Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

NMOCD Artesia

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

SUNDRY NOTICES AND REPORTS ON WELLS

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

SUBMIT IN TRIPLICATE - Other instructions on page 2

5. Lease Serial No.
NMNM0557563

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
HAMILTON FEDERAL COM 1H

2. Name of Operator
MACK ENERGY CORPORATION
Contact: DEANA WEAVER
E-Mail: DWEAVER@MEC.COM

9. API Well No.
30-005-64307-00-X1

3a. Address
P.O. BOX 960
ARTESIA, NM 88211-0960

3b. Phone No. (include area code)
Ph: 575-748-1288
Fx: 575-746-9539

10. Field and Pool or Exploratory Area
ROUND TANK-SAN ANDRES

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 15 T15S R29E SWSW 383FSL 598FWL
33.009712 N Lat, 104.022995 W Lon

11. County or Parish, State
CHAVES COUNTY, NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other Change to Original A PD
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

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

Mack Energy Corporation would like to request the following casing/cement change on the Hamilton Federal Com 1H:

RECEIVED
JUL 23 2019
DISTRICT II-ARTESIA O.C.D.

Surface - Drill 17 1/2" hole to 200', Run 13 3/8" J-55 ST&C 48# csg to 0-200', cement w/ 100sx RFC + 12% PF53 + 2% PF1 + 5pps42+ .125pps PF29, tail w/ 275sx Class C + 1% PF1- (collapse 7.411859, burst 4.700889, tension 4.74, jnt strength 52.86966)

Intermediate- Drill 12 1/2" hole to 1200', Run 9 5/8" J-55 ST&C 36# csg to 0-1200', cement w/ 215sx Class C+ 4% PF20 +1% PF1 + .4pps PF45 +.125pps PF 29, tail w/ 200sx Class C + 1% PF 1- (collapse 3.237179, burst 7.04, tension 7.04, jnt strength 10.76785)

Production- Drill 8 3/4" hole to 8778' Run 7" HCP-110 LT&C 26# csg to 0-2450' (collapse 5.89234,

SEE ATTACHED FOR CONDITIONS OF APPROVAL

14. I hereby certify that the foregoing is true and correct.
Electronic Submission #473917 verified by the BLM Well Information System
For MACK ENERGY CORPORATION, sent to the Roswell
Committed to AFMSS for processing by JENNIFER SANCHEZ on 07/17/2019 (19JS0110SE)

Name *(Printed/Typed)* DEANA WEAVER — Title PRODUCTION CLERK

Signature (Electronic Submission) — Date 07/17/2019

APPROVED
JUL 18 2019

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By — Title BUREAU OF LAND MANAGEMENT — Date

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

Office ROSWELL FIELD OFFICE

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.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

Additional data for EC transaction #473917 that would not fit on the form

32. Additional remarks, continued

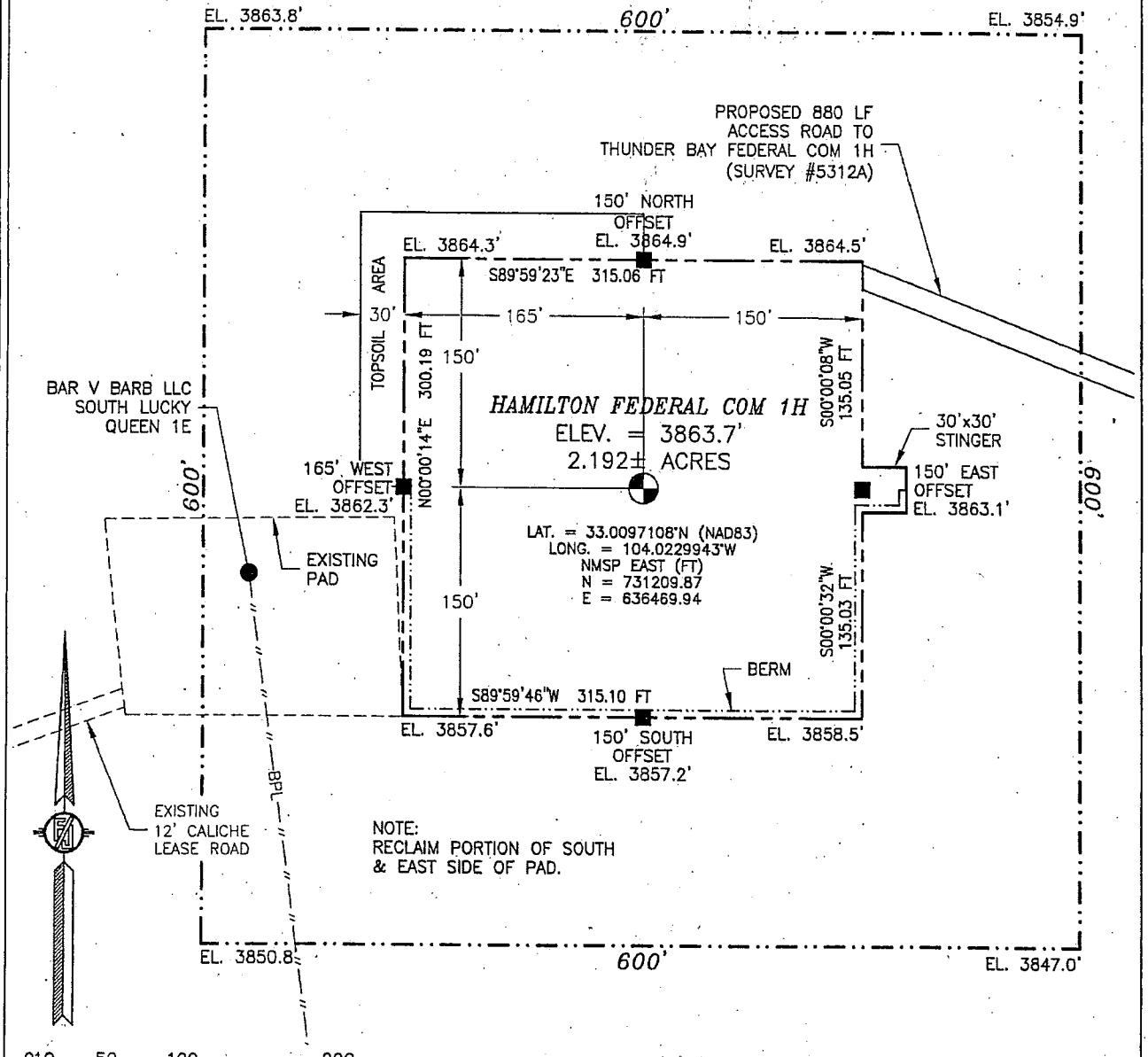
burst 3.316667, tension 3.316667, jnt strength 8.612196), 7" HCP-110 Buttress 26# csg to 2450-3460'(collapse 4.214033, burst 3.316667, tension 3.316667, jnt strength 7.417673), 5 1/2" HCP-110, Buttress 17# to 3460-8778'(collapse 4.922434, burst 3.546667, tension 3.546667), cement w/ 280sx Class C 4% PF20+4 pps PF45 + 125pps PF29, tail w/ 1300sx PVL+ 1.3 (BWOW) pf44 + 5% PF174 +.5% PF606+ .1% PF153 +.4pps PF44

Revisions to Operator-Submitted EC Data for Sundry Notice #473917

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type:	APDCH NOI	APDCH NOI
Lease:	NMNM0557563	NMNM0557563
Agreement:		
Operator:	MACK ENERGY CORPORATION P.O. BOX 960 ARTESIA, NM 88210 Ph: 575-748-1288	MACK ENERGY CORPORATION P.O. BOX 960 ARTESIA, NM 88211-0960 Ph: 505-748-1288
Admin Contact:	DEANA WEAVER PRODUCTION CLERK E-Mail: DWEAVER@MEC.COM Ph: 575-748-1288	DEANA WEAVER PRODUCTION CLERK E-Mail: DWEAVER@MEC.COM Ph: 575-748-1288 Fx: 575-746-9539
Tech Contact:	DEANA WEAVER PRODUCTION CLERK E-Mail: DWEAVER@MEC.COM Ph: 575-748-1288	DEANA WEAVER PRODUCTION CLERK E-Mail: DWEAVER@MEC.COM Ph: 575-748-1288 Fx: 575-746-9539
Location: State: County:	 NM CHAVES	 NM CHAVES
Field/Pool:	ROUND TANK; SAN ANDRES	ROUND TANK-SAN ANDRES
Well/Facility:	HAMILTON FEDERAL COM 1H Sec 15 T15S R29E SWSW 383FSL 598FWL	HAMILTON FEDERAL COM 1H Sec 15 T15S R29E SWSW 383FSL 598FWL 33.009712 N Lat, 104.022995 W Lon

SECTION 15, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO
SITE MAP

NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83). LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD83). BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST COORDINATES MODIFIED TO THE SURFACE



010 50 100 200
SCALE 1" = 100'

DIRECTIONS TO LOCATION
FROM THE INTERSECTION OF STATE HIGHWAY 82 AND CR 217 (HAGERMAN CUTOFF) GO NORTH ON CR 217 FOR APPROX. 10.0 MILES, CONTINUE WEST ON 20' CALICHE LEASE ROAD (CHAVES CO. LINE ROAD) FOR APPROX. 2.1 MILES, CONTINUE NORTHWEST ON 12' CALICHE LEASE ROAD FOR APPROX. 2.4 MILES TO SOUTH LUCKY QUEEN 1E PAD AND THE WEST SIDE OF HAMILTON FEDERAL COM 1H PAD.

MACK ENERGY CORPORATION
HAMILTON FEDERAL COM 1H
LOCATED 383 FT. FROM THE SOUTH LINE AND 598 FT. FROM THE WEST LINE OF SECTION 15, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M. CHAVES COUNTY, STATE OF NEW MEXICO

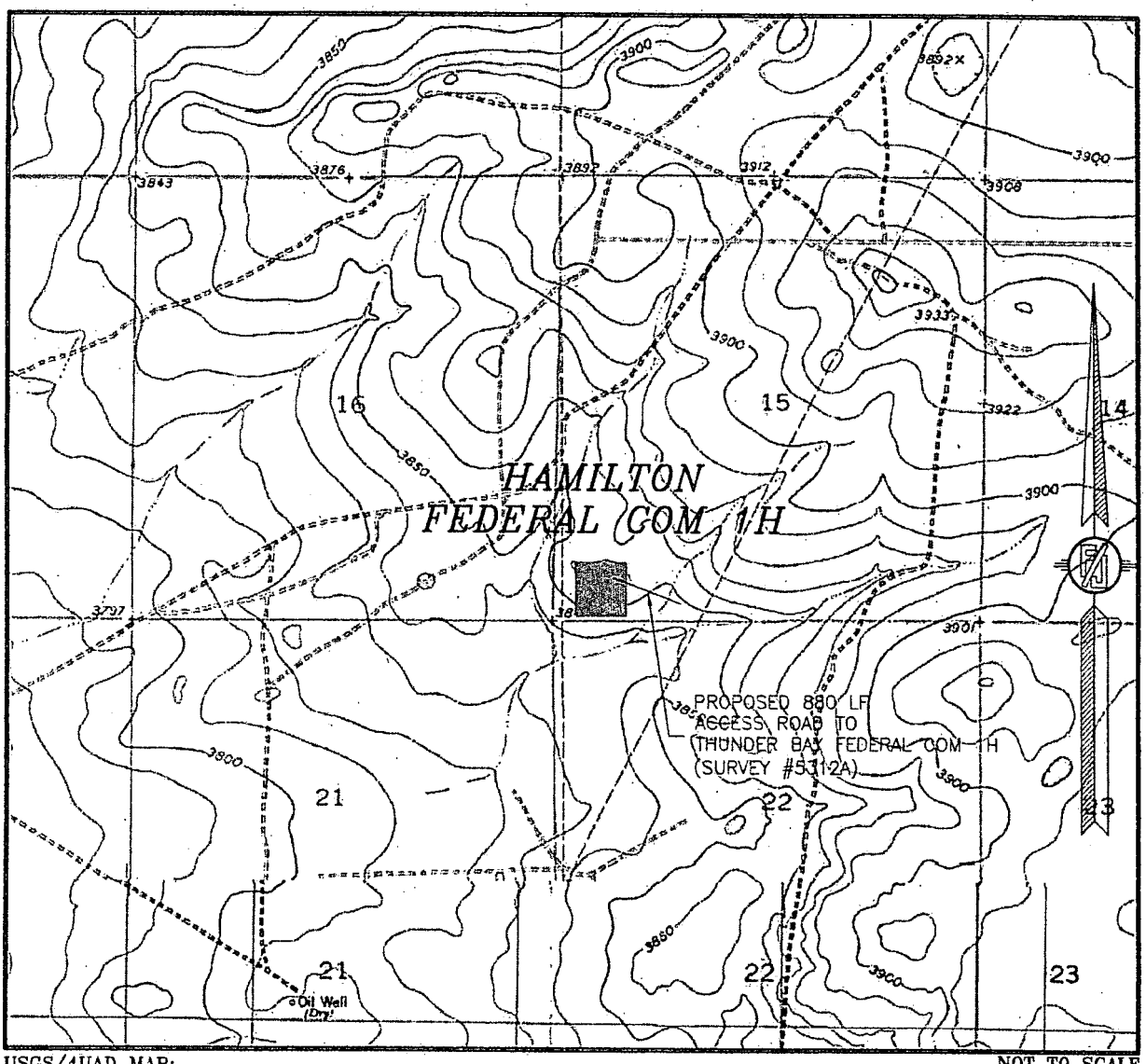
JULY 11, 2019

SURVEY NO. 5311C

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

SECTION 15, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO

LOCATION VERIFICATION MAP



USGS/4UAD MAP:
BASIN WELL

NOT TO SCALE

MACK ENERGY CORPORATION
HAMILTON FEDERAL COM 1H
LOCATED 383 FT. FROM THE SOUTH LINE
AND 598 FT. FROM THE WEST LINE OF
SECTION 15, TOWNSHIP 15 SOUTH,
RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO

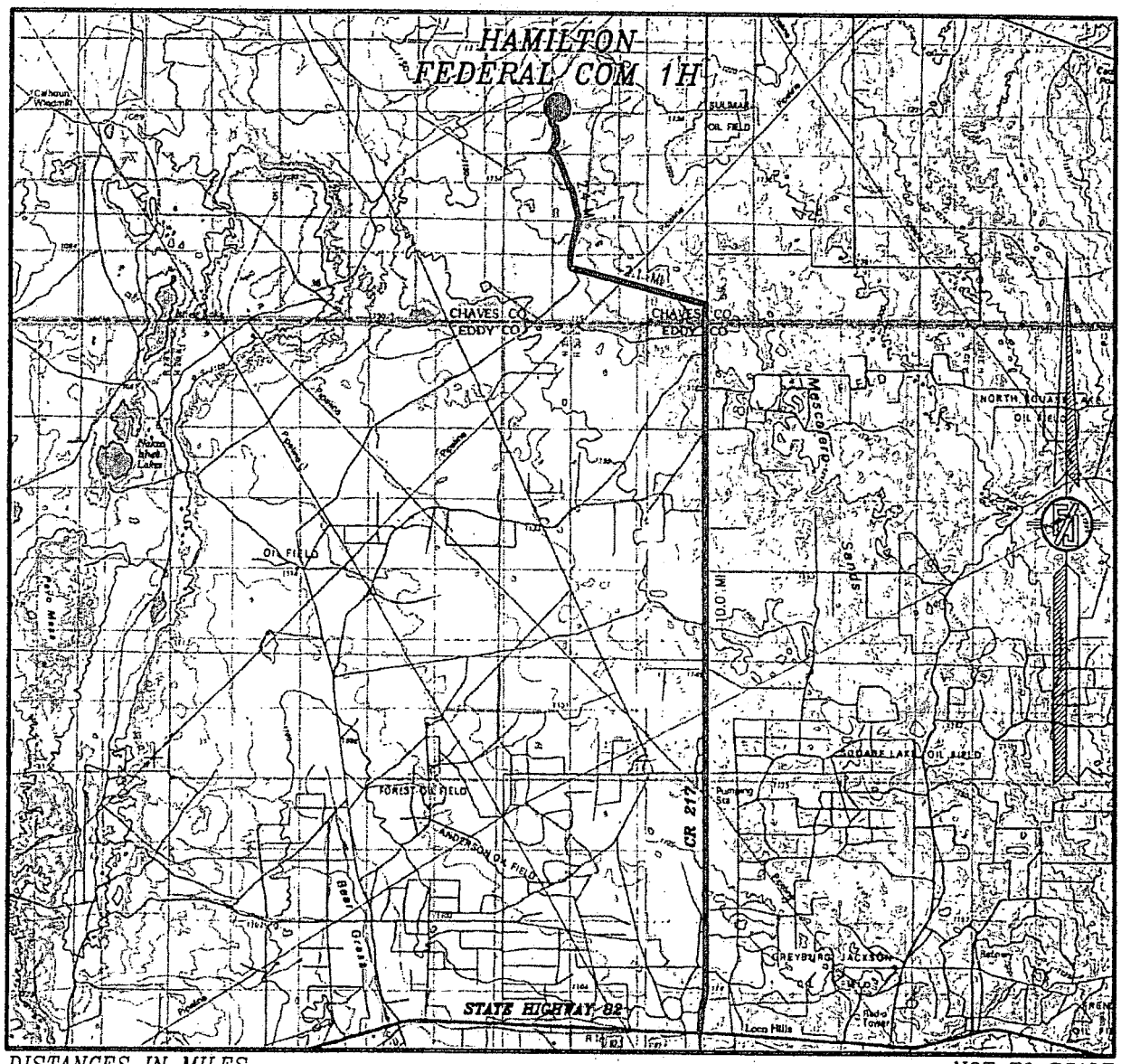
JULY 11, 2019

SURVEY NO. 5311C

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 15, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO

VICINITY MAP



DISTANCES IN MILES

NOT TO SCALE

DIRECTIONS TO LOCATION
FROM THE INTERSECTION OF STATE HIGHWAY 82 AND CR 217 (HAGERMAN CUTOFF) GO NORTH ON CR 217 FOR APPROX. 10.0 MILES, CONTINUE WEST ON 20' CALICHE LEASE ROAD (CHAVES CO. LINE ROAD) FOR APPROX. 2.1 MILES, CONTINUE NORTHWEST ON 12' CALICHE LEASE ROAD FOR APPROX. 2.4 MILES TO SOUTH LUCKY QUEEN 1E PAD AND THE WEST SIDE OF HAMILTON FEDERAL COM 1H PAD.

MACK ENERGY CORPORATION
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CHAVES COUNTY, STATE OF NEW MEXICO

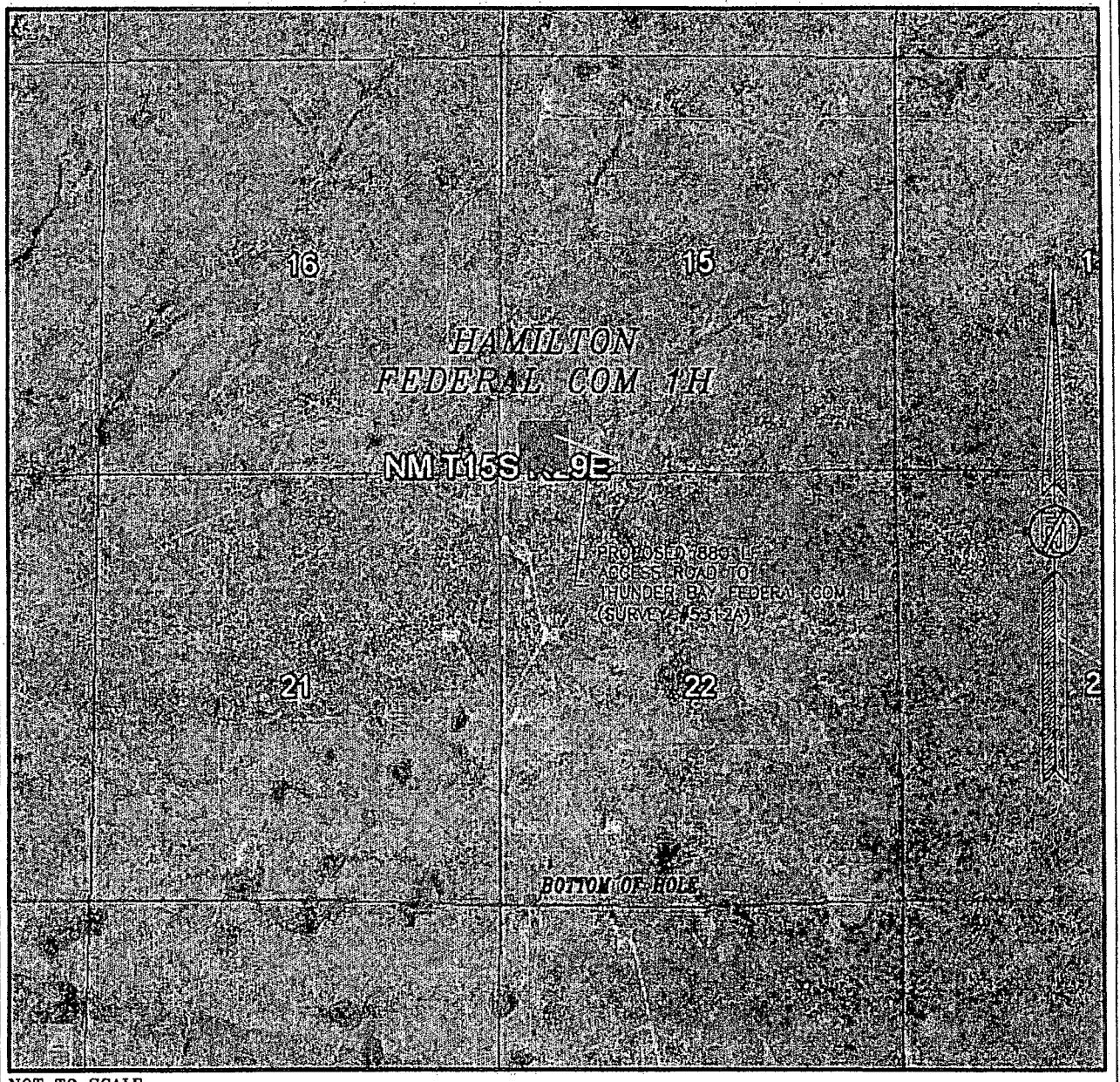
JULY 11, 2019

SURVEY NO. 5311C

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 15, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO

AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
FEBRUARY 2017

MACK ENERGY CORPORATION
HAMILTON FEDERAL COM 1H
LOCATED 383 FT. FROM THE SOUTH LINE
AND 598 FT. FROM THE WEST LINE OF
SECTION 15, TOWNSHIP 15 SOUTH,
RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO

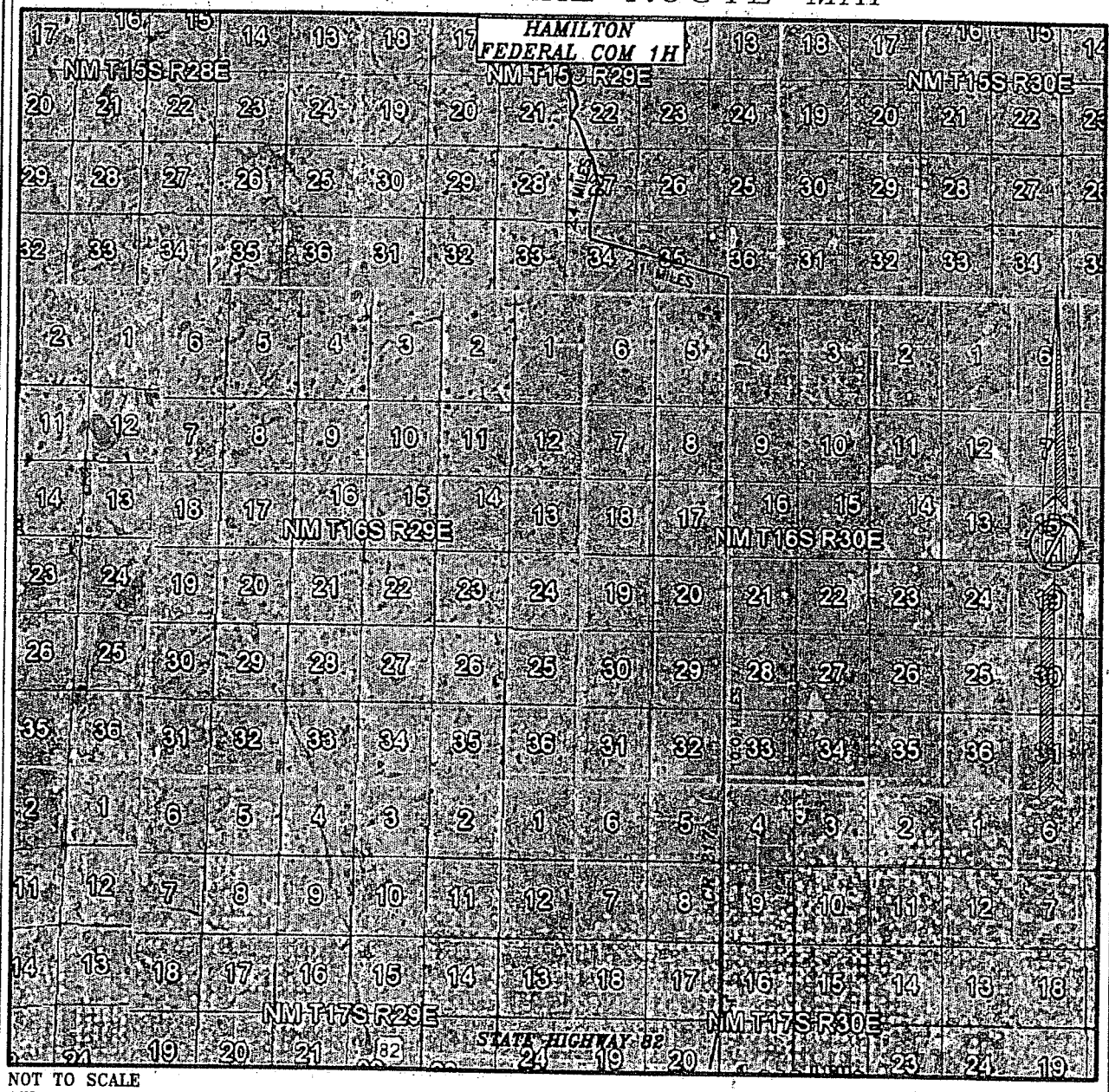
JULY 11, 2019

SURVEY NO. 5311C

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 15, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO

ACCESS AERIAL ROUTE MAP



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
FEBRUARY 2017

MACK ENERGY CORPORATION
HAMILTON FEDERAL COM 1H
LOCATED 383 FT. FROM THE SOUTH LINE
AND 598 FT. FROM THE WEST LINE OF
SECTION 15, TOWNSHIP 15 SOUTH,
RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO

JULY 11, 2019

SURVEY NO. 5311C

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

Hamilton Federal Com #1H

Surface- 17 ½"bit 200' 13 3/8" 48# J-55

Stage 1	Slurry	Density	Yield	Mix H2O Gals./sk	# of Sacks	% Excess	Slurry Top
Lead	RFC + 12% PF53+2%PF1+5ppsPF42+ .125ppsPF29	14.4	1.62	7.357	100		
Tail	Class C+1%PF1	14.8	1.34	6.323	275	100	

Comments	20bbls Gelled Water. 50 sacks of 11# Scavenger cement.

Cu. Ft per Lin. Ft 347

Intermediate- 12 ¼" bit 1,200' 9 5/8"-36# J-55

Stage 1	Slurry	Density	Yield	Mix H2O Gals./sk	# of Sacks	% Excess	Slurry Top
Lead	Class C + 4% PF20+1% PF1+.4pps PF45+.125pps PF29	13.5	1.73	9.116	215	100	Surface
Tail	Class C+1%PF1	14.8	1.34	6.323	200	100	800

Comments	20 bbls Gelled Water. 50 sacks of 11# Scavenger cement.

Cu. Ft per Lin. Ft 469.8

Production- 8 ¾"bit 8,778' 7" 26# HCP-110. 3,460' Crossover 7"X 5 ½". 5 ½"-17# HCP-110 ' 5,318'

Stage 1	Slurry	Density	Yield	Mix H2O Gals./sk	# of Sacks	% Excess	Slurry Top
Lead	Class "C" 4% PF20+4 pps PF45+125pps PF29	13.2	1.84	9.914	280	40	Surface
Tail	PVL+1.3 (BWOW) PF44+5%PF174+.5%PF606+.1%PF153+.4ppsPF44.	13	1.48	7.577	1300	40	2,200'

Comments	20bbls Gelled Water. 20bbls Chemical wash. 50 sacks of 11# Scavenger cement.

Cu. Ft per Lin. Ft 1871

Stage 2	Slurry	Density	Yield	# of sacks	% Excess	Slurry Top
Lead						
Tail						

Comments:	

Prior to any cement job it is Mack Energy policy to circulate bottoms up 1 time before commencing with cement operations. On wells where hole conditions have been an issue during the drilling and reaming process the number or circulations needs to increase to a minimum of 2 times around.

All production cement figured with an additional 10% for washout unless otherwise noted. Flush is figured with a 40' shoe joint. Do not displace more than 2bbls over calculated flush without prior approval.

Casing Design Well: Hamilton Federal Com #1H

String Size & Function: 13 3/8 in surface X intermediate

Total Depth: 200 ft

Pressure Gradient for Calculations (While drilling)

Mud weight, collapse: 9.6 #/gal Safety Factor Collapse: 1.125

Mud weight, burst: 9.6 #/gal Safety Factor Burst: 1.25

Mud weight for joint strength: 9.6 #/gal Safety Factor Joint Strength 1.8

BHP @ TD for: collapse: 99.84 psi Burst: 99.84 psi, joint strength: 99.84 psi

Partially evacuated hole? Pressure gradient remaining: 10 #/gal

Max. Shut in surface pressure: 500 psi

1st segment	200 ft to	0 ft		Make up Torque ft-lbs			Total ft =	200
O.D.	Weight	Grade	Threads	opt.	min.	mx.		
13.375 inches	48 #/ft	J-55	ST&C	3,220	2,420	4,030		
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift		
740	2,370 psi	433 ,000 #		744 ,000 #		12.559		

2nd segment	0 ft to	0 ft		Make up Torque ft-lbs			Total ft =	0
O.D.	Weight	Grade	Threads	opt.	min.	mx.		
inches	#/ft							
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift		
psi	psi	,000 #		,000 #				

3rd segment	0 ft to	0 ft		Make up Torque ft-lbs			Total ft =	0
O.D.	Weight	Grade	Threads	opt.	min.	mx.		
inches	#/ft							
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift		
psi	psi	,000 #		,000 #				

4th segment	0 ft to	0 ft		Make up Torque ft-lbs			Total ft =	0
O.D.	Weight	Grade	Threads	opt.	min.	mx.		
inches	#/ft							
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift		
psi	psi	,000 #		,000 #				

5th segment	0 ft to	0 ft		Make up Torque ft-lbs			Total ft =	0
O.D.	Weight	Grade	Threads	opt.	min.	mx.		
inches	#/ft							
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift		
psi	psi	,000 #		,000 #				

6th segment	0 ft to	0 ft		Make up Torque ft-lbs			Total ft =	0
O.D.	Weight	Grade	Threads	opt.	min.	mx.		
inches	#/ft							
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift		
psi	psi	,000 #		,000 #				

Select 1st segment bottom 200

200 ft	to	0 ft
13.375	0 J-55	ST&C

S.F.	Actual		Desire
collapse	7.411859	>=	1.125
burst-b	4.700889	>=	1.25
burst-t	4.74		

Top of segment 1 (ft) 0

Select 2nd segment from bottom

0 ft	to	0 ft	
0	0	0	0

S.F.	Actual		Desire
collapse	#DIV/0!	>=	1.125
burst-b	0	>=	1.25
burst-t	0		
jnt strngth	52.86966	>=	1.8

Casing Design Well: Hamilton Federal Com #1H

String Size & Function: 9 5/8 in surface intermediate x

Total Depth: 1200 ft TVD: 1200 ft

Pressure Gradient for Calculations (While drilling)

Mud weight, collapse: 10 #/gal Safety Factor Collapse: 1.125

Mud weight, burst: 10 #/gal Safety Factor Burst: 1.25

Mud weight for joint strength: 10 #/gal Safety Factor Joint Strength 1.8

BHP @ TD for: collapse: 624 psi Burst: 624 psi, joint strength: 624 psi

Partially evacuated hole? Pressure gradient remaining: 10 #/gal

Max. Shut in surface pressure: 500 psi

1st segment	1200 ft to 0 ft			Make up Torque ft-lbs			Total ft = 1200
O.D.	Weight	Grade	Threads	opt.	min.	mx.	
9.625 inches	36 #/ft	J-55	ST&C	3,940	2,960	4,930	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
2,020 psi	3,520 psi	394 ,000 #		564 ,000 #		8.765	

2nd segment	ft to ft			Make up Torque ft-lbs			Total ft = 0
O.D.	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	,000 #		,000 #			

3rd segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D.	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	,000 #		,000 #			

4th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D.	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	,000 #		,000 #			

5th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D.	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	,000 #		,000 #			

6th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D.	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	,000 #		,000 #			

Select 1st segment bottom 1200

1200 ft to 0 ft
9.625 0 J-55 ST&C

S.F.	Actual		Desire
collapse	3.237179	>=	1.125
burst-b	7.04	>=	1.25
burst-t	7.04		

Top of segment 1 (ft) 0

Select 2nd segment from bottom

0 ft to 0 ft
0 0 0 0

S.F.	Actual		Desire
collapse	#DIV/0!	>=	1.125
burst-b	0	>=	1.25
burst-t	0		
jnt strngth	10.76785	>=	1.8

Casing Design **Well:** Hamilton Federal Com #1H

String Size & Function: 7 x 5.5 in Production x

Total Depth: 8778 ft **TVD:** 3352 ft

Pressure Gradient for Calculations **(While drilling)**

Mud weight, collapse: 10 #/gal Safety Factor Collapse: 1.125

Mud weight, burst: 10 #/gal Safety Factor Burst: 1.25

Mud weight for joint strength: 10 #/gal Safety Factor Joint Strength 1.8

BHP @ TD for: collapse: 1743.04 psi Burst: 1743.04 psi, joint strength: 1743.04 psi

Partially evacuated hole? Pressure gradient remaining: 10 #/gal

Max. Shut in surface pressure: 3000 psi

1st segment	8778 ft to 3460 ft			Make up Torque ft-lbs			Total ft = 5318
O.D.	Weight	Grade	Threads	opt.	min.	mx.	
5.5 inches	17 #/ft	HCP-110	Buttress	4,620	3,470	5,780	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
8,580 psi	10,640 psi-lrcr	568 ,000 #		546 ,000 #		4.767	

2nd segment	2450 ft to 3460 ft			Make up Torque ft-lbs			Total ft = 1010
O.D.	Weight	Grade	Threads	opt.	min.	mx.	
7 inches	26 #/ft	HCP-110	Buttress	6,930	5,200	8,660	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
7,800 psi	9,950 psi-lrcr	853 ,000 #		830 ,000 #		6.151	

3rd segment	2450 ft to 0 ft			Make up Torque ft-lbs			Total ft = 2450
O.D.	Weight	Grade	Threads	opt.	min.	mx.	
7 inches	26 #/ft	HCP-110	LT&C	6930	5200	8660	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
7,800 psi	9,950 psi	693 ,000 #		830 ,000 #		6.151	

4th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D.	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	,000 #		,000 #			

5th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D.	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	,000 #		,000 #			

6th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D.	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	,000 #		,000 #			

Select 1st segment bottom 8878

S.F.	Actual		Desire
collapse	4.922434	>=	1.125
burst-b	3.546667	>=	1.25
burst-t	3.546667		

8778 ft to 3460 ft
5.5 0 HCP-110 Buttress

Top of segment 1 (ft) 3460

Select 2nd segment from bottom

S.F.	Actual		Desire
collapse	4.214033	>=	1.125
burst-b	3.316667	>=	1.25
burst-t	3.316667		
jnt strngth	7.417673	>=	1.8

3460 ft to 2450 ft
7 ,26 HCP-110 Buttress

Mack Energy

Chaves County
Sec 15-T15S-R29E
Hamilton Federal Com #1H

Wellbore #1

Plan: Plan #1 8/100-150 Tan-12/100

Standard Planning Report

16 July, 2019

Database:	EDM 5000.15 Single User Db	**Local Co-ordinate Reference:**	Well Hamilton Federal Com #1H
Company:	Mack Energy	**TVD Reference:**	3863.7 + 13 @ 3876.70usft
Project:	Chaves County	**MD Reference:**	3863.7 + 13 @ 3876.70usft
Site:	Sec 15-T15S-R29E	**North Reference:**	Grid
Well:	Hamilton Federal Com #1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 8/100-150 Tan-12/100		

Project Chaves County

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site Sec 15-T15S-R29E

Site Position:		**Northing:**	731,209.87 usft	**Latitude:**	33.0097108
From:	Map	**Easting:**	636,469.94 usft	**Longitude:**	-104.0229943
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.17 °

Well Hamilton Federal Com #1H

Well Position	**+N/-S**	0.00 usft	**Northing:**	731,209.87 usft	**Latitude:**	33.0097108
	+E/-W	0.00 usft	**Easting:**	636,469.94 usft	**Longitude:**	-104.0229943
Position Uncertainty		0.00 usft	**Wellhead Elevation:**		**Ground Level:**	3,863.70 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	07/15/19	7.00	60.68	48,136.34560560

Design Plan #1 8/100-150 Tan-12/100

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	181.92

Plan Survey Tool Program **Date** 07/16/19

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	8,777.03	Plan #1 8/100-150 Tan-12/100 (W	MWD	
				MWD - Standard	

Database:	EDM 5000.15 Single User Db	**Local Co-ordinate Reference:**	Well Hamilton Federal Com #1H
Company:	Mack Energy	**TVD Reference:**	3863.7 + 13 @ 3876.70usft
Project:	Chaves County	**MD Reference:**	3863.7 + 13 @ 3876.70usft
Site:	Sec 15-T15S-R29E	**North Reference:**	Grid
Well:	Hamilton Federal Com #1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 8/100-150 Tan-12/100		

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,569.08	0.00	0.00	2,569.08	0.00	0.00	0.00	0.00	0.00	0.00	
3,256.58	55.00	207.00	3,155.75	-272.12	-138.65	8.00	8.00	0.00	207.00	
3,406.58	55.00	207.00	3,241.79	-381.60	-194.43	0.00	0.00	0.00	0.00	
3,771.93	90.00	178.70	3,352.00	-713.93	-261.53	12.00	9.58	-7.75	-43.19	
3,871.93	90.00	178.70	3,352.00	-813.91	-259.26	0.00	0.00	0.00	0.00	
3,879.43	90.00	178.55	3,352.00	-821.41	-259.08	2.00	0.00	-2.00	-90.00	
6,279.43	90.00	178.55	3,352.00	-3,220.64	-198.35	0.00	0.00	0.00	0.00	
6,344.71	90.00	179.86	3,352.00	-3,285.91	-197.44	2.00	0.00	2.00	90.00	
8,777.11	90.00	179.86	3,352.00	-5,718.30	-191.31	0.00	0.00	0.00	0.00	BHL Hamilton Federa

Database:	EDM 5000.15 Single User Db	**Local Co-ordinate Reference:**	Well Hamilton Federal Com #1H
Company:	Mack Energy	**TVD Reference:**	3863.7 + 13 @ 3876.70usft
Project:	Chaves County	**MD Reference:**	3863.7 + 13 @ 3876.70usft
Site:	Sec 15-T15S-R29E	**North Reference:**	Grid
Well:	Hamilton Federal Com #1H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 8/100-150 Tan-12/100		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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
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	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,569.08	0.00	0.00	2,569.08	0.00	0.00	0.00	0.00	0.00	0.00
KOP BLD 8°/100'									
2,600.00	2.47	207.00	2,599.99	-0.59	-0.30	0.60	8.00	8.00	0.00
2,650.00	6.47	207.00	2,649.83	-4.07	-2.07	4.14	8.00	8.00	0.00
2,700.00	10.47	207.00	2,699.27	-10.63	-5.42	10.81	8.00	8.00	0.00
2,750.00	14.47	207.00	2,748.08	-20.25	-10.32	20.59	8.00	8.00	0.00
2,800.00	18.47	207.00	2,796.02	-32.88	-16.75	33.43	8.00	8.00	0.00
2,850.00	22.47	207.00	2,842.85	-48.46	-24.69	49.26	8.00	8.00	0.00
2,900.00	26.47	207.00	2,888.35	-66.92	-34.09	68.02	8.00	8.00	0.00
2,950.00	30.47	207.00	2,932.29	-88.15	-44.91	89.60	8.00	8.00	0.00
3,000.00	34.47	207.00	2,974.47	-112.07	-57.10	113.91	8.00	8.00	0.00
3,050.00	38.47	207.00	3,014.66	-138.54	-70.59	140.83	8.00	8.00	0.00
3,100.00	42.47	207.00	3,052.69	-167.45	-85.32	170.21	8.00	8.00	0.00
3,150.00	46.47	207.00	3,088.36	-198.66	-101.22	201.93	8.00	8.00	0.00
3,200.00	50.47	207.00	3,121.51	-232.01	-118.21	235.83	8.00	8.00	0.00
3,250.00	54.47	207.00	3,151.96	-267.33	-136.21	271.73	8.00	8.00	0.00
3,256.58	55.00	207.00	3,155.75	-272.12	-138.65	276.60	8.00	8.00	0.00
EOB HLD 55° Inc. 150' TANG									
3,300.00	55.00	207.00	3,180.66	-303.81	-154.80	308.81	0.00	0.00	0.00
3,406.58	55.00	207.00	3,241.79	-381.60	-194.43	387.88	0.00	0.00	0.00
CONT BLD&TRN 12°/100'									
3,425.00	56.63	205.19	3,252.14	-395.28	-201.13	401.79	12.00	8.82	-9.83
3,450.00	58.87	202.84	3,265.48	-414.59	-209.73	421.37	12.00	8.98	-9.41
3,475.00	61.16	200.59	3,277.98	-434.71	-217.74	441.75	12.00	9.15	-8.97
3,500.00	63.48	198.45	3,289.59	-455.57	-225.13	462.85	12.00	9.29	-8.58
3,525.00	65.83	196.39	3,300.29	-477.13	-231.89	484.62	12.00	9.41	-8.24
3,550.00	68.21	194.40	3,310.05	-499.32	-237.99	507.00	12.00	9.52	-7.94

Database:	EDM 5000.15 Single User Db	Local Co-ordinate Reference:	Well Hamilton Federal Com #1H
Company:	Mack Energy	TVD Reference:	3863.7 + 13 @ 3876.70usft
Project:	Chaves County	MD Reference:	3863.7 + 13 @ 3876.70usft
Site:	Sec 15-T15S-R29E	North Reference:	Grid
Well:	Hamilton Federal Com #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 8/100-150 Tan-12/100		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3,559.37	69.11	193.68	3,313.46	-507.78	-240.11	515.53	12.00	9.58	-7.75
FTP Hamilton Federal Com #1H									
3,575.00	70.61	192.48	3,318.84	-522.08	-243.43	529.92	12.00	9.63	-7.63
3,600.00	73.04	190.62	3,326.64	-545.35	-248.18	553.34	12.00	9.69	-7.45
3,625.00	75.47	188.80	3,333.43	-569.06	-252.24	577.18	12.00	9.75	-7.26
3,650.00	77.93	187.03	3,339.18	-593.16	-255.59	601.37	12.00	9.81	-7.11
3,675.00	80.39	185.28	3,343.88	-617.57	-258.22	625.85	12.00	9.85	-6.98
3,700.00	82.86	183.56	3,347.52	-642.22	-260.12	650.56	12.00	9.89	-6.87
3,725.00	85.34	181.86	3,350.09	-667.06	-261.30	675.42	12.00	9.91	-6.80
3,750.00	87.82	180.18	3,351.58	-692.01	-261.75	700.37	12.00	9.93	-6.75
3,771.93	90.00	178.70	3,352.00	-713.93	-261.53	722.28	12.00	9.94	-6.73
EOB&T HLD 90° Inc.									
3,800.00	90.00	178.70	3,352.00	-741.99	-260.89	750.30	0.00	0.00	0.00
3,871.93	90.00	178.70	3,352.00	-813.91	-259.26	822.12	0.00	0.00	0.00
CONT HLD 90° Inc. TRN 2°/100'									
3,879.43	90.00	178.55	3,352.00	-821.41	-259.08	829.61	2.00	0.00	-2.00
EOT CONT HLD 90° Inc.									
3,900.00	90.00	178.55	3,352.00	-841.97	-258.56	850.14	0.00	0.00	0.00
4,000.00	90.00	178.55	3,352.00	-941.93	-256.03	949.97	0.00	0.00	0.00
4,100.00	90.00	178.55	3,352.00	-1,041.90	-253.50	1,049.80	0.00	0.00	0.00
4,200.00	90.00	178.55	3,352.00	-1,141.87	-250.97	1,149.62	0.00	0.00	0.00
4,300.00	90.00	178.55	3,352.00	-1,241.84	-248.44	1,249.45	0.00	0.00	0.00
4,400.00	90.00	178.55	3,352.00	-1,341.81	-245.91	1,349.28	0.00	0.00	0.00
4,500.00	90.00	178.55	3,352.00	-1,441.77	-243.38	1,449.11	0.00	0.00	0.00
4,600.00	90.00	178.55	3,352.00	-1,541.74	-240.85	1,548.93	0.00	0.00	0.00
4,700.00	90.00	178.55	3,352.00	-1,641.71	-238.32	1,648.76	0.00	0.00	0.00
4,800.00	90.00	178.55	3,352.00	-1,741.68	-235.79	1,748.59	0.00	0.00	0.00
4,900.00	90.00	178.55	3,352.00	-1,841.65	-233.26	1,848.42	0.00	0.00	0.00
5,000.00	90.00	178.55	3,352.00	-1,941.61	-230.73	1,948.24	0.00	0.00	0.00
5,100.00	90.00	178.55	3,352.00	-2,041.58	-228.20	2,048.07	0.00	0.00	0.00
5,200.00	90.00	178.55	3,352.00	-2,141.55	-225.67	2,147.90	0.00	0.00	0.00
5,300.00	90.00	178.55	3,352.00	-2,241.52	-223.13	2,247.73	0.00	0.00	0.00
5,400.00	90.00	178.55	3,352.00	-2,341.49	-220.60	2,347.55	0.00	0.00	0.00
5,500.00	90.00	178.55	3,352.00	-2,441.45	-218.07	2,447.38	0.00	0.00	0.00
5,600.00	90.00	178.55	3,352.00	-2,541.42	-215.54	2,547.21	0.00	0.00	0.00
5,700.00	90.00	178.55	3,352.00	-2,641.39	-213.01	2,647.04	0.00	0.00	0.00
5,800.00	90.00	178.55	3,352.00	-2,741.36	-210.48	2,746.86	0.00	0.00	0.00
5,900.00	90.00	178.55	3,352.00	-2,841.33	-207.95	2,846.69	0.00	0.00	0.00
6,000.00	90.00	178.55	3,352.00	-2,941.29	-205.42	2,946.52	0.00	0.00	0.00
6,100.00	90.00	178.55	3,352.00	-3,041.26	-202.89	3,046.35	0.00	0.00	0.00
6,200.00	90.00	178.55	3,352.00	-3,141.23	-200.36	3,146.17	0.00	0.00	0.00
6,279.43	90.00	178.55	3,352.00	-3,220.64	-198.35	3,225.47	0.00	0.00	0.00
CONT HLD 90° Inc. TRN 2°/100'									
6,300.00	90.00	178.96	3,352.00	-3,241.20	-197.90	3,246.00	2.00	0.00	2.00
6,344.71	90.00	179.86	3,352.00	-3,285.91	-197.44	3,290.67	2.00	0.00	2.00
EOT CONT HLD 90° Inc.									
6,400.00	90.00	179.86	3,352.00	-3,341.20	-197.30	3,345.93	0.00	0.00	0.00
6,500.00	90.00	179.86	3,352.00	-3,441.20	-197.05	3,445.86	0.00	0.00	0.00
6,600.00	90.00	179.86	3,352.00	-3,541.20	-196.80	3,545.80	0.00	0.00	0.00
6,700.00	90.00	179.86	3,352.00	-3,641.20	-196.55	3,645.73	0.00	0.00	0.00
6,800.00	90.00	179.86	3,352.00	-3,741.20	-196.29	3,745.67	0.00	0.00	0.00
6,900.00	90.00	179.86	3,352.00	-3,841.19	-196.04	3,845.60	0.00	0.00	0.00
7,000.00	90.00	179.86	3,352.00	-3,941.19	-195.79	3,945.54	0.00	0.00	0.00

Database:	EDM 5000.15 Single User Db	Local Co-ordinate Reference:	Well Hamilton Federal Com #1H
Company:	Mack Energy	TVD Reference:	3863.7 + 13 @ 3876.70usft
Project:	Chaves County	MD Reference:	3863.7 + 13 @ 3876.70usft
Site:	Sec 15-T15S-R29E	North Reference:	Grid
Well:	Hamilton Federal Com #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1.8/100-150 Tan-12/100		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,100.00	90.00	179.86	3,352.00	-4,041.19	-195.54	4,045.47	0.00	0.00	0.00
7,200.00	90.00	179.86	3,352.00	-4,141.19	-195.29	4,145.41	0.00	0.00	0.00
7,300.00	90.00	179.86	3,352.00	-4,241.19	-195.03	4,245.34	0.00	0.00	0.00
7,400.00	90.00	179.86	3,352.00	-4,341.19	-194.78	4,345.28	0.00	0.00	0.00
7,500.00	90.00	179.86	3,352.00	-4,441.19	-194.53	4,445.21	0.00	0.00	0.00
7,600.00	90.00	179.86	3,352.00	-4,541.19	-194.28	4,545.15	0.00	0.00	0.00
7,700.00	90.00	179.86	3,352.00	-4,641.19	-194.03	4,645.08	0.00	0.00	0.00
7,800.00	90.00	179.86	3,352.00	-4,741.19	-193.77	4,745.02	0.00	0.00	0.00
7,900.00	90.00	179.86	3,352.00	-4,841.19	-193.52	4,844.96	0.00	0.00	0.00
8,000.00	90.00	179.86	3,352.00	-4,941.19	-193.27	4,944.89	0.00	0.00	0.00
8,100.00	90.00	179.86	3,352.00	-5,041.19	-193.02	5,044.83	0.00	0.00	0.00
8,200.00	90.00	179.86	3,352.00	-5,141.19	-192.76	5,144.76	0.00	0.00	0.00
8,300.00	90.00	179.86	3,352.00	-5,241.19	-192.51	5,244.70	0.00	0.00	0.00
8,400.00	90.00	179.86	3,352.00	-5,341.19	-192.26	5,344.63	0.00	0.00	0.00
8,500.00	90.00	179.86	3,352.00	-5,441.19	-192.01	5,444.57	0.00	0.00	0.00
8,600.00	90.00	179.86	3,352.00	-5,541.19	-191.76	5,544.50	0.00	0.00	0.00
8,678.14	90.00	179.86	3,352.00	-5,619.33	-191.56	5,622.59	0.00	0.00	0.00
LTP Hamilton Federal Com #1H									
8,700.00	90.00	179.86	3,352.00	-5,641.19	-191.50	5,644.44	0.00	0.00	0.00
8,777.11	90.00	179.86	3,352.00	-5,718.30	-191.31	5,721.50	0.00	0.00	0.00
TD at 8777.11 - BHL Hamilton Federal Com #1H									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BHL Hamilton Federal C - plan hits target center - Point	0.00	0.00	3,352.00	-5,718.30	-191.31	725,491.57	636,278.63	32.9939955	-104.0236733
FTP Hamilton Federal C - plan misses target center by 52.19usft at 3559.37usft MD (3313.46 TVD, -507.78 N, -240.11 E) - Point	0.00	0.00	3,352.00	-486.25	-267.94	730,723.62	636,202.00	33.0083765	-104.0238730
LTP Hamilton Federal C - plan misses target center by 0.08usft at 8678.14usft MD (3352.00 TVD, -5619.33 N, -191.56 E) - Point	0.00	0.00	3,352.00	-5,619.33	-191.64	725,590.54	636,278.30	32.9942675	-104.0236734

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
2,569.08	2,569.08	0.00	0.00	KOP BLD 8°/100'
3,256.58	3,155.75	-272.12	-138.65	EOB HLD 55° Inc. 150' TANG
3,406.58	3,241.79	-381.60	-194.43	CONT BLD&TRN 12°/100'
3,771.93	3,352.00	-713.93	-261.53	EOB&T HLD 90° Inc.
3,871.93	3,352.00	-813.91	-259.26	CONT HLD 90° Inc. TRN 2°/100'
3,879.43	3,352.00	-821.41	-259.08	EOT CONT HLD 90° Inc.
6,279.43	3,352.00	-3,220.64	-198.35	CONT HLD 90° Inc. TRN 2°/100'
6,344.71	3,352.00	-3,285.91	-197.44	EOT CONT HLD 90° Inc.
8,777.11	3,352.00	-5,718.30	-191.31	TD at 8777.11

PECOS DISTRICT
DRILLING OPERATIONS
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Mack Energy Corporation**
LEASE NO.:	**NMNM-0557563**
WELL NAME & NO.:	**Hamilton Federal Com 1H**
SURFACE HOLE FOOTAGE:	**0383' FSL & 0598' FWL**
BOTTOM HOLE FOOTAGE	**0001' FSL & 0330' FWL Sec. 22, T. 15 S., R 29 E.**
LOCATION:	**Section 15, T. 15 S., R 29 E., NMPM**
COUNTY:	**Chaves County, New Mexico**

Communitization Agreement

- The operator will submit a Communitization Agreement to the Roswell Field Office, 2909 West 2nd Street Roswell, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.

- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.

- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

A. DRILLING OPERATIONS REQUIREMENTS

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

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

☒ **Chaves and Roosevelt Counties**
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
During office hours call (575) 627-0272.
After office hours call (575) 627-0205.

1. **A Hydrogen Sulfide (H2S) Drilling Plan shall be activated prior to drilling out the surface shoe. As a result, the Hydrogen Sulfide area must 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.**

2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.

4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be 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.**

B. CASING

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.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

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.

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.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Medium Cave/Karst
Possibility of lost circulation in the Queen and San Andres formations.

1. The **13-3/8** inch surface casing shall be set at approximately **200** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt.**

    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 is to include the lead cement slurry.

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.

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

Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.

3. The minimum required fill of cement behind the **7 X 5-1/2** inch production casing is:

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

4. 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.

C. 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 53.

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi **(Operator will be installing a 3M system)**.

a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.

3. 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. 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).

   c. 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.

   d. The results of the test shall be reported to the appropriate BLM office.

   e. 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.**

   f. 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.

D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

E. 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.

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