Sulfide_Drilling_Uncle_Ches_20180919162321.docx

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Matador_UncleChesFed_231H_PrelimB_20181003140631.PDF

Matador_UncleChesFed_231H_PrelimB_ACReport_20181003140631.pdf

Matador_UncleChesFed_231H_PrelimB_WPReport_20181003140632.pdf

Other proposed operations facets description:**Other proposed operations facets attachment:****Other Variance attachment:**

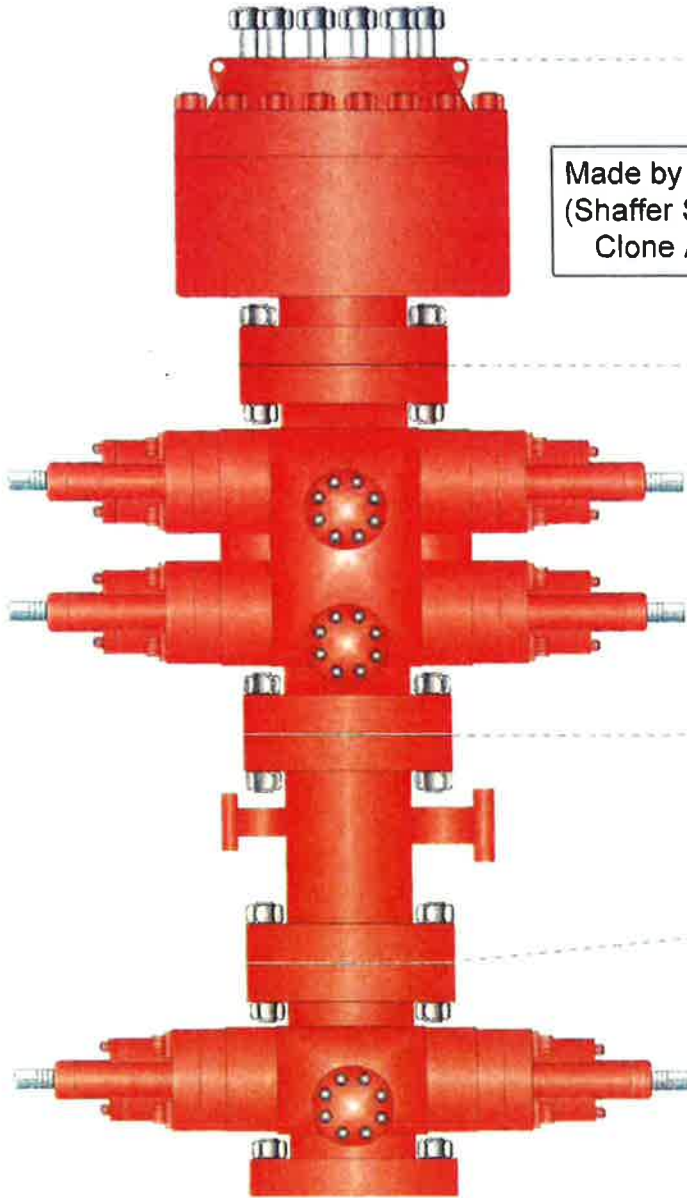
Close_Loop_System_20180920091435.docx

MQ_436_REV1__10K_3_STRING_20180920091500.PDF

4_String_Wellhead_Diagram_20190821143514.pdf

UncleChes231_10M_Well_Control_Plan_20200630115043.pdf

Uncle_Ches_Fed_231H_MTDR_Drill_Plan_6.30.20_20200630115705.pdf

**PATTERSON-UTI****Well Control****RIG:** **297**

Made by Cameron
(Shaffer Spherical)
Clone Annular

PATTERSON-UTI # PS2-628STYLE: New Shaffer SphericalBORE 13 5/8" PRESSURE 5,000HEIGHT: 48 1/2" WEIGHT: 13,800 lbsPATTERSON-UTI # PC2-128STYLE: New Cameron Type UBORE 13 5/8" PRESSURE 10,000RAMS: TOP 5" Pipe BTM BlindsHEIGHT: 66 5/8" WEIGHT: 24,000 lbsLength 40" Outlets 4" 10MDSA 4" 10M x 2" 10MPATTERSON-UTI # PC2-228STYLE: New Cameron Type UBORE 13 5/8" PRESSURE 10,000RAMS: 5" PipeHEIGHT: 41 5/8" WEIGHT: 13,000 lbs**WING VALVES**

2" Check Valve



2" Manual Valve



2" Manual Valve



4" Manual Valve



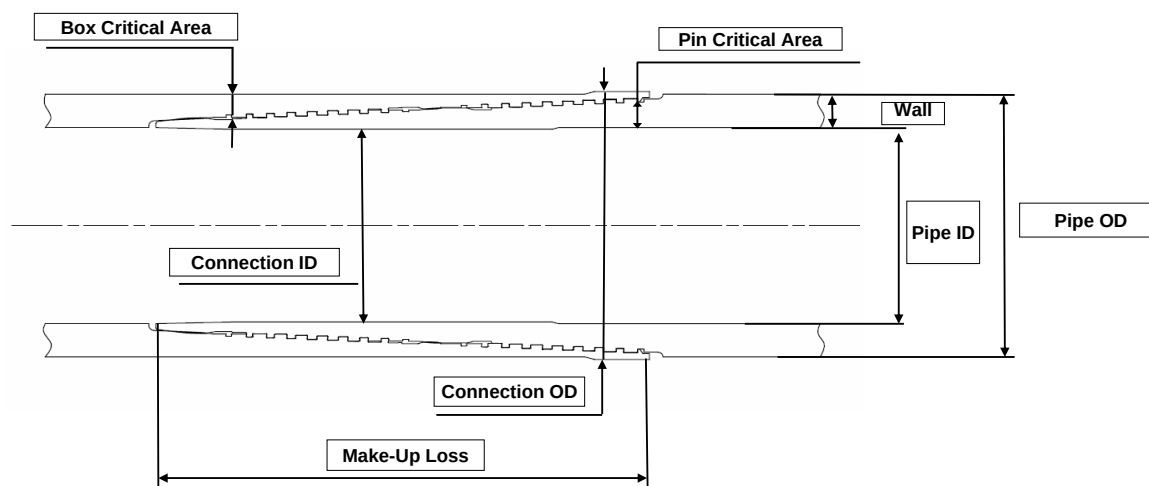
4" Hydraulic Valve

CONNECTION DATA SHEET (Imperial Units)



Connection: VAM® HTF-NR 7,625" 29,70# P110EC
 Alternate Drift: 6,750"

Drawing: PD-101836P PD-101836B Isolated connection



OD	WEIGHT	WALL	GRADE	API DRIFT
7,625"	29,70 lb/ft	0,375"	P110EC	6,750"

PIPE BODY PROPERTIES:			CONNECTION PROPERTIES:		
Outside Diameter	inch	7,625	Connection OD (nom)	inch	7,701
Internal Diameter	inch	6,875	Connection ID	inch	6,782
Nominal Area	sqin.	8,541	Coupling Length	inch	N/A
			Make-up Loss	inch	4,657
			Box critical area	%PBYS	58%
			Pin critical area	%PBYS	67%
Yield Strength	klb	1 068	Yield Strength	klb	619
Ultimate Strength	klb	1 153	Ultimate strength	klb	669
			Structural compression	klb	776
			Compression with sealability	klb	371
MIYP	psi	10 760	MIYP	psi	10 760
Collapse Pressure	psi	5 670	Ext Pressure Resistance	psi	5 670
			Regular Make-up Torque	ft.lb	
			Min		9 600
			Opt		11 300
			Max		13 000
			Maximum Torque with Sealability	ft.lb	58 500
			Maximum Torsional Value	ft.lb	73 000

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 canada@vamfieldservice.com
 mexico@vamfieldservice.com

80 VAM Specialists available worldwide 24/7 for Rig Site Assistance



Designed by :
 X. MENCAGLIA

Reference: VRCC16-1177
 Revision : 0
 Date : July 19, 2016

OCTG DIVISION

For the latest performance data, always visit our website: www.tenaris.com

April 19 2016



Connection: TenarisXP® BTC
Casing/Tubing: CAS
Coupling Option: REGULAR

Size: 4.500 in.
Wall: 0.290 in.
Weight: 13.50 lbs/ft
Grade: P110-ICY
Min. Wall Thickness: 87.5 %



PIPE BODY DATA

GEOMETRY			
Nominal OD	4.500 in.	Nominal Weight	13.50 lbs/ft
Nominal ID	3.920 in.	Wall Thickness	0.290 in.
Plain End Weight	13.05 lbs/ft	Standard Drift Diameter	3.795 in.
		Special Drift Diameter	N/A
PERFORMANCE			
Body Yield Strength	479 x 1000 lbs	Internal Yield	14100 psi
Collapse	11620 psi	SMYS	125000 psi

TENARISXP® BTC CONNECTION DATA

GEOMETRY			
Connection OD	5.000 in.	Coupling Length	9.075 in.
Critical Section Area	3.836 sq. in.	Threads per in.	5.00
		Connection ID	3.908 in.
		Make-Up Loss	4.016 in.
PERFORMANCE			
Tension Efficiency	100 %	Joint Yield Strength	479 x 1000 lbs
Structural Compression Efficiency	100 %	Structural Compression Strength	479 x 1000 lbs
External Pressure Capacity	11620 psi	Internal Pressure Capacity ⁽¹⁾	14100 psi
		Structural Bending ⁽²⁾	127 °/100 ft

ESTIMATED MAKE-UP TORQUES⁽³⁾

Minimum	6950 ft-lbs	Optimum	7720 ft-lbs	Maximum	8490 ft-lbs
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OPERATIONAL LIMIT TORQUES

Operating Torque	10500 ft-lbs	Yield Torque	12200 ft-lbs
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BLANKING DIMENSIONS

Blanking Dimensions

(1) Internal Pressure Capacity related to structural resistance only. Internal pressure leak resistance as per section 10.3 API 5C3 / ISO 10400 - 2007.

(2) Structural rating, pure bending to yield (i.e no other loads applied)

(3) Torque values calculated for API Modified thread compounds with Friction Factor=1. For other thread compounds please contact us at licensees@oilfield.tenaris.com. Torque values may be further reviewed.

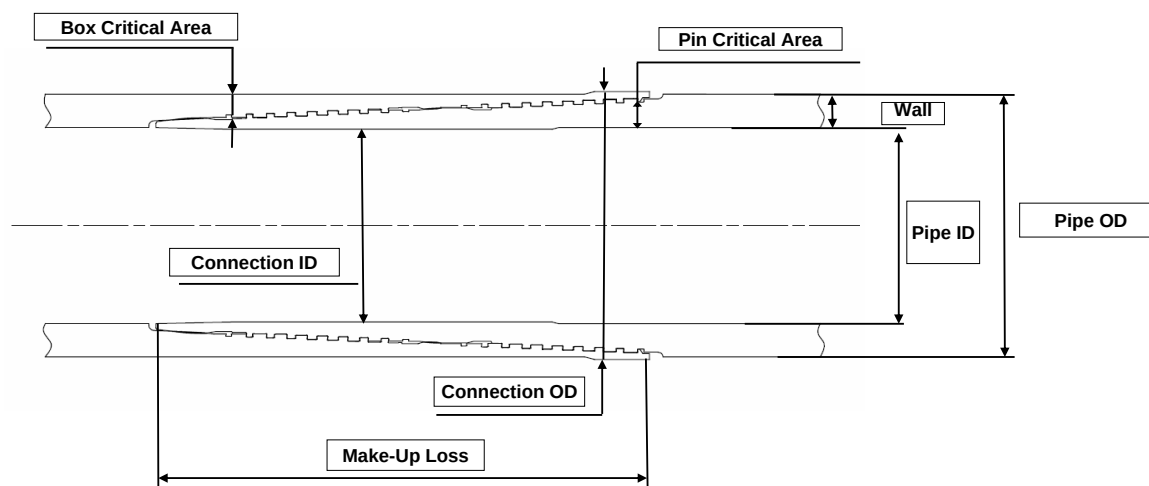
For additional information, please contact us at contact-tenarishydril@tenaris.com

CONNECTION DATA SHEET (Imperial Units)



Connection: VAM® HTF-NR 7,625" 29,70# P110EC
 Alternate Drift: 6,750"

Drawing: PD-101836P PD-101836B Isolated connection



OD	WEIGHT	WALL	GRADE	API DRIFT
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			Box critical area	%PBYS	58%
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Collapse Pressure	psi	5 670	Ext Pressure Resistance	psi	5 670
			Regular Make-up Torque	ft.lb	
			Min		9 600
			Opt		11 300
			Max		13 000
			Maximum Torque with Sealability	ft.lb	58 500
			Maximum Torsional Value	ft.lb	73 000

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80 VAM Specialists available worldwide 24/7 for Rig Site Assistance



Designed by :
 X. MENCAGLIA

Reference: VRCC16-1177
 Revision : 0
 Date : July 19, 2016

OCTG DIVISION

Casing Design Criteria and Load Case Assumptions

Surface Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.43 psi/ft). The effects of axial load on collapse will be considered.
- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and an internal force equal to mud gradient of displacement fluid (0.52 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: Casing test per Onshore Oil and Gas Order No. 2 with an external force equal to the mud gradient in which the casing will be run (0.43 psi/ft), which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (8.3 ppg).

Intermediate #1 Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.52 psi/ft). The effects of axial load on collapse will be considered.
- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: Casing test per Onshore Oil and Gas Order No. 2 with an external force equal to the mud gradient in which the casing will be run (0.52 psi/ft), which is a more conservative backup force than pore pressure.
- Gas Kick Profile: Internal burst force at the shoe will be Fracture Pressure at that depth. Surface burst pressure will be fracture gradient at setting depth less a gas gradient to equivalent height of 50 bbl kick with Drill Pipe inside casing and mud gradient with which the next hole section will be run above that (0.47 psi/ft). External force will be equal to the mud gradient in which the casing will be run (0.52 psi/ft), which is a more conservative backup force than pore pressure.
- Fracture at Shoe with 1/3 BHP at Surface: Internal burst force at the shoe will be Fracture Pressure at setting depth. Internal burst force at surface will be 1/3 of pore pressure at setting depth. External force will be equal to the mud gradient in which the casing will be run (0.52 psi/ft) which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (10.0 ppg).

Intermediate #2 Casing

Collapse: $DF_c=1.125$

- Partial Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.47 psi/ft). The effects of axial load on collapse will be considered. Internal force equal to gas gradient over half of setting depth and mud gradient with which the next hole section will be run below that (0.65 psi/ft).

- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and mud gradient in which the casing will be run above that (0.47 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: Casing test per Onshore Oil and Gas Order No. 2 with an external force equal to the mud gradient in which the casing will be run (0.47 psi/ft), which is a more conservative backup force than pore pressure.
- Gas Kick Profile: Internal burst force at the shoe will be Fracture Pressure at that depth. Surface burst pressure will be fracture gradient at setting depth less a gas gradient to equivalent height of 100 bbl kick with Drill Pipe inside casing and mud gradient with which the next hole section will be run above that (0.65 psi/ft). External force will be equal to the mud gradient in which the casing will be run (0.47 psi/ft), which is a more conservative backup force than pore pressure.
- Fracture at Shoe with 1/3 BHP at Surface: Internal burst force at the shoe will be Fracture Pressure at setting depth. Internal burst force at surface will be 1/3 of pore pressure at setting depth. External force will be equal to the mud gradient in which the casing will be run (0.47 psi/ft) which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (9.0 ppg).

Production Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: 8000 psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
- Injection Down Casing: 9500 psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (12.5 ppg).

Casing Design Criteria and Load Case Assumptions

Surface Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.43 psi/ft). The effects of axial load on collapse will be considered.
- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and an internal force equal to mud gradient of displacement fluid (0.52 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: Casing test per Onshore Oil and Gas Order No. 2 with an external force equal to the mud gradient in which the casing will be run (0.43 psi/ft), which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (8.3 ppg).

Intermediate #1 Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.52 psi/ft). The effects of axial load on collapse will be considered.
- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: Casing test per Onshore Oil and Gas Order No. 2 with an external force equal to the mud gradient in which the casing will be run (0.52 psi/ft), which is a more conservative backup force than pore pressure.
- Gas Kick Profile: Internal burst force at the shoe will be Fracture Pressure at that depth. Surface burst pressure will be fracture gradient at setting depth less a gas gradient to equivalent height of 50 bbl kick with Drill Pipe inside casing and mud gradient with which the next hole section will be run above that (0.47 psi/ft). External force will be equal to the mud gradient in which the casing will be run (0.52 psi/ft), which is a more conservative backup force than pore pressure.
- Fracture at Shoe with 1/3 BHP at Surface: Internal burst force at the shoe will be Fracture Pressure at setting depth. Internal burst force at surface will be 1/3 of pore pressure at setting depth. External force will be equal to the mud gradient in which the casing will be run (0.52 psi/ft) which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (10.0 ppg).

Intermediate #2 Casing

Collapse: $DF_c=1.125$

- Partial Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.47 psi/ft). The effects of axial load on collapse will be considered. Internal force equal to gas gradient over half of setting depth and mud gradient with which the next hole section will be run below that (0.65 psi/ft).

- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and mud gradient in which the casing will be run above that (0.47 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: Casing test per Onshore Oil and Gas Order No. 2 with an external force equal to the mud gradient in which the casing will be run (0.47 psi/ft), which is a more conservative backup force than pore pressure.
- Gas Kick Profile: Internal burst force at the shoe will be Fracture Pressure at that depth. Surface burst pressure will be fracture gradient at setting depth less a gas gradient to equivalent height of 100 bbl kick with Drill Pipe inside casing and mud gradient with which the next hole section will be run above that (0.65 psi/ft). External force will be equal to the mud gradient in which the casing will be run (0.47 psi/ft), which is a more conservative backup force than pore pressure.
- Fracture at Shoe with 1/3 BHP at Surface: Internal burst force at the shoe will be Fracture Pressure at setting depth. Internal burst force at surface will be 1/3 of pore pressure at setting depth. External force will be equal to the mud gradient in which the casing will be run (0.47 psi/ft) which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (9.0 ppg).

Production Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: 8000 psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
- Injection Down Casing: 9500 psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (12.5 ppg).

Casing Design Criteria and Load Case Assumptions

Surface Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.43 psi/ft). The effects of axial load on collapse will be considered.
- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and an internal force equal to mud gradient of displacement fluid (0.52 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: Casing test per Onshore Oil and Gas Order No. 2 with an external force equal to the mud gradient in which the casing will be run (0.43 psi/ft), which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (8.3 ppg).

Intermediate #1 Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.52 psi/ft). The effects of axial load on collapse will be considered.
- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: Casing test per Onshore Oil and Gas Order No. 2 with an external force equal to the mud gradient in which the casing will be run (0.52 psi/ft), which is a more conservative backup force than pore pressure.
- Gas Kick Profile: Internal burst force at the shoe will be Fracture Pressure at that depth. Surface burst pressure will be fracture gradient at setting depth less a gas gradient to equivalent height of 50 bbl kick with Drill Pipe inside casing and mud gradient with which the next hole section will be run above that (0.47 psi/ft). External force will be equal to the mud gradient in which the casing will be run (0.52 psi/ft), which is a more conservative backup force than pore pressure.
- Fracture at Shoe with 1/3 BHP at Surface: Internal burst force at the shoe will be Fracture Pressure at setting depth. Internal burst force at surface will be 1/3 of pore pressure at setting depth. External force will be equal to the mud gradient in which the casing will be run (0.52 psi/ft) which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (10.0 ppg).

Production Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.47 psi/ft). The effects of axial load on collapse will be considered.

- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and mud gradient in which the casing will be run above that (0.47 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: 8000 psi casing test with an external force equal to the mud gradient in which the casing will be run (0.47 psi/ft), which is a more conservative backup force than pore pressure.
- Injection Down Casing: 9500 psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.47 psi/ft), which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (9.0 ppg).

Casing Design Criteria and Load Case Assumptions

Surface Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.43 psi/ft). The effects of axial load on collapse will be considered.
- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and an internal force equal to mud gradient of displacement fluid (0.52 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: Casing test per Onshore Oil and Gas Order No. 2 with an external force equal to the mud gradient in which the casing will be run (0.43 psi/ft), which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (8.3 ppg).

Intermediate #1 Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.52 psi/ft). The effects of axial load on collapse will be considered.
- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: Casing test per Onshore Oil and Gas Order No. 2 with an external force equal to the mud gradient in which the casing will be run (0.52 psi/ft), which is a more conservative backup force than pore pressure.
- Gas Kick Profile: Internal burst force at the shoe will be Fracture Pressure at that depth. Surface burst pressure will be fracture gradient at setting depth less a gas gradient to equivalent height of 50 bbl kick with Drill Pipe inside casing and mud gradient with which the next hole section will be run above that (0.47 psi/ft). External force will be equal to the mud gradient in which the casing will be run (0.52 psi/ft), which is a more conservative backup force than pore pressure.
- Fracture at Shoe with 1/3 BHP at Surface: Internal burst force at the shoe will be Fracture Pressure at setting depth. Internal burst force at surface will be 1/3 of pore pressure at setting depth. External force will be equal to the mud gradient in which the casing will be run (0.52 psi/ft) which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (10.0 ppg).

Intermediate #2 Casing

Collapse: $DF_c=1.125$

- Partial Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.47 psi/ft). The effects of axial load on collapse will be considered. Internal force equal to gas gradient over half of setting depth and mud gradient with which the next hole section will be run below that (0.65 psi/ft).

- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and mud gradient in which the casing will be run above that (0.47 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: Casing test per Onshore Oil and Gas Order No. 2 with an external force equal to the mud gradient in which the casing will be run (0.47 psi/ft), which is a more conservative backup force than pore pressure.
- Gas Kick Profile: Internal burst force at the shoe will be Fracture Pressure at that depth. Surface burst pressure will be fracture gradient at setting depth less a gas gradient to equivalent height of 100 bbl kick with Drill Pipe inside casing and mud gradient with which the next hole section will be run above that (0.65 psi/ft). External force will be equal to the mud gradient in which the casing will be run (0.47 psi/ft), which is a more conservative backup force than pore pressure.
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Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (9.0 ppg).

Production Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: 8000 psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
- Injection Down Casing: 9500 psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (12.5 ppg).

Casing Design Criteria and Load Case Assumptions

Surface Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.43 psi/ft). The effects of axial load on collapse will be considered.
- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and an internal force equal to mud gradient of displacement fluid (0.52 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: Casing test per Onshore Oil and Gas Order No. 2 with an external force equal to the mud gradient in which the casing will be run (0.43 psi/ft), which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (8.3 ppg).

Intermediate #1 Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.52 psi/ft). The effects of axial load on collapse will be considered.
- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: Casing test per Onshore Oil and Gas Order No. 2 with an external force equal to the mud gradient in which the casing will be run (0.52 psi/ft), which is a more conservative backup force than pore pressure.
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Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (10.0 ppg).

Intermediate #2 Casing

Collapse: $DF_c=1.125$

- Partial Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.47 psi/ft). The effects of axial load on collapse will be considered. Internal force equal to gas gradient over half of setting depth and mud gradient with which the next hole section will be run below that (0.65 psi/ft).

- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and mud gradient in which the casing will be run above that (0.47 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: Casing test per Onshore Oil and Gas Order No. 2 with an external force equal to the mud gradient in which the casing will be run (0.47 psi/ft), which is a more conservative backup force than pore pressure.
- Gas Kick Profile: Internal burst force at the shoe will be Fracture Pressure at that depth. Surface burst pressure will be fracture gradient at setting depth less a gas gradient to equivalent height of 100 bbl kick with Drill Pipe inside casing and mud gradient with which the next hole section will be run above that (0.65 psi/ft). External force will be equal to the mud gradient in which the casing will be run (0.47 psi/ft), which is a more conservative backup force than pore pressure.
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Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (9.0 ppg).

Production Casing

Collapse: $DF_c=1.125$

- Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
- Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft).

Burst: $DF_b=1.125$

- Pressure Test: 8000 psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
- Injection Down Casing: 9500 psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.

Tensile: $DF_t=1.8$

- Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (12.5 ppg).

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HYDROGEN SULFIDE CONTINGENCY PLAN Drilling, Testing, & Completion

MRC ENERGY CO.

Reviewers

----- Operations Manager
----- Operations Supt.
----- Staff RES
----- Field Supv.
----- Engineering

Latitude: N

Longitude: W

(Surface Location)

H2S Contingency Plan # 0165

Revision# 0

This H2S Contingency Plan is subject to updating

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Effective date: July 8, 2015

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INTRODUCTION

The H₂S equipment will be rigged up 2 days prior to reaching a potential H₂S containing zone. Drilling into any potential H₂S zone shall not commence until the on-site MRC Drilling Supervisor has confirmed this plan in place.

The onsite Drilling Foreman will give Total Safety one week (7 days) notice to prepare for rig up of H₂S equipment)

To be effective, the plan requires the cooperation and effort of each person participating in the drilling of an H₂S well. Each person must know his/her responsibilities and all emergency and safety procedures. He/she should thoroughly understand and be able to use with accuracy, all safety equipment while performing his/her normal duties, if the circumstance should arise. He/she should therefore familiarize himself/herself with the location of all safety equipment and check to see that it is properly stored, easily accessible at all times, and routinely maintained.

It is the intention of MRC ENERGY CO. and the Drilling Contractor to make every effort to provide adequate safeguards against harm to persons on the rig and in the immediate vicinity from the effects of hydrogen sulfide, which may be released into the atmosphere under emergency conditions. However, the initiative rests with the individual in utilizing the safeguards provided. The ideas and suggestions of the individuals involved in the drilling of this well are highly welcomed and act as a fundamental tool for providing the safest working conditions possible.

The drilling representative is required to enforce these procedures. They are set up for your safety and the safety of all others.

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II. PURPOSE

It is MRC Energy Co.'s intent to provide a safe working place, not only for its employees, but also for other contractors who are aiding in the drilling of this well. The safety of the general public is of utmost concern. All precautions will be taken to keep a safe working environment and protect the public.

There is a possibility of encountering toxic hydrogen sulfide gas. Safety procedures must be adhered to in order to protect all personnel connected with the operations as well as people living within the area.

The MRC Energy Co. representative will enforce all aspects of the H2S Contingency Plan. This job will become easier by a careful study of the following pages and training and informing all personnel that will be working on the well, their duties and responsibilities.

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A. OPERATING PROCEDURES**DEFINITIONS:**

For purpose of this plan, on-site personnel shall be referred to as “In Scope Personnel” or “Out of Scope Personnel”, per the following definitions:

In Scope Personnel – Personnel who will be working or otherwise present in potential H₂S release areas, including the rig floor, cellar, pits, and shaker areas.

Out of Scope Personnel – Personnel who will not be working or Otherwise present in potential H₂S areas. Such personnel include rig Site visitor, delivery and camp services personnel.

GENERAL:

Before this H₂S contingency plan becomes operational, all regularly assigned In Scope Personnel (primarily the MRC, drilling contractor, and certain service personnel,) shall be thoroughly trained in the use of breathing equipment, emergency procedures, and responsibilities. Total Safety Technician or a designee assigned by the MRC Drilling Foreman shall keep a list of all personnel who have been through the on-site H₂S training program at the drill site.

All In Scope Personnel shall be given H₂S training and the steps to be taken during H₂S conditions under which the well may be drilled. General information will be explained about toxic gases, as well as the physiological effects of H₂S and the various classified operating conditions. In addition, the reader will be informed his/her general responsibility concerning safety equipment and emergency procedures.

The Total Safety H₂S Safety Technician or MRC on-site RSE Technician shall make available the H₂S Contingency Plan for all personnel to review.

Without exception, all personnel that arrive on location must proceed directly to and sign-in with the on-site MRC RSE Technician. In Scope Personnel will be required to complete an on-site H₂S training and respirator fit testing before starting work, or produce evidence that they have received equivalent training. Out of Scope Personnel will be required to complete a site H₂S awareness and general safety briefing. This

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briefing will consist of a H₂S hazard overview, alarm review and required response to alarms.

B. PROCEDURES TO BE INITIATED PRIOR TO H₂S CONTINGENCY PLAN COMPLIANCE:

A list of emergency phone numbers and contacts will be on location and posted at the following locations:

1. MRC ENERGY CO.'S Representative's Office
2. Drilling Contractor's, Toolpusher Office
3. Living Quarters Area

All safety equipment and H₂S related hardware must be set up as required by MRC Energy Co. with regard to location of briefing areas, breathing equipment, etc. All safety equipment must be inspected periodically (at least weekly) with particular attention to resuscitators and breathing equipment.

In Scope Personnel working in the well site area will be assigned breathing apparatus. Operator and drilling contractor personnel required to work in the following areas will be provided with Self Contained Breathing Apparatus:

1. Rig Floor
2. Mud Pits
3. Derrick
4. Shale Shaker
5. Cellar

The Total Safety H₂S Safety Technician will be responsible for rigging up all H₂S continuous monitoring-type detectors. The Total Safety Technician will monitor and bump test the detector units periodically (at least at least once a week to test alarm function during drilling conditions. In the event H₂S is detected, or when drilling in a zone confirmed to contain H₂S, the units shall be bump tested at least once every 24 hours. A bump test/calibration log will be kept on location. All results will be reported to the MRC on-site Drilling Foreman.

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All Total Safety H₂S equipment will be maintained and inspected by a Total Safety Technician on at least a Weekly basis.

C. DRILLING BELOW CONTINGENCY PLAN DEPTH

H₂S response drills will be held at least once per week if possible or as often as necessary to acquaint the crews and service company personnel of their responsibilities and the proper procedures to shut-in a well. Initial drills will be performed until crews demonstrate competency donning and working under mask. After the MRC Energy Co.'s representative is satisfied with initial blowout drill procedures, a drill will be conducted weekly with each crew, as necessary. The H₂S Safety Technician or designee will conduct safety talks and maintain the safety equipment, consult and carry out the instructions of the drilling supervisor. All personnel allowed in the well work area during drilling or testing operations will be instructed in the use of breathing equipment until supervisory personnel are satisfied that they are capable of using it.

After familiarization, each person must perform a drill with breathing equipment. The drill should include getting the breathing equipment, donning the breathing apparatus, and performing expected duties for a short period. A record shall be kept of all personnel drilled and the date of the drill. H₂S training records will be kept on location for all personnel.

Rig crews and service company personnel shall be made aware of the location of spare air bottles, resuscitation equipment, portable fire extinguishers, H₂S monitors and detectors. Knowledge of the location of the H₂S monitors and detectors are vital in determining as our gas location and the severity of the emergency conditions.

After any device has initially detected H₂S, all areas of poor ventilation shall be inspected periodically by means of a portable H₂S detector instrument. The buddy system will be utilized. (When an alarm sounds, personnel will don an SCBA, shut the well in, and proceed to SBA for roll call. The H₂S Technician or designee will mask up, with a buddy and will verify source of H₂S and report back to the on-site MRC Foreman.)

D. PROCEDURES PROGRAM

1. Drill Site

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- a. The drilling rig will be located to allow prevailing winds to blow across the reserve pit.
- b. A Safe Briefing Area will be provided with a breathing air cascade trailer and or 30-minute SCBA's at the Primary Area. Personnel will assemble at the most up-wind station under alarm conditions, or when so ordered by the MRC Energy Co. representative, the Contractor representative, or the Total Safety H₂S Safety Technician. Windsocks or streamers will be anchored to various strategic places on a pole about 10 feet high, so it is in easy view from the rig floor at all times.
- c. Warning signs will be posted on the perimeters. "No Smoking" signs will be posted by MRC Energy Co.as well.
- d. One multi-channel automatic H₂S monitor will be provided by Total Safety and the detector heads will be at the shale shaker, bell nipple, mud pits, rig floor, and quarter's area. The monitor will be located inside HSE or Company man trailer. Should the alarm be shut off to silence the sirens, the blinker light must continue to warn of H₂S presence. The Total Safety H₂S Safety Technician or designee will continuously monitor the detectors and will reactivate the alarm if H₂S concentrations increase to a dangerous level.
- e. A method of escape will be open at all times.
- f. If available, land line telephone service will be provided or cell phones provided. (Primary communications provided)
- g. A rig communication system will be provided, as needed.
- h. A gas trap, choke manifold, and degasser will be installed.
- i. A kill line, securely anchored and of ample strength, will be laid to the well-head from a safe location. This line is to be used only in an emergency.

General

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- a. The MRC Energy Co. representative and/or the Contractor's Toolpusher will be available at all times. The drilling supervisor, while on duty, will have complete charge of the rig and location operations and will take whatever action is deemed necessary to insure personnel safety, to protect the well, and to prevent damage.
- b. b. A Mud Engineer will be on location at all times when
- c drilling takes place at the depth H₂S may be expected. The mud engineer will be able to verify the presence or absence of H₂S.

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III. CONDITIONS AND EMERGENCY PROCEDURES**A. DEFINITION OF OPERATIONAL "CONDITIONS"**

CONDITION I	"POSSIBLE DANGER"
Warning Flags	Green
Alarms	No Alarm. Less than 10 ppm
Characterized By:	Drilling operations in zones that may contain hydrogen sulfide. This condition remains in effect unless H ₂ S is detected and it becomes necessary to go to Condition II.
General Action:	- Be alert for a condition change - Check all safety equipment for availability and proper functioning. - Perform all drills for familiarization and proficiency.
CONDITION II	"MODERATE DANGER"
Warning Flags	Yellow
Alarms:	Actuates at 10 ppm. Continuous flashing light.
Characterized By:	Drilling operations in zones containing hydrogen sulfide. This condition will remain in effect until adding chemicals to the mud system neutralizes the hydrogen sulfide or it becomes necessary to go to Condition III.
General Action:	- Be alert for a condition change - WHEN DRILLING AHEAD - Driller and designated crewmember will don 30 min SCBA, shut-in the well and immediately proceed to the Safe Briefing Area. WHEN TRIPPING – Driller and two designated crewmembers will don 30 min SCBA, shut in the well and

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immediately proceed to the Safe Briefing Area. The Derrickman will don a 5-minute escape pack, descend to the rig floor, don a 30-min SCBA (if necessary) and immediately proceed to the Safe Briefing Area.

- c. All In Scope Personnel will proceed directly to the appropriate Safe Briefing Area.
- d. Remain in safe briefing area, take roll call and wait for instructions
- e. Contact the Total H₂S Technician if not on location.
- f. Personnel shall ensure that their breathing apparatus is properly fitted and operational before entering an H₂S contaminated area to provide assistance to anyone who may be injured or overcome by toxic gases.
- g. All Out of Scope Personnel will report to the appropriate Safe Briefing Area.

CONDITION III “EXTREME DANGER”

Warning Flags

Red

Alarms

Actuate at 15 ppm. Continuous Sirens and Flashing Lights

Characterized by:

Critical well operations which pose an immediate threat of H₂S exposure to on-site personnel and a potential threat to the public.

General Action:

- a. WHEN DRILLING AHEAD - Driller and designated crewmember will don 30 min SCBA, shut-in the

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well and immediately proceed to the Safe Briefing Area.

WHEN TRIPPING – Driller and two designated crewmembers will don 30 min SCBA, shut in the well and immediately proceed to the Safe Briefing Area. The Derrickman will don a 5-minute escape pack, descend to the rig floor, don a 30-min SCBA (if necessary) and immediately proceed to the Safe Briefing Area.

- b. All In Scope Personnel should don SCBA if nearby and immediately proceed to Safe Briefing Area. If SCBA is not nearby at time of alarm, DO NOT GO TOWARDS RIG AREA, but proceed directly to the Safe Briefing Area
- c. All out of Scope Personnel shall evacuate the location.
- d. Remain in the Safe Briefing Area, take roll call and wait for instructions.
- e. Contact the Total H₂S Technician if not on location.
- f. Personnel shall ensure that their breathing apparatus is properly fitted and operational before entering an H₂S contaminated area to provide assistance to anyone who may be injured or overcome by toxic gases. Use the buddy system.
- g. Remain in safe briefing area, take roll call and wait for instructions.
- h. A cascade breathing air systems shall be mobilized and utilized to conduct

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any additional on rig work required to correct the H₂S release condition.

- i. If well is ignited do not assume area is safe. SO₂ is hazardous and not all H₂S will burn.

H₂S EMERGENCY PROCEDURES; IN SCOPE PERSONNEL

A. Day To Day Drilling Operations

1. Upon discovering a release of H₂S gas in the ambient air by warning alarms or in any other way **Do Not Panic**.
2. Hold your breath donning the nearest Self Contained Breathing Apparatus and rapidly move up or across-wind away from the areas where H₂S sensing devices are in place, to the closest available safe briefing area. Continue to use breathing apparatus until it has been determined that the exposure of H₂S gas in the ambient air no longer exists. **Do Not Panic!**
3. Utilize the "Buddy System", i.e.; select and pair up each person participating in the drilling of an H₂S well prior to an emergency situation.
4. Help anyone who is overcome or affected by the H₂S gas by taking him/her up-wind out of the contaminated area. (This should be done utilizing an SCBA and with a buddy.)
5. Take necessary steps to confirm the release of the H₂S gas into the ambient air.
 - When an H₂S alarm activates, two designated personnel using the buddy system, while wearing their self contained breathing apparatus, will determine by the read-out on the fixed monitor which sensing device has detected the release of the H₂S gas.
 - They will utilize the hand-held sniffer type device at the particular sensing point disclosed on the fixed monitor to corroborate the fact that H₂S gas has actually been released. This will rule out the possibility of a false alarm. This will be done with a buddy and under mask after reporting to the Safe Briefing Area for roll call and instructions by on-site MRC Foreman.

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6. Refer to the Emergency Phone Numbers and call emergency personnel.
7. Take the necessary steps to suppress the release of H₂S gas into the ambient air. Comply with the MRC Energy Co. Representative to physically suppress the release of H₂S gas at the actual release point.
8. Check all of MRC Energy Co.'s monitoring devices and increase gas-monitoring activities with the portable hand-operated H₂S and gas detector units.

Do Not Panic!

The MRC Energy Co. representative will assess the situation and with assistance of the Contractor's Representative and Total Safety's H₂S Safety Technician or on site designee, will assign duties to each person to bring the situation under control.

B. RESPONSIBILITIES OF WELL-SITE PERSONNEL

In the event of a release of potentially hazardous amounts of H₂S, all personnel will immediately don their protective breathing apparatus, the well will be shut in and personnel will proceed upwind to the nearest designated safe briefing area for roll call and instructions by MRC Foreman. Consideration will be given to evacuating Out of Scope Personnel, as situation warrants.

1. MRC ENERGY CO.'S Well-site Representatives

- a. If MRC Energy Co.'s well-site representative is incapacitated or not on location, this responsibility will fall to the Toolpusher/Driller.
- b. Immediately upon assessing the situation, set this plan into Action by initiating the proper procedures to contain the gas and notify the appropriate people and agencies.
- c. Ensure that the alarm area indicated by the fixed H₂S Monitor is checked and verified with a portable H₂S detector. (Safety Technician if on location or MRC assigned designee with a buddy utilizing SCBA's)
- d. Consult Pusher/driller of remedial actions as needed.

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- e. Ensure that non-essential personnel proceed to the safe briefing area.
- f. Ensure location entrance barricades are positioned. Keep the number of persons on location to a minimum during hazardous operations.
- g. Consult each contractor, Service Company and all others allowed to enter the site, that H₂S gas may be encountered and the potential hazards that may exist.
- h. Authorize the evacuation of local residents if H₂S threatens Their safety.
- i. Non essential personnel should be evacuated from location if Situation warrants.

2. Toolpusher

- a. Toolpusher/Driller will assume responsibilities of MRC Energy Co.'s well-site representative if that person is incapacitated or not on location.
- b. Ensure that the alarm area indicated by the fixed H₂S monitor is checked and verified with a portable H₂S gas detector. (Alarm area indicated by the monitor will be Checked by the H₂S Technician and a buddy, under mask.) This will be done after checking in and roll call at the Upwind Safe Briefing Area.
- c. Confer with MRC Energy Co.'s well-site representative or superintendent and direct remedial action to suppress the H₂S and control the well.
- d. Ensure that personnel at the safe briefing area are instructed on emergency actions required.
- e. Ensure that personnel at the drill floor area are instructed on emergency actions required.
- f. Ensure that all personnel observe the appropriate safety and emergency procedures.

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- g. Ensure that all persons are accounted for and provided emergency assistance as necessary.

3. Mud Engineer

- a. Run a sulfide check on the flowline mud.
- b. Take steps to determine the source of the H₂S and suppress it. Lime and H₂S scavenger shall be added to the mud as necessary.

4. Total H₂S Safety Technician, if on location, or MRC Designee

- a. H₂S Safety Technician or designee don nearest SCBA and report to Safe Briefing Area for roll call, take a buddy masked up and check monitor and verify with a portable H₂S detector the alarm area indicated by the fixed H₂S monitor. Advise the Toolpusher/Driller and MRC Energy Co.'s well-site representative of findings. Record all findings.
- b. If H₂S is flared, check for sulfur dioxide (SO₂) near the flare as necessary. Take hourly readings at different perimeters, log readings and record on location.
- c. Ensure that personnel at the safe briefing area are instructed on emergency actions required.
- d. Ensure that the appropriate warning flags are displayed.
- e. Ensure that all personnel are in S.C.B.A. as necessary.
- f. Ensure that all persons are accounted for and provide emergency assistance as necessary.

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- g. Be prepared to evacuate rig if order is issued.

5. General Personnel & Visitors

- a. All In Scope Personnel, if not specifically designated to shut the well in or control the well, shall proceed to the (upwind) safe briefing area. All Out of Scope Personnel shall immediately proceed to the appropriate (upwind) safe briefing area or evacuate the site as conditions warrant.
- b. During any emergency, use the "buddy" system to prevent anyone from entering or being left in a gas area alone, even wearing breathing apparatus.
- c. Provide assistance to anyone who may be injured or overcome by toxic gases. Personnel shall ensure that their breathing apparatus is properly fitted and operational before entering a potentially H₂S contaminated area.
- d. Remain in safe briefing area and wait for instructions.

C. INSTRUCTIONS FOR IGNITING THE WELL

- 1. The Toolpusher/Driller will confer with MRC Energy Co.'s well-site representative who will secure the approval of the "Texas Wells Delivery Manager, prior to igniting the well, if at all possible.

The Toolpusher/Driller will be responsible for igniting the well in the event of severe well control problems. This decision should be made only as a last resort in situations where it is clear that:

- a. Human life and property are endangered, or
 - b. There is no hope of controlling the well under current conditions.
- 2. Once the decision has been made, the following procedures should be followed:

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- a. Two people wearing self-contained breathing apparatus will be needed for the actual lighting of the well. They must first establish the flammable perimeter by using an explosimeter. This should be established at 30% to 40% of the lower flammable limits.
- b. After the flammable perimeter has been established and everyone removed from the area, the ignition team should select a site upwind of the well from which to ignite the well. This site should offer the maximum protection and have a clear path for retreat from the area.
- c. The ignition team should have safety belts and lifeline attached and manned before attempting ignition. If the leak is not ignited on the first attempt, move in 20 to 30 feet and fire again. Continue to monitor with the explosimeter and NEVER fire from an area with over 75% of the Lower Explosive Limit (LEL). If having trouble igniting the well, try firing 40 degrees to 90 degrees on either side of the well.
- d. If ignition is not possible due to the makeup of the gas, the toxic perimeter must be established and evacuation continued until the well is contained.
- e. All personnel must act only as directed by the person in charge of the operations.

NOTE: After the well is ignited, burning hydrogen sulfide (H_2S) will convert to sulfur dioxide (SO_2), which is also a highly toxic gas.

DO NOT ASSUME THE AREA IS SAFE AFTER THE WELL IS IGNITED**D. CORING PROCEDURES**

Only essential personnel shall be on the rig floor. Ten (10) stands prior to retrieving core barrel; all personnel on drill floor and in derrick shall confirm self-Contained breathing apparatus available and ready for use.

A Total H2S Technician will don a SCBA with a buddy assigned from the rig crew, and continuously monitor for H2S at each connection. Any levels detected will require operations to be shut down and all involved

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personnel to don SCBAs. Precautions will remain in place until barrel is laid down.

All involved personnel will don SCBAs when removing the inner barrel from the outer barrel. SCBAs can be removed once the absence of H₂S is confirmed by the Total H₂S Technician.

Cores will be appropriately marked and sealed for transportation.

Normal Operations

1. Responsibilities of well-site personnel

a. Well-site Representative

1. Notify H₂S Technician of expected date to reach Contingency Plan implementation depth (Two (2) days prior to reaching suspected H₂S bearing zone) or prior to starting well work.
2. Ensure H₂S Safety Technician completes rig-up procedures prior to reaching Contingency Plan effective depth.
3. Restrict the number of personnel at the drilling rig or well site to a minimum while drilling, starting well work, testing or coring.
4. Ensure weekly H₂S drills/training are performed, if possible.

B. Toolpusher

1. Ensure that necessary H₂S safety equipment is provided on the rig, and that it is properly inspected and maintained.
2. Ensure that all personnel that work in the well area, are thoroughly trained in the use of H₂S safety

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equipment and periodic drills are held to maintain an adequate level of proficiency.

C. In Scope Personnel

1. Remain clean-shaven. Beards and long sideburns do not allow a proper facepiece seal.
2. Receive H₂S safety training on location, or confirm prior training by certification that is one year within date.
3. Familiarize yourself with the rig's Contingency Plan.
4. Inspect and practice putting on your breathing apparatus.
5. Know the location of the "safe briefing areas".
6. Keep yourself "wind conscious". Be prepared to quickly move upwind and away in the event of any emergency involving release of H₂S.

D. Total Safety H₂S Safety Technician or MRC Designee

1. Conduct training as necessary to ensure all personnel working in well area are familiar with the contingency procedures and the operation of emergency equipment.
2. Check all H₂S safety equipment to ensure that it is ready for emergency use:
 - Check pressure weekly for each shift on breathing apparatus (both 30-minute and hip-packs) to make sure they are charged to full volume.
 - Check pressure on cascade air bottles, if on location, to see that they are capable of recharging breathing apparatus.

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- Check oxygen resuscitator, if on location, to ensure that it is charged to full volume.
 - Check H₂S detectors weekly for each shift (fixed and portable), and explosimeter, to ensure they are working properly.
3. Provide a weekly report to MRC Energy Co.'s well-site representative documenting:
- Calibrations performed on H₂S detectors.
 - Proper location and working order of H₂S safety equipment.
 - Attendance of all personnel, trained or retrained, and their company.
 - Weekly drills, if held and a list of personnel participating and summary of actions.

OUT OF SCOPE PERSONNEL

MRC Energy Co. policy will not require Out of Scope Personnel to be clean shaven, have processed medical questionnaires, fit testing, or have certified H₂S Training.

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SAFETY EQUIPMENT

All respirators will be designed, selected, used and maintained in conformance with ANSI Z88.2, American National Standard for respiratory protection.

Personal protective equipment must be provided and used. Those who are expected to use respiratory equipment in case of an emergency will be carefully instructed in the proper use and told why the equipment is being used. Careful attention will be given to the minute details in order to avoid possible misuse of the equipment during periods of extreme stress.

Self-contained breathing apparatus provides complete respiratory and eye protection in any concentration of toxic gases and under any condition of oxygen deficiency. The wearer is independent of the surrounding atmosphere because he/she is breathing with a system admitting no outside air. It consists of a full face mask, breathing tube, pressure demand regulator, air supply cylinder, and harness. Pure breathing air from the supply cylinder flows to the mask automatically through the pressure demand regulator which reduces the pressure to a breathing level. Upon inhalation, air flows into the mask at a rate precisely regulated to the user's demand. Upon exhalation, the flow to the mask stops and the exhaled breath passes through a valve in the face piece to the surrounding atmosphere. The apparatus includes an alarm & gauge which warns the wearer to leave the contaminated area for a new cylinder of air or cylinder refill.

The derrickman is provided with a full face piece unit attached to a 5– minute escape cylinder. He will also have his own self-contained 30-minute unit breathing apparatus located on the drilling floor. He will use the 5-minute unit to exit the derrick to the floor, donning the 30-minute unit located on the floor, if needed.

All respiratory protective equipment, when not in use, should be stored in a clean, cool, dry place, and out of direct sunlight to retard the deterioration of rubber parts. After each use, the mask assembly will be scrubbed with soap and water, rinsed thoroughly, and dried. Air cylinders can be recharged to a full condition from a cascade system.

Personnel in each crew will be trained in the proper techniques of bottle filling.

The primary piece of equipment to be utilized, should anyone be overcome by hydrogen sulfide, is the oxygen resuscitator, if on location.

When asphyxiation occurs, the victim must be moved to fresh air and immediately given artificial respiration. In order to assure readiness, the bottles of oxygen will be checked at regular intervals and an extra tank kept on hand.

Hand-operated pump-type detectors incorporating detector tubes will give more accurate readings of hydrogen sulfide. The pump-type draws air to be tested through the detector

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tube containing lead acetate-silica gel granules. Presence of hydrogen sulfide in the air sample is shown by the development of a dark brown stain on the granules, which is the scale reading of the concentration of hydrogen sulfide. By changing the type of detector tube used, this detector may also be used for sulfur dioxide (SO₂) detection when hydrogen sulfide (H₂S) is being burned in the flare area.

Provisions must be made for the storage of all safety equipment as is evident from the foregoing discussion. All equipment must be stored in an available location so that anyone engaged in normal work situations is no more than "one breath away" from a mask.

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V – TOXICITY OF VARIOUS GASES

Lethal Common Name ppm⁴	Chemical Formula	Specific Gravity¹	PEL (OSHA)²	STEL³
Hydrogen Cyanide 300	HCN	0.94	10	150
Hydrogen Sulfide 600	H ₂ S	1.18	20	Peak- 50ppm
Note: The ACGIH(7) recommends a TWA(6) value of 10ppm as the TLV(5) for H ₂ S and an STEL of 15ppm.				
Sulfur Dioxide 1000	SO ₂	2.21	2	5 ppm
Chlorine	CL ₂	2.45	1	
Carbon Monoxide 1000	CO	0.97	35	200/1 Hour
Carbon Dioxide 10%	CO ₂	1.52	5000	5%
Methane	CH ₄	0.55	90000	

¹ **Air = 1.0**² **Permissible** - Concentration at which is believed that all workers may repeatedly be exposed, day after day, without adverse effect.³ **STEL** - Short Term Exposure Limit. A 15-minute time weighted average.⁴ **Lethal** - Concentration that will cause death with short-term exposure.**TLV** – Threshold Limit Value; a concentration recommended by the American Conference of Governmental Industrial Hygienists (ACGIH)**TWA** – Time Weighted Average; the average concentration of contaminant one can be exposed to over a given eight-hour period.**ACGIH** – (American Conference of Governmental Industrial Hygienists) is an organization comprised of Occupational Health Professionals believed

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by many to be the top experts in the field of Industrial Hygiene. They are recognized as an expert resource by OSHA. The ACGIH releases a bi-annual publication "Threshold Limit Values and Biological Indices" that many safety professionals consider to be the authoritative document on airborne contaminants.

Reference: API RP-49, September 1974 - Reissued August 1978

VI. PROPERTIES OF GASES

A. CARBON DIOXIDE

1. Carbon Dioxide (CO₂) is usually considered inert and is commonly used to extinguish fires. It is 1.52 times heavier than air and will concentrate in low areas of still air. Humans cannot breathe air containing more than 10% CO₂ without losing conscience or becoming disorientation in a few minutes. Continued exposure to CO₂ after being affected will cause convulsions, coma, and respiratory failure.
2. The threshold limit of CO₂ is 5000 ppm. Short-term exposure to 50,000 ppm (5%) is reasonable. This gas is colorless, odorless, and can be tolerated in relatively high concentrations.

B. HYDROGEN SULFIDE

1. Hydrogen Sulfide (H₂S) is a colorless, transparent, flammable gas. It is heavier than air and, hence, may accumulate in low places.
2. Although the slightest presence of H₂S in the air is normally detectable by its characteristic "rotten egg" odor, it is dangerous to rely on the odor as a means of detecting excessive concentrations because the sense of smell is rapidly lost, allowing lethal concentrations to be accumulated without warning. The following table indicates the poisonous nature of H₂S.

CONCENTRATION			EFFECTS
% H ₂ S	PPM	GR/100 SCF ¹	
0.001	10	.65	Safe for 8 hours without respirator. Obvious and unpleasant odor.
0.0015	15	0.975	Safe for 15 minutes of exposure without respirator.
0.01	100	6.48	Kills smell in 3-15 minutes; may sting eyes and throat.
0.02	200	12.96	Kills smell quickly; stings eyes and throat.
0.05	500	32.96	Dizziness; breathing ceases in a few minutes; need prompt artificial respiration.
0.07	700	45.92	Rapid Unconsciousness; death will result if not rescued promptly.
0.1	1000	64.80	Instant unconsciousness, followed by death within

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			minutes.
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¹ Grains per 100 Cubic Feet

VII. Treatment Procedures for Hydrogen Sulfide Poisoning

- A. Remove the victim to fresh air.
- B. If breathing has ceased or is labored, begin resuscitation immediately.
Note: This is the quickest and preferred method of clearing victim's lungs of contaminated air; however, under disaster conditions, it may not be practical to move the victim to fresh air. In such instances, where those rendering first aid must continue to wear masks, a resuscitator should be used.
- C. Apply resuscitator to help purge H₂S from the blood stream.
- D. Keep the victim at rest and prevent chilling.
- E. Get victim under physician's care as soon as possible.

C. SULPHUR DIOXIDE

1. Sulfur Dioxide (SO₂) is a colorless, non-flammable, transparent gas.
2. SO₂ is produced during the burning of H₂S. Although SO₂ is heavier than air, it can be picked up by a breeze and carried downwind at elevated temperatures. Since SO₂ is extremely irritating to the eyes and mucous membranes of the upper respiratory tract, it has exceptionally good warning powers in this respect. The following table indicates the toxic nature of SO₂:

CONCENTRATION		EFFECTS
% SO ₂	PPM	
0.0005	3 to 5	Pungent odor, normally a person can detect SO ₂ in this range.
0.0012	12	Throat irritation, coughing, constriction of the chest, tearing and smarting of eyes.
0.015	150	So irritating that it can only be endured for a few minutes.
.05	500	Causes a sense of suffocation, event with the first

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		breath.
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VIII. BREATHING AIR EQUIPMENT DRILLS FOR ON & OFF DUTY PERSONNEL

An H₂S Drill and Training Session must be given once a week to ALL on-duty personnel with off duty personnel. On-duty and Off-duty personnel will reverse roles on alternate drills.

An H₂S drill and training session must be given once a week to all off-duty personnel in coincidence with on-duty personnel reversing roles on alternate drills.

The purpose of this drill is to instruct the crews in the operation and use of breathing air and H₂S related emergency equipment and to allow the personnel to become acquainted with using the equipment under working conditions. The crews should be trained to put on the breathing air equipment within one minute when required or requested to do so.

The following procedure should be used for weekly drills. The MRC supervisor must be satisfied that the crews are proficient with the equipment.

1. All personnel should be informed that a drill will be held.
2. The Total H₂S Safety Technician or a designee assigned by the MRC Drilling Foreman should initiate the drill by signaling as he/she would if H₂S was detected.
3. Personnel should don their breathing apparatus.
4. Once the breathing air equipment is on, the H₂S Technician should check all personnel to insure proper operation.

A training and information session will be conducted after each drill to answer any H₂S related questions and to cover any gaps identified from one of the following topics:

- Condition II, and III alerts and steps to be taken by all personnel.
- The importance of wind direction when dealing with H₂S.
- Proper use and storage of all types of breathing equipment.
- Proper use and storage of oxygen resuscitators.
- Proper use and storage of H₂S detectors (Mini Checks or equivalent).
- The "buddy system" and the procedure for rescuing a person overcome by H₂S.
- Responsibilities and duties.
- Location of H₂S safety equipment.
- Other parts of the "H₂S Contingency Plan" that should be reviewed.

NOTE: A record of attendance must be kept for weekly drills and training sessions.

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IX. HYDROGEN SULFIDE TRAINING CURRICULUM

(FOR EMPLOYERS, VISITORS, AND CONTRACTORS)

EACH PERSON WILL BE INFORMED ON THE RESTRICTIONS OF HAVING BEARDS AND CONTACT LENS. THEY WILL ALSO BE INFORMED OF THE AVAILABILITY OF SPECTACLE KITS.

AFTER THE H2S EQUIPMENT IS RIGGED UP, ALL IN SCOPE PERSONNEL WILL BE H2S TRAINED AND PUT THROUGH A DRILL. ANY DEFICIENCIES WILL BE CORRECTED.

Training Completion cards are good for one year and will indicate date of completion or expiration. Personnel previously trained on another facility and visiting, must attend a "supplemental briefing" on H2S equipment and procedures before beginning duty. Visitors who remain on the location more than 24 hours must receive full H2S training given all crew members. A "supplemental briefing" will include but not be limited to: Location of respirators, familiarization with safe briefing areas, alarms with instruction on responsibilities in the event of a release and hazards of H2S and (SO2, if applicable). A training and drill log will be kept.

Topics for full H2S training shall include the following equipment if on location, but not be limited to the following:

1. **Brief Introduction on H2S**
 - A. Slide or Computer presentation (If Available)
 - B. H2S material will be distributed
 - C. Re-emphasize the properties, toxicity, and hazards of H2S
 - D. Source of SO2 (if applicable)
2. **H2S Detection**
 - A. Description of H2S sensors
 - B. Description of warning system (how it works & it's location)
 - C. Actual location of H2S sensors
 - D. Instruction on use of pump type detector (Gastec)
 - E. Use of card detectors, ampoules, or dosimeters
 - F. Use of combustible gas detector
 - G. Other personnel detectors used
 - H. Alarm conditions I & II,
 - I. SO2 alarms (if applicable)

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3. **H2S Protection**
 - A. Types of breathing apparatus provided (30-minute SCBA & 5-minute SCBA (with voice diaphragms for communication if supplied)
 - B. Principle of how breathing apparatus works
 - C. Demonstration on how to use breathing apparatus
 - D. Location of breathing apparatus
4. **Cascade System**
 - A. Description of cascade system
 - B. How system works
 - C. Cascade location of rig with reference to briefing areas
 - D. How to use cascade system (with 5-minute hose work line units & refill, if supplied)
 - E. Importance of wind direction and actual location of Windsocks
 - F. Purpose of compressor/function (if one is on site)
5. **H2S Rescue and First Aid**
 - A. Importance of wind direction
 - B. Safe briefing area
 - C. Buddy system
 - D. H2S symptoms
 - E. Methods of rescue
6. **Hands on Training**
 - A. Donning/familiarization of SCBA 30-minute unit
 - B. Donning/familiarization of SKADA 5- MIN. Packs
 - C. Familiarization of cascades
 - D. Use of O2 resuscitator
 - E. Alarm conditions - upwind briefing areas, etc...
 - F. Duties and responsibilities of all personnel
 - G. Procedures for evacuation
 - H. Search and Rescue teams
7. **Certification**
 - A. Testing on material covered

TOTAL SAFETY US INC., FIT TEST

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X. EMPLOYEE INFORMATION

Employee Name: _____ Date: _____

Date of Employee Medical Evaluation: _____

Medical Status (circle): Unrestricted Limitations on Use Use Not Authorized

RESPIRATOR INFORMATION

Respirator Type (Dustmask, SCBA, etc): _____

Brand: _____

Size: (circle): XS S M L XL

FIT TEST INFORMATION

Type of Fit Test Performed:

QuantitativePorta Count
Fittestest 3000Fit Factor: _____
Fit Factor: _____**Qualitative**

Irritant Smoke	Passed / Failed
Isoamyl Acetate (Banana Oil)	Passed / Failed
Saccharin	Passed / Failed
Bitrex	Passed / Failed

I hereby certify that this fittestest was conducted in accordance with the OSHA Fit Testing Protocols found in Appendix A of 1910.134.

Fit Tester Name (Print): _____

Signature: _____ Date: _____

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XI. H₂S SAFETY SERVICES

HYDROGEN SULFIDE SAFETY PACKAGE – Contained on location in Total Safety H₂S Equipment Trailer, unless otherwise noted:

RESPIRATORY SAFETY SYSTEMS**QTY DESCRIPTION**

- 12 30-Minute Pressure Demand SCBA
(4-Primary Safe Briefing Area, 4-Secondary Safe Briefing Area, 4-floor with one of these for derrick man)
- 9 Hose Line 5-minute Work Unit w/Escapes Cylinder (1 in derrick, 6 on drill floor, 1 in mud pit wt area, 1 in shaker area)

The following shall be part of the package if requested by the MRC Foremen (at least one trailer with cascade system is required to be located in the MRC Magnolia asset for use as needed)

- 1 Breathing air cascade of 10 bottles w/regulator
- 2 Refill lines to refill 30-minute units on location
- 1 6-Man manifold that can be rigged up to work area on floor, if needed
- 6 25 foot hose lines
- 2 50 foot hose lines
- 100 Feet of hose line to rig cascade up to 12 man manifold on floor
- 12 30-minute Self Contained Breathing apparatus

DETECTION AND ALARM SAFETY SYSTEM

- 1 H₂S Fixed Monitor w/8Channels (Loc determined at rig up) suggested.
(Mud pit area, shaker area, bell nipple area, floor/driller area, & outside quarters)
- 5 H₂S Sensors
- 3 Explosion Proof Alarms (Light and Siren)
(1 on floor, 1 in work area, 1 in trailer area where quarters are located)
- 2 Personal H₂S monitors
- 1 Portable Tri-Gas Hand Held Meter (O₂, LEL, H₂S)
- 1 Sensidyne/Gastech Manual Pump Type Detector
- 8 Boxes H₂S Tubes Various Ranges
- 2 Boxes SO₂ Tubes Various Ranges
- 1 Calibration Gas
- 1 Set Paper Work for Records: Training, Cal, Inspection, other

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ADDITIONAL SAFETY RELATED EQUIPMENT

QTY DESCRIPTION

2	Windssocks with Pole and Bracket
1	Set Well Condition Sign w/Green, Yellow, Red Flags
1	Primary Safe Briefing Area Sign
1	Secondary Safe Briefing Area Sign
6	Operating Condition Signs for Work Areas & Living Quarters

**TRAILER WITH BREATHING AIR CASCADE WILL
ALSO INCLUDE THE FOLLOWING:**

This equipment will be part of the H2S equipment stored in the trailer, when on location

1	First aid kit
1	Fire Blanket
1	Eye wash station
2	Safety Harness w/150' safety line

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XII. EMERGENCY PHONE NUMBERS (Updated March 18, 2009)**EMERGENCY PHONE NUMBERS**

MRC Energy Co. Emergency Phone #

MRC Energy Co. Permian Operations Phone-----

MRC Energy Co. Production

113 Daw Rd

Mansfield LA 71052

Title	Names	Phone	Cell
Operations Manager			
Operation Supt.			
Operations Supervisor			
Operations Supervisor			
Office Supervisor			
HSE			
Scheduler Planner			

Hydrogen Sulfide Safety Consultants

Total Safety W. Bender Blvd. Hobbs, NM	575-392-2973	After Hours 24 Hour Call Center Through Office Number
Tommy Throckmorton Operations Manager	575-392-2973	940-268-9614
Rodney Jourdan Sales Contact	575-392-2973	432-349-3928

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MRC Energy Co. MEDICAL RESPONSE PLAN AND IT'S MEDICAL PROTOCOLS WILL BE FOLLOWED**MEDICAL COORDINATOR # -----**[Emergency Numbers & Directions](#)**Hospitals (911)**

Artesia General Hospital 702 N. 13th St. Artesia, NM 88210	Main Phone Number	575-748-3333
Nor-Lea General Hospital 1600 N. Main Ave. Lovington, NM 88260	Main Phone Number	575-396-6611
Lea Regional Medical Center 5419 N. Lovington Hwy Hobbs, NM 88240	Main Phone Number	575-492-5260
Carlsbad General Hospital 2430 W. Pierce St. Carlsbad, NM	Main Phone Number	575-887-4100
Lovelace Regional Hospital 117 E. 19th St Roswell, NM 88201	Main Phone Number	575-627-7000
Winkler Co. Memorial Hospital 821 Jeffee Dr. Kermit, Texas 79745	Main Phone Number	432-586-8299
Reeves County Hospital 2323 Texas St. Pecos, Texas 79772	Main Phone Number	432-447-3551

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State Police (911)

Texas DPS Loving co. 225 N.Pecos Mentone, Texas 79754	Office Number	432-377-2411
Texas DPS Winkler Co. 100 E Winkler Kermit, Texas 79745	Office Number	432-586-3465
Texas DPS Pecos Co. 148 N I-20 Frontage RD Pecos, Texas 79772	Office Number	432-447-3532
New Mexico State Police 3300 W. Main St Artesia, NM	Office Number	575-748-9718
New Mexico State Police 304 N. Canyon St Carlsbad, NM 88220	Office Number	575-885-3137
New Mexico State Police 5100 Jack Gomez Blvd. Hobbs, NM 88240	Office Number	575-392-5588

Local Law Enforcement (911) (Sheriff)

Reeves Co. Sheriff 500 N. Oak ST Pecos, Texas 79722	Office Number	432-445-4901
Winkler Co. Sheriff 1300 Bellaire St. Kermit, Texas 79745	Office Number	432-586-3461
Loving Co. Sheriff Courthouse Mentone, Texas	Office Number	432-377-2411

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Lea Co. Sheriff 1417 S. Commercial St. Lovington, NM 88260	Office Number	
Eddy Co. Sheriff 305 N 7th St. Artesia, NM 88210	Office Number	575-766-9888
Eddy Co. Sheriff 305 N 7th St. Carlsbad, NM 88220	Office Number	575-746-9888

Federal & State Agencies

OSHA Lubbock Area Office 1205 Texas Av. Room 806 Lubbock, Texas 79401	Main Number	806-472-7681 EXT 7685
New Mexico Environment Department 400 N Pennsylvania Roswell, NM 88201	Joe Fresquez	575-623-3935
Texas Railroad Commission Midland, Texas	Main Number	844-773-0305
BLM Carlsbad, NM Field Office 620 E. Green ST Carlsbad, NM 88220	Main Number	575-234-5972
BLM Hobbs Field Station 414 W. Taylor Rd. Hobbs, NM 88240	Main Number	575-393-3612
BLM Roswell District Office 2909 W. Second St. Roswell, NM 88201	Main Number	575-627-0272

MRC ENERGY CO.'S

TECQ Texas Commission on Environmental Quality	Main Number	800-832-8224
New Mexico OCD		
U.S. Environmental Protection Agency Region 6 Texas/New Mexico	Main Number	214-655-2222
National Response Center Toxic Chemicals & Oil Spills	Main Number	800-424-8802

Rig Company

XIII. EVACUATION OF THE GENERAL PUBLIC

The procedure to be used in alerting nearby persons in the event of any occurrence that could pose a threat to life or property will be arranged and completed with public officials in detail, prior to drilling into the hydrogen sulfide formations.

In the event of an actual emergency, the following steps will be immediately taken:

1. The MRC Energy Co.'s representative will dispatch sufficient personnel to immediately warn each resident and transients down-wind within radius of exposure from the well site. Then warn all residence in the radius of exposure. Additional evacuation zones may be necessary as the situation warrants.
2. The MRC Energy Co.'s representative will immediately notify proper authorities, including the Sheriff's Office, Highway Patrol, and any other public officials as described above and will enlist their assistance in warning residents and transients in the calculated radius of exposure.
3. The MRC Energy Co.'s representative will dispatch sufficient personnel to divert traffic in the vicinity away from the potentially dangerous area. A

MRC ENERGY CO.'S

guard to the entrance of the well site will be posted to monitor essential and non essential traffic.

4. General:

- A. The area included within the radius of exposure is considered to be the zone of maximum potential hazard from a hydrogen sulfide gas escape. Immediate evacuation of public areas, in accordance with the provisions of this contingency plan, is imperative. When it is determined that conditions exist which create an additional area (beyond the initial zone of maximum potential hazard) vulnerable to possible hazard, public areas in the additional hazardous area will be evacuated in accordance with the contingency plan.
- B. In the event of a disaster, after the public areas have been evacuated and traffic stopped, it is expected that local civil authorities will have arrived and within a few hours will have assumed direction of and control of the public, including all public areas. MRC Energy Co. will cooperate with these authorities to the fullest extent and will exert every effort by careful advice to such authorities to prevent panic or rumors.
- C. MRC Energy Co. will dispatch appropriate management personnel at the disaster site as soon as possible. The company's personnel will cooperate with and provide such information to civil authorities as they might require.
- D. One of the products of the combustion of hydrogen sulfide is sulfur dioxide (SO₂). Under certain conditions this gas may be equally as dangerous as H₂S. A pump type detector device, which determines the percent of SO₂ in air through concentrations in ppm, will be available. Although normal air movement is sufficient to dissipate this material to safe levels, the SO₂ detector should be utilized to check concentrations in the proximity of the well once every hour, or as necessary and the situation warrants. Also, if any low areas are suspected of having high concentrations, personnel should be made aware of these areas, and steps should be taken to determine whether or not these low areas are hazardous.

Exhibit E-6: H2S Contingency Plan Emergency Contacts
 Uncle Ches Fed #121H
 Matador Resources Company
 UL: M, Sec. 21, 20S, 35E
 Lea Co, NM

Company Office			
Matador Resources Company		(972)-371-5200	
Key Personnel			
Name	Title	Office	Mobile
Billy Goodwin	Vice President Drilling	972-371-5210	817-522-2928
Dee Smith	Drilling Superintendent	972-371-5447	972-822-1010
Toby Solis	Drilling Superintendent		817-372-7817
Patrick Walsh	Drilling Engineer	972-371-5291	626-318-5808
	Construction		
Jimmy Benefield	Superintendent		318-548-6659
Artesia			
Ambulance		911	
State Police		575-746-2703	
City Police		575-746-2703	
Sheriff's Office		575-746-9888	
Fire Department		575-746-2701	
Local Emergency Planning Committee		575-746-2122	
New Mexico Oil Conservation Division		575-748-1283	
Carlsbad			
Ambulance		911	
State Police		575-885-3137	
City Police		575-885-2111	
Sheriff's Office		575-887-7551	
Fire Department		575-887-3798	
Local Emergency Planning Committee		575-887-6544	
New Mexico Oil Conservation Division		575-887-6544	
Santa Fe			
New Mexico Emergency Response Comission (Santa Fe)		505-476-9600	
New Mexico Emergency Response Comission (Santa Fe) 24 hrs		505-827-9126	
New Mexico State Emergency Operations Center		505-476-9635	
National			
National Emergency Response Center (Washington, D.C.)		800-424-8802	
Medical			
Flight for Life- 4000 24th St.; Lubbock, TX		806-743-9911	
Aerocare- R3, Box 49F; Lubbock, TX		806-747-8923	
Med Flight Air Amb- 2301 Yale Blvd S.E., D3; Albuquerque, NM		505-842-4433	
SB Air Med Service- 2505 Clark Carr Loop S.E.; Albuquerque, NM		505-842-4949	
Other			
Boots & Coots IWC	800-256-9688	or 281-931-8884	
Cudd Pressure Control	432-699-0139	or 432-563-3356	
Haliburton	575-746-2757		
B.J. Services	575-746-3569		

Hydrogen Sulfide Drilling
Operations Plan
Matador Resources

1 H2S safety instructions to the following:

- Characteristics of H2S
- Physical effects and hazards
- Principal and operation of H2S detectors, warning system and briefing areas
- Evacuation procedures, routes and first aid
- Proper use of safety equipment & life support systems
- Essential personnel meeting medical evaluation criteria will receive additional training on the proper use of 30min pressure demand air packs

2 H2S Detection and Alarm Systems:

- H2S sensor/detectors to be located on the drilling rig floor, in the base of the sub structure / cellar area, on the mud pits in the shale shaker area. Additional H2S detectors may be placed as deemed necessary
- An audio alarm system will be installed on the derrick floor and in the doghouse

3 Windssocks and / Wind Streamers:

- Windssocks at mud pit area should be high enough to be visible
- Windssock on the rig floor and / top of doghouse should be high enough to be visible

4 Condition Flags and Signs:

- Warning sign on access road to location
- Flags to be displayed on sign at entrance to location
 - o Green Flag – Normal Safe Operation Condition
 - o Yellow Flag – Potential Pressure and Danger
 - o Red Flag – Danger (H2S present in dangerous concentrations) Only H2S trained personnel admitted on location

5 Well Control Equipment:

- See Exhibit E-1

6 Communication:

- While working under masks chalkboards will be used for communications

- Hand signals will be used where chalk board is inappropriate
- Two way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at most drilling foreman's trailer or living quarters.

7 Drilling Stem Testing:

- No DST cores are planned at this time

8 Drilling contractor supervisor will be required to be familiar with the effects H₂S has on tubulars good and other mechanical equipment

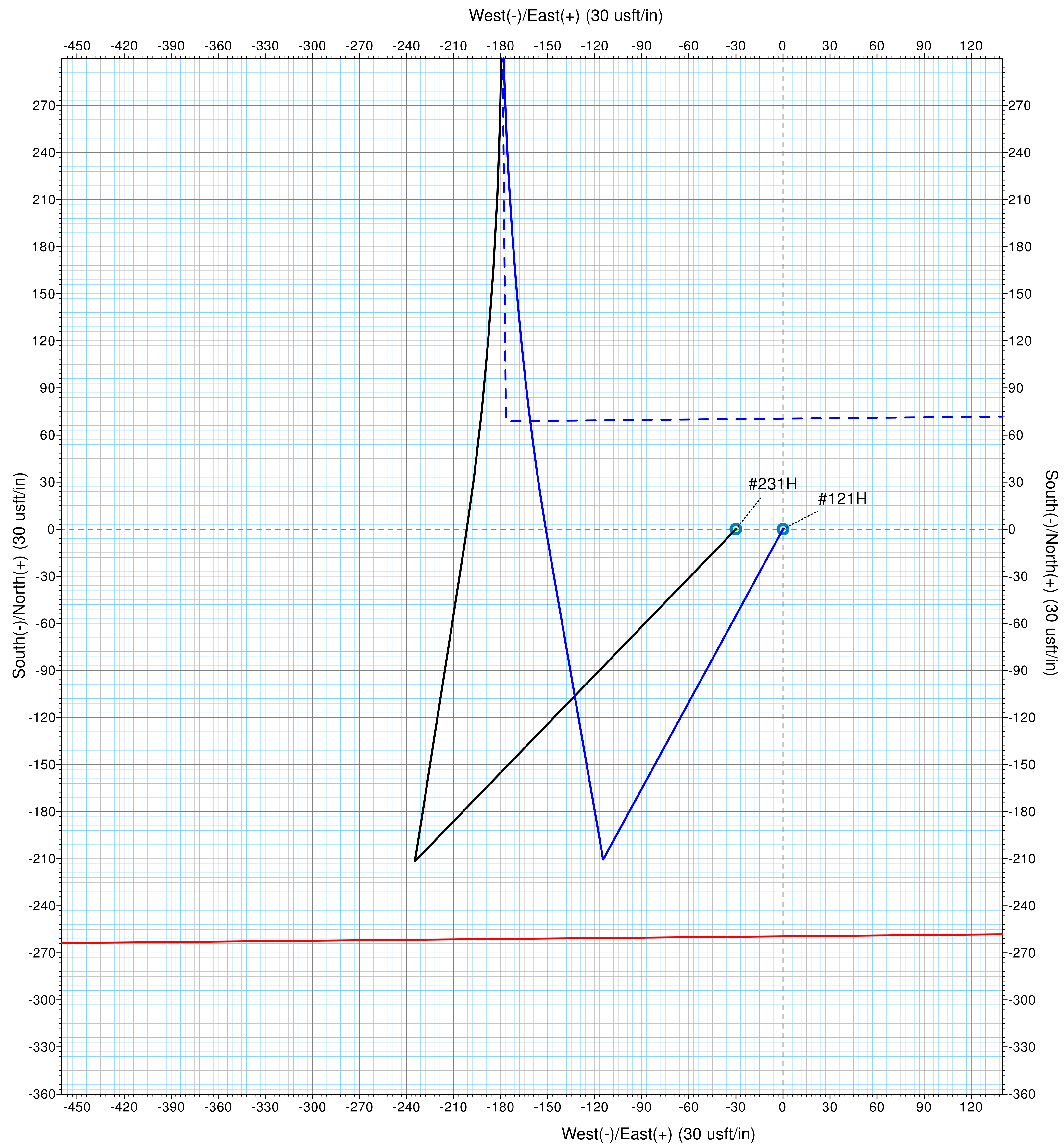
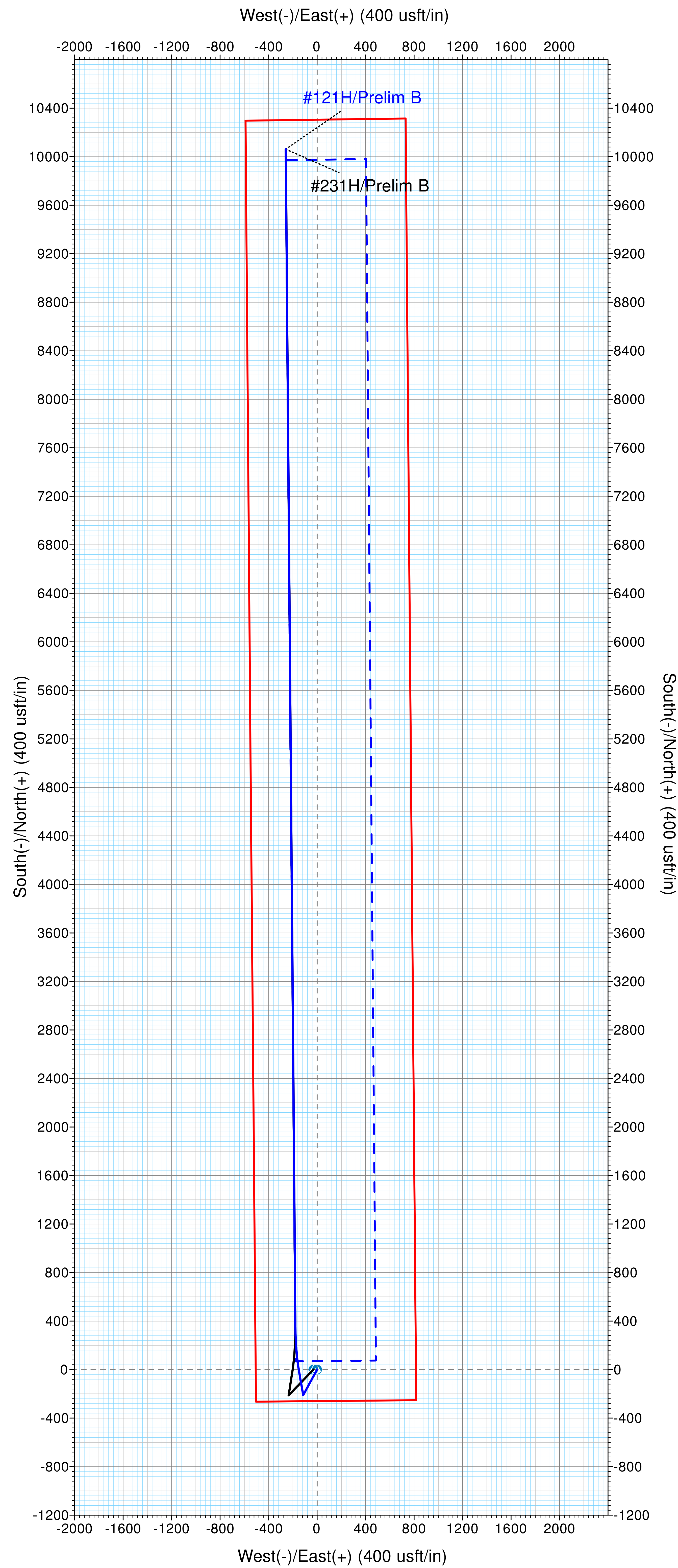
9 If H₂S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H₂S scavengers if necessary

11 Emergency Contacts

- See exhibit E-6



Matador Resources
Lea County, NM
Uncle Ches 2116 Fed
Slot 1 Pad
Prelim B
Patterson 809





Pro Directional Anticollision Report



Company:	Matador Resources	Local Co-ordinate Reference:	Well #231H
Project:	Lea County, NM	TVD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Reference Site:	Uncle Ches 2116 Fed	MD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#231H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim B	Offset TVD Reference:	Offset Datum

Reference	Prelim B		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 us	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	6/22/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	22,350.50	Prelim B (OH)	MWD+HDGM	OWSG MWD + HRGM	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Uncle Ches 2116 Fed						
#121H - OH - Prelim B	1,000.00	1,000.00	30.00	23.29	4.472	CC
#121H - OH - Prelim B	1,200.00	1,200.50	30.76	22.70	3.818	ES
#121H - OH - Prelim B	10,110.01	10,109.32	118.41	47.83	1.678	SF

Offset Design Uncle Ches 2116 Fed - #121H - OH - Prelim B												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
	0.00	0.00	0.00	0.00	0.00	90.00		0.00	30.00	30.00			
	100.00	100.00	100.00	0.13	0.13	90.00		0.00	30.00	30.00	29.74	0.26	117.047
	200.00	200.00	200.00	0.49	0.49	90.00		0.00	30.00	30.00	29.03	0.97	30.825
	300.00	300.00	300.00	0.85	0.85	90.00		0.00	30.00	30.00	28.31	1.69	17.749
	400.00	400.00	400.00	1.20	1.20	90.00		0.00	30.00	30.00	27.59	2.41	12.463
	500.00	500.00	500.00	1.56	1.56	90.00		0.00	30.00	30.00	26.88	3.12	9.603
	600.00	600.00	600.00	1.92	1.92	90.00		0.00	30.00	30.00	26.16	3.84	7.810
	700.00	700.00	700.00	2.28	2.28	90.00		0.00	30.00	30.00	25.44	4.56	6.582
	800.00	800.00	800.00	2.64	2.64	90.00		0.00	30.00	30.00	24.73	5.27	5.687
	900.00	900.00	900.00	3.00	3.00	90.00		0.00	30.00	30.00	24.01	5.99	5.007
	1,000.00	1,000.00	1,000.00	3.35	3.35	90.00		0.00	30.00	30.00	23.29	6.71	4.472 CC
	1,100.00	1,099.99	1,100.25	3.70	3.70	-133.76		-0.77	29.58	30.19	22.79	7.39	4.083
	1,200.00	1,199.96	1,200.50	4.03	4.03	-132.97		-3.08	28.32	30.76	22.70	8.06	3.818 ES
	1,300.00	1,299.86	1,300.74	4.37	4.36	-131.72		-6.93	26.23	31.72	22.99	8.73	3.635
	1,400.00	1,399.68	1,400.97	4.71	4.70	-130.09		-12.32	23.30	33.09	23.68	9.41	3.518
	1,500.46	1,499.82	1,501.65	5.06	5.05	-128.18		-19.28	19.51	34.89	24.80	10.10	3.456
	1,600.00	1,598.98	1,601.15	5.41	5.40	-126.34		-26.90	15.36	36.93	26.13	10.79	3.421
	1,700.00	1,698.60	1,701.13	5.76	5.75	-124.69		-34.55	11.19	39.01	27.51	11.50	3.392
	1,800.00	1,798.22	1,801.10	6.12	6.11	-123.21		-42.21	7.03	41.11	28.90	12.21	3.366
	1,900.00	1,897.84	1,901.07	6.48	6.47	-121.88		-49.87	2.86	43.24	30.31	12.93	3.344
	2,000.00	1,997.46	2,001.04	6.84	6.83	-120.67		-57.53	-1.31	45.40	31.74	13.65	3.325
	2,100.00	2,097.08	2,101.02	7.21	7.19	-119.57		-65.18	-5.48	47.57	33.19	14.38	3.308

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



Pro Directional Anticollision Report



Company:	Matador Resources	Local Co-ordinate Reference:	Well #231H
Project:	Lea County, NM	TVD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Reference Site:	Uncle Ches 2116 Fed	MD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#231H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim B	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
2,200.00	2,196.70	2,200.99	2,197.68	7.58	7.56	-118.57	-72.84	-9.64	49.76	34.65	15.11	3.293		
2,300.00	2,296.32	2,300.96	2,297.28	7.94	7.93	-117.65	-80.50	-13.81	51.96	36.11	15.84	3.280		
2,400.00	2,395.93	2,400.93	2,396.87	8.31	8.29	-116.81	-88.15	-17.98	54.17	37.59	16.58	3.268		
2,500.00	2,495.55	2,500.91	2,496.46	8.68	8.66	-116.03	-95.81	-22.15	56.40	39.08	17.32	3.257		
2,600.00	2,595.17	2,600.88	2,596.05	9.05	9.03	-115.31	-103.47	-26.31	58.63	40.57	18.06	3.247		
2,700.00	2,694.79	2,700.85	2,695.64	9.42	9.40	-114.65	-111.13	-30.48	60.87	42.08	18.80	3.238		
2,800.00	2,794.41	2,800.82	2,795.23	9.79	9.77	-114.03	-118.78	-34.65	63.12	43.58	19.54	3.231		
2,900.00	2,894.03	2,900.80	2,894.83	10.17	10.15	-113.45	-126.44	-38.82	65.38	45.10	20.28	3.223		
3,000.00	2,993.65	3,000.77	2,994.42	10.54	10.52	-112.92	-134.10	-42.98	67.64	46.61	21.03	3.217		
3,100.00	3,093.27	3,100.74	3,094.01	10.91	10.89	-112.41	-141.75	-47.15	69.91	48.14	21.77	3.211		
3,200.00	3,192.88	3,200.71	3,193.60	11.29	11.27	-111.94	-149.41	-51.32	72.19	49.66	22.52	3.205		
3,300.00	3,292.50	3,300.69	3,293.19	11.66	11.64	-111.50	-157.07	-55.48	74.46	51.19	23.27	3.200		
3,400.00	3,392.12	3,400.66	3,392.78	12.04	12.01	-111.09	-164.72	-59.65	76.75	52.73	24.02	3.195		
3,500.00	3,491.74	3,500.63	3,492.38	12.41	12.39	-110.70	-172.38	-63.82	79.03	54.26	24.77	3.191		
3,600.00	3,591.36	3,600.60	3,591.97	12.79	12.76	-110.33	-180.04	-67.99	81.32	55.80	25.52	3.187		
3,700.00	3,690.98	3,700.58	3,691.56	13.16	13.14	-109.98	-187.70	-72.15	83.62	57.35	26.27	3.183		
3,800.00	3,790.60	3,800.49	3,791.11	13.54	13.51	-109.80	-195.15	-76.21	85.93	58.91	27.02	3.180		
3,900.00	3,890.22	3,900.33	3,890.70	13.91	13.88	-110.62	-201.25	-79.53	88.37	60.61	27.76	3.183		
4,000.00	3,989.83	4,000.08	3,990.32	14.29	14.25	-112.49	-205.83	-82.02	91.02	62.53	28.49	3.195		
4,100.00	4,089.45	4,099.70	4,089.88	14.67	14.61	-115.29	-208.88	-83.68	94.05	64.85	29.20	3.221		
4,200.00	4,189.07	4,199.11	4,189.27	15.04	14.96	-118.89	-210.40	-84.51	97.68	67.78	29.90	3.267		
4,300.00	4,288.69	4,301.47	4,288.69	15.42	15.30	-123.04	-210.60	-84.62	102.13	71.55	30.58	3.340		
4,374.57	4,362.98	4,372.81	4,362.98	15.70	15.53	-125.98	-210.60	-84.62	105.82	74.76	31.06	3.407		
4,400.00	4,388.31	4,401.85	4,388.31	15.80	15.63	-126.93	-210.60	-84.62	107.11	75.87	31.24	3.428		
4,500.00	4,488.04	4,502.12	4,488.04	16.17	15.96	-130.00	-210.60	-84.62	111.73	79.82	31.91	3.502		
4,600.00	4,587.88	4,602.29	4,587.88	16.54	16.29	-132.18	-210.60	-84.62	115.46	82.88	32.58	3.544		
4,700.00	4,687.80	4,702.36	4,687.80	16.90	16.62	-133.61	-210.60	-84.62	118.14	84.88	33.25	3.552		
4,800.00	4,787.77	4,802.39	4,787.77	17.25	16.96	-134.38	-210.60	-84.62	119.65	85.72	33.94	3.526		
4,875.03	4,862.80	4,872.64	4,862.80	17.51	17.19	89.48	-210.60	-84.62	119.99	85.57	34.43	3.486		
4,900.00	4,887.77	4,902.39	4,887.77	17.59	17.29	89.48	-210.60	-84.62	119.99	85.39	34.61	3.467		
5,000.00	4,987.77	5,002.39	4,987.77	17.92	17.63	89.48	-210.60	-84.62	119.99	84.72	35.27	3.402		
5,100.00	5,087.77	5,102.39	5,087.77	18.24	17.96	89.48	-210.60	-84.62	119.99	84.05	35.94	3.338		
5,200.00	5,187.77	5,202.39	5,187.77	18.57	18.30	89.48	-210.60	-84.62	119.99	83.38	36.61	3.277		
5,300.00	5,287.77	5,302.39	5,287.77	18.91	18.64	89.48	-210.60	-84.62	119.99	82.71	37.29	3.218		
5,400.00	5,387.77	5,402.39	5,387.77	19.24	18.98	89.48	-210.60	-84.62	119.99	82.03	37.96	3.161		
5,500.00	5,487.77	5,502.39	5,487.77	19.57	19.32	89.48	-210.60	-84.62	119.99	81.36	38.64	3.106		
5,600.00	5,587.77	5,602.39	5,587.77	19.91	19.66	89.48	-210.60	-84.62	119.99	80.68	39.31	3.052		
5,700.00	5,687.77	5,702.39	5,687.77	20.24	20.00	89.48	-210.60	-84.62	119.99	80.00	39.99	3.001		
5,800.00	5,787.77	5,802.39	5,787.77	20.58	20.34	89.48	-210.60	-84.62	119.99	79.32	40.67	2.950		
5,900.00	5,887.77	5,902.39	5,887.77	20.91	20.68	89.48	-210.60	-84.62	119.99	78.64	41.35	2.902		
6,000.00	5,987.77	6,002.39	5,987.77	21.25	21.02	89.48	-210.60	-84.62	119.99	77.96	42.03	2.855		
6,100.00	6,087.77	6,102.39	6,087.77	21.59	21.37	89.48	-210.60	-84.62	119.99	77.28	42.72	2.809		
6,200.00	6,187.77	6,202.39	6,187.77	21.93	21.71	89.48	-210.60	-84.62	119.99	76.59	43.40	2.765		
6,300.00	6,287.77	6,302.39	6,287.77	22.27	22.05	89.48	-210.60	-84.62	119.99	75.91	44.09	2.722		
6,400.00	6,387.77	6,402.39	6,387.77	22.61	22.40	89.48	-210.60	-84.62	119.99	75.22	44.77	2.680		
6,500.00	6,487.77	6,502.39	6,487.77	22.95	22.74	89.48	-210.60	-84.62	119.99	74.53	45.46	2.639		
6,600.00	6,587.77	6,602.39	6,587.77	23.29	23.09	89.48	-210.60	-84.62	119.99	73.85	46.15	2.600		
6,700.00	6,687.77	6,702.39	6,687.77	23.63	23.43	89.48	-210.60	-84.62	119.99	73.16	46.84	2.562		
6,800.00	6,787.77	6,802.39	6,787.77	23.97	23.78	89.48	-210.60	-84.62	119.99	72.47	47.53	2.525		
6,900.00	6,887.77	6,902.39	6,887.77	24.31	24.13	89.48	-210.60	-84.62	119.99	71.78	48.22	2.489		
7,000.00	6,987.77	7,002.39	6,987.77	24.66	24.47	89.48	-210.60	-84.62	119.99	71.08	48.91	2.453		

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



Pro Directional Anticollision Report



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Reference Well:	#231H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim B	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
7,100.00	7,087.77	7,102.39	7,087.77	25.00	24.82	89.48	-210.60	-84.62	119.99	70.39	49.60	2.419		
7,200.00	7,187.77	7,202.39	7,187.77	25.34	25.17	89.48	-210.60	-84.62	119.99	69.70	50.30	2.386		
7,300.00	7,287.77	7,302.39	7,287.77	25.69	25.51	89.48	-210.60	-84.62	119.99	69.01	50.99	2.353		
7,400.00	7,387.77	7,402.39	7,387.77	26.03	25.86	89.48	-210.60	-84.62	119.99	68.31	51.68	2.322		
7,500.00	7,487.77	7,502.39	7,487.77	26.38	26.21	89.48	-210.60	-84.62	119.99	67.62	52.38	2.291		
7,600.00	7,587.77	7,602.39	7,587.77	26.72	26.56	89.48	-210.60	-84.62	119.99	66.92	53.07	2.261		
7,700.00	7,687.77	7,702.39	7,687.77	27.07	26.91	89.48	-210.60	-84.62	119.99	66.22	53.77	2.232		
7,800.00	7,787.77	7,802.39	7,787.77	27.41	27.26	89.48	-210.60	-84.62	119.99	65.53	54.47	2.203		
7,900.00	7,887.77	7,902.39	7,887.77	27.76	27.61	89.48	-210.60	-84.62	119.99	64.83	55.16	2.175		
8,000.00	7,987.77	8,002.39	7,987.77	28.11	27.96	89.48	-210.60	-84.62	119.99	64.13	55.86	2.148		
8,100.00	8,087.77	8,102.39	8,087.77	28.45	28.31	89.48	-210.60	-84.62	119.99	63.44	56.56	2.122		
8,200.00	8,187.77	8,202.39	8,187.77	28.80	28.66	89.48	-210.60	-84.62	119.99	62.74	57.26	2.096		
8,300.00	8,287.77	8,302.39	8,287.77	29.15	29.01	89.48	-210.60	-84.62	119.99	62.04	57.96	2.070		
8,400.00	8,387.77	8,402.39	8,387.77	29.50	29.36	89.48	-210.60	-84.62	119.99	61.34	58.66	2.046		
8,500.00	8,487.77	8,502.39	8,487.77	29.84	29.71	89.48	-210.60	-84.62	119.99	60.64	59.36	2.022		
8,600.00	8,587.77	8,602.39	8,587.77	30.19	30.06	89.48	-210.60	-84.62	119.99	59.94	60.06	1.998		
8,700.00	8,687.77	8,702.39	8,687.77	30.54	30.41	89.48	-210.60	-84.62	119.99	59.24	60.76	1.975		
8,800.00	8,787.77	8,802.39	8,787.77	30.89	30.76	89.48	-210.60	-84.62	119.99	58.54	61.46	1.952		
8,900.00	8,887.77	8,902.39	8,887.77	31.24	31.11	89.48	-210.60	-84.62	119.99	57.84	62.16	1.930		
9,000.00	8,987.77	9,002.39	8,987.77	31.59	31.46	89.48	-210.60	-84.62	119.99	57.13	62.86	1.909		
9,100.00	9,087.77	9,102.39	9,087.77	31.94	31.82	89.48	-210.60	-84.62	119.99	56.43	63.56	1.888		
9,200.00	9,187.77	9,202.39	9,187.77	32.29	32.17	89.48	-210.60	-84.62	119.99	55.73	64.27	1.867		
9,300.00	9,287.77	9,302.39	9,287.77	32.64	32.52	89.48	-210.60	-84.62	119.99	55.03	64.97	1.847		
9,400.00	9,387.77	9,402.39	9,387.77	32.99	32.87	89.48	-210.60	-84.62	119.99	54.32	65.67	1.827		
9,500.00	9,487.77	9,502.39	9,487.77	33.34	33.22	89.48	-210.60	-84.62	119.99	53.62	66.37	1.808		
9,600.00	9,587.77	9,602.39	9,587.77	33.69	33.58	89.48	-210.60	-84.62	119.99	52.92	67.08	1.789		
9,700.00	9,687.77	9,702.39	9,687.77	34.04	33.93	89.48	-210.60	-84.62	119.99	52.21	67.78	1.770		
9,800.00	9,787.77	9,802.39	9,787.77	34.39	34.28	89.48	-210.60	-84.62	119.99	51.51	68.49	1.752		
9,900.00	9,887.77	9,902.39	9,887.77	34.74	34.63	89.48	-210.60	-84.62	119.99	50.81	69.19	1.734		
10,000.00	9,987.77	9,998.88	9,989.01	35.09	34.97	88.84	-209.27	-84.85	119.79	49.91	69.88	1.714		
10,100.00	10,087.77	10,099.60	10,088.38	35.44	35.31	81.33	-193.83	-87.53	118.43	47.91	70.53	1.679		
10,110.01	10,097.78	10,109.32	10,097.78	35.48	35.34	80.15	-191.43	-87.95	118.41	47.83	70.58	1.678 SF		
10,200.00	10,187.77	10,192.28	10,176.10	35.79	35.60	67.24	-164.68	-92.59	122.04	51.30	70.74	1.725		
10,300.00	10,287.77	10,273.71	10,248.37	36.14	35.83	51.56	-127.87	-98.99	140.48	71.20	69.28	2.028		
10,400.00	10,387.77	10,343.15	10,305.30	36.50	36.00	38.80	-88.76	-105.78	177.99	111.98	66.02	2.696		
10,500.00	10,487.77	10,400.00	10,348.06	36.85	36.14	30.04	-51.88	-112.18	231.52	169.31	62.22	3.721		
10,600.00	10,587.77	10,450.00	10,382.44	37.20	36.26	23.79	-16.13	-118.38	296.38	237.18	59.20	5.006		
10,700.00	10,687.77	10,490.28	10,407.77	37.55	36.35	19.70	14.74	-123.54	369.11	312.49	56.62	6.519		
10,800.00	10,787.77	10,524.11	10,427.36	37.90	36.44	16.89	42.03	-127.57	447.45	392.82	54.62	8.192		
10,900.00	10,887.77	10,550.00	10,441.25	38.25	36.50	15.07	63.68	-130.44	529.81	476.89	52.92	10.011		
11,000.00	10,987.77	10,577.78	10,455.09	38.61	36.57	13.40	87.60	-133.32	615.15	563.22	51.93	11.846		
11,100.00	11,087.77	10,600.00	10,465.31	38.96	36.62	12.23	107.20	-135.47	702.80	651.72	51.07	13.761		
11,200.00	11,187.77	10,617.96	10,473.03	39.31	36.67	11.39	123.33	-137.10	792.24	741.87	50.37	15.728		
11,300.00	11,287.77	10,634.37	10,479.65	39.66	36.71	10.70	138.28	-138.51	883.13	833.25	49.88	17.707		
11,400.00	11,387.77	10,650.00	10,485.56	40.02	36.75	10.09	152.70	-139.77	975.18	925.63	49.55	19.680		
11,500.00	11,487.77	10,650.00	10,485.56	40.37	36.75	10.09	152.70	-139.77	1,068.37	1,019.38	48.99	21.807		
11,600.00	11,587.77	10,673.27	10,493.63	40.72	36.81	9.28	174.45	-141.52	1,161.99	1,112.87	49.13	23.653		
11,700.00	11,687.77	10,683.61	10,496.94	41.08	36.83	8.95	184.22	-142.24	1,256.47	1,207.42	49.05	25.614		
11,745.03	11,732.80	10,700.00	10,501.83	41.24	36.87	8.47	199.83	-143.32	1,299.39	1,250.12	49.27	26.373		
11,750.00	11,737.77	10,700.00	10,501.83	41.25	36.87	-0.42	199.83	-143.32	1,304.09	1,254.83	49.26	26.475		

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



Pro Directional Anticollision Report



Company:	Matador Resources	Local Co-ordinate Reference:	Well #231H
Project:	Lea County, NM	TVD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Reference Site:	Uncle Ches 2116 Fed	MD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#231H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim B	Offset TVD Reference:	Offset Datum

Offset Design													Uncle Ches 2116 Fed - #121H - OH - Prelim B		Offset Site Error:		0.00 usft
Survey Program: 0-MWD+HDGM															Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis			Distance										
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning				
11,800.00	11,787.69	10,700.00	10,501.83	41.43	36.87	-0.33	199.83	-143.32	1,350.69	1,301.56	49.12	27.495					
11,850.00	11,837.18	10,700.00	10,501.83	41.60	36.87	-0.28	199.83	-143.32	1,395.85	1,346.89	48.96	28.512					
11,900.00	11,885.89	10,700.00	10,501.83	41.76	36.87	-0.24	199.83	-143.32	1,439.39	1,390.62	48.77	29.516					
11,950.00	11,933.43	10,700.00	10,501.83	41.91	36.87	-0.21	199.83	-143.32	1,481.12	1,432.56	48.56	30.500					
12,000.00	11,979.44	10,722.97	10,507.93	42.06	36.93	-0.46	221.93	-144.69	1,520.27	1,471.61	48.65	31.246					
12,050.00	12,023.57	10,731.96	10,510.09	42.20	36.95	-0.51	230.64	-145.17	1,557.36	1,508.84	48.53	32.093					
12,100.00	12,065.49	10,750.00	10,514.00	42.33	37.00	-0.64	248.23	-146.08	1,592.08	1,543.59	48.50	32.830					
12,150.00	12,104.88	10,750.00	10,514.00	42.45	37.00	-0.60	248.23	-146.08	1,624.03	1,575.79	48.24	33.662					
12,200.00	12,141.44	10,750.00	10,514.00	42.56	37.00	-0.56	248.23	-146.08	1,653.50	1,605.49	48.02	34.437					
12,245.03	12,171.71	10,771.56	10,517.96	42.65	37.05	-0.69	269.40	-147.02	1,677.30	1,629.29	48.02	34.932					
12,250.00	12,174.89	10,772.64	10,518.14	42.67	37.05	-0.67	270.47	-147.06	1,679.81	1,631.80	48.00	34.995					
12,300.00	12,205.04	10,800.00	10,521.98	42.77	37.12	-0.54	297.53	-148.03	1,703.70	1,655.68	48.02	35.476					
12,350.00	12,231.69	10,800.00	10,521.98	42.87	37.12	-0.32	297.53	-148.03	1,724.09	1,676.26	47.83	36.044					
12,400.00	12,254.66	10,800.00	10,521.98	42.97	37.12	-0.16	297.53	-148.03	1,741.78	1,694.09	47.69	36.526					
12,450.00	12,273.76	10,818.75	10,523.88	43.07	37.17	-0.11	316.18	-148.55	1,756.31	1,708.64	47.67	36.839					
12,500.00	12,288.84	10,830.82	10,524.79	43.16	37.20	-0.06	328.21	-148.82	1,767.77	1,720.12	47.65	37.097					
12,550.00	12,299.80	10,850.00	10,525.72	43.26	37.25	-0.04	347.36	-149.16	1,776.12	1,728.44	47.68	37.250					
12,600.00	12,306.55	10,850.00	10,525.72	43.36	37.25	0.00	347.36	-149.16	1,781.19	1,733.49	47.70	37.345					
12,654.05	12,309.05	10,868.78	10,526.01	43.46	37.29	0.00	365.87	-149.37	1,783.04	1,735.24	47.79	37.308					
12,700.00	12,309.05	10,914.46	10,526.01	43.55	37.41	0.00	411.82	-149.74	1,783.04	1,735.12	47.91	37.213					
12,800.00	12,309.05	11,014.46	10,526.01	43.78	37.71	0.00	511.82	-150.55	1,783.04	1,734.82	48.21	36.982					
12,900.00	12,309.05	11,114.46	10,526.01	44.06	38.05	0.00	611.81	-151.36	1,783.03	1,734.47	48.56	36.716					
13,000.00	12,309.05	11,214.46	10,526.01	44.39	38.45	0.00	711.81	-152.17	1,783.03	1,734.07	48.96	36.417					
13,100.00	12,309.05	11,314.46	10,526.01	44.76	38.90	0.00	811.81	-152.98	1,783.03	1,733.63	49.41	36.089					
13,200.00	12,309.05	11,414.46	10,526.01	45.17	39.40	0.00	911.80	-153.79	1,783.03	1,733.14	49.90	35.734					
13,300.00	12,309.05	11,514.46	10,526.01	45.63	39.94	0.00	1,011.80	-154.60	1,783.03	1,732.60	50.43	35.355					
13,400.00	12,309.05	11,614.46	10,526.01	46.13	40.52	0.00	1,111.80	-155.42	1,783.03	1,732.02	51.01	34.954					
13,500.00	12,309.04	11,714.46	10,526.01	46.67	41.15	0.00	1,211.79	-156.23	1,783.03	1,731.40	51.63	34.534					
13,600.00	12,309.04	11,814.46	10,526.01	47.24	41.82	0.00	1,311.79	-157.04	1,783.03	1,730.74	52.29	34.098					
13,700.00	12,309.04	11,914.46	10,526.01	47.86	42.52	0.00	1,411.79	-157.85	1,783.03	1,730.04	52.99	33.649					
13,800.00	12,309.04	12,014.46	10,526.01	48.50	43.27	0.00	1,511.78	-158.66	1,783.03	1,729.31	53.72	33.189					
13,900.00	12,309.04	12,114.46	10,526.01	49.19	44.05	0.00	1,611.78	-159.47	1,783.03	1,728.54	54.49	32.719					
14,000.00	12,309.04	12,214.46	10,526.01	49.90	44.86	0.00	1,711.78	-160.28	1,783.03	1,727.73	55.30	32.243					
14,100.00	12,309.04	12,314.46	10,526.01	50.65	45.70	0.00	1,811.77	-161.09	1,783.03	1,726.89	56.14	31.763					
14,200.00	12,309.04	12,414.46	10,526.01	51.42	46.57	0.00	1,911.77	-161.90	1,783.03	1,726.03	57.00	31.279					
14,300.00	12,309.04	12,514.46	10,526.01	52.23	47.47	0.00	2,011.77	-162.71	1,783.03	1,725.13	57.90	30.795					
14,400.00	12,309.04	12,614.46	10,526.01	53.06	48.40	0.00	2,111.76	-163.53	1,783.03	1,724.20	58.83	30.310					
14,500.00	12,309.04	12,714.46	10,526.01	53.92	49.35	0.00	2,211.76	-164.34	1,783.03	1,723.25	59.78	29.828					
14,600.00	12,309.04	12,814.46	10,526.01	54.80	50.33	0.00	2,311.76	-165.15	1,783.03	1,722.27	60.76	29.348					
14,700.00	12,309.04	12,914.46	10,526.01	55.70	51.32	0.00	2,411.75	-165.96	1,783.03	1,721.27	61.76	28.872					
14,800.00	12,309.04	13,014.46	10,526.01	56.63	52.34	0.00	2,511.75	-166.77	1,783.03	1,720.25	62.78	28.400					
14,900.00	12,309.04	13,114.46	10,526.01	57.58	53.38	0.00	2,611.75	-167.58	1,783.03	1,719.20	63.83	27.935					
15,000.00	12,309.04	13,214.46	10,526.01	58.55	54.44	0.00	2,711.74	-168.39	1,783.03	1,718.13	64.90	27.475					
15,100.00	12,309.04	13,314.46	10,526.01	59.54	55.51	0.00	2,811.74	-169.20	1,783.03	1,717.04	65.98	27.022					
15,200.00	12,309.04	13,414.46	10,526.01	60.55	56.60	0.00	2,911.74	-170.01	1,783.03	1,715.94	67.09	26.576					
15,300.00	12,309.04	13,514.46	10,526.01	61.57	57.71	0.00	3,011.73	-170.82	1,783.03	1,714.81	68.22	26.138					
15,400.00	12,309.04	13,614.46	10,526.01	62.61	58.83	0.00	3,111.73	-171.63	1,783.03	1,713.67	69.36	25.708					
15,500.00	12,309.03	13,714.46	10,526.01	63.67	59.96	0.00	3,211.73	-172.45	1,783.03	1,712.51	70.52	25.286					
15,600.00	12,309.03	13,814.46	10,526.01	64.74	61.11	0.00	3,311.72	-173.26	1,783.02	1,711.34	71.69	24.872					
15,700.00	12,309.03	13,914.46	10,526.01	65.83	62.27	0.00	3,411.72	-174.07	1,783.02	1,710.15	72.88	24.466					
15,800.00	12,309.03	14,014.46	10,526.01	66.93	63.44	0.00	3,511.72	-174.88	1,783.02	1,708.94	74.08	24.069					

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



Pro Directional Anticollision Report



Company:	Matador Resources	Local Co-ordinate Reference:	Well #231H
Project:	Lea County, NM	TVD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Reference Site:	Uncle Ches 2116 Fed	MD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#231H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim B	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
15,900.00	12,309.03	14,114.46	10,526.01	68.04	64.63	0.00	3,611.71	-175.69	1,783.02	1,707.73	75.30	23.680		
16,000.00	12,309.03	14,214.46	10,526.01	69.17	65.82	0.00	3,711.71	-176.50	1,783.02	1,706.50	76.52	23.300		
16,100.00	12,309.03	14,314.46	10,526.01	70.31	67.03	0.00	3,811.71	-177.31	1,783.02	1,705.26	77.76	22.929		
16,200.00	12,309.03	14,414.46	10,526.01	71.45	68.24	0.00	3,911.70	-178.12	1,783.02	1,704.01	79.02	22.565		
16,300.00	12,309.03	14,514.46	10,526.01	72.61	69.46	0.00	4,011.70	-178.93	1,783.02	1,702.74	80.28	22.210		
16,400.00	12,309.03	14,614.46	10,526.01	73.78	70.69	0.00	4,111.70	-179.74	1,783.02	1,701.47	81.55	21.863		
16,500.00	12,309.03	14,714.46	10,526.01	74.96	71.93	0.00	4,211.69	-180.56	1,783.02	1,700.18	82.84	21.524		
16,600.00	12,309.03	14,814.46	10,526.01	76.15	73.18	0.00	4,311.69	-181.37	1,783.02	1,698.89	84.13	21.193		
16,700.00	12,309.03	14,914.46	10,526.01	77.34	74.43	0.00	4,411.69	-182.18	1,783.02	1,697.59	85.43	20.870		
16,800.00	12,309.03	15,014.46	10,526.01	78.55	75.69	0.00	4,511.68	-182.99	1,783.02	1,696.28	86.75	20.555		
16,900.00	12,309.03	15,114.46	10,526.01	79.76	76.95	0.00	4,611.68	-183.80	1,783.02	1,694.96	88.06	20.247		
17,000.00	12,309.03	15,214.46	10,526.01	80.98	78.23	0.00	4,711.68	-184.61	1,783.02	1,693.63	89.39	19.946		
17,100.00	12,309.03	15,314.46	10,526.01	82.21	79.51	0.00	4,811.67	-185.42	1,783.02	1,692.29	90.73	19.652		
17,200.00	12,309.03	15,414.46	10,526.01	83.45	80.79	0.00	4,911.67	-186.23	1,783.02	1,690.95	92.07	19.366		
17,300.00	12,309.03	15,514.46	10,526.01	84.69	82.08	0.00	5,011.67	-187.04	1,783.02	1,689.60	93.42	19.086		
17,400.00	12,309.03	15,614.46	10,526.01	85.94	83.37	0.00	5,111.66	-187.85	1,783.02	1,688.24	94.78	18.813		
17,500.00	12,309.02	15,714.46	10,526.01	87.19	84.67	0.00	5,211.66	-188.66	1,783.02	1,686.88	96.14	18.546		
17,600.00	12,309.02	15,814.46	10,526.01	88.45	85.98	0.00	5,311.66	-189.48	1,783.02	1,685.51	97.51	18.286		
17,700.00	12,309.02	15,914.46	10,526.01	89.71	87.29	0.00	5,411.65	-190.29	1,783.02	1,684.13	98.88	18.031		
17,800.00	12,309.02	16,014.46	10,526.01	90.99	88.60	0.00	5,511.65	-191.10	1,783.02	1,682.75	100.26	17.783		
17,900.00	12,309.02	16,114.46	10,526.01	92.26	89.92	0.00	5,611.65	-191.91	1,783.02	1,681.37	101.65	17.541		
18,000.00	12,309.02	16,214.46	10,526.01	93.54	91.24	0.00	5,711.64	-192.72	1,783.02	1,679.97	103.04	17.304		
18,100.00	12,309.02	16,314.46	10,526.01	94.83	92.56	0.00	5,811.64	-193.53	1,783.02	1,678.58	104.44	17.072		
18,200.00	12,309.02	16,414.46	10,526.01	96.12	93.89	0.00	5,911.64	-194.34	1,783.02	1,677.18	105.84	16.846		
18,300.00	12,309.02	16,514.46	10,526.01	97.41	95.22	0.00	6,011.63	-195.15	1,783.01	1,675.77	107.25	16.626		
18,400.00	12,309.02	16,614.46	10,526.01	98.71	96.56	0.00	6,111.63	-195.96	1,783.01	1,674.36	108.66	16.410		
18,500.00	12,309.02	16,714.46	10,526.01	100.01	97.90	0.00	6,211.63	-196.77	1,783.01	1,672.94	110.07	16.199		
18,600.00	12,309.02	16,814.46	10,526.01	101.32	99.24	0.00	6,311.62	-197.59	1,783.01	1,671.52	111.49	15.993		
18,700.00	12,309.02	16,914.46	10,526.01	102.63	100.58	0.00	6,411.62	-198.40	1,783.01	1,670.10	112.91	15.791		
18,800.00	12,309.02	17,014.46	10,526.01	103.94	101.93	0.00	6,511.62	-199.21	1,783.01	1,668.68	114.34	15.594		
18,900.00	12,309.02	17,114.46	10,526.00	105.26	103.28	0.00	6,611.61	-200.02	1,783.01	1,667.24	115.77	15.402		
19,000.00	12,309.02	17,214.46	10,526.00	106.58	104.63	0.00	6,711.61	-200.83	1,783.01	1,665.81	117.20	15.213		
19,100.00	12,309.02	17,314.46	10,526.00	107.91	105.98	0.00	6,811.61	-201.64	1,783.01	1,664.37	118.64	15.029		
19,200.00	12,309.02	17,414.46	10,526.00	109.23	107.34	0.00	6,911.61	-202.45	1,783.01	1,662.93	120.08	14.849		
19,300.00	12,309.02	17,514.46	10,526.00	110.56	108.70	0.00	7,011.60	-203.26	1,783.01	1,661.49	121.52	14.672		
19,400.00	12,309.02	17,614.46	10,526.00	111.90	110.06	0.00	7,111.60	-204.07	1,783.01	1,660.04	122.97	14.500		
19,500.00	12,309.01	17,714.46	10,526.00	113.23	111.43	0.00	7,211.60	-204.88	1,783.01	1,658.59	124.42	14.331		
19,600.00	12,309.01	17,814.46	10,526.00	114.57	112.79	0.00	7,311.59	-205.69	1,783.01	1,657.14	125.87	14.165		
19,700.00	12,309.01	17,914.46	10,526.00	115.91	114.16	0.00	7,411.59	-206.51	1,783.01	1,655.68	127.33	14.003		
19,800.00	12,309.01	18,014.46	10,526.00	117.25	115.53	0.00	7,511.59	-207.32	1,783.01	1,654.23	128.78	13.845		
19,900.00	12,309.01	18,114.46	10,526.00	118.60	116.90	0.00	7,611.58	-208.13	1,783.01	1,652.76	130.24	13.690		
20,000.00	12,309.01	18,214.46	10,526.00	119.95	118.27	0.00	7,711.58	-208.94	1,783.01	1,651.30	131.71	13.538		
20,100.00	12,309.01	18,314.46	10,526.00	121.30	119.65	0.00	7,811.58	-209.75	1,783.01	1,649.84	133.17	13.389		
20,200.00	12,309.01	18,414.46	10,526.00	122.65	121.02	0.00	7,911.57	-210.56	1,783.01	1,648.37	134.64	13.243		
20,300.00	12,309.01	18,514.46	10,526.00	124.01	122.40	0.00	8,011.57	-211.37	1,783.01	1,646.90	136.11	13.100		
20,400.00	12,309.01	18,614.46	10,526.00	125.36	123.78	0.00	8,111.57	-212.18	1,783.01	1,645.42	137.58	12.960		
20,500.00	12,309.01	18,714.46	10,526.00	126.72	125.16	0.00	8,211.56	-212.99	1,783.01	1,643.95	139.06	12.822		
20,600.00	12,309.01	18,814.46	10,526.00	128.08	126.54	0.00	8,311.56	-213.80	1,783.01	1,642.47	140.53	12.687		
20,700.00	12,309.01	18,914.46	10,526.00	129.44	127.93	0.00	8,411.56	-214.62	1,783.01	1,640.99	142.01	12.555		
20,800.00	12,309.01	19,014.46	10,526.00	130.81	129.31	0.00	8,511.55	-215.43	1,783.01	1,639.51	143.49	12.426		

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



Pro Directional Anticollision Report



Company:	Matador Resources	Local Co-ordinate Reference:	Well #231H
Project:	Lea County, NM	TVD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Reference Site:	Uncle Ches 2116 Fed	MD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#231H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim B	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
20,900.00	12,309.01	19,114.46	10,526.00	132.17	130.70	0.00	8,611.55	-216.24	1,783.01	1,638.03	144.97	12.299		
21,000.00	12,309.01	19,214.46	10,526.00	133.54	132.09	0.00	8,711.55	-217.05	1,783.00	1,636.55	146.46	12.174		
21,100.00	12,309.01	19,314.46	10,526.00	134.91	133.48	0.00	8,811.54	-217.86	1,783.00	1,635.06	147.94	12.052		
21,200.00	12,309.01	19,414.46	10,526.00	136.28	134.87	0.00	8,911.54	-218.67	1,783.00	1,633.57	149.43	11.932		
21,300.00	12,309.01	19,514.46	10,526.00	137.65	136.26	0.00	9,011.54	-219.48	1,783.00	1,632.08	150.92	11.814		
21,400.00	12,309.01	19,614.46	10,526.00	139.03	137.65	0.00	9,111.53	-220.29	1,783.00	1,630.59	152.41	11.699		
21,500.00	12,309.00	19,714.46	10,526.00	140.40	139.04	0.00	9,211.53	-221.10	1,783.00	1,629.10	153.90	11.585		
21,600.00	12,309.00	19,814.46	10,526.00	141.78	140.44	0.00	9,311.53	-221.91	1,783.00	1,627.61	155.40	11.474		
21,700.00	12,309.00	19,914.46	10,526.00	143.16	141.83	0.00	9,411.52	-222.72	1,783.00	1,626.11	156.89	11.365		
21,800.00	12,309.00	20,014.46	10,526.00	144.54	143.23	0.00	9,511.52	-223.54	1,783.00	1,624.61	158.39	11.257		
21,900.00	12,309.00	20,114.46	10,526.00	145.92	144.63	0.00	9,611.52	-224.35	1,783.00	1,623.12	159.89	11.152		
22,000.00	12,309.00	20,214.46	10,526.00	147.30	146.03	0.00	9,711.51	-225.16	1,783.00	1,621.62	161.39	11.048		
22,100.00	12,309.00	20,314.46	10,526.00	148.68	147.43	0.00	9,811.51	-225.97	1,783.00	1,620.11	162.89	10.946		
22,200.00	12,309.00	20,414.46	10,526.00	150.07	148.83	0.00	9,911.51	-226.78	1,783.00	1,618.61	164.39	10.846		
22,300.00	12,309.00	20,514.46	10,526.00	151.45	150.23	0.00	10,011.50	-227.59	1,783.00	1,617.11	165.89	10.748		
22,350.50	12,309.00	20,564.96	10,526.00	152.15	150.94	0.00	10,062.00	-228.00	1,783.00	1,616.35	166.65	10.699		

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

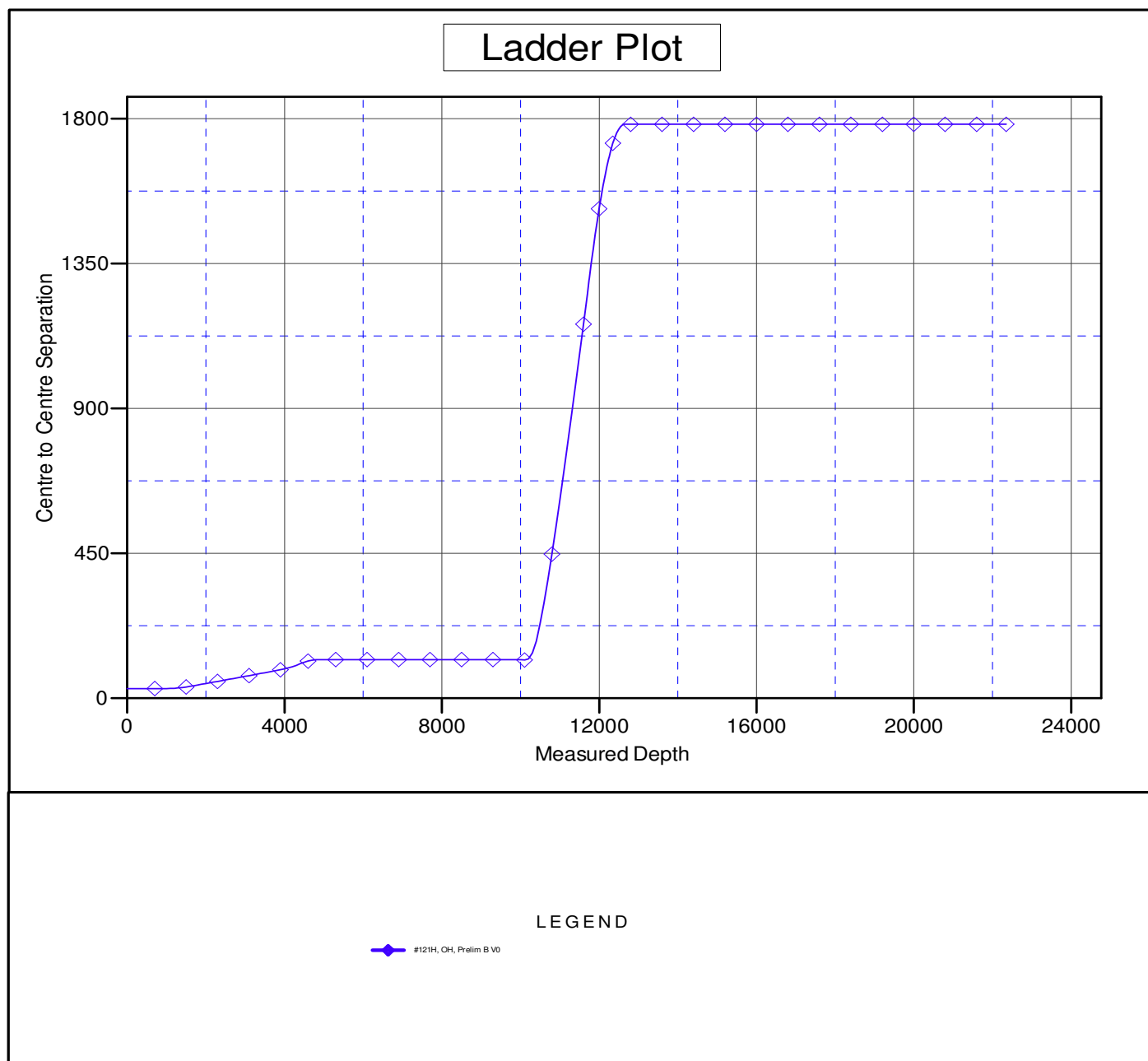


Pro Directional Anticollision Report



Company:	Matador Resources	Local Co-ordinate Reference:	Well #231H
Project:	Lea County, NM	TVD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Reference Site:	Uncle Ches 2116 Fed	MD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#231H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim B	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL: 3719' + KB: 28.5' @ 3747.50usft Coordinates are relative to: #231H
 Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Central Meridian is -104.333334 Grid Convergence at Surface is: 0.47°



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



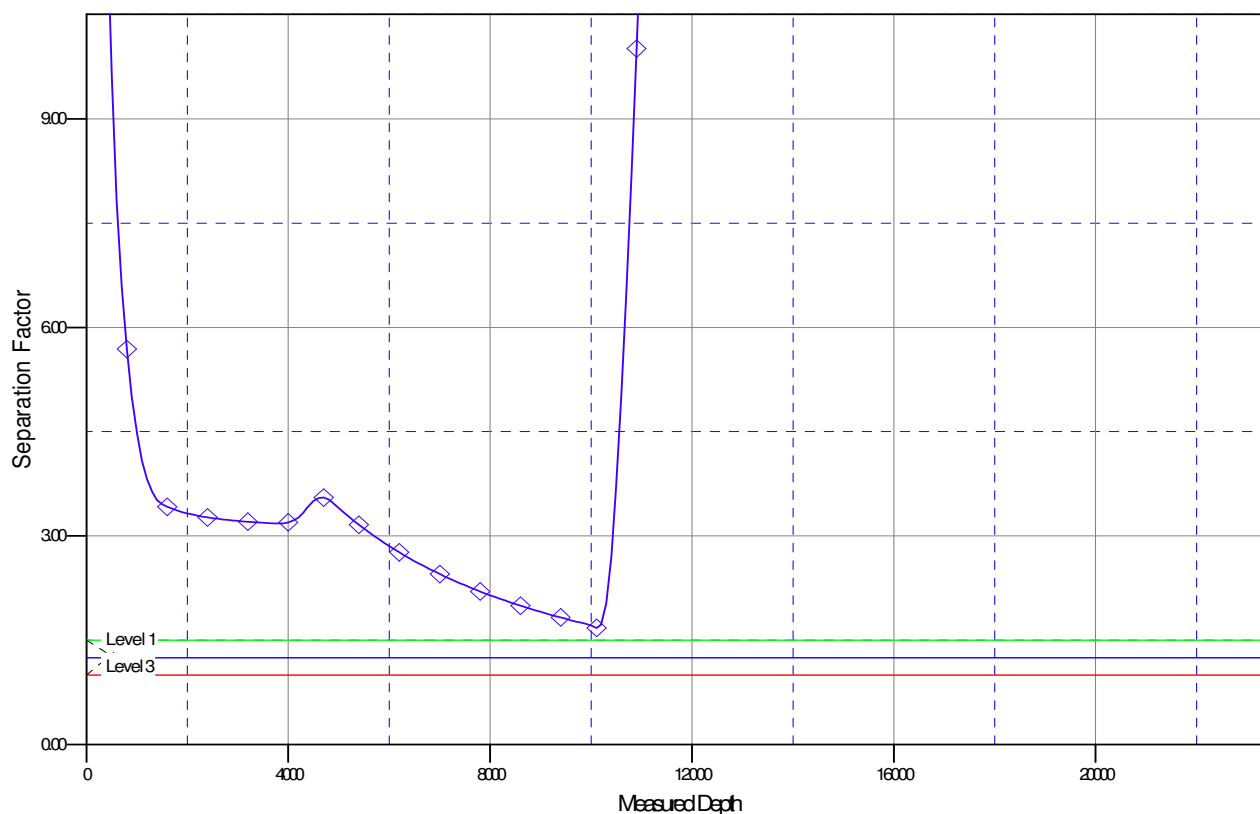
Pro Directional Anticollision Report



Company:	Matador Resources	Local Co-ordinate Reference:	Well #231H
Project:	Lea County, NM	TVD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Reference Site:	Uncle Ches 2116 Fed	MD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#231H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	Prelim B	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL: 3719' + KB: 28.5' @ 3747.50usft Coordinates are relative to: #231H
 Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Central Meridian is -104.333334 Grid Convergence at Surface is: 0.47°

Separation Factor Plot



LEGEND

—◆— #121H, OH, Prelim B V0



Pro Directional Survey Report



Company:	Matador Resources	Local Co-ordinate Reference:	Well #231H
Project:	Lea County, NM	TVD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Site:	Uncle Ches 2116 Fed	MD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Well:	#231H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim B	Database:	WellPlanner1

Project	Lea County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site		Uncle Ches 2116 Fed			
Site Position:		Northing:	565,604.00 usft	Latitude:	32.551980
From:	Map	Easting:	766,403.00 usft	Longitude:	-103.468749
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.47 °

Well	#231H					
Well Position	+N/-S	0.00 usft	Northing:	565,604.00 usft	Latitude:	32.551981
	+E/-W	0.00 usft	Easting:	766,373.00 usft	Longitude:	-103.468846
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,719.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	6/15/2018	6.67	60.48	48,157.50

Design	Prelim B			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	359.54

Survey Tool Program	Date	6/22/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	22,350.50	Prelim B (OH)	MWD+HDGM	OWSG MWD + HRGM

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	



Pro Directional Survey Report



Company:	Matador Resources	Local Co-ordinate Reference:	Well #231H
Project:	Lea County, NM	TVD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Site:	Uncle Ches 2116 Fed	MD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Well:	#231H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim B	Database:	WellPlanner1

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)
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	1.00	224.03	1,099.99	-0.63	-0.61	-0.62	1.00	1.00	0.00
1,200.00	2.00	224.03	1,199.96	-2.51	-2.43	-2.49	1.00	1.00	0.00
1,300.00	3.00	224.03	1,299.86	-5.65	-5.46	-5.60	1.00	1.00	0.00
1,400.00	4.00	224.03	1,399.68	-10.04	-9.70	-9.96	1.00	1.00	0.00
1,500.46	5.00	224.03	1,499.82	-15.71	-15.18	-15.58	1.00	1.00	0.00
1,600.00	5.00	224.03	1,598.98	-21.95	-21.22	-21.78	0.00	0.00	0.00
1,700.00	5.00	224.03	1,698.60	-28.22	-27.28	-28.00	0.00	0.00	0.00
1,800.00	5.00	224.03	1,798.22	-34.49	-33.34	-34.23	0.00	0.00	0.00
1,900.00	5.00	224.03	1,897.84	-40.77	-39.40	-40.45	0.00	0.00	0.00
2,000.00	5.00	224.03	1,997.46	-47.04	-45.47	-46.67	0.00	0.00	0.00
2,100.00	5.00	224.03	2,097.08	-53.31	-51.53	-52.90	0.00	0.00	0.00
2,200.00	5.00	224.03	2,196.70	-59.58	-57.59	-59.12	0.00	0.00	0.00
2,300.00	5.00	224.03	2,296.32	-65.86	-63.65	-65.34	0.00	0.00	0.00
2,400.00	5.00	224.03	2,395.93	-72.13	-69.72	-71.57	0.00	0.00	0.00
2,500.00	5.00	224.03	2,495.55	-78.40	-75.78	-77.79	0.00	0.00	0.00
2,600.00	5.00	224.03	2,595.17	-84.67	-81.84	-84.01	0.00	0.00	0.00
2,700.00	5.00	224.03	2,694.79	-90.95	-87.91	-90.24	0.00	0.00	0.00
2,800.00	5.00	224.03	2,794.41	-97.22	-93.97	-96.46	0.00	0.00	0.00
2,900.00	5.00	224.03	2,894.03	-103.49	-100.03	-102.69	0.00	0.00	0.00
3,000.00	5.00	224.03	2,993.65	-109.76	-106.09	-108.91	0.00	0.00	0.00
3,100.00	5.00	224.03	3,093.27	-116.04	-112.16	-115.13	0.00	0.00	0.00
3,200.00	5.00	224.03	3,192.88	-122.31	-118.22	-121.36	0.00	0.00	0.00
3,300.00	5.00	224.03	3,292.50	-128.58	-124.28	-127.58	0.00	0.00	0.00
3,400.00	5.00	224.03	3,392.12	-134.85	-130.34	-133.80	0.00	0.00	0.00
3,500.00	5.00	224.03	3,491.74	-141.13	-136.41	-140.03	0.00	0.00	0.00
3,600.00	5.00	224.03	3,591.36	-147.40	-142.47	-146.25	0.00	0.00	0.00
3,700.00	5.00	224.03	3,690.98	-153.67	-148.53	-152.47	0.00	0.00	0.00
3,800.00	5.00	224.03	3,790.60	-159.94	-154.60	-158.70	0.00	0.00	0.00
3,900.00	5.00	224.03	3,890.22	-166.22	-160.66	-164.92	0.00	0.00	0.00
4,000.00	5.00	224.03	3,989.83	-172.49	-166.72	-171.15	0.00	0.00	0.00
4,100.00	5.00	224.03	4,089.45	-178.76	-172.78	-177.37	0.00	0.00	0.00
4,200.00	5.00	224.03	4,189.07	-185.03	-178.85	-183.59	0.00	0.00	0.00
4,300.00	5.00	224.03	4,288.69	-191.31	-184.91	-189.82	0.00	0.00	0.00
4,374.57	5.00	224.03	4,362.98	-195.98	-189.43	-194.46	0.00	0.00	0.00
4,400.00	4.75	224.03	4,388.31	-197.54	-190.93	-196.00	1.00	-1.00	0.00
4,500.00	3.75	224.03	4,488.04	-202.87	-196.08	-201.29	1.00	-1.00	0.00
4,600.00	2.75	224.03	4,587.88	-206.94	-200.02	-205.33	1.00	-1.00	0.00
4,700.00	1.75	224.03	4,687.80	-209.77	-202.75	-208.13	1.00	-1.00	0.00
4,800.00	0.75	224.03	4,787.77	-211.34	-204.27	-209.69	1.00	-1.00	0.00
4,875.03	0.00	0.00	4,862.80	-211.69	-204.61	-210.04	1.00	-1.00	0.00



Pro Directional Survey Report



Company:	Matador Resources	Local Co-ordinate Reference:	Well #231H
Project:	Lea County, NM	TVD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Site:	Uncle Ches 2116 Fed	MD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Well:	#231H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim B	Database:	WellPlanner1

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)
4,900.00	0.00	0.00	4,887.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
5,000.00	0.00	0.00	4,987.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
5,100.00	0.00	0.00	5,087.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
5,200.00	0.00	0.00	5,187.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
5,300.00	0.00	0.00	5,287.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
5,400.00	0.00	0.00	5,387.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
5,500.00	0.00	0.00	5,487.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
5,600.00	0.00	0.00	5,587.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
5,700.00	0.00	0.00	5,687.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
5,800.00	0.00	0.00	5,787.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
5,900.00	0.00	0.00	5,887.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
6,000.00	0.00	0.00	5,987.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
6,100.00	0.00	0.00	6,087.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
6,200.00	0.00	0.00	6,187.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
6,300.00	0.00	0.00	6,287.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
6,400.00	0.00	0.00	6,387.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
6,500.00	0.00	0.00	6,487.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
6,600.00	0.00	0.00	6,587.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
6,700.00	0.00	0.00	6,687.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
6,800.00	0.00	0.00	6,787.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
6,900.00	0.00	0.00	6,887.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
7,000.00	0.00	0.00	6,987.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
7,100.00	0.00	0.00	7,087.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
7,200.00	0.00	0.00	7,187.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
7,300.00	0.00	0.00	7,287.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
7,400.00	0.00	0.00	7,387.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
7,500.00	0.00	0.00	7,487.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
7,600.00	0.00	0.00	7,587.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
7,700.00	0.00	0.00	7,687.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
7,800.00	0.00	0.00	7,787.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
7,900.00	0.00	0.00	7,887.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
8,000.00	0.00	0.00	7,987.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
8,100.00	0.00	0.00	8,087.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
8,200.00	0.00	0.00	8,187.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
8,300.00	0.00	0.00	8,287.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
8,400.00	0.00	0.00	8,387.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
8,500.00	0.00	0.00	8,487.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
8,600.00	0.00	0.00	8,587.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
8,700.00	0.00	0.00	8,687.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
8,800.00	0.00	0.00	8,787.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
8,900.00	0.00	0.00	8,887.77	-211.69	-204.61	-210.04	0.00	0.00	0.00
9,000.00	0.00	0.00	8,987.77	-211.69	-204.61	-210.04	0.00	0.00	0.00



Pro Directional Survey Report



Company:	Matador Resources	Local Co-ordinate Reference:	Well #231H
Project:	Lea County, NM	TVD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Site:	Uncle Ches 2116 Fed	MD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Well:	#231H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim B	Database:	WellPlanner1

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
9,100.00	0.00	0.00	9,087.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
9,200.00	0.00	0.00	9,187.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
9,300.00	0.00	0.00	9,287.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
9,400.00	0.00	0.00	9,387.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
9,500.00	0.00	0.00	9,487.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
9,600.00	0.00	0.00	9,587.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
9,700.00	0.00	0.00	9,687.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
9,800.00	0.00	0.00	9,787.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
9,900.00	0.00	0.00	9,887.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
10,000.00	0.00	0.00	9,987.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
10,100.00	0.00	0.00	10,087.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
10,200.00	0.00	0.00	10,187.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
10,300.00	0.00	0.00	10,287.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
10,400.00	0.00	0.00	10,387.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
10,500.00	0.00	0.00	10,487.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
10,600.00	0.00	0.00	10,587.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
10,700.00	0.00	0.00	10,687.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
10,800.00	0.00	0.00	10,787.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
10,900.00	0.00	0.00	10,887.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
11,000.00	0.00	0.00	10,987.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
11,100.00	0.00	0.00	11,087.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
11,200.00	0.00	0.00	11,187.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
11,300.00	0.00	0.00	11,287.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
11,400.00	0.00	0.00	11,387.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
11,500.00	0.00	0.00	11,487.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
11,600.00	0.00	0.00	11,587.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
11,700.00	0.00	0.00	11,687.77	-211.69	-204.61	-210.04	0.00	0.00	0.00	
11,745.03	0.00	0.00	11,732.80	-211.69	-204.61	-210.04	0.00	0.00	0.00	
11,750.00	0.50	8.90	11,737.77	-211.67	-204.61	-210.02	10.00	10.00	0.00	
11,800.00	5.50	8.90	11,787.69	-209.09	-204.20	-207.44	10.00	10.00	0.00	
11,850.00	10.50	8.90	11,837.18	-202.22	-203.13	-200.58	10.00	10.00	0.00	
11,900.00	15.50	8.90	11,885.89	-191.11	-201.39	-189.49	10.00	10.00	0.00	
11,950.00	20.50	8.90	11,933.43	-175.85	-199.00	-174.25	10.00	10.00	0.00	
12,000.00	25.50	8.90	11,979.44	-156.56	-195.98	-154.98	10.00	10.00	0.00	
12,050.00	30.50	8.90	12,023.57	-133.38	-192.35	-131.83	10.00	10.00	0.00	
12,100.00	35.50	8.90	12,065.49	-106.49	-188.14	-104.97	10.00	10.00	0.00	
12,150.00	40.50	8.90	12,104.88	-76.08	-183.37	-74.61	10.00	10.00	0.00	
12,200.00	45.50	8.90	12,141.44	-42.41	-178.10	-40.98	10.00	10.00	0.00	
12,245.03	50.00	8.90	12,171.71	-9.49	-172.95	-8.10	10.00	10.00	0.00	
12,250.00	50.48	8.74	12,174.89	-5.71	-172.36	-4.33	10.00	9.69	-3.22	
12,300.00	55.34	7.24	12,205.04	33.77	-166.83	35.11	10.00	9.71	-3.00	
12,350.00	60.21	5.91	12,231.69	75.78	-162.01	77.08	10.00	9.74	-2.66	



Pro Directional Survey Report



Company:	Matador Resources	Local Co-ordinate Reference:	Well #231H
Project:	Lea County, NM	TVD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Site:	Uncle Ches 2116 Fed	MD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Well:	#231H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim B	Database:	WellPlanner1

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
12,400.00	65.09	4.70	12,254.66	119.99	-157.91	121.25	10.00	9.77	-2.42	
12,450.00	69.98	3.59	12,273.76	166.06	-154.58	167.30	10.00	9.79	-2.23	
12,500.00	74.88	2.54	12,288.84	213.65	-152.04	214.86	10.00	9.80	-2.10	
12,550.00	79.79	1.54	12,299.80	262.38	-150.31	263.58	10.00	9.81	-2.00	
12,600.00	84.69	0.57	12,306.55	311.90	-149.40	313.09	10.00	9.81	-1.94	
12,654.05	90.00	359.54	12,309.05	365.87	-149.36	367.06	10.00	9.82	-1.91	
12,700.00	90.00	359.54	12,309.05	411.82	-149.73	413.01	0.00	0.00	0.00	
12,800.00	90.00	359.54	12,309.05	511.82	-150.54	513.01	0.00	0.00	0.00	
12,900.00	90.00	359.54	12,309.05	611.81	-151.35	613.01	0.00	0.00	0.00	
13,000.00	90.00	359.54	12,309.05	711.81	-152.16	713.01	0.00	0.00	0.00	
13,100.00	90.00	359.54	12,309.05	811.81	-152.97	813.01	0.00	0.00	0.00	
13,200.00	90.00	359.54	12,309.05	911.80	-153.78	913.01	0.00	0.00	0.00	
13,300.00	90.00	359.54	12,309.05	1,011.80	-154.60	1,013.01	0.00	0.00	0.00	
13,400.00	90.00	359.54	12,309.05	1,111.80	-155.41	1,113.01	0.00	0.00	0.00	
13,500.00	90.00	359.54	12,309.04	1,211.79	-156.22	1,213.01	0.00	0.00	0.00	
13,600.00	90.00	359.54	12,309.04	1,311.79	-157.03	1,313.01	0.00	0.00	0.00	
13,700.00	90.00	359.54	12,309.04	1,411.79	-157.84	1,413.01	0.00	0.00	0.00	
13,800.00	90.00	359.54	12,309.04	1,511.78	-158.65	1,513.01	0.00	0.00	0.00	
13,900.00	90.00	359.54	12,309.04	1,611.78	-159.46	1,613.01	0.00	0.00	0.00	
14,000.00	90.00	359.54	12,309.04	1,711.78	-160.27	1,713.01	0.00	0.00	0.00	
14,100.00	90.00	359.54	12,309.04	1,811.78	-161.08	1,813.01	0.00	0.00	0.00	
14,200.00	90.00	359.54	12,309.04	1,911.77	-161.90	1,913.01	0.00	0.00	0.00	
14,300.00	90.00	359.54	12,309.04	2,011.77	-162.71	2,013.01	0.00	0.00	0.00	
14,400.00	90.00	359.54	12,309.04	2,111.77	-163.52	2,113.01	0.00	0.00	0.00	
14,500.00	90.00	359.54	12,309.04	2,211.76	-164.33	2,213.01	0.00	0.00	0.00	
14,600.00	90.00	359.54	12,309.04	2,311.76	-165.14	2,313.01	0.00	0.00	0.00	
14,700.00	90.00	359.54	12,309.04	2,411.76	-165.95	2,413.01	0.00	0.00	0.00	
14,800.00	90.00	359.54	12,309.04	2,511.75	-166.76	2,513.01	0.00	0.00	0.00	
14,900.00	90.00	359.54	12,309.04	2,611.75	-167.57	2,613.01	0.00	0.00	0.00	
15,000.00	90.00	359.54	12,309.04	2,711.75	-168.38	2,713.01	0.00	0.00	0.00	
15,100.00	90.00	359.54	12,309.04	2,811.74	-169.19	2,813.01	0.00	0.00	0.00	
15,200.00	90.00	359.54	12,309.04	2,911.74	-170.01	2,913.01	0.00	0.00	0.00	
15,300.00	90.00	359.54	12,309.04	3,011.74	-170.82	3,013.01	0.00	0.00	0.00	
15,400.00	90.00	359.54	12,309.04	3,111.73	-171.63	3,113.01	0.00	0.00	0.00	
15,500.00	90.00	359.54	12,309.03	3,211.73	-172.44	3,213.01	0.00	0.00	0.00	
15,600.00	90.00	359.54	12,309.03	3,311.73	-173.25	3,313.01	0.00	0.00	0.00	
15,700.00	90.00	359.54	12,309.03	3,411.72	-174.06	3,413.01	0.00	0.00	0.00	
15,800.00	90.00	359.54	12,309.03	3,511.72	-174.87	3,513.01	0.00	0.00	0.00	
15,900.00	90.00	359.54	12,309.03	3,611.72	-175.68	3,613.01	0.00	0.00	0.00	
16,000.00	90.00	359.54	12,309.03	3,711.71	-176.49	3,713.01	0.00	0.00	0.00	
16,100.00	90.00	359.54	12,309.03	3,811.71	-177.31	3,813.01	0.00	0.00	0.00	
16,200.00	90.00	359.54	12,309.03	3,911.71	-178.12	3,913.01	0.00	0.00	0.00	



Pro Directional Survey Report



Company:	Matador Resources	Local Co-ordinate Reference:	Well #231H
Project:	Lea County, NM	TVD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Site:	Uncle Ches 2116 Fed	MD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Well:	#231H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim B	Database:	WellPlanner1

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)
16,300.00	90.00	359.54	12,309.03	4,011.70	-178.93	4,013.01	0.00	0.00	0.00
16,400.00	90.00	359.54	12,309.03	4,111.70	-179.74	4,113.01	0.00	0.00	0.00
16,500.00	90.00	359.54	12,309.03	4,211.70	-180.55	4,213.01	0.00	0.00	0.00
16,600.00	90.00	359.54	12,309.03	4,311.69	-181.36	4,313.01	0.00	0.00	0.00
16,700.00	90.00	359.54	12,309.03	4,411.69	-182.17	4,413.01	0.00	0.00	0.00
16,800.00	90.00	359.54	12,309.03	4,511.69	-182.98	4,513.01	0.00	0.00	0.00
16,900.00	90.00	359.54	12,309.03	4,611.68	-183.79	4,613.01	0.00	0.00	0.00
17,000.00	90.00	359.54	12,309.03	4,711.68	-184.60	4,713.01	0.00	0.00	0.00
17,100.00	90.00	359.54	12,309.03	4,811.68	-185.42	4,813.01	0.00	0.00	0.00
17,200.00	90.00	359.54	12,309.03	4,911.67	-186.23	4,913.01	0.00	0.00	0.00
17,300.00	90.00	359.54	12,309.03	5,011.67	-187.04	5,013.01	0.00	0.00	0.00
17,400.00	90.00	359.54	12,309.03	5,111.67	-187.85	5,113.01	0.00	0.00	0.00
17,500.00	90.00	359.54	12,309.02	5,211.66	-188.66	5,213.01	0.00	0.00	0.00
17,600.00	90.00	359.54	12,309.02	5,311.66	-189.47	5,313.01	0.00	0.00	0.00
17,700.00	90.00	359.54	12,309.02	5,411.66	-190.28	5,413.01	0.00	0.00	0.00
17,800.00	90.00	359.54	12,309.02	5,511.65	-191.09	5,513.01	0.00	0.00	0.00
17,900.00	90.00	359.54	12,309.02	5,611.65	-191.90	5,613.01	0.00	0.00	0.00
18,000.00	90.00	359.54	12,309.02	5,711.65	-192.72	5,713.01	0.00	0.00	0.00
18,100.00	90.00	359.54	12,309.02	5,811.64	-193.53	5,813.01	0.00	0.00	0.00
18,200.00	90.00	359.54	12,309.02	5,911.64	-194.34	5,913.01	0.00	0.00	0.00
18,300.00	90.00	359.54	12,309.02	6,011.64	-195.15	6,013.01	0.00	0.00	0.00
18,400.00	90.00	359.54	12,309.02	6,111.63	-195.96	6,113.01	0.00	0.00	0.00
18,500.00	90.00	359.54	12,309.02	6,211.63	-196.77	6,213.01	0.00	0.00	0.00
18,600.00	90.00	359.54	12,309.02	6,311.63	-197.58	6,313.01	0.00	0.00	0.00
18,700.00	90.00	359.54	12,309.02	6,411.62	-198.39	6,413.01	0.00	0.00	0.00
18,800.00	90.00	359.54	12,309.02	6,511.62	-199.20	6,513.01	0.00	0.00	0.00
18,900.00	90.00	359.54	12,309.02	6,611.62	-200.01	6,613.01	0.00	0.00	0.00
19,000.00	90.00	359.54	12,309.02	6,711.61	-200.83	6,713.01	0.00	0.00	0.00
19,100.00	90.00	359.54	12,309.02	6,811.61	-201.64	6,813.01	0.00	0.00	0.00
19,200.00	90.00	359.54	12,309.02	6,911.61	-202.45	6,913.01	0.00	0.00	0.00
19,300.00	90.00	359.54	12,309.02	7,011.60	-203.26	7,013.01	0.00	0.00	0.00
19,400.00	90.00	359.54	12,309.02	7,111.60	-204.07	7,113.01	0.00	0.00	0.00
19,500.00	90.00	359.54	12,309.01	7,211.60	-204.88	7,213.01	0.00	0.00	0.00
19,600.00	90.00	359.54	12,309.01	7,311.59	-205.69	7,313.01	0.00	0.00	0.00
19,700.00	90.00	359.54	12,309.01	7,411.59	-206.50	7,413.01	0.00	0.00	0.00
19,800.00	90.00	359.54	12,309.01	7,511.59	-207.31	7,513.01	0.00	0.00	0.00
19,900.00	90.00	359.54	12,309.01	7,611.58	-208.13	7,613.01	0.00	0.00	0.00
20,000.00	90.00	359.54	12,309.01	7,711.58	-208.94	7,713.01	0.00	0.00	0.00
20,100.00	90.00	359.54	12,309.01	7,811.58	-209.75	7,813.01	0.00	0.00	0.00
20,200.00	90.00	359.54	12,309.01	7,911.57	-210.56	7,913.01	0.00	0.00	0.00
20,300.00	90.00	359.54	12,309.01	8,011.57	-211.37	8,013.01	0.00	0.00	0.00
20,400.00	90.00	359.54	12,309.01	8,111.57	-212.18	8,113.01	0.00	0.00	0.00



Pro Directional Survey Report



Company:	Matador Resources	Local Co-ordinate Reference:	Well #231H
Project:	Lea County, NM	TVD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Site:	Uncle Ches 2116 Fed	MD Reference:	GL: 3719' + KB: 28.5' @ 3747.50usft (Patterson 809)
Well:	#231H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim B	Database:	WellPlanner1

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)	
20,500.00	90.00	359.54	12,309.01	8,211.56	-212.99	8,213.01	0.00	0.00	0.00	
20,600.00	90.00	359.54	12,309.01	8,311.56	-213.80	8,313.01	0.00	0.00	0.00	
20,700.00	90.00	359.54	12,309.01	8,411.56	-214.61	8,413.01	0.00	0.00	0.00	
20,800.00	90.00	359.54	12,309.01	8,511.55	-215.42	8,513.01	0.00	0.00	0.00	
20,900.00	90.00	359.54	12,309.01	8,611.55	-216.24	8,613.01	0.00	0.00	0.00	
21,000.00	90.00	359.54	12,309.01	8,711.55	-217.05	8,713.01	0.00	0.00	0.00	
21,100.00	90.00	359.54	12,309.01	8,811.55	-217.86	8,813.01	0.00	0.00	0.00	
21,200.00	90.00	359.54	12,309.01	8,911.54	-218.67	8,913.01	0.00	0.00	0.00	
21,300.00	90.00	359.54	12,309.01	9,011.54	-219.48	9,013.01	0.00	0.00	0.00	
21,400.00	90.00	359.54	12,309.01	9,111.54	-220.29	9,113.01	0.00	0.00	0.00	
21,500.00	90.00	359.54	12,309.00	9,211.53	-221.10	9,213.01	0.00	0.00	0.00	
21,600.00	90.00	359.54	12,309.00	9,311.53	-221.91	9,313.01	0.00	0.00	0.00	
21,700.00	90.00	359.54	12,309.00	9,411.53	-222.72	9,413.01	0.00	0.00	0.00	
21,800.00	90.00	359.54	12,309.00	9,511.52	-223.54	9,513.01	0.00	0.00	0.00	
21,900.00	90.00	359.54	12,309.00	9,611.52	-224.35	9,613.01	0.00	0.00	0.00	
22,000.00	90.00	359.54	12,309.00	9,711.52	-225.16	9,713.01	0.00	0.00	0.00	
22,100.00	90.00	359.54	12,309.00	9,811.51	-225.97	9,813.01	0.00	0.00	0.00	
22,200.00	90.00	359.54	12,309.00	9,911.51	-226.78	9,913.01	0.00	0.00	0.00	
22,300.00	90.00	359.54	12,309.00	10,011.51	-227.59	10,013.01	0.00	0.00	0.00	
22,350.50	90.00	359.54	12,309.00	10,062.00	-228.00	10,063.51	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
LPP(U C F #231H)	0.00	0.00	12,309.00	9,972.00	-227.00	575,576.00	766,146.00	32.579394	-103.469320	
- plan misses target center by 0.27usft at 22260.49usft MD (12309.00 TVD, 9972.00 N, -227.27 E)										
- Point										
BHL(U C F #231H)	0.00	0.00	12,309.00	10,062.00	-228.00	575,666.00	766,145.00	32.579642	-103.469321	
- plan hits target center										
- Point										
FPP(U C F #231H)	0.00	0.00	12,309.00	69.00	-147.00	565,673.00	766,226.00	32.552174	-103.469321	
- plan misses target center by 72.30usft at 12380.76usft MD (12246.27 TVD, 102.74 N, -159.40 E)										
- Point										

Checked By: _____ Approved By: _____ Date: _____

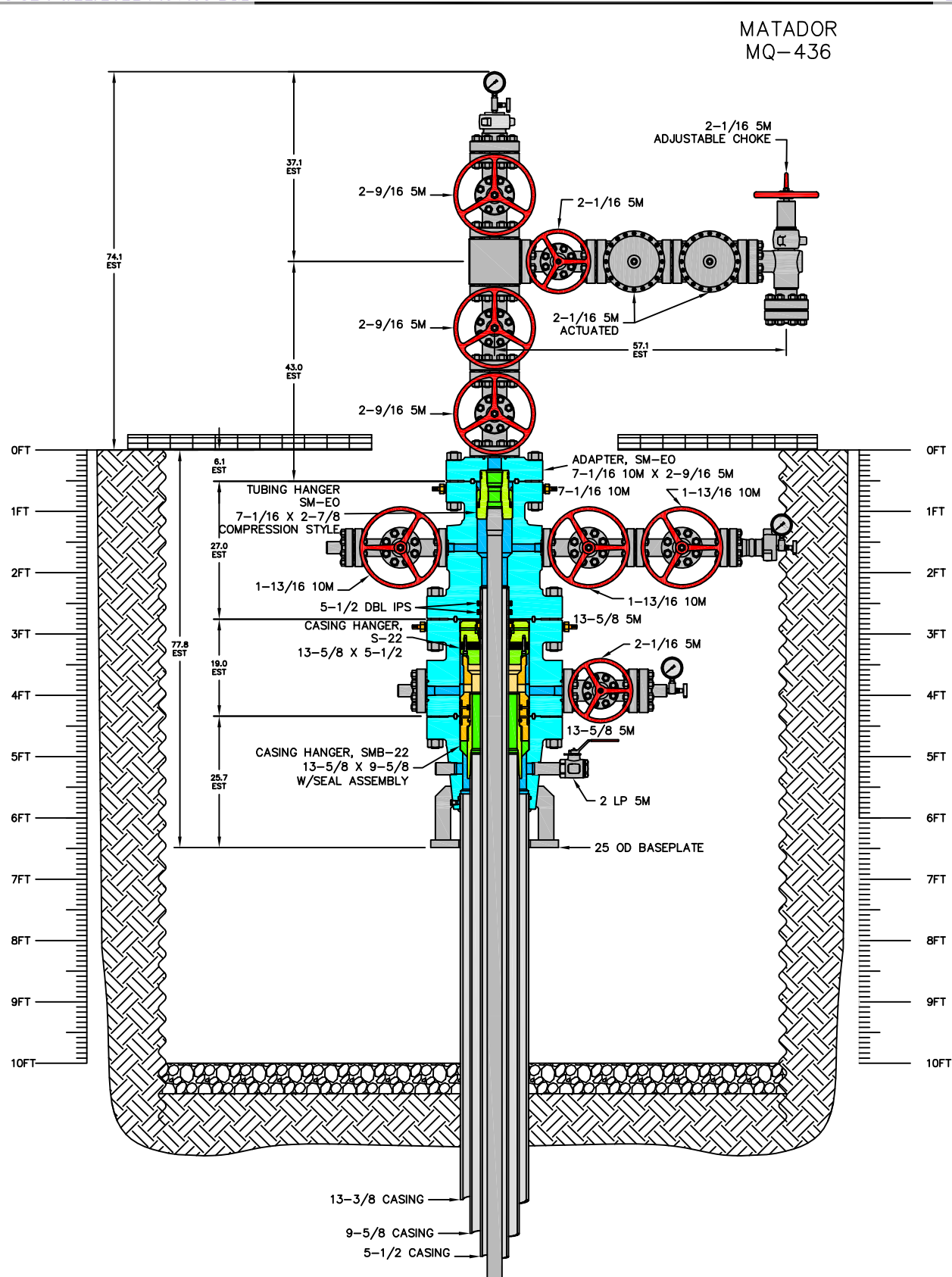
Closed-Loop System

Operating and Maintenance Plan:

During drilling operations, third party service companies will utilize solids control equipment to remove cuttings from the drilling fluids and collect it in haul-off bins. Equipment will be closely monitored at all times while drilling by the derrick man and the service company employees.

Closure Plan:

During drilling operations, third party service companies will haul off drill solids and fluids to an approved disposal facility. At the end of the well, all closed loop equipment will be removed from the location.



NOTE:
DIMENSIONS SHOWN ON THIS DRAWING ARE ESTIMATES ONLY AND CAN VARY SIGNIFICANTLY DEPENDING ON RAW MATERIAL LENGTHS. NO GUARANTEE OF STACKUP HEIGHT IS IMPLIED. DIMENSIONS SHOWN SHOULD BE CONSIDERED FOR REFERENCE PURPOSES ONLY.

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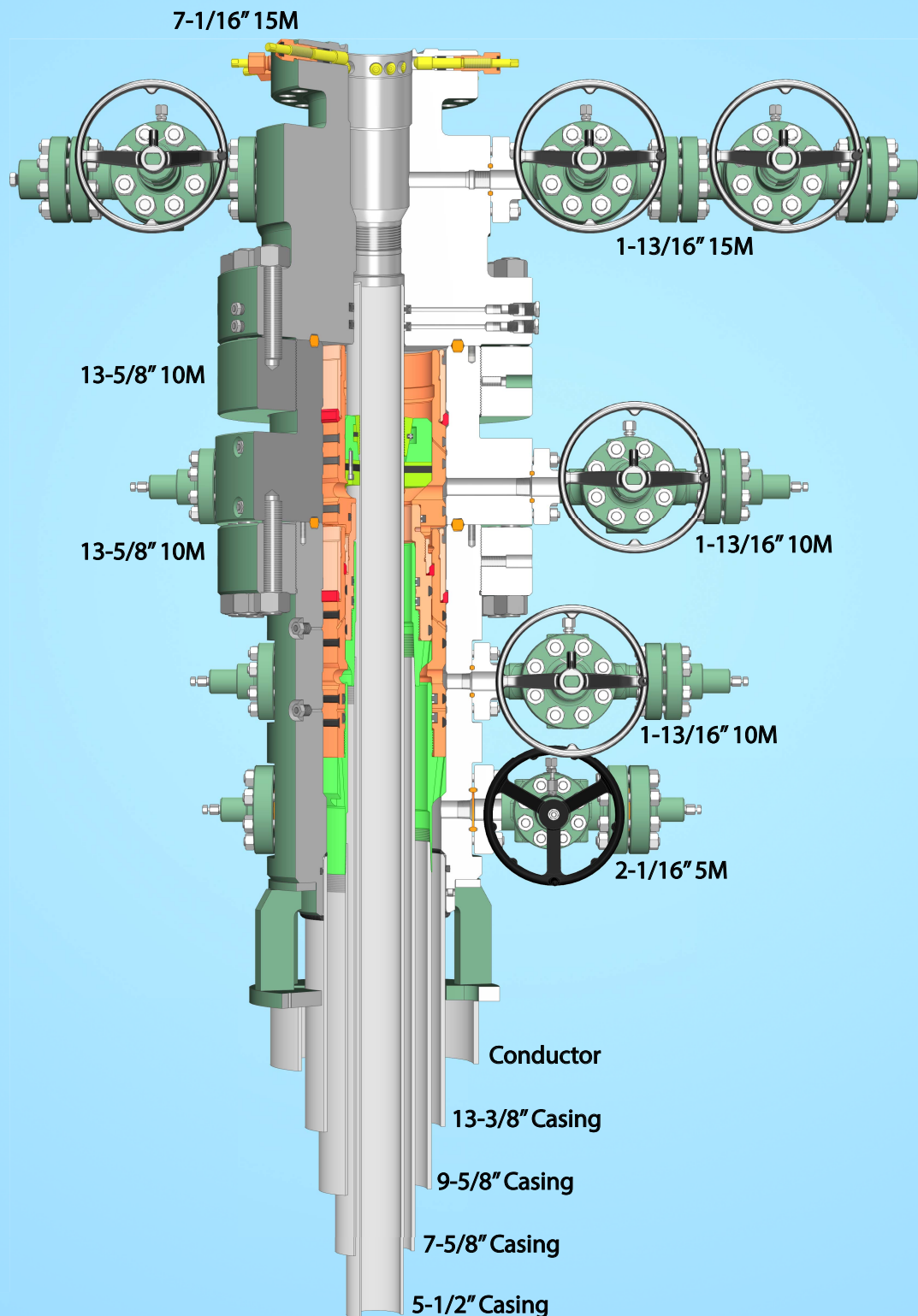


5,000 PSI WELLHEAD & TREE ASSEMBLY
13-3/8 X 9-5/8 X 5-1/2 X 2-7/8

DRAWN BY: RPL	SCALE: 1:10	DATE: 23SEP16	REV
CHECKED BY:	DRAWING NO. P-21629		
APPROVED BY:			



13-5/8" 10M MN-DS Wellhead Four Stage MN-DS



2018-083-03



Well Control Plan For 10M MASP Section of Wellbore

Component and Preventer Compatibility Table:

The table below covers the drilling and casing of the 10M MASP portion of the well and outlines the tubulars and the compatible preventers in use. This table, combined with the mud program, documents that two barriers to flow can be maintained at all times, independent of the rating of the annular preventer.

Component	OD	Preventer	RWP
Drill pipe	4"	Lower 3.5-5.5" VBR Upper 3.5-5.5" VBR	10M
HWDP	4"		
Jars/Agitator	4.75-5"		
Drill collars and MWD tools	4.75-5.25"		
Mud Motor	4.75-5.25"		
Production casing	4.5-5.5"		
ALL	0-13.625"	Annular	5M
Open-hole	-	Blind Rams	10M

VBR = Variable Bore Ram with compatible range listed in chart

HWDP = Heavy Weight Drill Pipe

MWD = Measurement While Drilling

Well Control Procedures

Well control procedures are specific to the rig equipment and the operation at the time the kick occurs. Below are the minimal high-level tasks prescribed to assure a proper shut-in while drilling, tripping, running casing, pipe out of the hole (open hole), and moving the Bottom Hole Assembly (BHA) through the Blowout Preventers (BOP). The maximum pressure at which well control is transferred from the annular to another compatible ram is 3,000 psi.

General Procedure While Drilling

1. Sound alarm (alert crew)
2. Space out drill string
3. Shut down pumps and stop rotary
4. Shut-in well with the annular preventer (The Hydraulic Control Remote (HCR) valve and choke will already be in the closed position)
5. Confirm shut-in
6. Notify tool pusher and company representative
7. Read and record the following:
 - SIDPP and SICP
 - Pit gain
 - Time of shut in
8. Regroup and identify forward plan
9. If pressure has increased or is anticipated to increase above 3,000 psi, confirm spacing and close the upper pipe rams

General Procedure While Tripping

1. Sound alarm (alert crew)
2. Stab full opening safety valve and close
3. Space out drill string



Well Control Plan For 10M MASP Section of Wellbore

4. Shut-in well with annular preventer (The HCR valve and choke will already be in the closed position)
5. Confirm shut-in
6. Notify tool pusher and company representative
7. Read and record the following:
 - SIDPP and SICP
 - Pit gain
 - Time of shut in
8. Regroup and identify forward plan
9. If pressure has increased or is anticipated to increase above 3,000 psi, confirm spacing and close the upper pipe rams

General Procedure While Running Casing

1. Sound alarm (alert crew)
2. Stab crossover and full opening safety valve and close
3. Space out string
4. Shut-in well with annular preventer (The HCR valve and choke will already be in the closed position)
5. Confirm shut-in
6. Notify tool pusher and company representative
7. Read and record the following:
 - SIDPP and SICP
 - Pit gain
 - Time of shut in
8. Regroup and identify forward plan
9. If pressure has increased or is anticipated to increase above 3,000 psi, confirm spacing and close the upper pipe rams

General Procedure with No Pipe In Hole

1. At any point when the BOP stack is clear of pipe or BHA, the well will be shut in with blind rams, the HCR valve will be open, and choke will be closed. If pressure increase is observed:
2. Sound alarm (alert crew)
3. Confirm shut-in
4. Notify tool pusher and company representative
5. Read and record the following:
 - SICP
 - Time of shut in
6. Regroup and identify forward plan

General Procedure While Pulling BHA through Stack

1. Prior to pulling last joint/stand of drill pipe through the stack, perform flow check. If flowing:
 - a. Sound alarm (alert crew)
 - b. Stab full opening safety valve and close
 - c. Space out drill string
 - d. Shut-in well with annular preventer (The HCR valve and choke will already be in the closed position)
 - e. Confirm shut-in
 - f. Notify tool pusher and company representative
 - g. Read and record the following:
 - SIDPP and SICP



Well Control Plan For 10M MASP Section of Wellbore

- Pit gain
 - Time of shut in
 - h. Regroup and identify forward plan
2. With BHA in the stack and compatible ram preventer and pipe combo immediately available:
 - a. Sound alarm (alert crew)
 - b. Stab crossover and full opening safety valve and close
 - c. Space out drill string with the upset just beneath the compatible pipe ram
 - d. Shut-in well using compatible pipe rams (The HCR valve and choke will already be in the closed position)
 - e. Confirm shut-in
 - f. Notify tool pusher and company representative
 - g. Read and record the following:
 - SIDPP and SICP
 - Pit gain
 - Time of shut in
 - h. Regroup and identify forward plan
 3. With BHA in the stack and no compatible ram preventer and pipe combo immediately available:
 - a. Sound alarm (alert crew)
 - b. If possible to pick up high enough, pull BHA clear of the stack
 - i. Follow "No Pipe in Hole" procedure above
 - c. If impossible to pick up high enough to pull string clear of the stack:
 - i. Stab crossover, make up one joint/stand of drill pipe, and full opening safety valve and close
 - ii. Space out drill string with the upset just beneath the compatible pipe ram
 - iii. Shut-in well using compatible pipe rams (The HCR valve and choke will already be in the closed position)
 - iv. Confirm shut-in
 - v. Notify tool pusher and company representative
 - vi. Read and record the following:
 - SIDPP and SICP
 - Pit gain
 - Time of shut in
 - vii. Regroup and identify forward plan

Well Control Drills

Well control drills are specific to the rig equipment, personnel, and operations. Each crew will execute one drill weekly relevant to ongoing operations, but will make a reasonable attempt to vary the type of drills. The drills will be recorded in the daily drilling log.

Drilling Operations Plan
Uncle Ches Fed Com #231H
Matador Resources Company
UL:M, Sec 21, 20S, 35E
Lea County, NM

Surface Location: 260' FSL & 476' FWL, Sec. 21
Bottom Hole Location: 240' FNL & 330' FWL, Sec. 16
Elevation Above Sea Level: 3719'

Type of Well: Horizontal well, No Pilot Hole, Drilled with conventional rotary tools

Proposed Drilling Depth: 22,350' MD / 12,309' TVD

Estimated Tops of Geological Markers w/ Mineral Bearing Formation:

Formation Name	Est Top	Bearing	
Rustler	1779	1959	Salt/Washout
Salado	1434	2304	Salt/Washout
Delaware	-2580	6318	Hydrocarbon/Loss Circ
Brushy Canyon	-3613	7351	Oil/Gas
Bone Spring Lime	-4770	8508	Oil/Gas
1st Bone Spring Carbonate	-5883	9621	Oil/Gas
1st Bone Spring Sand	-6056	9794	Oil/Gas
2nd Bone Spring Carbonate	-6377	10115	Oil/Gas
2nd Bone Spring Sand	-6738	10476	Oil/Gas
3rd Bone Spring Carbonate	-7246	10984	Oil/Gas
3rd Bone Spring Sand	-7796	11534	Oil/Gas
Wolfcamp A	-7999	11737	Oil/Gas
Wolfcamp B	-8097	11835	Oil/Gas
Wolfcamp C	-8358	12096	Oil/Gas
Wolfcamp D	-8521	12259	Oil/Gas

OSE Ground Water Estimated Depth: 877'

Casing Program

Name	Hole Size	Casing Size	Wt/Grade	Thread Collar	Setting Depth	Top Cement
Surface	20"	13-3/8" (new)	54.5# J-55	BTC	1984	Surface
Intermediate 1	12-1/4"	9-5/8" (new)	40# J-55	BTC	5900	Surface
Intermediate 2	8-3/4"	7-5/8" (new)	29.7# P-110	BTC	0-5700	4900'
		7-5/8" (new)	29.7# P-110	VAM HTF-NR	5700-11695	
		7" (new)	29# P-110	BTC	11695-12500	
Production	6-1/8"	5-1/2" (new)	20# P-110	Tenaris XP	0-11595	11500'
		4-1/2" (new)	13.5# P-110	Tenaris XP	11595-22350	

Minimum Safety Factors: Burst: 1.125 Collapse: 1.125 Tension 1.8

Cementing Program

Drilling Operations Plan
Uncle Ches Fed Com #231H
Matador Resources Company
UL:M, Sec 21, 20S, 35E
Lea County, NM

Name	Type	Sacks	Yield	Weight	Blend
Surface	Lead	2188	1.75	13.5	Class C + 3% NaCl + LCM
	Tail	694	1.38	14.8	Class C + 5% NaCl + LCM
TOC = 0'		100% Excess		Centralizers per Onshore Order 2.III.B.1f	
Intermediate 1	Lead	1344	1.81	13.5	Class C + Bentonite + 1% CaCL ₂ + 8% NaCl + LCM
	Tail	536	1.38	14.8	Class C + 5% NaCl + LCM
TOC = 0'		100% Excess		2 on btm jt, 1 on 2nd jt, 1 every 4th jt to surface	
Intermediate 2	Lead	945	2.36	11.5	TXI + Fluid Loss + Dispersant + Retarder + LCM
	Tail	168	1.38	13.2	TXI + Fluid Loss + Dispersant + Retarder + LCM
TOC = 4900'		35% Excess		2 on btm jt, 1 on 2nd jt, 1 every other jt to top of tail cement (500' above TOC), 1 every 4th jt to surface	
Production	Tail	814	1.38	15.8	Class H + Fluid Loss + Dispersant + Retarder + LCM
TOC = 11500'		10% Excess		2 on btm jt, 1 on 2nd jt, 1 every 4th jt to top of tail cement (1000' tie back)	

Matador requests the option to run a DV tool with annular packer as contingency in the intermediate section on 9-5/8" casing if lost circulation is encountered. If losses occur the DV tool with packer will be placed at least 100' above the loss zone to give the option to pump cement as either a single stage or two stage.

Pressure Control Equipment:

A 10000-psi BOP stack consisting of 3 rams with 2 pipe rams, 1 blind ram, and 1 annular preventer will be used below surface casing to TD. See attached BOP, choke manifold, co-flex hose, and speed head diagrams. An accumulator complying with Onshore Order 2 requirements for the BOP stack pressure rating will be present. Rotating head will be installed as needed. Pressure tests will be conducted before drilling out from under all casing strings. BOP will be inspected and operated as required in Onshore Order 2. Kelly cock and sub equipped with a full opening valve sized to fit the drill pipe and collars will be available on the rig floor in the open position. A third party company will test the BOPs.

After setting surface casing, and before drilling below the surface casing shoe, BOPE will be tested to 250 psi low and 2000 psi high. Annular will be tested to 250 psi low and 1000 psi high. After setting 9-5/8" casing, pressure tests will be made to 250 psi low and 5000 psi high. Annular will be tested to 250 psi low and 2500 psi high. After setting 7-5/8" x 7" Casing, pressure tests will be made to 250 psi low and 10000 psi high. Annular will tested to 250 psi low and 5000 psi high.

Drilling Operations Plan
Uncle Ches Fed Com #231H
Matador Resources Company
UL:M, Sec 21, 20S, 35E
Lea County, NM

Matador requests a variance to drill this well using a co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. Manufacturer does not require the hose to be anchored. If the specific hose is not available, then one of equal or higher rating will be used.

Matador is requesting a variance to use a speed head for setting the intermediate (9-5/8") casing. In the case of running a speed head with landing mandrel for 9-5/8" casing, BOP test pressures after setting surface casing will be 250 psi low and 10000 psi high. Annular will be tested to 250 psi low and 5000 psi high before drilling below the surface shoe. BOPE will 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. A diagram of the speed head is attached.

Proposed Mud System:

Name	Hole Size	Mud Weight	Visc	Fluid Loss	Type Mud
Surface	20"	8.40	28	NC	FW Spud Mud
Intermediate 1	12-1/4"	10.00	30-32	NC	Brine Water
Intermediate 2	8-3/4"	9.00	30-32	NC	FW/Cut Brine
Intermediate 3	6-1/8"	12.00	50-60	<10	OBM

All necessary mud products for weight addition and fluid loss control will be on location at all times. Mud program subject to change due to hole conditions.

The Mud Monitoring System is an electronic Pason system satisfying requirements of Onshore Order 1.

Testing, Logging & Coring Program:

- Mud Logging Program: 2 man unit from 1984 – TD
- Electric Logging Program: No electric logs are planned at this time. GR will be collected through the MWD tools from Inter. Csg to TD
- No DSTs or cores are planned at this time
- CBL w/ CCL from as far as gravity will let it fall to TOC

Potential Hazards:

No abnormal pressures or temperatures are expected. In accordance with Onshore Order 6, Matador does not anticipate that there will be enough H₂S from the surface to the Bone Spring formations to meet the BLM's minimum requirements for the submission of an "H₂S Drilling Operation Plan" or "Public Protection Plan" for the drilling and completion of this well. Since we have an H₂S safety package on all wells, attached is an "H₂S Drilling Operations Plan". Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely. All personnel will be familiar with all aspects of safe operation of equipment being used.

Estimated BHP: 6154 psi

Estimated BHT: 170° F

Construction and Drilling:

Drilling Operations Plan
Uncle Ches Fed Com #231H
Matador Resources Company
UL:M, Sec 21, 20S, 35E
Lea County, NM

Road and location construction will begin after BLM approval of APD. Anticipated spud date as soon as approved. Drilling expected to take 35 days. If production casing is run an additional 30 days will be required to complete and construct surface facilities.

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District IV
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State of New Mexico
Energy, Minerals & Natural Resources
Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

FORM C-102

Revised August 1, 2011

Submit one copy to appropriate

District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-025-48865	² Pool Code 98346	³ Pool Name WC-025 G-09 S203521N;WOLFCAMP
⁴ Property Code 326210	⁵ Property Name UNCLE CHES 2116 FED COM	⁶ Well Number #231H
⁷ OGRID No. 228937	⁸ Operator Name MATADOR PRODUCTION COMPANY	⁹ Elevation 3719'

¹⁰Surface Location

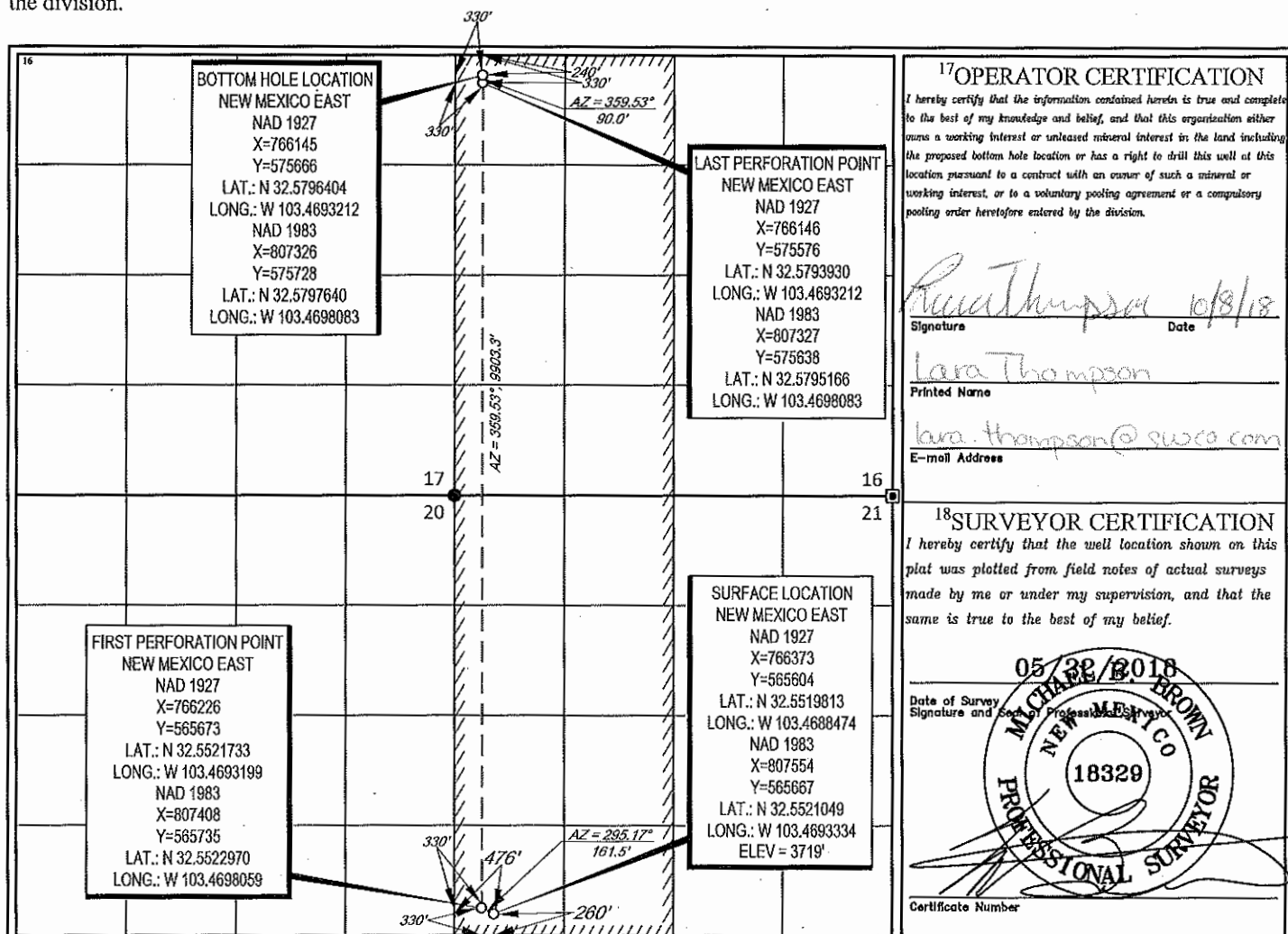
UL or lot no.	Section	Township	Range	Lot Ida	Feet from the	North/South line	Feet from the	East/West line	County
M	21	20-S	35-E	--	260'	SOUTH	476'	WEST	LEA

¹¹Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Ida	Feet from the	North/South line	Feet from the	East/West line	County
D	16	20-S	35-E	-	240'	NORTH	330'	WEST	LEA

¹² Dedicated Acres 640	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



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☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number		² Pool Code		³ Pool Name		
⁴ Property Code		⁵ Property Name UNCLE CHES 2116 FED COM				⁶ Well Number #231H
⁷ OGRID No.		⁸ Operator Name MATADOR PRODUCTION COMPANY				⁹ Elevation 3719'

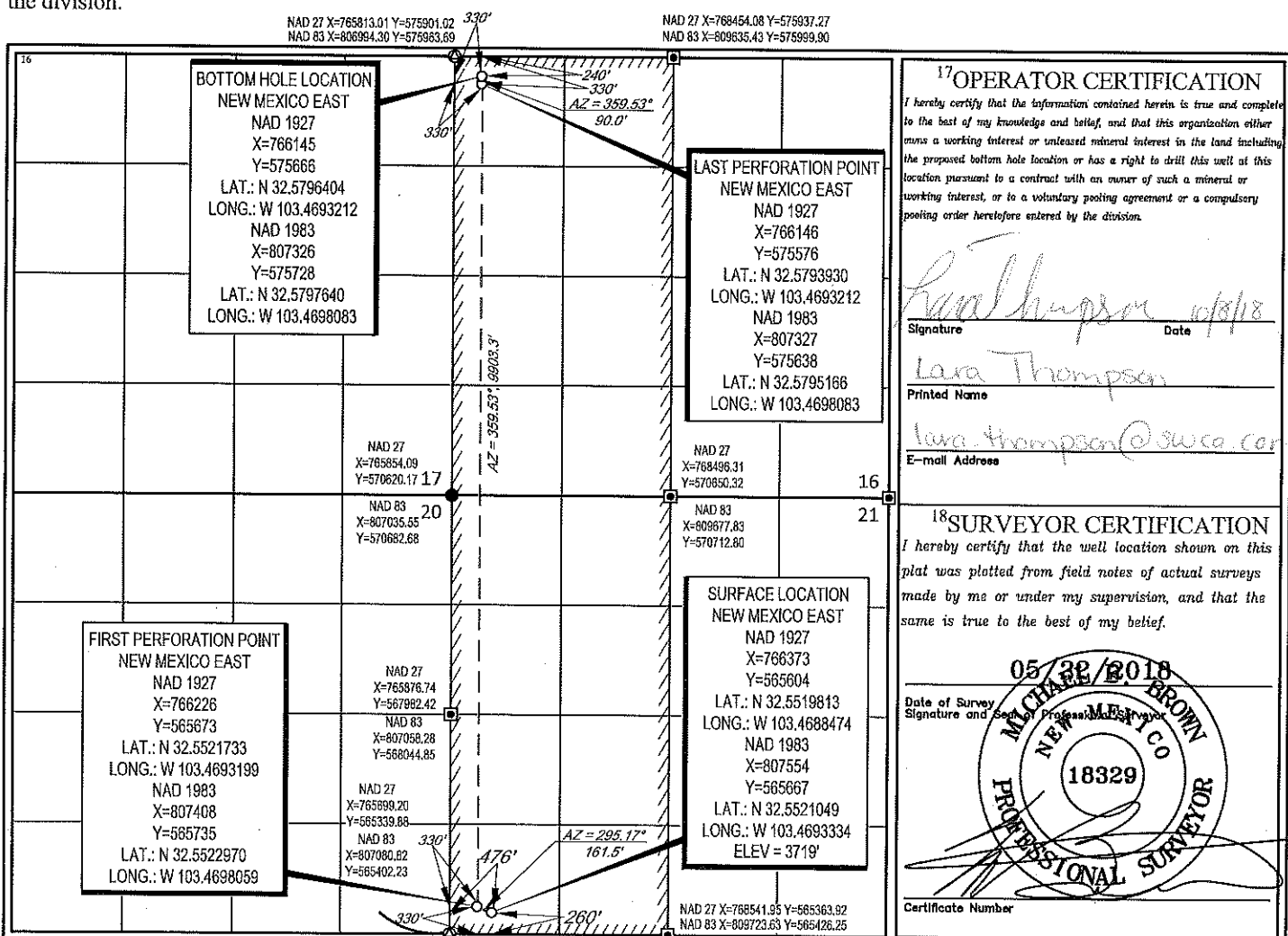
¹⁰Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	21	20-S	35-E	-	260'	SOUTH	476'	WEST	LEA

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	16	20-S	35-E	-	240'	NORTH	330'	WEST	LEA

¹¹ Dedicated Acres 640	¹² Joint or Infill	¹³ Consolidation Code	¹⁴ Order No.
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Oil Conservation Division
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Santa Fe, NM 87505

Submit Original
to Appropriate
District Office

GAS CAPTURE PLAN

X Original Operator & OGRID No.: Matador Production Company (228937)
☐ Amended Date: 6/28/2018
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: A C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule 19.15.18.12.A

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
Uncle Ches Fed Com #121H	N/A	UL-M Sec 21 T20S R35E	260' FSL 506' FWL	~400	~21 days	Flare ~21 days on flowback before turn into TB. Time est. depends on sales connect and well cleanup.
Uncle Ches 2116 Fed Com #122H	N/A	UL-N Sec 21 T20S R35E	260' FSL 1827' FWL	~400	~21 days	Flare ~21 days on flowback before turn into TB. Time est. depends on sales connect and well cleanup.
Uncle Ches 2116 Fed Com #123H	N/A	UL-O Sec 21 T20S R35E	260' FSL 2303' FEL	~400	~21 days	Flare ~21 days on flowback before turn into TB. Time est. depends on sales connect and well cleanup.
Uncle Ches Federal #124H	N/A	UL-P Sec 21 T20S R35E	350' FSL 203' FEL	~400	~21 days	Flare ~21 days on flowback before turn into TB. Time est. depends on sales connect and well cleanup.
Uncle Ches 2116 Fed Com #231H	N/A	UL-M Sec 21 T20S R35E	260' FSL 476' FWL	~500	~21 days	Flare ~21 days on flowback before turn into TB. Time est. depends on sales connect and well cleanup.

30-025-48865

Uncle Ches 2116 Fed Com #232H	N/A	UL-N Sec 21 T20S R35E	260' FSL 1797' FWL	~500	~21 days	Flare ~21 days on flowback before turn into TB. Time est. depends on sales connect and well cleanup.
Uncle Ches 2116 Fed Com #233H	N/A	UL-O Sec 21 T20S R35E	260' FSL 2333' FEL	~500	~21 days	Flare ~21 days on flowback before turn into TB. Time est. depends on sales connect and well cleanup.
Uncle Ches 2116 Fed Com #234H	N/A	UL-P Sec 21 T20S R35E	425' FSL 604' FEL	~500	~21 days	Flare ~21 days on flowback before turn into TB. Time est. depends on sales connect and well cleanup.

Gathering System and Pipeline Notification

The well will be connected to a production facility after flowback operations are complete so long as the gas transporter system is in place. The gas produced from the production facility should be connected to DCP Midstream gathering system. It will require ~1,000' of pipeline to connect the facility to a low/high pressure gathering system. Matador Production Company periodically provides a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future to DCP Midstream gathering. If changes occur that will affect the drilling and completion schedule, Matador Production Company will notify DCP Midstream gathering. Additionally, the gas produced from the well will be processed at a processing plant further downstream and, although unanticipated, any issues with downstream facilities could cause flaring at the wellhead. The actual flow of the gas will be based on compression operating parameters and gathering system pressures measured when the well starts producing.

Flowback Strategy

After the fracture treatment/completion operations (flowback), the well will be produced to temporary production tanks and the gas will be flared or vented. During flowback, the fluids and sand content will be monitored. If the produced fluids contain minimal sand, then the well will be turned to production facilities. The gas sales should start as soon as the well starts flowing through the production facilities, unless there are operational issues on the midstream system at that time. Based on current information, it is Matador's belief the system will be able to take the gas upon completion of the well.

Commented [DA1]: Is this flowback or before/after?

Safety requirements during cleanup operations 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
 - Operating a generator will only utilize a portion of the produced gas and the remainder of gas would still need to be flared.
 - Power Company has to be willing to purchase gas back and if they are willing they require a 5 year commitment to supply the agreed upon amount of power back to them. With gas decline rates and unpredictability of markets it is impossible to agree to such long term demands. If the demands are not met then operator is burdened with penalty for not delivering.
- Compressed Natural Gas – On lease
 - Compressed Natural Gas is likely to be uneconomic to operate when the gas volume declines.
- NGL Removal – On lease
 - NGL Removal requires a plant and is expensive on such a small scale rendering it uneconomic and still requires residue gas to be flared.

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CONDITIONS

Action 25314

CONDITIONS OF APPROVAL

Operator:	OGRID:	Action Number:	Action Type:
MATADOR PRODUCTION COMPANY 5400 LBJ Freeway, Ste 1500	228937	25314	FORM 3160-3
One Lincoln Centre Dallas, TX75240			

OCD Reviewer	Condition
pkautz	Will require a File As Drilled C-102 and a Directional Survey with the C-104
pkautz	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string