

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Tap Rock Operating LLC
WELL NAME & NO.:	Mulva Fed Com 112H
LOCATION:	Sec 27-24S-35E-NMP
COUNTY:	Eddy County, New Mexico

COA

H2S	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
Potash	<input checked="" type="radio"/> None	<input type="radio"/> Secretary	<input type="radio"/> R-111-P
Cave/Karst Potential	<input checked="" type="radio"/> Low	<input type="radio"/> Medium	<input type="radio"/> High
Cave/Karst Potential	<input type="radio"/> Critical		
Variance	<input type="radio"/> None	<input checked="" type="radio"/> Flex Hose	<input type="radio"/> Other
Wellhead	<input type="radio"/> Conventional	<input checked="" type="radio"/> Multibowl	<input type="radio"/> Both
Other	<input type="checkbox"/> 4 String Area	<input type="checkbox"/> Capitan Reef	<input type="checkbox"/> WIPP
Other	<input checked="" type="checkbox"/> Fluid Filled	<input type="checkbox"/> Cement Squeeze	<input type="checkbox"/> Pilot Hole
Special Requirements	<input type="checkbox"/> Water Disposal	<input checked="" type="checkbox"/> COM	<input type="checkbox"/> 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

1. The **13-3/8** inch surface casing shall be set at approximately 550 feet (a minimum of 70 feet (Eddy County) into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours

after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

- d. If cement falls back, remedial cementing will be done prior to drilling out that string.

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

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
 - Cement to surface. If cement does not circulate see B.1.a, c-d above.
3. The minimum required fill of cement behind the **5-1/2** inch production casing is:
 - Cement should tie-back at least **50 feet** on top of Capitan Reef top. If cement does not circulate see B.1.a, c-d above.

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

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

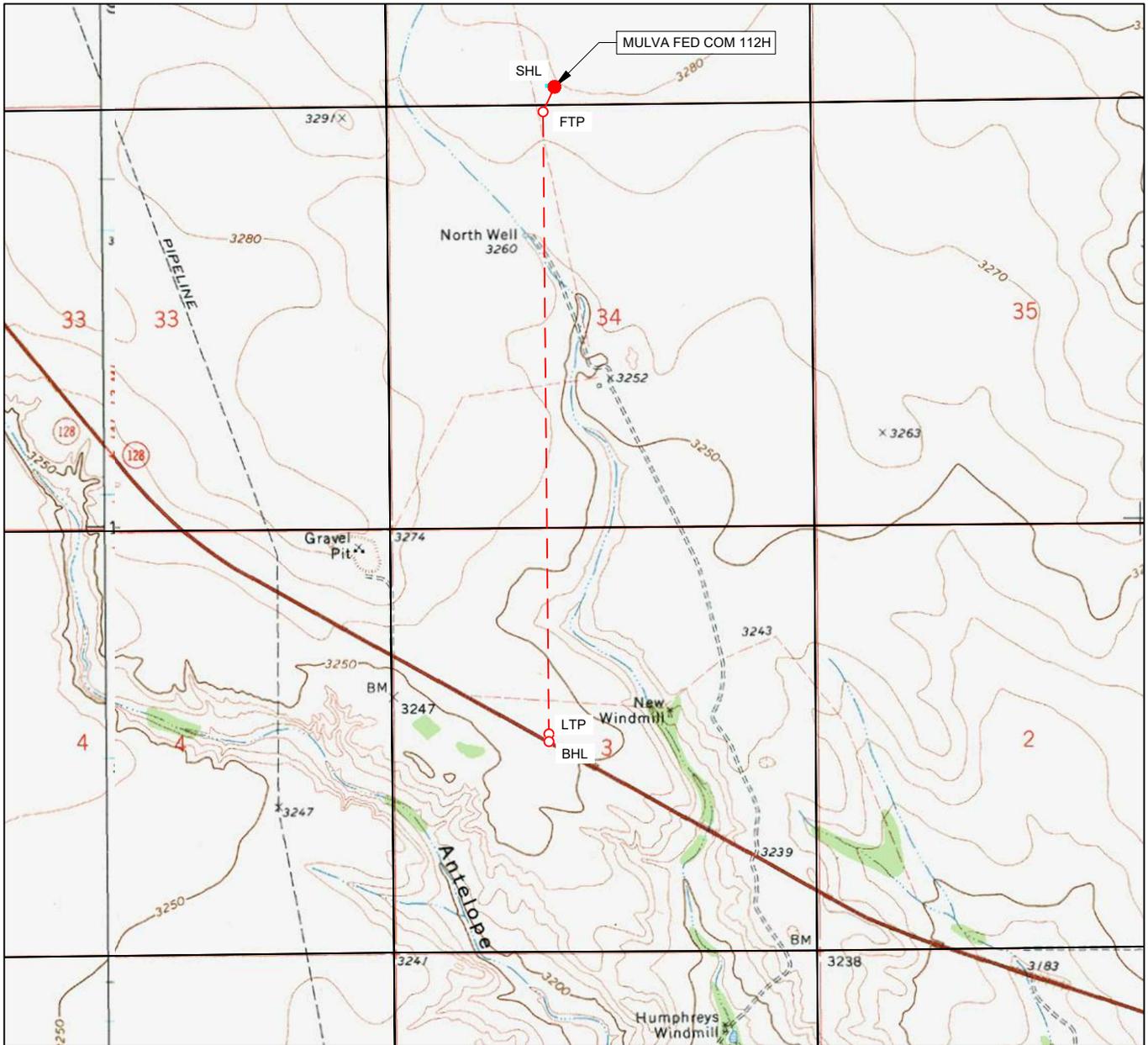
Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

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.

LOCATION & ELEVATION VERIFICATION MAP



LEASE NAME & WELL NO.: MULVA FED COM 112H

SECTION 27 TWP 24-S RGE 35-E SURVEY N.M.P.M.
 COUNTY LEA STATE NM ELEVATION 3281'
 DESCRIPTION 210' FSL & 2126' FWL

LATITUDE N 32.1818185 LONGITUDE W 103.3570520



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

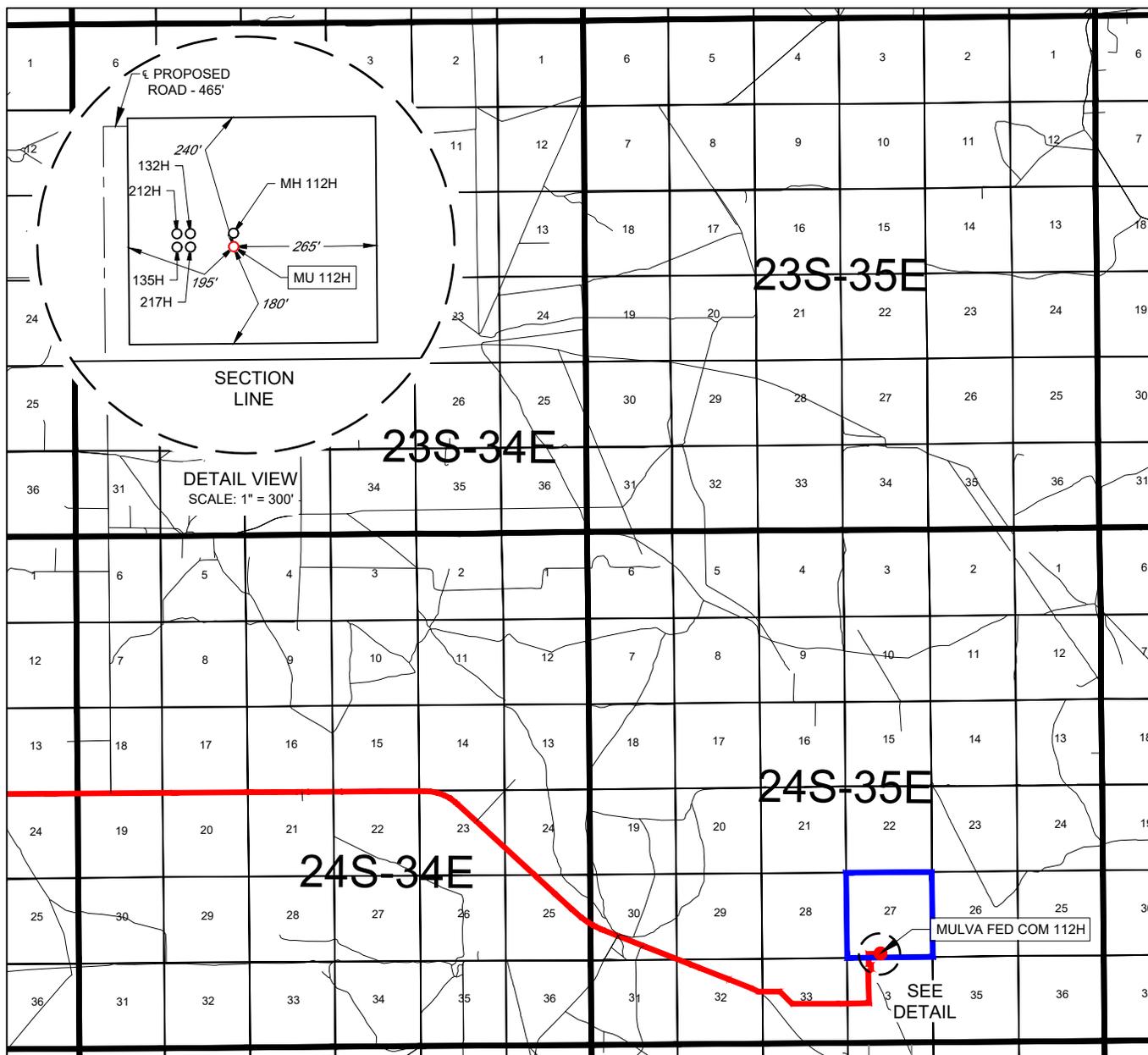
THIS EASEMENT/SERVITUDE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.



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 2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
 TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
 WWW.TOPOGRAPHIC.COM

EXHIBIT 2
VICINITY MAP



LEASE NAME & WELL NO.: MULVA FED COM 112H

SECTION 27 TWP 24-S RGE 35-E SURVEY N.M.P.M.
 COUNTY LEA STATE NM
 DESCRIPTION 210' FSL & 2126' FWL

DISTANCE & DIRECTION

FROM INT. OF NM-128 & DELAWARE BASIN RD., GO EAST ON NM-128
±9.7 MILES, THENCE NORTHEAST (LEFT) ON A LEASE RD. ±0.9 MILES,
THENCE NORTH (LEFT) ON A PROPOSED RD. ±465 FEET TO A POINT
±298 FEET NORTHWEST OF THE LOCATION.

THIS EASEMENT/SERVITUDE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.

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SCALE: 1" = 10000'
 0' 5000' 10000'

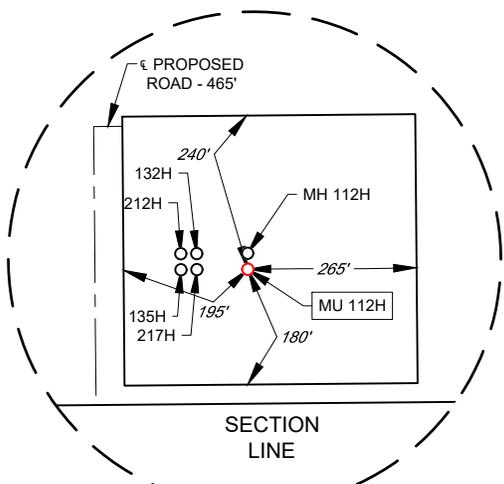
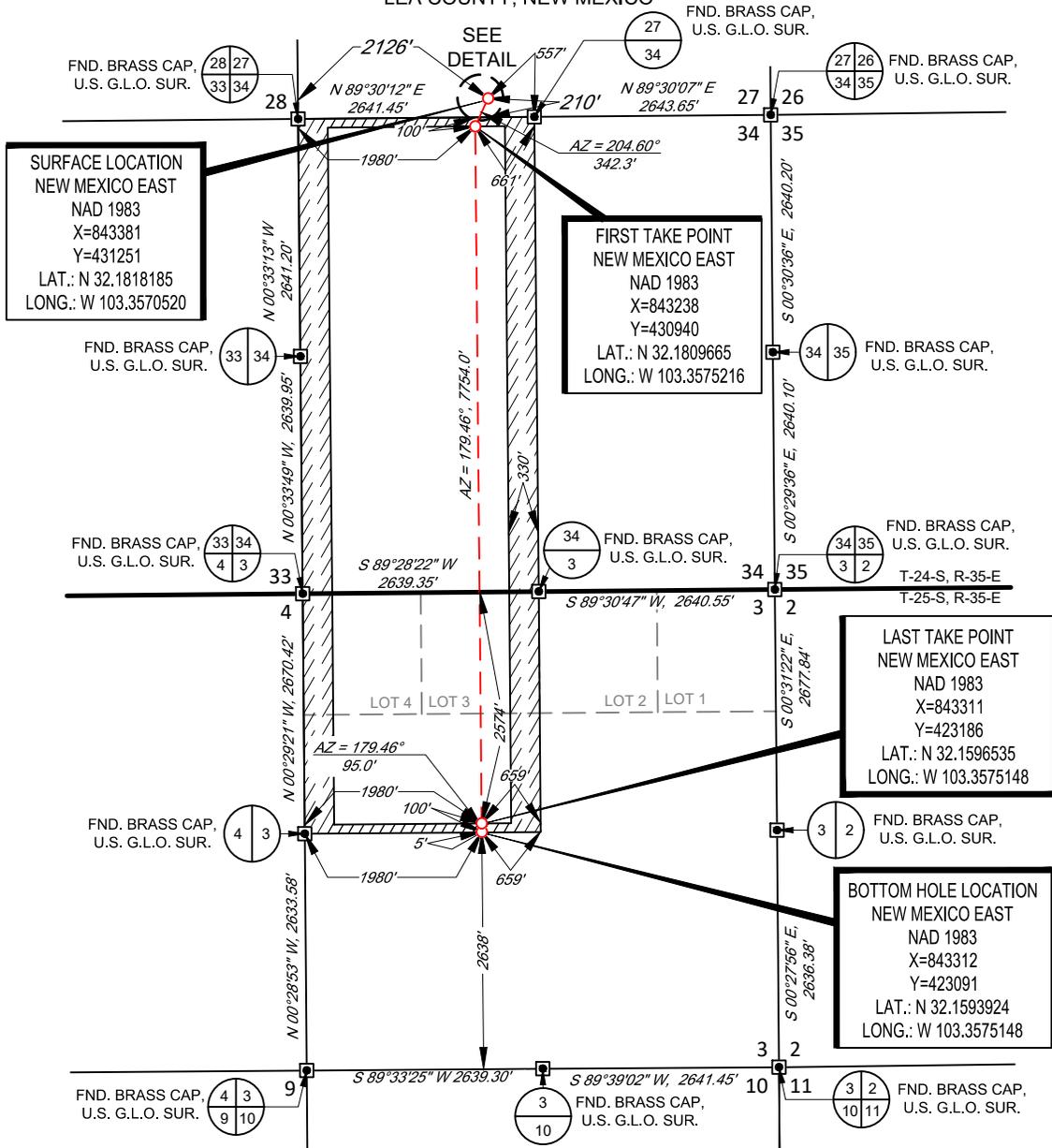


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EXHIBIT 2A

SECTION 27, TOWNSHIP 24-S, RANGE 35-E, N.M.P.M.
LEA COUNTY, NEW MEXICO



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

LEASE NAME & WELL NO.: MULVA FED COM 112H

SECTION 27 TWP 24-S RGE 35-E SURVEY N.M.P.M.
 COUNTY LEA STATE NM
 DESCRIPTION 210' FSL & 2126' FWL

DISTANCE & DIRECTION
 FROM INT. OF NM-128 & DELAWARE BASIN RD., GO EAST ON NM-128
 ±9.7 MILES, THENCE NORTHEAST (LEFT) ON A LEASE RD. ±0.9 MILES,
 THENCE NORTH (LEFT) ON A PROPOSED RD. ±465 FEET TO A POINT
 ±298 FEET NORTHWEST OF THE LOCATION.



John Trevor Carnegie, P.S. No. 11401

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.

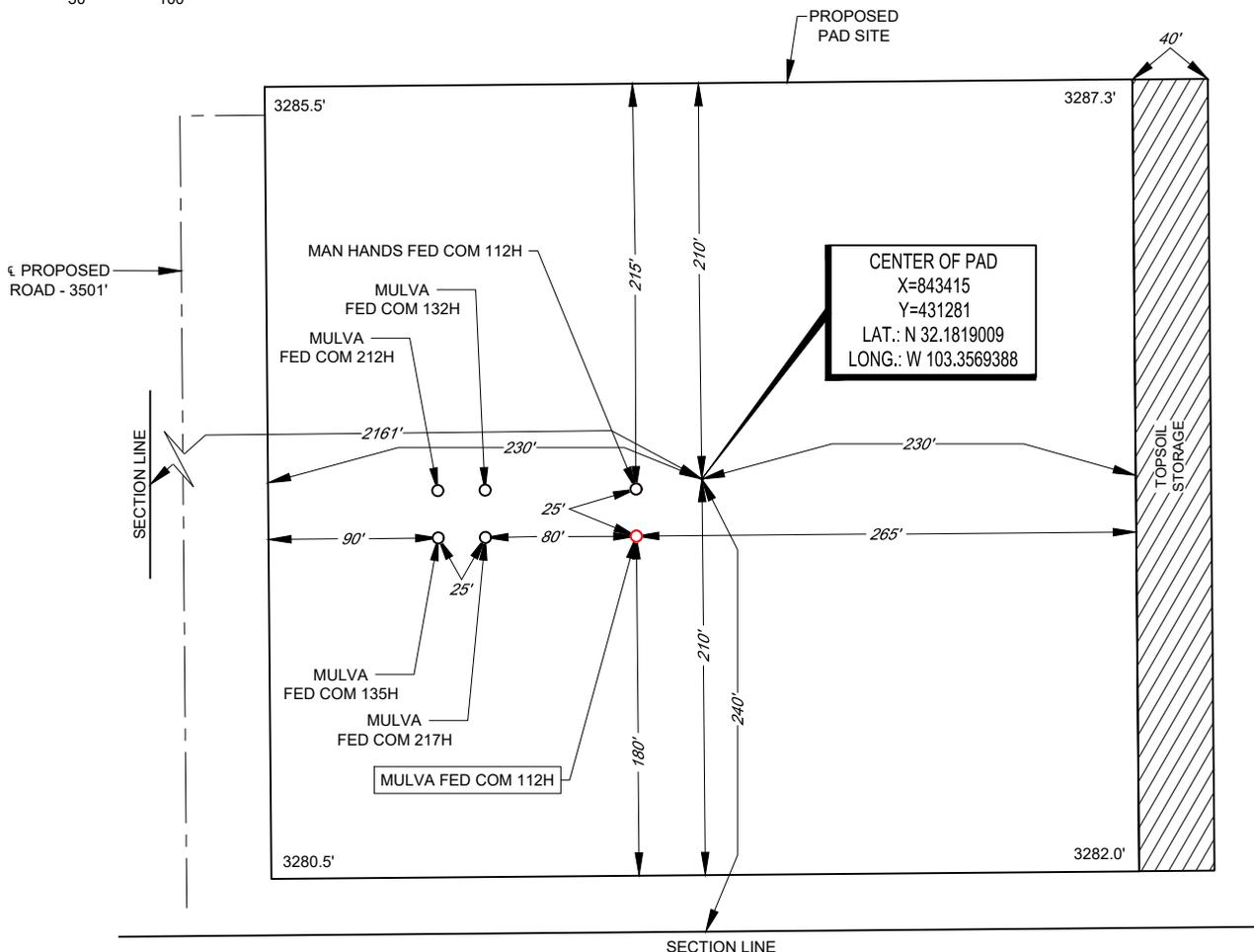
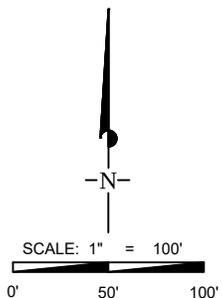
THIS EASEMENT/SERVITUDE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.

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EXHIBIT 2B



SECTION 27, TOWNSHIP 24-S, RANGE 35-E, N.M.P.M.
LEA COUNTY, NEW MEXICO



LEASE NAME & WELL NO.: MULVA FED COM 112H
 112H LATITUDE N 32.1818185 112H LONGITUDE W 103.3570520
 CENTER OF PAD IS 240' FSL & 2161' FWL



John Trevor Carnegie, P.S. No. 11401

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET. ELEVATIONS USED ARE NAVD88, OBTAINED THROUGH AN OPUS SOLUTION.

THIS PROPOSED PAD SITE LOCATION SHOWN HEREON HAS BEEN SURVEYED ON THE GROUND UNDER MY SUPERVISION AND PREPARED ACCORDING TO THE EVIDENCE FOUND AT THE TIME OF SURVEY, AND DATA PROVIDED BY TAP ROCK OPERATING, LLC. ONLY THE DATA SHOWN ABOVE IS BEING CERTIFIED TO, ALL OTHER INFORMATION WAS INTENTIONALLY OMITTED. THIS PLAT IS ONLY INTENDED TO BE USED FOR A PERMIT AND IS NOT A BOUNDARY SURVEY. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.

ORIGINAL DOCUMENT SIZE: 8.5" X 11"



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Hydrogen Sulfide Drilling

Operations Plan

Tap Rock 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
 - Green Flag – Normal Safe Operation Condition
 - Yellow Flag – Potential Pressure and Danger
 - Red Flag – Danger (H2S present in dangerous concentrations) Only H2S trained personnel admitted on location

5 Well Control Equipment:

- See Drilling Operations Plan Schematics

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

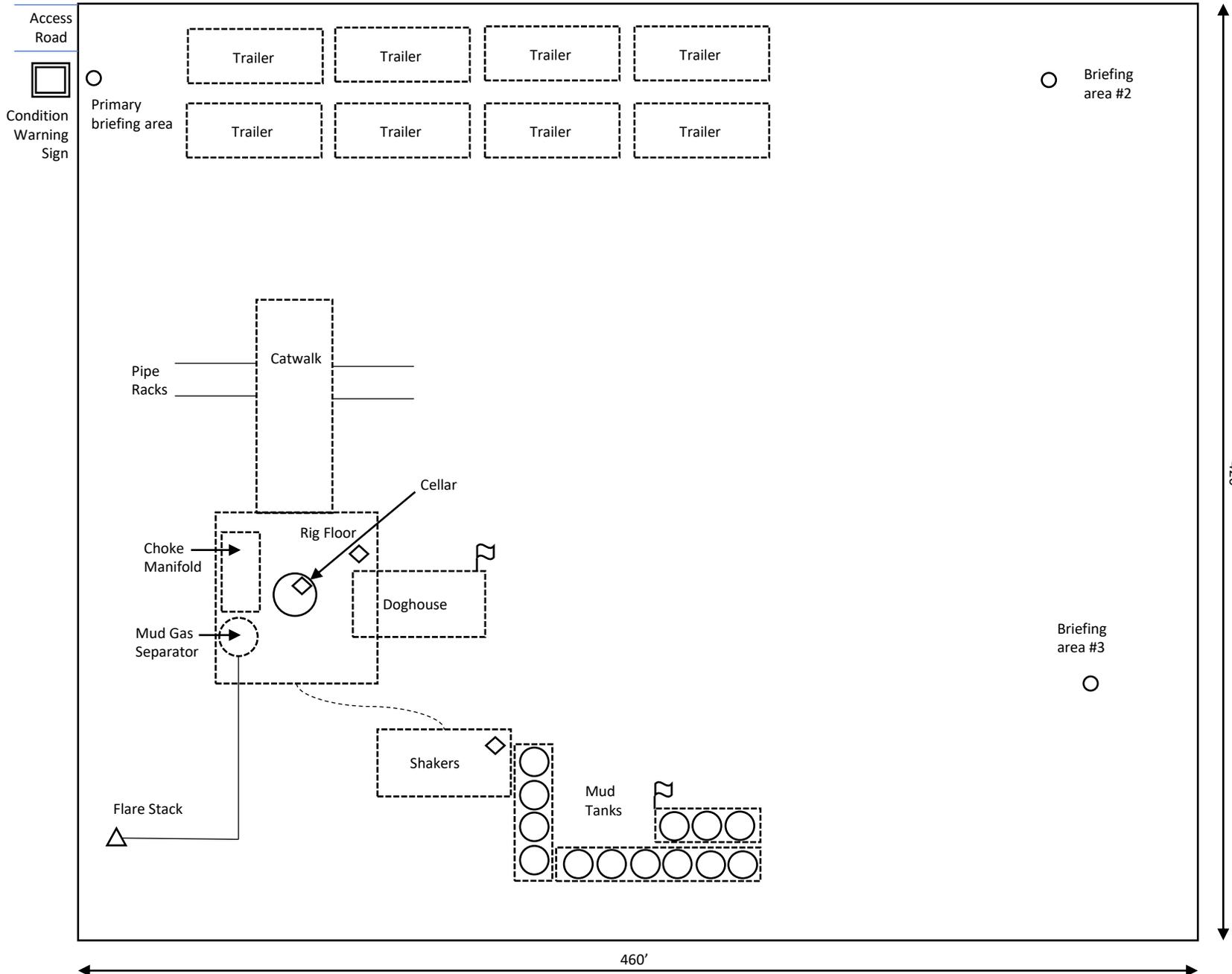
11 Emergency Contacts

Emergency Contacts		
Carlsbad Police Department	575.887.7551	911
Carlsbad Medical Center	575.887.4100	911
Eddy County Fire Service	575.628.5450	911
Eddy County Sherriff	575.887.7551	911
Lea County Fire Service	575.391.2983	911
Lea County Sherriff	575.396.3611	911
Jal Police Department	575.395.2121	911
Jal Fire Department	575.395.2221	911
Tap Rock Resources	720.772.5090	

H2S Diagram
 Mulva E2W2 Pad
 Tap Rock Operating, LLC
 27-24S-35E
 Lea County, NM



-  Briefing Area
-  Current Well
-  Flare Stack
-  H2S Monitor
-  Wind Indicator
-  Mud Gas Separator

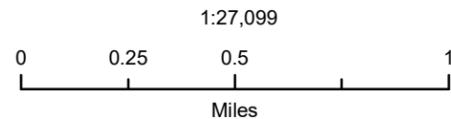


Tap Rock Operating, LLC

Mulva E2W2 Pad H2S Contingency Plan: Radius Map

Section 27, Township 24S, Range 35E
Lea County, New Mexico

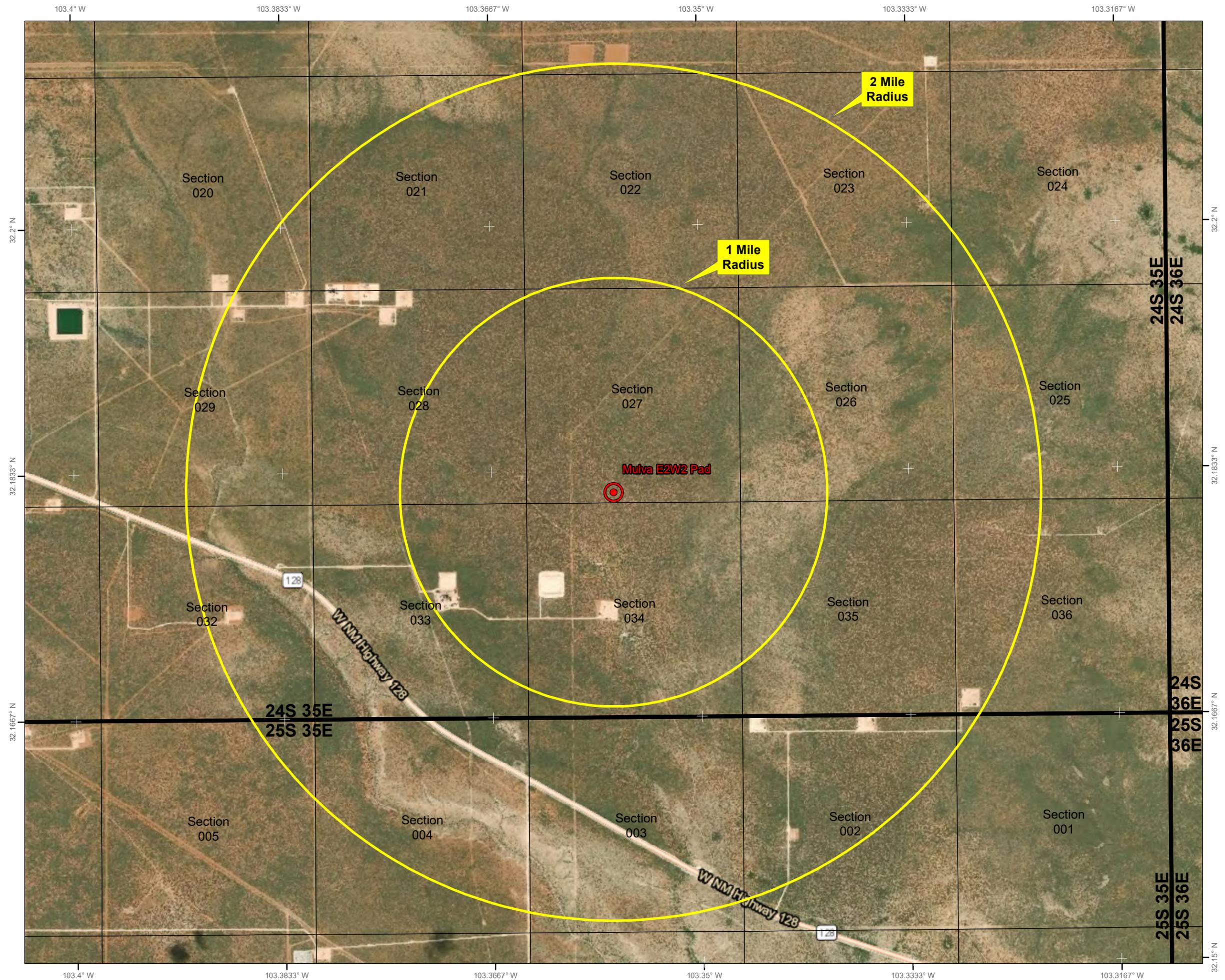
 Pad Center Point



NAD 1983 New Mexico State Plane East
FIPS 3001 Feet



Prepared by Permits West, Inc., February 7, 2020
for Tap Rock Operating, LLC





Tap Rock Resources, LLC

Lea County, NM (NAD 83 NME)
(Mulva Fed) Sec-27_T-24-S_R-35-E
Mulva Fed Com #112H

OWB

Plan: Plan #2

Standard Planning Report

23 July, 2020





Database:	EDM 5000.15 Single User Db	Local Co-ordinate Reference:	Well Mulva Fed Com #112H
Company:	Tap Rock Resources, LLC	TVD Reference:	KB @ 3307.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	KB @ 3307.0usft
Site:	(Mulva Fed) Sec-27_T-24-S_R-35-E	North Reference:	Grid
Well:	Mulva Fed Com #112H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #2		

Project	Lea County, NM (NAD 83 NME)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	(Mulva Fed) Sec-27_T-24-S_R-35-E				
Site Position:	Northing:	431,446.00 usft	Latitude:	32° 10' 56.609 N	
From: Map	Easting:	841,909.00 usft	Longitude:	103° 21' 42.490 W	
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.52 °

Well	Mulva Fed Com #112H					
Well Position	+N/-S	-195.0 usft	Northing:	431,251.00 usft	Latitude:	32° 10' 54.548 N
	+E/-W	1,472.0 usft	Easting:	843,381.00 usft	Longitude:	103° 21' 25.384 W
Position Uncertainty	0.0 usft		Wellhead Elevation:		Ground Level:	3,281.0 usft

Wellbore	OWB			
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	12/30/19	6.57	60.02	47,675.37065315

Design	Plan #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	179.46

Plan Survey Tool Program	Date				
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.0	18,127.3 Plan #2 (OWB)	MWD		
			OWSG MWD - Standard		

Plan Sections											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00		
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00		
2,200.1	4.00	220.27	2,199.9	-5.3	-4.5	2.00	2.00	0.00	220.27		
5,192.5	4.00	220.27	5,185.1	-164.7	-139.5	0.00	0.00	0.00	0.00		
5,392.6	0.00	0.00	5,385.0	-170.0	-144.0	2.00	-2.00	0.00	180.00		
9,809.7	0.00	0.00	9,802.1	-170.0	-144.0	0.00	0.00	0.00	0.00		
10,704.6	89.49	179.46	10,375.0	-737.8	-138.7	10.00	10.00	20.05	179.46		
18,127.4	89.49	179.46	10,441.0	-8,160.0	-69.0	0.00	0.00	0.00	0.00	PBHL (Mulva Fed C	



Database:	EDM 5000.15 Single User Db	Local Co-ordinate Reference:	Well Mulva Fed Com #112H
Company:	Tap Rock Resources, LLC	TVD Reference:	KB @ 3307.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	KB @ 3307.0usft
Site:	(Mulva Fed) Sec-27_T-24-S_R-35-E	North Reference:	Grid
Well:	Mulva Fed Com #112H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
915.0	0.00	0.00	915.0	0.0	0.0	0.0	0.00	0.00	0.00
Rustler Anhydrite									
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,285.0	0.00	0.00	1,285.0	0.0	0.0	0.0	0.00	0.00	0.00
Top Salt									
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
NUDGE - Build 2.00									
2,100.0	2.00	220.27	2,100.0	-1.3	-1.1	1.3	2.00	2.00	0.00
2,200.1	4.00	220.27	2,199.9	-5.3	-4.5	5.3	2.00	2.00	0.00
HOLD - 2992.5 at 2200.1 MD									
2,300.0	4.00	220.27	2,299.6	-10.6	-9.0	10.6	0.00	0.00	0.00
2,400.0	4.00	220.27	2,399.3	-16.0	-13.5	15.8	0.00	0.00	0.00
2,500.0	4.00	220.27	2,499.1	-21.3	-18.0	21.1	0.00	0.00	0.00
2,600.0	4.00	220.27	2,598.9	-26.6	-22.6	26.4	0.00	0.00	0.00
2,700.0	4.00	220.27	2,698.6	-31.9	-27.1	31.7	0.00	0.00	0.00
2,800.0	4.00	220.27	2,798.4	-37.3	-31.6	37.0	0.00	0.00	0.00
2,900.0	4.00	220.27	2,898.1	-42.6	-36.1	42.3	0.00	0.00	0.00
3,000.0	4.00	220.27	2,997.9	-47.9	-40.6	47.5	0.00	0.00	0.00
3,100.0	4.00	220.27	3,097.6	-53.2	-45.1	52.8	0.00	0.00	0.00
3,200.0	4.00	220.27	3,197.4	-58.6	-49.6	58.1	0.00	0.00	0.00
3,300.0	4.00	220.27	3,297.2	-63.9	-54.1	63.4	0.00	0.00	0.00
3,400.0	4.00	220.27	3,396.9	-69.2	-58.6	68.7	0.00	0.00	0.00
3,500.0	4.00	220.27	3,496.7	-74.5	-63.1	73.9	0.00	0.00	0.00
3,600.0	4.00	220.27	3,596.4	-79.9	-67.7	79.2	0.00	0.00	0.00
3,700.0	4.00	220.27	3,696.2	-85.2	-72.2	84.5	0.00	0.00	0.00
3,800.0	4.00	220.27	3,795.9	-90.5	-76.7	89.8	0.00	0.00	0.00
3,900.0	4.00	220.27	3,895.7	-95.8	-81.2	95.1	0.00	0.00	0.00
4,000.0	4.00	220.27	3,995.4	-101.2	-85.7	100.4	0.00	0.00	0.00
4,100.0	4.00	220.27	4,095.2	-106.5	-90.2	105.6	0.00	0.00	0.00
4,200.0	4.00	220.27	4,195.0	-111.8	-94.7	110.9	0.00	0.00	0.00
4,300.0	4.00	220.27	4,294.7	-117.1	-99.2	116.2	0.00	0.00	0.00
4,400.0	4.00	220.27	4,394.5	-122.5	-103.7	121.5	0.00	0.00	0.00
4,500.0	4.00	220.27	4,494.2	-127.8	-108.2	126.8	0.00	0.00	0.00
4,600.0	4.00	220.27	4,594.0	-133.1	-112.8	132.1	0.00	0.00	0.00
4,700.0	4.00	220.27	4,693.7	-138.4	-117.3	137.3	0.00	0.00	0.00



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Project:	Lea County, NM (NAD 83 NME)	MD Reference:	KB @ 3307.0usft
Site:	(Mulva Fed) Sec-27_T-24-S_R-35-E	North Reference:	Grid
Well:	Mulva Fed Com #112H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #2		

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)
4,800.0	4.00	220.27	4,793.5	-143.8	-121.8	142.6	0.00	0.00	0.00
4,841.6	4.00	220.27	4,835.0	-146.0	-123.7	144.8	0.00	0.00	0.00
Base Salt									
4,900.0	4.00	220.27	4,893.3	-149.1	-126.3	147.9	0.00	0.00	0.00
5,000.0	4.00	220.27	4,993.0	-154.4	-130.8	153.2	0.00	0.00	0.00
5,100.0	4.00	220.27	5,092.8	-159.7	-135.3	158.5	0.00	0.00	0.00
5,192.5	4.00	220.27	5,185.1	-164.7	-139.5	163.3	0.00	0.00	0.00
DROP - -2.00									
5,200.0	3.85	220.27	5,192.5	-165.1	-139.8	163.7	2.00	-2.00	0.00
5,262.6	2.60	220.27	5,255.0	-167.7	-142.1	166.4	2.00	-2.00	0.00
Delaware Mountain Gp									
5,267.6	2.50	220.27	5,260.0	-167.9	-142.2	166.6	2.00	-2.00	0.00
Lamar									
5,272.6	2.40	220.27	5,265.0	-168.1	-142.4	166.7	2.00	-2.00	0.00
Bell Canyon									
5,287.6	2.10	220.27	5,280.0	-168.5	-142.8	167.2	2.00	-2.00	0.00
Ramsey Sand									
5,300.0	1.85	220.27	5,292.4	-168.9	-143.0	167.5	2.00	-2.00	0.00
5,392.6	0.00	0.00	5,385.0	-170.0	-144.0	168.6	2.00	-2.00	0.00
HOLD - 4417.1 at 5392.6 MD									
5,400.0	0.00	0.00	5,392.4	-170.0	-144.0	168.6	0.00	0.00	0.00
5,500.0	0.00	0.00	5,492.4	-170.0	-144.0	168.6	0.00	0.00	0.00
5,600.0	0.00	0.00	5,592.4	-170.0	-144.0	168.6	0.00	0.00	0.00
5,700.0	0.00	0.00	5,692.4	-170.0	-144.0	168.6	0.00	0.00	0.00
5,800.0	0.00	0.00	5,792.4	-170.0	-144.0	168.6	0.00	0.00	0.00
5,900.0	0.00	0.00	5,892.4	-170.0	-144.0	168.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,992.4	-170.0	-144.0	168.6	0.00	0.00	0.00
6,100.0	0.00	0.00	6,092.4	-170.0	-144.0	168.6	0.00	0.00	0.00
6,187.6	0.00	0.00	6,180.0	-170.0	-144.0	168.6	0.00	0.00	0.00
Cherry Canyon									
6,200.0	0.00	0.00	6,192.4	-170.0	-144.0	168.6	0.00	0.00	0.00
6,300.0	0.00	0.00	6,292.4	-170.0	-144.0	168.6	0.00	0.00	0.00
6,400.0	0.00	0.00	6,392.4	-170.0	-144.0	168.6	0.00	0.00	0.00
6,500.0	0.00	0.00	6,492.4	-170.0	-144.0	168.6	0.00	0.00	0.00
6,600.0	0.00	0.00	6,592.4	-170.0	-144.0	168.6	0.00	0.00	0.00
6,700.0	0.00	0.00	6,692.4	-170.0	-144.0	168.6	0.00	0.00	0.00
6,800.0	0.00	0.00	6,792.4	-170.0	-144.0	168.6	0.00	0.00	0.00
6,900.0	0.00	0.00	6,892.4	-170.0	-144.0	168.6	0.00	0.00	0.00
7,000.0	0.00	0.00	6,992.4	-170.0	-144.0	168.6	0.00	0.00	0.00
7,100.0	0.00	0.00	7,092.4	-170.0	-144.0	168.6	0.00	0.00	0.00
7,200.0	0.00	0.00	7,192.4	-170.0	-144.0	168.6	0.00	0.00	0.00
7,300.0	0.00	0.00	7,292.4	-170.0	-144.0	168.6	0.00	0.00	0.00
7,400.0	0.00	0.00	7,392.4	-170.0	-144.0	168.6	0.00	0.00	0.00
7,500.0	0.00	0.00	7,492.4	-170.0	-144.0	168.6	0.00	0.00	0.00
7,600.0	0.00	0.00	7,592.4	-170.0	-144.0	168.6	0.00	0.00	0.00
7,667.6	0.00	0.00	7,660.0	-170.0	-144.0	168.6	0.00	0.00	0.00
Brushy Canyon									
7,700.0	0.00	0.00	7,692.4	-170.0	-144.0	168.6	0.00	0.00	0.00
7,800.0	0.00	0.00	7,792.4	-170.0	-144.0	168.6	0.00	0.00	0.00
7,900.0	0.00	0.00	7,892.4	-170.0	-144.0	168.6	0.00	0.00	0.00
8,000.0	0.00	0.00	7,992.4	-170.0	-144.0	168.6	0.00	0.00	0.00
8,100.0	0.00	0.00	8,092.4	-170.0	-144.0	168.6	0.00	0.00	0.00
8,200.0	0.00	0.00	8,192.4	-170.0	-144.0	168.6	0.00	0.00	0.00



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Project:	Lea County, NM (NAD 83 NME)	MD Reference:	KB @ 3307.0usft
Site:	(Mulva Fed) Sec-27_T-24-S_R-35-E	North Reference:	Grid
Well:	Mulva Fed Com #112H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #2		

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)
8,300.0	0.00	0.00	8,292.4	-170.0	-144.0	168.6	0.00	0.00	0.00
8,400.0	0.00	0.00	8,392.4	-170.0	-144.0	168.6	0.00	0.00	0.00
8,500.0	0.00	0.00	8,492.4	-170.0	-144.0	168.6	0.00	0.00	0.00
8,600.0	0.00	0.00	8,592.4	-170.0	-144.0	168.6	0.00	0.00	0.00
8,700.0	0.00	0.00	8,692.4	-170.0	-144.0	168.6	0.00	0.00	0.00
8,800.0	0.00	0.00	8,792.4	-170.0	-144.0	168.6	0.00	0.00	0.00
8,900.0	0.00	0.00	8,892.4	-170.0	-144.0	168.6	0.00	0.00	0.00
8,987.6	0.00	0.00	8,980.0	-170.0	-144.0	168.6	0.00	0.00	0.00
Bone Spring Lime									
9,000.0	0.00	0.00	8,992.4	-170.0	-144.0	168.6	0.00	0.00	0.00
9,022.6	0.00	0.00	9,015.0	-170.0	-144.0	168.6	0.00	0.00	0.00
Upper Avalon									
9,100.0	0.00	0.00	9,092.4	-170.0	-144.0	168.6	0.00	0.00	0.00
9,200.0	0.00	0.00	9,192.4	-170.0	-144.0	168.6	0.00	0.00	0.00
9,272.6	0.00	0.00	9,265.0	-170.0	-144.0	168.6	0.00	0.00	0.00
Middle Avalon									
9,300.0	0.00	0.00	9,292.4	-170.0	-144.0	168.6	0.00	0.00	0.00
9,400.0	0.00	0.00	9,392.4	-170.0	-144.0	168.6	0.00	0.00	0.00
9,500.0	0.00	0.00	9,492.4	-170.0	-144.0	168.6	0.00	0.00	0.00
9,600.0	0.00	0.00	9,592.4	-170.0	-144.0	168.6	0.00	0.00	0.00
9,700.0	0.00	0.00	9,692.4	-170.0	-144.0	168.6	0.00	0.00	0.00
9,707.6	0.00	0.00	9,700.0	-170.0	-144.0	168.6	0.00	0.00	0.00
Lower Avalon									
9,809.7	0.00	0.00	9,802.1	-170.0	-144.0	168.6	0.00	0.00	0.00
KOP - DLS 10.00 TFO 179.46									
9,850.0	4.03	179.46	9,842.3	-171.4	-144.0	170.1	10.00	10.00	0.00
9,900.0	9.03	179.46	9,892.0	-177.1	-143.9	175.7	10.00	10.00	0.00
9,950.0	14.03	179.46	9,941.0	-187.1	-143.8	185.7	10.00	10.00	0.00
10,000.0	19.03	179.46	9,988.9	-201.3	-143.7	199.9	10.00	10.00	0.00
10,050.0	24.03	179.46	10,035.4	-219.6	-143.5	218.3	10.00	10.00	0.00
10,100.0	29.03	179.46	10,080.1	-242.0	-143.3	240.6	10.00	10.00	0.00
10,150.0	34.03	179.46	10,122.7	-268.1	-143.1	266.7	10.00	10.00	0.00
10,200.0	39.03	179.46	10,162.9	-297.9	-142.8	296.5	10.00	10.00	0.00
10,242.7	43.29	179.46	10,195.0	-325.9	-142.5	324.6	10.00	10.00	0.00
1st Bone Spring Sand									
10,250.0	44.03	179.46	10,200.3	-331.0	-142.5	329.6	10.00	10.00	0.00
10,300.0	49.03	179.46	10,234.7	-367.3	-142.1	365.9	10.00	10.00	0.00
10,350.0	54.03	179.46	10,265.8	-406.4	-141.8	405.0	10.00	10.00	0.00
10,400.0	59.03	179.46	10,293.4	-448.1	-141.4	446.7	10.00	10.00	0.00
10,450.0	64.03	179.46	10,317.2	-492.0	-141.0	490.7	10.00	10.00	0.00
10,500.0	69.03	179.46	10,337.1	-537.9	-140.5	536.5	10.00	10.00	0.00
10,550.0	74.03	179.46	10,352.9	-585.3	-140.1	583.9	10.00	10.00	0.00
10,600.0	79.03	179.46	10,364.6	-633.9	-139.6	632.5	10.00	10.00	0.00
10,650.0	84.03	179.46	10,371.9	-683.3	-139.2	682.0	10.00	10.00	0.00
10,704.6	89.49	179.46	10,375.0	-737.8	-138.7	736.5	10.00	10.00	0.00
EOC - 7422.8 hold at 10704.6 MD									
10,800.0	89.49	179.46	10,375.9	-833.2	-137.8	831.9	0.00	0.00	0.00
10,900.0	89.49	179.46	10,376.8	-933.2	-136.8	931.9	0.00	0.00	0.00
11,000.0	89.49	179.46	10,377.7	-1,033.2	-135.9	1,031.9	0.00	0.00	0.00
11,100.0	89.49	179.46	10,378.5	-1,133.2	-135.0	1,131.9	0.00	0.00	0.00
11,200.0	89.49	179.46	10,379.4	-1,233.2	-134.0	1,231.9	0.00	0.00	0.00
11,300.0	89.49	179.46	10,380.3	-1,333.2	-133.1	1,331.8	0.00	0.00	0.00
11,400.0	89.49	179.46	10,381.2	-1,433.2	-132.1	1,431.8	0.00	0.00	0.00



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Site:	(Mulva Fed) Sec-27_T-24-S_R-35-E	North Reference:	Grid
Well:	Mulva Fed Com #112H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #2		

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)
11,500.0	89.49	179.46	10,382.1	-1,533.1	-131.2	1,531.8	0.00	0.00	0.00
11,600.0	89.49	179.46	10,383.0	-1,633.1	-130.3	1,631.8	0.00	0.00	0.00
11,700.0	89.49	179.46	10,383.9	-1,733.1	-129.3	1,731.8	0.00	0.00	0.00
11,800.0	89.49	179.46	10,384.8	-1,833.1	-128.4	1,831.8	0.00	0.00	0.00
11,900.0	89.49	179.46	10,385.7	-1,933.1	-127.5	1,931.8	0.00	0.00	0.00
12,000.0	89.49	179.46	10,386.5	-2,033.1	-126.5	2,031.8	0.00	0.00	0.00
12,100.0	89.49	179.46	10,387.4	-2,133.1	-125.6	2,131.8	0.00	0.00	0.00
12,200.0	89.49	179.46	10,388.3	-2,233.1	-124.6	2,231.8	0.00	0.00	0.00
12,300.0	89.49	179.46	10,389.2	-2,333.1	-123.7	2,331.8	0.00	0.00	0.00
12,400.0	89.49	179.46	10,390.1	-2,433.1	-122.8	2,431.8	0.00	0.00	0.00
12,500.0	89.49	179.46	10,391.0	-2,533.1	-121.8	2,531.8	0.00	0.00	0.00
12,600.0	89.49	179.46	10,391.9	-2,633.1	-120.9	2,631.8	0.00	0.00	0.00
12,700.0	89.49	179.46	10,392.8	-2,733.0	-119.9	2,731.8	0.00	0.00	0.00
12,800.0	89.49	179.46	10,393.7	-2,833.0	-119.0	2,831.8	0.00	0.00	0.00
12,900.0	89.49	179.46	10,394.5	-2,933.0	-118.1	2,931.8	0.00	0.00	0.00
13,000.0	89.49	179.46	10,395.4	-3,033.0	-117.1	3,031.8	0.00	0.00	0.00
13,100.0	89.49	179.46	10,396.3	-3,133.0	-116.2	3,131.8	0.00	0.00	0.00
13,200.0	89.49	179.46	10,397.2	-3,233.0	-115.2	3,231.8	0.00	0.00	0.00
13,300.0	89.49	179.46	10,398.1	-3,333.0	-114.3	3,331.8	0.00	0.00	0.00
13,400.0	89.49	179.46	10,399.0	-3,433.0	-113.4	3,431.8	0.00	0.00	0.00
13,500.0	89.49	179.46	10,399.9	-3,533.0	-112.4	3,531.8	0.00	0.00	0.00
13,600.0	89.49	179.46	10,400.8	-3,633.0	-111.5	3,631.8	0.00	0.00	0.00
13,700.0	89.49	179.46	10,401.7	-3,733.0	-110.6	3,731.8	0.00	0.00	0.00
13,800.0	89.49	179.46	10,402.5	-3,833.0	-109.6	3,831.8	0.00	0.00	0.00
13,900.0	89.49	179.46	10,403.4	-3,932.9	-108.7	3,931.7	0.00	0.00	0.00
14,000.0	89.49	179.46	10,404.3	-4,032.9	-107.7	4,031.7	0.00	0.00	0.00
14,100.0	89.49	179.46	10,405.2	-4,132.9	-106.8	4,131.7	0.00	0.00	0.00
14,200.0	89.49	179.46	10,406.1	-4,232.9	-105.9	4,231.7	0.00	0.00	0.00
14,300.0	89.49	179.46	10,407.0	-4,332.9	-104.9	4,331.7	0.00	0.00	0.00
14,400.0	89.49	179.46	10,407.9	-4,432.9	-104.0	4,431.7	0.00	0.00	0.00
14,500.0	89.49	179.46	10,408.8	-4,532.9	-103.0	4,531.7	0.00	0.00	0.00
14,600.0	89.49	179.46	10,409.7	-4,632.9	-102.1	4,631.7	0.00	0.00	0.00
14,700.0	89.49	179.46	10,410.5	-4,732.9	-101.2	4,731.7	0.00	0.00	0.00
14,800.0	89.49	179.46	10,411.4	-4,832.9	-100.2	4,831.7	0.00	0.00	0.00
14,900.0	89.49	179.46	10,412.3	-4,932.9	-99.3	4,931.7	0.00	0.00	0.00
15,000.0	89.49	179.46	10,413.2	-5,032.9	-98.4	5,031.7	0.00	0.00	0.00
15,100.0	89.49	179.46	10,414.1	-5,132.8	-97.4	5,131.7	0.00	0.00	0.00
15,200.0	89.49	179.46	10,415.0	-5,232.8	-96.5	5,231.7	0.00	0.00	0.00
15,300.0	89.49	179.46	10,415.9	-5,332.8	-95.5	5,331.7	0.00	0.00	0.00
15,400.0	89.49	179.46	10,416.8	-5,432.8	-94.6	5,431.7	0.00	0.00	0.00
15,500.0	89.49	179.46	10,417.7	-5,532.8	-93.7	5,531.7	0.00	0.00	0.00
15,600.0	89.49	179.46	10,418.5	-5,632.8	-92.7	5,631.7	0.00	0.00	0.00
15,700.0	89.49	179.46	10,419.4	-5,732.8	-91.8	5,731.7	0.00	0.00	0.00
15,800.0	89.49	179.46	10,420.3	-5,832.8	-90.8	5,831.7	0.00	0.00	0.00
15,900.0	89.49	179.46	10,421.2	-5,932.8	-89.9	5,931.7	0.00	0.00	0.00
16,000.0	89.49	179.46	10,422.1	-6,032.8	-89.0	6,031.7	0.00	0.00	0.00
16,100.0	89.49	179.46	10,423.0	-6,132.8	-88.0	6,131.7	0.00	0.00	0.00
16,200.0	89.49	179.46	10,423.9	-6,232.8	-87.1	6,231.7	0.00	0.00	0.00
16,300.0	89.49	179.46	10,424.8	-6,332.7	-86.2	6,331.7	0.00	0.00	0.00
16,400.0	89.49	179.46	10,425.6	-6,432.7	-85.2	6,431.6	0.00	0.00	0.00
16,500.0	89.49	179.46	10,426.5	-6,532.7	-84.3	6,531.6	0.00	0.00	0.00
16,600.0	89.49	179.46	10,427.4	-6,632.7	-83.3	6,631.6	0.00	0.00	0.00
16,700.0	89.49	179.46	10,428.3	-6,732.7	-82.4	6,731.6	0.00	0.00	0.00
16,800.0	89.49	179.46	10,429.2	-6,832.7	-81.5	6,831.6	0.00	0.00	0.00



Database:	EDM 5000.15 Single User Db	Local Co-ordinate Reference:	Well Mulva Fed Com #112H
Company:	Tap Rock Resources, LLC	TVD Reference:	KB @ 3307.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	KB @ 3307.0usft
Site:	(Mulva Fed) Sec-27_T-24-S_R-35-E	North Reference:	Grid
Well:	Mulva Fed Com #112H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #2		

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)	
16,900.0	89.49	179.46	10,430.1	-6,932.7	-80.5	6,931.6	0.00	0.00	0.00	
17,000.0	89.49	179.46	10,431.0	-7,032.7	-79.6	7,031.6	0.00	0.00	0.00	
17,100.0	89.49	179.46	10,431.9	-7,132.7	-78.6	7,131.6	0.00	0.00	0.00	
17,200.0	89.49	179.46	10,432.8	-7,232.7	-77.7	7,231.6	0.00	0.00	0.00	
17,300.0	89.49	179.46	10,433.6	-7,332.7	-76.8	7,331.6	0.00	0.00	0.00	
17,400.0	89.49	179.46	10,434.5	-7,432.7	-75.8	7,431.6	0.00	0.00	0.00	
17,500.0	89.49	179.46	10,435.4	-7,532.6	-74.9	7,531.6	0.00	0.00	0.00	
17,600.0	89.49	179.46	10,436.3	-7,632.6	-74.0	7,631.6	0.00	0.00	0.00	
17,700.0	89.49	179.46	10,437.2	-7,732.6	-73.0	7,731.6	0.00	0.00	0.00	
17,800.0	89.49	179.46	10,438.1	-7,832.6	-72.1	7,831.6	0.00	0.00	0.00	
17,900.0	89.49	179.46	10,439.0	-7,932.6	-71.1	7,931.6	0.00	0.00	0.00	
18,000.0	89.49	179.46	10,439.9	-8,032.6	-70.2	8,031.6	0.00	0.00	0.00	
18,014.9	89.49	179.46	10,440.0	-8,047.5	-70.1	8,046.5	0.00	0.00	0.00	
2nd Bone Spring Carb										
18,100.0	89.49	179.46	10,440.8	-8,132.6	-69.3	8,131.6	0.00	0.00	0.00	
18,127.4	89.49	179.46	10,441.0	-8,160.0	-69.0	8,159.0	0.00	0.00	0.00	
TD at 18127.4										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
FTP (Mulva Fed Com - hit/miss target - Shape - Point	0.00	0.00	10,375.0	-311.0	-143.0	430,940.00	843,238.00	32° 10' 51.483 N	103° 21' 27.080 W	- plan misses target center by 144.6usft at 10343.2usft MD (10261.8 TVD, -401.0 N, -141.8 E)
LTP (Mulva Fed Com - plan misses target center by 0.9usft at 18032.4usft MD (10440.2 TVD, -8065.0 N, -69.9 E) - Point	0.00	0.00	10,441.0	-8,065.0	-70.0	423,186.00	843,311.00	32° 9' 34.753 N	103° 21' 27.049 W	
PBHL (Mulva Fed Cor - plan hits target center - Rectangle (sides W100.0 H7,850.0 D30.0)	0.51	179.46	10,441.0	-8,160.0	-69.0	423,091.00	843,312.00	32° 9' 33.813 N	103° 21' 27.048 W	



Database:	EDM 5000.15 Single User Db	Local Co-ordinate Reference:	Well Mulva Fed Com #112H
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Project:	Lea County, NM (NAD 83 NME)	MD Reference:	KB @ 3307.0usft
Site:	(Mulva Fed) Sec-27_T-24-S_R-35-E	North Reference:	Grid
Well:	Mulva Fed Com #112H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #2		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
915.0	915.0	Rustler Anhydrite			
1,285.0	1,285.0	Top Salt			
4,841.6	4,835.0	Base Salt			
5,262.6	5,255.0	Delaware Mountain Gp			
5,267.6	5,260.0	Lamar			
5,272.6	5,265.0	Bell Canyon			
5,287.6	5,280.0	Ramsey Sand			
6,187.6	6,180.0	Cherry Canyon			
7,667.6	7,660.0	Brushy Canyon			
8,987.6	8,980.0	Bone Spring Lime			
9,022.6	9,015.0	Upper Avalon			
9,272.6	9,265.0	Middle Avalon			
9,707.6	9,700.0	Lower Avalon			
10,242.7	10,195.0	1st Bone Spring Sand			
18,014.9	10,440.0	2nd Bone Spring Carb			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,000.0	2,000.0	0.0	0.0	NUDGE - Build 2.00
2,200.1	2,199.9	-5.3	-4.5	HOLD - 2992.5 at 2200.1 MD
5,192.5	5,185.1	-164.7	-139.5	DROP - -2.00
5,392.6	5,385.0	-170.0	-144.0	HOLD - 4417.1 at 5392.6 MD
9,809.7	9,802.1	-170.0	-144.0	KOP - DLS 10.00 TFO 179.46
10,704.6	10,375.0	-737.8	-138.7	EOC - 7422.8 hold at 10704.6 MD
18,127.4	10,441.0	-8,160.0	-69.0	TD at 18127.4



Drilling Operations Plan
Mulva Fed Com #112H
Tap Rock Operating, LLC
SHL 210' FSL & 2126' FWL, Sec. 27
BHL 2638' FSL & 1980' FWL, Sec. 3
Surface- T. 24S., R. 35E Lea County, NM
BHL- T. 25S., R. 35E Lea County, NM

Elevation above Sea Level: 3281'

DRILLING PROGRAM

1. Estimated Tops

Formation	TVD	MD	Lithologies	Bearing
Quaternary Deposits	0	0	Surface	None
Rustler Anhydrite	915	915		Salt
Salado	1285	1285	Salt	Salt
Base Salt	4835	4842		Salt
Lamar	5260	5268	Limestone	None
Bell Canyon	5265	5273	Sandstone	Hydrocarbons
Cherry Canyon	6180	6188	Sandstone	Hydrocarbons
Brushy Canyon	7660	7668	Sandstone	Hydrocarbons
Bone Spring	8980	8988	Limestone	Hydrocarbons
KOP	9802	9809	Sandstone	Hydrocarbons
1st Bone Spring	10195	10243	Sandstone	Hydrocarbons
TD	10441	18127	Shale	Hydrocarbons

2. Notable Zones

1st Bone Spring Sand is the target formation.

3. Pressure Control

Pressure Control Equipment (See Schematics):

A 15,000' 5,000 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 attachments for BOP and choke manifold diagrams. Also present will be an accumulator that meets the requirements of Onshore Order #2 for the pressure rating of the BOP stack. A rotating head will also be installed as needed. BOP will be inspected and operated as recommended in Onshore Order #2. A top drive check valve 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. The wellhead will be a multi-bowl speed head.

BOP Test procedure will be as follows:

After surface casing is set and the BOP is nipped up, the BOP pressure tests will be made with a third party tester to 250 psi low, 5000 psi high, and the annular preventer will be tested to 2,500 psi. The BOP will be tested in this manner after nipple-up if any break of the stack occurs.



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Variance Requests:

Tap Rock requests a variance to run a multi-bowl speed head for setting the Intermediate 1, and Production Strings. Tap Rock 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. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used.

Tap Rock requests approval to possibly utilize a spudder rig to drill and set casing for the surface interval on this well. The spudder rig will be possibly utilized in order to reduce cost and save time. The wellhead will be installed and tested as soon as the surface casing is cut off per the existing COAs. A blind flange with the same pressure rating as the wellhead will be installed on the well. Once the spudder rig is removed, Tap Rock will secure the wellhead area by placing a guard rail around the cellar. Pressure will be monitored and a means for intervention will be maintained while the drilling rig is not over the well. Spudder rig operations are expected to take 2-3 days per well. Three wells on the pad will have surface casing set by the spudder rig as a part of this operation. The BLM will be notified 24 hours prior to commencing spudder rig operations. Within 90 days of the departure of the spudder rig, drilling operations will recommence on these wells. This rig will have a BOP stack equal or greater to the pressure rating required in the COAs. The BLM will be notified 24 hours before the larger rig moves on the pre-set wells. Tap Rock will have supervision on the spudder rig to ensure compliance with all BLM and NMOCD regulations.

4. Casing & Cement

All Casing will be new.

Name	Hole Size	Casing Size	Standard	Tapered	Top MD	Bottom MD	Top TVD	BTM TVD	Grade	Weight	Thread	Collapse	Burst	Tension
Surface	17 1/2	13 3/8	API	No	0	990	0	990	J-55	54.5	BUTT	1.13	1.15	1.6
1st Intermediate	12 1/4	9 5/8	API	No	0	5287 3/5	0	5280	J-55	40	BUTT	1.13	1.15	1.6
Production	8 1/2	5 1/2	NON API	No	0	18127	0	10441	P-110	20	TXP	1.13	1.15	1.6

Name	Type	Top MD	Sacks	Yield	Cu. Ft	Weight	Excess	Cement	Additives
Surface	Tail	0	1019	1.35	1375	14.8	100%	C	5% NCI + LCM
1st Intermediate	Lead	0	1003	2.18	2186	12.7	65%	C	Bentonite + 1% CaCL2 + 8% NaCl + LCM
	Tail	4288	411	1.33	546	14.8	65%	C	5% NaCl + LCM
Production	Tail	4288	2561	1.71	4379	14.2	25%	H	Fluid Loss + Dispersant + Retarder + LCM



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5. Mud Program

Name	Top	Bottom	Type	Mud Weight	Visc	Fluid Loss
Surface	0	990	FW Spud Mud	8.30	28	NC
Intermediate	990	5288	Brine Water	10.00	30-32	NC
Production	5288	18127	Oil Base Mud	9.00	15-20	<10

Electronic Pason mud monitor system complying with Onshore Order 1 will be used. All necessary mud products (e. g., barite, cedar bark) for weight addition and fluid loss control will always be on site. Mud program is subject to change due to hole conditions. A closed loop system will be used.

6. Cores, Tests, & Logs

- Electric Logging Program: No open-hole logs are planned at this time for the pilot hole.
- GR will be collected while drilling through the MWD tools from 9.625" casing shoe to TD.
- A 2-person mud logging program will be used from 9.625" casing shoe 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.

7. Down Hole Conditions

No abnormal pressure or temperature is expected. Maximum expected bottom hole pressure is $\approx 4,870$ psi. Expected bottom hole temperature is $\approx 160^\circ$ F.

Tap Rock does not anticipate that there will be enough H₂S from the surface to the Wolfcamp formations to meet the BLM's Onshore Order 6 requirements for the submission of an "H₂S Drilling Operation Plan" or "Public Protection Plan" for drilling and completing this well. Tap Rock has an H₂S safety package on all wells and an "H₂S Drilling Operations Plan" is attached. Adequate flare lines will be installed off the mud/gas separator where gas may be safely flared. All personnel will be familiar with all aspects of safe operation of equipment being used.

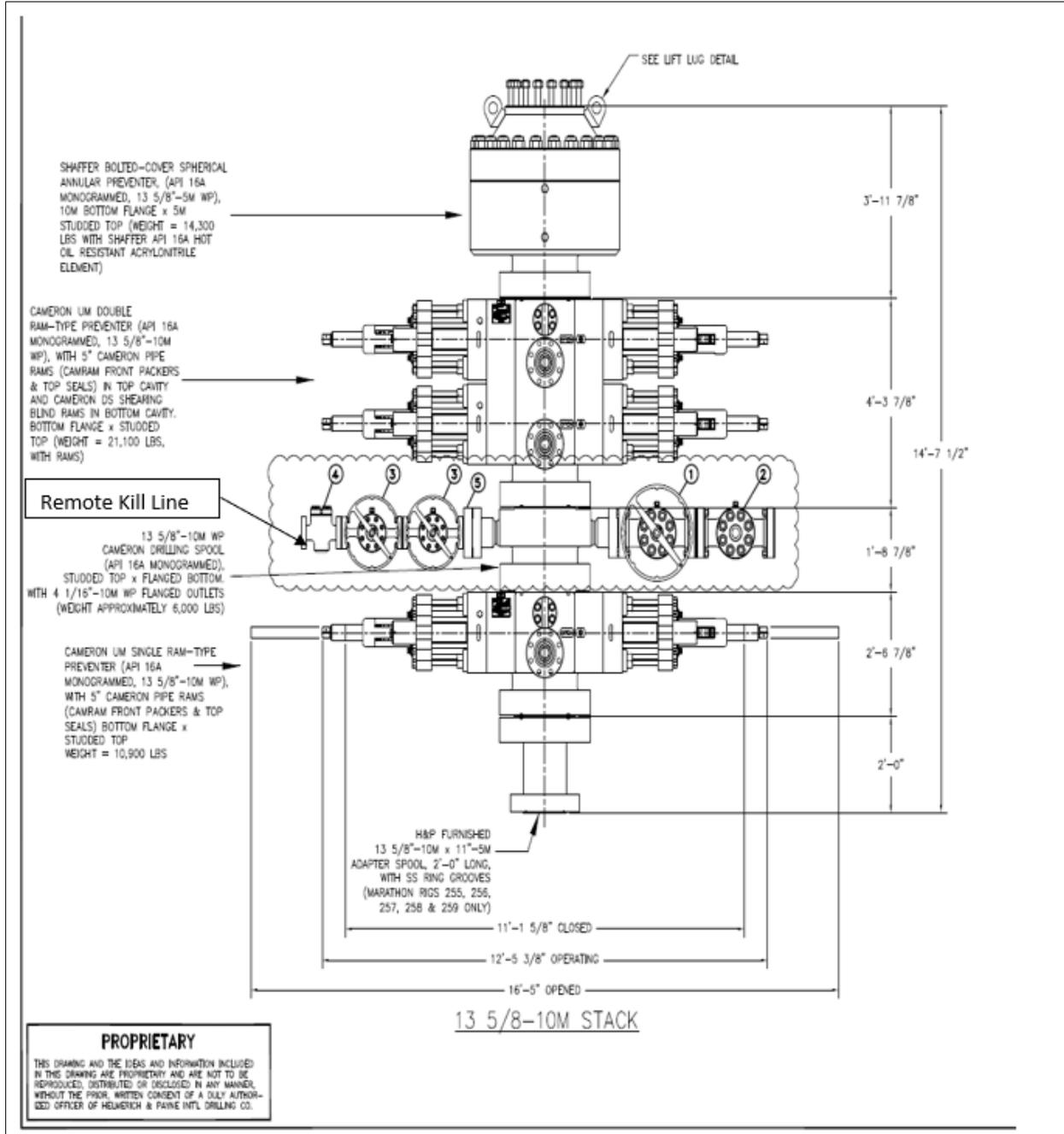
8. Other Conditions

Road and location construction will begin after BLM approval of APD. Anticipated spud date as soon as approved. Drilling expected to take 30 days. If production casing is run an additional 60 days will be required to complete and construct surface facilities.



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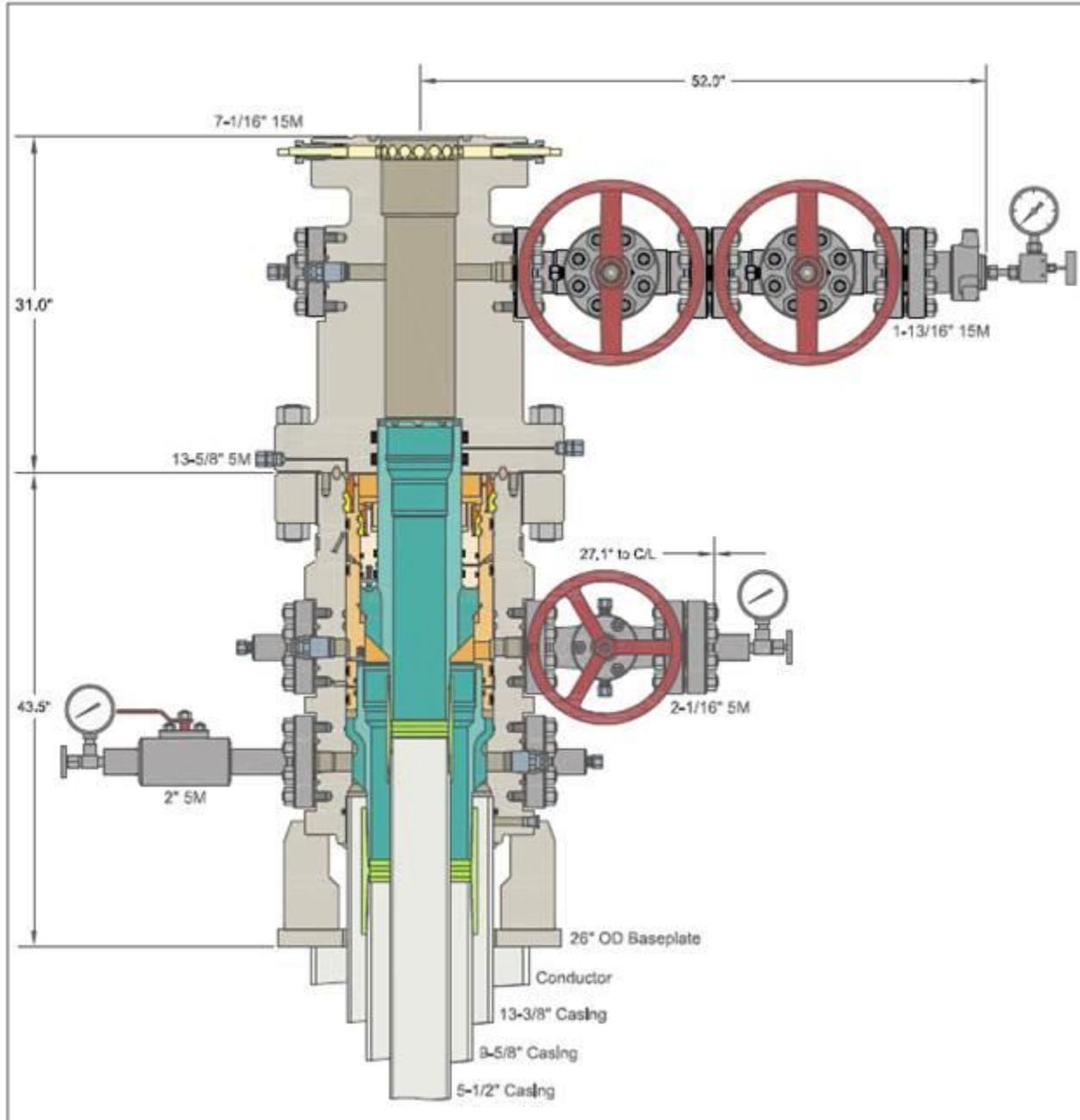
5,000 psi BOP Stack





Drilling Operations Plan
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Tap Rock Operating, LLC
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BHL 2638' FSL & 1980' FWL, Sec. 3
Surface- T. 24S., R. 35E Lea County, NM
BHL- T. 25S., R. 35E Lea County, NM

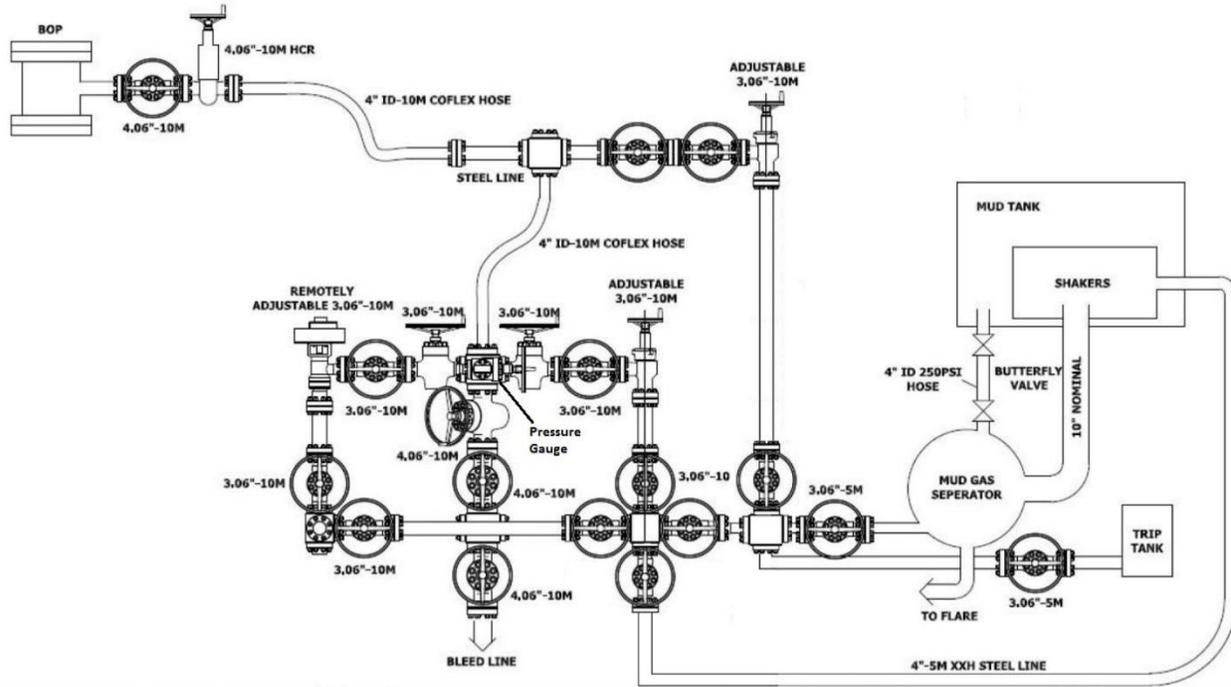
Multi-bowl Wellhead





Drilling Operations Plan
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Tap Rock Operating, LLC
SHL 210' FSL & 2126' FWL, Sec. 27
BHL 2638' FSL & 1980' FWL, Sec. 3
Surface- T. 24S., R. 35E Lea County, NM
BHL- T. 25S., R. 35E Lea County, NM

10M Choke Layout



District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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

QEF '6' J QDDU
"2; B94242
"T GEKXGE

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-025-47740	² Pool Code 98294	³ Pool Name WC-025 G-07 S243517D; MIDDLE BONE SP
⁴ Property Code 328302	⁵ Property Name MULVA FED COM	
⁷ OGRID No. 372043	⁸ Operator Name TAP ROCK OPERATING, LLC.	⁶ Well Number 112H
⁹ Elevation 3281'		

¹⁰Surface Location

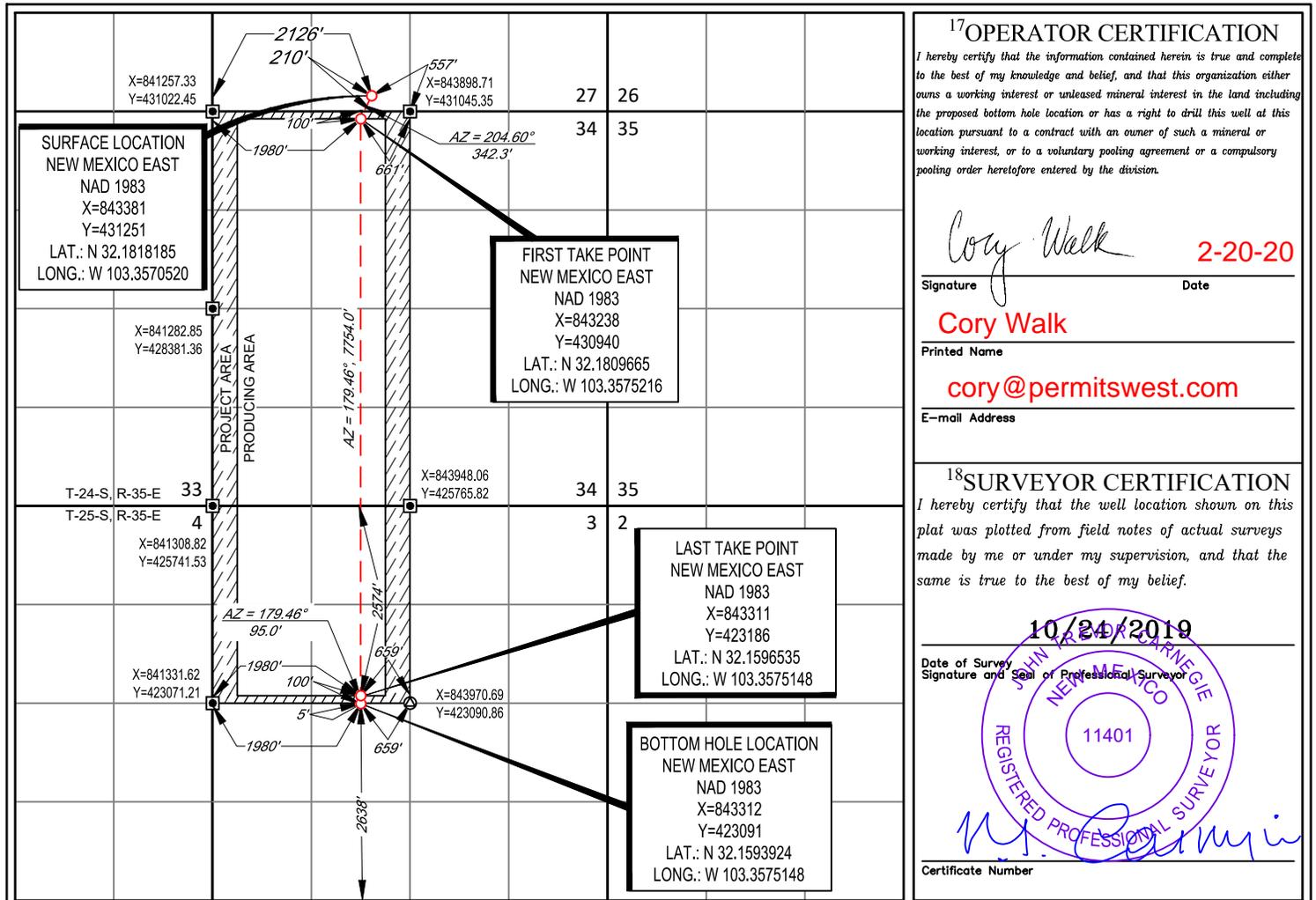
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	27	24-S	35-E	-	210'	SOUTH	2126'	WEST	LEA

¹¹Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
F	3	25-S	35-E	-	2638'	SOUTH	1980'	WEST	LEA

¹² Dedicated Acres 481.66	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.



¹⁷OPERATOR CERTIFICATION

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

Cory Walk **2-20-20**
Signature Date

Cory Walk
Printed Name

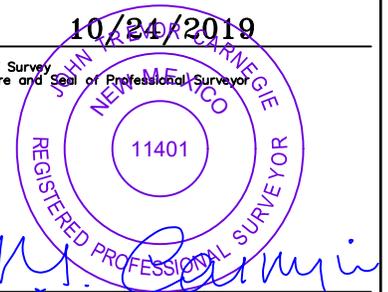
cory@permitswest.com
E-mail Address

¹⁸SURVEYOR CERTIFICATION

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

10/24/2019

Date of Survey
Signature and Seal of Professional Surveyor



Certificate Number

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

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Submit Original
to Appropriate
District Office

OCD - HOBBS
09/17/2020
RECEIVED

GAS CAPTURE PLAN

Date: 1/8/2020

Original Operator & OGRID No.: 372043
 Amended - Reason for Amendment: _____

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

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

Well(s)/Production Facility – Name of facility

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

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
MAN HANDS FED COM #112H	30-025-47740	N SEC 34 T24S R35E	235' FNL 2126' FWL	+/- 8000	21 days	Gas will be flared for ~21 days during flowback before being turned to the TB. Time est. depends on sales connect and well cleanup.

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility should be connected to Lucid Energy Group, LLC and will be connected to Lucid Energy Group LLC's low/high pressure gathering system located in Eddy County, New Mexico. It will require approximately 2500' of pipeline to connect the facility to low/high pressure gathering system. Tap Rock Operating, LLC provides (periodically) to Lucid Energy Group, LLC a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Tap Rock Operating, LLC and Lucid Energy Group, LLC have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be Processed at Lucid Energy Group, LLC 's Red Hills processing facility located in Lea County, New Mexico, 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.

Flowback Strategy

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

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

Alternatives to Reduce Flaring

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

- Power Generation – On lease
 - Only a portion of gas is consumed operating the generator, remainder of gas will be flared

- Compressed Natural Gas – On lease
 - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
 - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines