

Form 3160-3  
(June 2015)

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

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

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM112269
1b. Type of Well: <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input checked="" type="checkbox"/> Other OTH		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator DEVON ENERGY PRODUCTION COMPANY LP		8. Lease Name and Well No. WYATT EARP 20-17 FED COM 621H
3a. Address 333 West Sheridan Avenue, Oklahoma City, OK 73102	3b. Phone No. (include area code) (800) 583-3866	9. API Well No. 3001547596
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface SWSW / 342 FSL / 266 FWL / LAT 32.196456 / LONG -104.220321 At proposed prod. zone NWNW / 20 FNL / 1310 FWL / LAT 32.224443 / LONG -104.216793		10. Field and Pool, or Exploratory PURPLE SAGE WOLFCAMP/PURPLE S / 11. Sec., T. R. M. or Blk. and Survey or Area SEC 20/T24S/R27E/NMP
14. Distance in miles and direction from nearest town or post office*		12. County or Parish EDDY
		13. State NM
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 266 feet	16. No of acres in lease 2080	17. Spacing Unit dedicated to this well 640.0
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 2900 feet	19. Proposed Depth 8960 feet / 19296 feet	20. BLM/BIA Bond No. in file FED: NMB000801
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3312 feet	22. Approximate date work will start* 08/03/2021	23. Estimated duration 45 days
24. Attachments		

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

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

25. Signature (Electronic Submission)	Name (Printed/Typed) ERIN WORKMAN / Ph: (800) 583-3866	Date 08/27/2019
Title Regulatory Compliance Professional		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575) 234-5959	Date 09/09/2020
Title Assistant Field Manager Lands & Minerals Office Carlsbad Field Office		

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

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

Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system

- Will require a directional survey with the C-104
- NSL Will require an administrative order for non-standard location prior to placing the well on production

(Continued on page 2)



Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string

KP 10/19/2020 GEO Review

\*(Instructions on page 2)

Approval Date: 09/09/2020

Entered - KMS NMOCD

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 RD., 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, New Mexico 87505

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

AMENDED REPORT

**WELL LOCATION AND ACREAGE DEDICATION PLAT**

API Number <b>3001547596</b>	Pool Code <b>98220</b>	Pool Name <b>PURPLE SAGE WOLFCAMP GAS</b>
Property Code <b>329720</b>	Property Name <b>WYATT EARP 20-17 FED COM</b>	Well Number <b>621H</b>
OGRID No. <b>6137</b>	Operator Name <b>DEVON ENERGY PRODUCTION COMPANY, L.P.</b>	Elevation <b>3312.0'</b>

**Surface Location**

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	20	24-S	27-E		342	SOUTH	266	WEST	EDDY

**Bottom Hole Location If Different From Surface**

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	17	24-S	27-E		20	NORTH	1310	WEST	EDDY

Dedicated Acres <b>640</b>	Joint or Infill	Consolidation Code	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**

WYATT EARP 20-17 FED COM 621H

ELEV: 3312.0'  
LAT: 32.196456  
LON: 104.220321  
N: 435223.51  
E: 576295.11

FIRST TAKE POINT

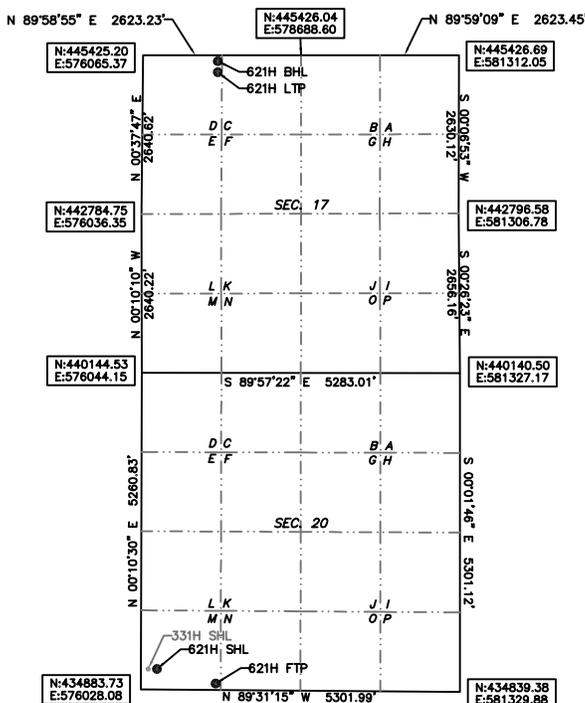
100' FSL 1310' FWL SEC. 20  
LAT: 32.195764  
LON: 104.216949  
N: 434972.77  
E: 577338.35

LAST TAKE POINT

100' FNL 1310' FWL SEC. 17  
LAT: 32.224223  
LON: 104.216796  
N: 445325.62  
E: 577374.36

BOTTOM OF HOLE

LAT: 32.224443  
LON: 104.216793  
N: 445405.62  
E: 577375.23



Note: All bearings recited herein are based on the New Mexico State Plane Coordinate System, NAD 83, New Mexico East Zone 3001, US Survey Feet, all distances are grid.

**OPERATOR CERTIFICATION**

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

Signature \_\_\_\_\_ Date \_\_\_\_\_

Printed Name \_\_\_\_\_

E-mail Address \_\_\_\_\_

**SURVEYOR CERTIFICATION**

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

05/2019

Date of Survey

Signature & Seal of Professional Surveyor



06/05/19

Certificate No. 22404 B.L. LAMAN

DRAWN BY: CM

Intent  As Drilled

API #									
Operator Name:					Property Name:				Well Number

Kick Off Point (KOP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
Latitude					Longitude				NAD

First Take Point (FTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
Latitude					Longitude				NAD

Last Take Point (LTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
Latitude					Longitude				NAD

Is this well the defining well for the Horizontal Spacing Unit?

Is this well an infill well?

If infill is yes please provide API if available, Operator Name and well number for Defining well for Horizontal Spacing Unit.

API #									
Operator Name:					Property Name:				Well 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

**GAS CAPTURE PLAN**

Date: 08/15/2019

Original

Devon & OGRID No.: Devon Energy Prod Co., LP (6137)

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

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

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

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

Well Name	API	Well Location (ULSTR)	Footages	Expected	Flared/Vented	Comments
Wyatt Earp 20-17 Fed Com 331H		Sec 20, T24S, R27E	342 FNL, 263 FWL			Huckleberry 29 CTB 2
Wyatt Earp 20-17 Fed Com 332H		Sec 29, T24S, R27E	514 FNL, 1995FEL			Huckleberry 29 CTB 2
Wyatt Earp 20-17 Fed Com 333H		Sec 20, T24S, R27E	364 FSL572.5 FEL			Huckleberry 29 CTB 2
Wyatt Earp 20-17 Fed Com 621H		Sec 20, T24S, R27E	342 FSL, 266 FWL			Huckleberry 29 CTB 2
Wyatt Earp 20-17 Fed Com 622H		Sec 29, T24S, R27E	514 FNL, 1965 FEL			Huckleberry 29 CTB 2
Wyatt Earp 20-17 Fed Com 623H		Sec 20, T24S, R27E	364 FSL, 542.5 FEL			Huckleberry 29 CTB 2
Wyatt Earp 20-17 Fed Com 733H		Sec 29, T24S, R27E	664 FNL, 1995 FEL			Huckleberry 29 CTB 2
Wyatt Earp 20-17 Fed Com 734H		Sec 29, T24S, R27E	664 FNL, 1965 FEL			Huckleberry 29 CTB 2

**Gathering System and Pipeline Notification**

Well(s) will be connected to a production facility after flowback operations are complete, if DCP system is in place. The gas produced from production facility is dedicated to DCP and will be connected to DCP low/high pressure gathering system located in Eddy County, New Mexico. It will require 10,560 of pipeline to connect the facility to low/high pressure gathering system. Devon provides (periodically) to DCP a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Devon and DCP have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at DCP Processing Plant located NENW in Sec.6, Twn. 24S, Rng. 29E, Eddy County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

**Flowback Strategy**

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



**2. Casing Program (Primary Design)**

Hole Size	Casing Interval		Csg. Size	Wt (PPF)	Grade	Conn	Min SF Collapse	Min SF Burst	Min SF Tension
	From	To							
17 1/2	0	213 TVD	13 3/8	48.0	H40	STC	1.125	1.25	1.6
9 7/8	0	8595 TVD	7 5/8	29.7	P110	Flushmax III	1.125	1.25	1.6
6 3/4	0	TD	5 1/2	20.0	P110	Vam SG	1.125	1.25	1.6
BLM Minimum Safety Factor							1.125	1	1.6 Dry 1.8 Wet

- All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 IILB.1.h Must have table for contingency casing.
- Rustler top will be validated via drilling parameters (i.e. reduction in ROP) and surface casing setting depth revised accordingly if needed.
- A variance is requested for collapse rating on intermediate casing. Operator will keep pipe full while running casing.
- Int casing shoe will be selected based on drilling data/gamma, setting depth with be revised accordingly if needed.
- A variance is requested to wave the centralizer requirement for the Intermediate casing and production casing.
- A variance is requested to set intermediate casing in the curve if hole conditions dictate that a higher shoe strength is required.

**Casing Program (Alternative Design)**

Hole Size	Casing Interval		Csg. Size	Wt (PPF)	Grade	Conn	Min SF Collapse	Min SF Burst	Min SF Tension
	From	To							
17 1/2	0	213 TVD	13 3/8	48.0	H40	STC	1.125	1.25	1.6
9 7/8	0	8595 TVD	8 5/8	32.0	P110	TLW	1.125	1.25	1.6
7 7/8	0	TD	5 1/2	17.0	P110	BTC	1.125	1.25	1.6
BLM Minimum Safety Factor							1.125	1	1.6 Dry 1.8 Wet

- All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 IILB.1.h Must have table for contingency casing.
- Rustler top will be validated via drilling parameters (i.e. reduction in ROP) and surface casing setting depth revised accordingly if needed.
- A variance is requested for collapse rating on intermediate casing. Operator will keep pipe full while running casing.
- Int casing shoe will be selected based on drilling data/gamma, setting depth with be revised accordingly if needed.
- A variance is requested to wave the centralizer requirement for the Intermediate casing and production casing.
- Variance requested to drill 10.625" hole instead of 9.875" for intermediate 1, the 8.625" connection will change from TLW to BTC.
- A variance is requested to set intermediate casing in the curve if hole conditions dictate that a higher shoe strength is required.

Wyatt Earp 20-17 Fed Com 621H

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

**3. Cementing Program (Primary Design)**

Casing	# Skis	TOC	Wt. (lb/gal)	Yld (ft <sup>3</sup> /sack)	Slurry Description
Surface	193	Surf	13.2	1.44	Lead: Class C Cement + additives
Int 1	411	Surf	9	3.27	Lead: Class C Cement + additives
	783	4000' above shoe	13.2	1.44	Tail: Class H / C + additives
Int 1 Two Stage w/ DV @ TVD of Delaware	665	Surf	9	3.27	1st stage Lead: Class C Cement + additives
	93	500' above shoe	13.2	1.44	1st stage Tail: Class H / C + additives
	159	Surf	9	3.27	2nd stage Lead: Class C Cement + additives
	93	500' above DV	13.2	1.44	2nd stage Tail: Class H / C + additives
Int 1 Intermediate Squeeze	As Needed	Surf	9	1.44	Squeeze Lead: Class C Cement + additives
	411	Surf	9	3.27	Lead: Class C Cement + additives
	783	4000' above shoe	13.2	1.44	Tail: Class H / C + additives
Production	63	6495	9.0	3.3	Lead: Class H / C + additives
	689	8495	13.2	1.4	Tail: Class H / C + additives

If a DV tool is ran the depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. Slurry weights will be adjusted based on estimated fracture gradient of the formation. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. If cement is not returned to surface during the primary cement job on the surface casing string, a planned top job will be conducted immediately after completion of the primary job.

Casing String	% Excess
Surface	50%
Intermediate 1	30%
Intermediate 1 (Two Stage)	25%
Prod	10%

**3. Cementing Program (Alternative Design)**

Casing	# Sks	TOC	Wt. ppg	Yld (ft <sup>3</sup> /sack)	Slurry Description
Surface	193	Surf	13.2	1.44	Lead: Class C Cement + additives
Int 1	251	Surf	9	3.27	Lead: Class C Cement + additives
	465	4000' above shoe	13.2	1.44	Tail: Class H / C + additives
Int 1 Two Stage w DV @ ~4500	390	Surf	9	3.27	1st stage Lead: Class C Cement + additives
	55	500' above shoe	13.2	1.44	1st stage Tail: Class H / C + additives
	103	Surf	9	3.27	2nd stage Lead: Class C Cement + additives
	55	500' above DV	13.2	1.44	2nd stage Tail: Class H / C + additives
Int 1 Intermediate Squeeze	As Needed	Surf	13.2	1.44	Squeeze Lead: Class C Cement + additives
	251	Surf	9	3.27	Lead: Class C Cement + additives
	465	4000' above shoe	13.2	1.44	Tail: Class H / C + additives
Int 1 (10.625" Hole Size)	397	Surf	9	3.27	Lead: Class C Cement + additives
	768	4000' above shoe	13.2	1.44	Tail: Class H / C + additives
Production	117	6495	9.0	3.3	Lead: Class H / C + additives
	1430	8495	13.2	1.4	Tail: Class H / C + additives

If a DV tool is ran the depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. Slurry weights will be adjusted based on estimated fracture gradient of the formation. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. If cement is not returned to surface during the primary cement job on the surface casing string, a planned top job will be conducted immediately after completion of the primary job.

Casing String	% Excess
Surface	50%
Intermediate 1	30%
Intermediate 1 (Two Stage)	25%
Prod	10%

**4. Pressure Control Equipment (Three String Design)**

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
Int 1	13-58"	5M	Annular	X	50% of rated working pressure
			Blind Ram	X	5M
			Pipe Ram		
			Double Ram	X	
			Other*		
Production	13-5/8"	5M	Annular (5M)	X	50% of rated working pressure
			Blind Ram	X	5M
			Pipe Ram		
			Double Ram	X	
			Other*		
			Annular (5M)		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other*		
N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.				
Y	A variance is requested to run a 5 M annular on a 10M system				

**5. Mud Program (Three String Design)**

Section	Type	Weight (ppg)
Surface	FW Gel	8.5-9
Intermediate	DBE / Cut Brine	10-10.5
Production	OBM	10-10.5

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

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring
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**6. Logging and Testing Procedures**

Logging, Coring and Testing	
X	Will run GR/CNL from TD to surface (horizontal well - vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No logs are planned based on well control or offset log information.
	Drill stem test? If yes, explain.
	Coring? If yes, explain.

Additional logs planned	Interval
	Resistivity
	Density
X	CBL
X	Mud log
	PEX
	Int. shoe to KOP
	Int. shoe to KOP
	Production casing
	Intermediate shoe to TD

**7. Drilling Conditions**

Condition	Specify what type and where?
BH pressure at deepest TVD	4892
Abnormal temperature	No

Mitigation measure for abnormal conditions. Describe. Lost circulation material/sweeps/mud scavengers.

Hydrogen Sulfide (H<sub>2</sub>S) monitors will be installed prior to drilling out the surface shoe. If H<sub>2</sub>S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered measured values and formations will be provided to the BLM.

N	H <sub>2</sub> S is present
Y	H <sub>2</sub> S plan attached.

**8. Other facets of operation**

Is this a walking operation? Potentially

- 1 If operator elects, drilling rig will batch drill the surface holes and run/cement surface casing; walking the rig to next wells on the pad.
- 2 The drilling rig will then batch drill the intermediate sections and run/cement intermediate casing; the wellbore will be isolated with a blind flange and pressure gauge installed for monitoring the well before walking to the next well.
- 3 The drilling rig will then batch drill the production hole sections on the wells with OBM, run/cement production casing, and install TA caps or tubing heads for completions.

NOTE: During batch operations the drilling rig will be moved from well to well however, it will not be removed from the pad until all wells have production casing run/cemented.

Will be pre-setting casing? Potentially

- 1 Spudder rig will move in and batch drill surface hole.
  - a. Rig will utilize fresh water based mud to drill surface hole to TD. Solids control will be handled entirely on a closed loop basis.,
- 2 After drilling the surface hole section, the spudder rig will run casing and cement following all of the applicable rules and regulations (OnShore Order 2, all COAs and NMOCD regulations).
- 3 The wellhead will be installed and tested once the surface casing is cut off and the WOC time has been reached.
- 4 A blind flange with the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with a pressure gauge installed on the wellhead.
- 5 Spudder rig operations is expected to take 4-5 days per well on a multi-well pa.
- 6 The NMOCD will be contacted and notified 24 hours prior to commencing spudder rig operations.
- 7 Drilling operations will be performed with drilling rig. A that time an approved BOP stack will be nipped up and tested on the wellhead before drilling operations commences on each well.
  - a. The NMOCD will be contacted / notified 24 hours before the drilling rig moves back on to the pad with the pre-set surface casing.

Attachments

X Directional Plan  
           Other, describe

# **WCDSC Permian NM**

**Eddy County (NAD 83 NM Eastern)**

**Sec 20-T24S-R27E**

**Wyatt Earp 20-17 Fed Com 621H**

**Wellbore #1**

**Plan: Permit Plan 1**

## **Standard Planning Report - Geographic**

**08 July, 2019**

Planning Report - Geographic

<b>Database:</b>	EDM r5000.141_Prod US	<b>Local Co-ordinate Reference:</b>	Well Wyatt Earp 20-17 Fed Com 621H
<b>Company:</b>	WCDCS Permian NM	<b>TVD Reference:</b>	RKB @ 3337.00ft
<b>Project:</b>	Eddy County (NAD 83 NM Eastern)	<b>MD Reference:</b>	RKB @ 3337.00ft
<b>Site:</b>	Sec 20-T24S-R27E	<b>North Reference:</b>	Grid
<b>Well:</b>	Wyatt Earp 20-17 Fed Com 621H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permit Plan 1		

<b>Project</b>	Eddy County (NAD 83 NM Eastern)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	New Mexico Eastern Zone		

<b>Site</b>	Sec 20-T24S-R27E				
<b>Site Position:</b>	<b>Northing:</b>	440,144.53 usft	<b>Latitude:</b>	32.209984	
<b>From:</b> Map	<b>Easting:</b>	576,044.15 usft	<b>Longitude:</b>	-104.221116	
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.06 °

<b>Well</b>	Wyatt Earp 20-17 Fed Com 621H					
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	435,223.51 usft	<b>Latitude:</b>	32.196456
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	576,295.11 usft	<b>Longitude:</b>	-104.220321
<b>Position Uncertainty</b>		0.50 ft	<b>Wellhead Elevation:</b>		<b>Ground Level:</b>	3,312.00 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination</b>	<b>Dip Angle</b>	<b>Field Strength</b>
	IGRF2015	7/2/2019	(°)	(°)	(nT)
			7.03	59.91	47,643.98178638

<b>Design</b>	Permit Plan 1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>
	(ft)	(ft)	(ft)	(°)
	0.00	0.00	0.00	6.06

<b>Plan Survey Tool Program</b>	<b>Date</b>	7/8/2019		
<b>Depth From</b>	<b>Depth To</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
(ft)	(ft)			
1	0.00	19,296.36 Permit Plan 1 (Wellbore #1)	MWD+HDGM	
			OWSG MWD + HDGM	

<b>Plan Sections</b>										
<b>Measured</b>	<b>Inclination</b>	<b>Azimuth</b>	<b>Vertical</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Dogleg</b>	<b>Build</b>	<b>Turn</b>	<b>TFO</b>	<b>Target</b>
<b>Depth</b>	<b>(°)</b>	<b>(°)</b>	<b>Depth</b>	<b>(ft)</b>	<b>(ft)</b>	<b>Rate</b>	<b>Rate</b>	<b>Rate</b>	<b>(°)</b>	
(ft)			(ft)			(°/100usft)	(°/100usft)	(°/100usft)		
0.00	0.00	0.00	0.00	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	
3,219.28	12.19	105.63	3,210.09	-34.81	124.47	1.00	1.00	0.00	105.63	
7,332.23	12.19	105.63	7,230.27	-268.79	961.02	0.00	0.00	0.00	0.00	
8,145.08	0.00	0.00	8,037.00	-292.00	1,044.00	1.50	-1.50	0.00	180.00	
8,495.12	0.00	0.00	8,387.04	-292.00	1,044.00	0.00	0.00	0.00	0.00	
9,395.12	90.00	0.20	8,960.00	280.96	1,045.98	10.00	10.00	0.00	0.20	PBHL - Wyatt Earp 2C
19,296.36	90.00	0.20	8,960.00	10,182.13	1,080.12	0.00	0.00	0.00	0.00	PBHL - Wyatt Earp 2C

Planning Report - Geographic

<b>Database:</b>	EDM r5000.141_Prod US	<b>Local Co-ordinate Reference:</b>	Well Wyatt Earp 20-17 Fed Com 621H
<b>Company:</b>	WCDSO Permian NM	<b>TVD Reference:</b>	RKB @ 3337.00ft
<b>Project:</b>	Eddy County (NAD 83 NM Eastern)	<b>MD Reference:</b>	RKB @ 3337.00ft
<b>Site:</b>	Sec 20-T24S-R27E	<b>North Reference:</b>	Grid
<b>Well:</b>	Wyatt Earp 20-17 Fed Com 621H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permit Plan 1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
100.00	0.00	0.00	100.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
200.00	0.00	0.00	200.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
300.00	0.00	0.00	300.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
400.00	0.00	0.00	400.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
500.00	0.00	0.00	500.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
600.00	0.00	0.00	600.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
700.00	0.00	0.00	700.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
800.00	0.00	0.00	800.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
900.00	0.00	0.00	900.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
1,700.00	0.00	0.00	1,700.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
1,900.00	0.00	0.00	1,900.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	435,223.51	576,295.11	32.196456	-104.220321	
2,100.00	1.00	105.63	2,099.99	-0.24	0.84	435,223.27	576,295.95	32.196456	-104.220318	
2,200.00	2.00	105.63	2,199.96	-0.94	3.36	435,222.57	576,298.47	32.196454	-104.220310	
2,300.00	3.00	105.63	2,299.86	-2.12	7.56	435,221.39	576,302.67	32.196450	-104.220297	
2,400.00	4.00	105.63	2,399.68	-3.76	13.44	435,219.75	576,308.55	32.196446	-104.220278	
2,500.00	5.00	105.63	2,499.37	-5.87	21.00	435,217.64	576,316.11	32.196440	-104.220253	
2,600.00	6.00	105.63	2,598.90	-8.45	30.23	435,215.06	576,325.34	32.196433	-104.220223	
2,700.00	7.00	105.63	2,698.26	-11.50	41.13	435,212.01	576,336.24	32.196425	-104.220188	
2,800.00	8.00	105.63	2,797.40	-15.02	53.70	435,208.49	576,348.81	32.196415	-104.220148	
2,900.00	9.00	105.63	2,896.30	-19.00	67.93	435,204.51	576,363.05	32.196404	-104.220102	
3,000.00	10.00	105.63	2,994.93	-23.45	83.83	435,200.06	576,378.94	32.196392	-104.220050	
3,100.00	11.00	105.63	3,093.26	-28.35	101.38	435,195.16	576,396.49	32.196378	-104.219994	
3,200.00	12.00	105.63	3,191.25	-33.72	120.58	435,189.79	576,415.69	32.196363	-104.219931	
3,219.28	12.19	105.63	3,210.09	-34.81	124.47	435,188.70	576,419.58	32.196360	-104.219919	
3,300.00	12.19	105.63	3,289.00	-39.40	140.89	435,184.10	576,436.00	32.196348	-104.219866	
3,400.00	12.19	105.63	3,386.74	-45.09	161.23	435,178.42	576,456.34	32.196332	-104.219800	
3,500.00	12.19	105.63	3,484.49	-50.78	181.57	435,172.73	576,476.68	32.196316	-104.219734	
3,600.00	12.19	105.63	3,582.23	-56.47	201.90	435,167.04	576,497.02	32.196300	-104.219669	
3,700.00	12.19	105.63	3,679.97	-62.16	222.24	435,161.35	576,517.36	32.196285	-104.219603	
3,800.00	12.19	105.63	3,777.72	-67.85	242.58	435,155.66	576,537.70	32.196269	-104.219537	
3,900.00	12.19	105.63	3,875.46	-73.54	262.92	435,149.97	576,558.04	32.196253	-104.219471	
4,000.00	12.19	105.63	3,973.21	-79.23	283.26	435,144.28	576,578.38	32.196238	-104.219406	
4,100.00	12.19	105.63	4,070.95	-84.92	303.60	435,138.59	576,598.71	32.196222	-104.219340	
4,200.00	12.19	105.63	4,168.70	-90.60	323.94	435,132.91	576,619.05	32.196206	-104.219274	
4,300.00	12.19	105.63	4,266.44	-96.29	344.28	435,127.22	576,639.39	32.196191	-104.219208	
4,400.00	12.19	105.63	4,364.18	-101.98	364.62	435,121.53	576,659.73	32.196175	-104.219143	
4,500.00	12.19	105.63	4,461.93	-107.67	384.96	435,115.84	576,680.07	32.196159	-104.219077	
4,600.00	12.19	105.63	4,559.67	-113.36	405.30	435,110.15	576,700.41	32.196144	-104.219011	
4,700.00	12.19	105.63	4,657.42	-119.05	425.64	435,104.46	576,720.75	32.196128	-104.218946	
4,800.00	12.19	105.63	4,755.16	-124.74	445.98	435,098.77	576,741.09	32.196112	-104.218880	
4,900.00	12.19	105.63	4,852.91	-130.43	466.32	435,093.08	576,761.43	32.196096	-104.218814	
5,000.00	12.19	105.63	4,950.65	-136.12	486.66	435,087.39	576,781.77	32.196081	-104.218748	
5,100.00	12.19	105.63	5,048.39	-141.80	507.00	435,081.71	576,802.11	32.196065	-104.218683	
5,200.00	12.19	105.63	5,146.14	-147.49	527.34	435,076.02	576,822.45	32.196049	-104.218617	
5,300.00	12.19	105.63	5,243.88	-153.18	547.68	435,070.33	576,842.79	32.196034	-104.218551	

Planning Report - Geographic

<b>Database:</b>	EDM r5000.141_Prod US	<b>Local Co-ordinate Reference:</b>	Well Wyatt Earp 20-17 Fed Com 621H
<b>Company:</b>	WCDCS Permian NM	<b>TVD Reference:</b>	RKB @ 3337.00ft
<b>Project:</b>	Eddy County (NAD 83 NM Eastern)	<b>MD Reference:</b>	RKB @ 3337.00ft
<b>Site:</b>	Sec 20-T24S-R27E	<b>North Reference:</b>	Grid
<b>Well:</b>	Wyatt Earp 20-17 Fed Com 621H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permit Plan 1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,400.00	12.19	105.63	5,341.63	-158.87	568.02	435,064.64	576,863.13	32.196018	-104.218485	
5,500.00	12.19	105.63	5,439.37	-164.56	588.36	435,058.95	576,883.47	32.196002	-104.218420	
5,600.00	12.19	105.63	5,537.12	-170.25	608.69	435,053.26	576,903.81	32.195987	-104.218354	
5,700.00	12.19	105.63	5,634.86	-175.94	629.03	435,047.57	576,924.15	32.195971	-104.218288	
5,800.00	12.19	105.63	5,732.60	-181.63	649.37	435,041.88	576,944.49	32.195955	-104.218222	
5,900.00	12.19	105.63	5,830.35	-187.31	669.71	435,036.20	576,964.82	32.195939	-104.218157	
6,000.00	12.19	105.63	5,928.09	-193.00	690.05	435,030.51	576,985.16	32.195924	-104.218091	
6,100.00	12.19	105.63	6,025.84	-198.69	710.39	435,024.82	577,005.50	32.195908	-104.218025	
6,200.00	12.19	105.63	6,123.58	-204.38	730.73	435,019.13	577,025.84	32.195892	-104.217960	
6,300.00	12.19	105.63	6,221.33	-210.07	751.07	435,013.44	577,046.18	32.195877	-104.217894	
6,400.00	12.19	105.63	6,319.07	-215.76	771.41	435,007.75	577,066.52	32.195861	-104.217828	
6,500.00	12.19	105.63	6,416.81	-221.45	791.75	435,002.06	577,086.86	32.195845	-104.217762	
6,600.00	12.19	105.63	6,514.56	-227.14	812.09	434,996.37	577,107.20	32.195830	-104.217697	
6,700.00	12.19	105.63	6,612.30	-232.83	832.43	434,990.69	577,127.54	32.195814	-104.217631	
6,800.00	12.19	105.63	6,710.05	-238.51	852.77	434,985.00	577,147.88	32.195798	-104.217565	
6,900.00	12.19	105.63	6,807.79	-244.20	873.11	434,979.31	577,168.22	32.195782	-104.217499	
7,000.00	12.19	105.63	6,905.54	-249.89	893.45	434,973.62	577,188.56	32.195767	-104.217434	
7,100.00	12.19	105.63	7,003.28	-255.58	913.79	434,967.93	577,208.90	32.195751	-104.217368	
7,200.00	12.19	105.63	7,101.02	-261.27	934.13	434,962.24	577,229.24	32.195735	-104.217302	
7,300.00	12.19	105.63	7,198.77	-266.96	954.47	434,956.55	577,249.58	32.195720	-104.217236	
7,332.23	12.19	105.63	7,230.27	-268.79	961.02	434,954.72	577,256.13	32.195715	-104.217215	
7,400.00	11.18	105.63	7,296.64	-272.49	974.24	434,951.02	577,269.35	32.195704	-104.217173	
7,500.00	9.68	105.63	7,394.98	-277.36	991.67	434,946.15	577,286.78	32.195691	-104.217116	
7,600.00	8.18	105.63	7,493.77	-281.54	1,006.61	434,941.97	577,301.72	32.195679	-104.217068	
7,700.00	6.68	105.63	7,592.93	-285.02	1,019.06	434,938.49	577,314.17	32.195670	-104.217028	
7,800.00	5.18	105.63	7,692.39	-287.80	1,029.00	434,935.71	577,324.11	32.195662	-104.216996	
7,900.00	3.68	105.63	7,792.09	-289.88	1,036.43	434,933.63	577,331.54	32.195656	-104.216972	
8,000.00	2.18	105.63	7,891.95	-291.26	1,041.35	434,932.25	577,336.46	32.195653	-104.216956	
8,100.00	0.68	105.63	7,991.92	-291.93	1,043.74	434,931.58	577,338.85	32.195651	-104.216948	
8,145.08	0.00	0.00	8,037.00	-292.00	1,044.00	434,931.51	577,339.11	32.195651	-104.216947	
8,200.00	0.00	0.00	8,091.92	-292.00	1,044.00	434,931.51	577,339.11	32.195651	-104.216947	
8,300.00	0.00	0.00	8,191.92	-292.00	1,044.00	434,931.51	577,339.11	32.195651	-104.216947	
8,400.00	0.00	0.00	8,291.92	-292.00	1,044.00	434,931.51	577,339.11	32.195651	-104.216947	
8,495.10	0.00	0.00	8,387.02	-292.00	1,044.00	434,931.51	577,339.11	32.195651	-104.216947	
<b>KOP @ 8495' MD, 50' FSL, 1310' FWL</b>										
8,495.12	0.00	0.00	8,387.04	-292.00	1,044.00	434,931.51	577,339.11	32.195651	-104.216947	
8,500.00	0.49	0.20	8,391.92	-291.98	1,044.00	434,931.53	577,339.11	32.195651	-104.216947	
8,600.00	10.49	0.20	8,491.34	-282.43	1,044.03	434,941.08	577,339.14	32.195677	-104.216947	
8,700.00	20.49	0.20	8,587.58	-255.76	1,044.13	434,967.75	577,339.24	32.195750	-104.216947	
8,736.00	24.09	0.20	8,620.89	-242.11	1,044.17	434,981.40	577,339.28	32.195788	-104.216946	
<b>FTP @ 8736' MD, 100' FSL, 1310' FWL</b>										
8,800.00	30.49	0.20	8,677.73	-212.78	1,044.27	435,010.73	577,339.38	32.195868	-104.216946	
8,900.00	40.49	0.20	8,759.06	-154.80	1,044.47	435,068.71	577,339.58	32.196028	-104.216945	
9,000.00	50.49	0.20	8,829.07	-83.58	1,044.72	435,139.93	577,339.83	32.196223	-104.216944	
9,100.00	60.49	0.20	8,885.66	-1.29	1,045.00	435,222.22	577,340.11	32.196450	-104.216943	
9,200.00	70.49	0.20	8,927.09	89.58	1,045.32	435,313.09	577,340.43	32.196699	-104.216942	
9,300.00	80.49	0.20	8,952.12	186.27	1,045.65	435,409.78	577,340.76	32.196965	-104.216940	
9,395.12	90.00	0.20	8,960.00	280.96	1,045.98	435,504.46	577,341.09	32.197226	-104.216939	
9,400.00	90.00	0.20	8,960.00	285.83	1,045.99	435,509.34	577,341.10	32.197239	-104.216939	
9,500.00	90.00	0.20	8,960.00	385.83	1,046.34	435,609.34	577,341.45	32.197514	-104.216937	
9,600.00	90.00	0.20	8,960.00	485.83	1,046.68	435,709.34	577,341.79	32.197789	-104.216936	
9,700.00	90.00	0.20	8,960.00	585.83	1,047.03	435,809.34	577,342.14	32.198064	-104.216934	
9,800.00	90.00	0.20	8,960.00	685.83	1,047.37	435,909.34	577,342.48	32.198339	-104.216933	
9,900.00	90.00	0.20	8,960.00	785.83	1,047.72	436,009.34	577,342.83	32.198613	-104.216931	

Planning Report - Geographic

<b>Database:</b>	EDM r5000.141_Prod US	<b>Local Co-ordinate Reference:</b>	Well Wyatt Earp 20-17 Fed Com 621H
<b>Company:</b>	WCDCS Permian NM	<b>TVD Reference:</b>	RKB @ 3337.00ft
<b>Project:</b>	Eddy County (NAD 83 NM Eastern)	<b>MD Reference:</b>	RKB @ 3337.00ft
<b>Site:</b>	Sec 20-T24S-R27E	<b>North Reference:</b>	Grid
<b>Well:</b>	Wyatt Earp 20-17 Fed Com 621H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permit Plan 1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
10,000.00	90.00	0.20	8,960.00	885.83	1,048.06	436,109.34	577,343.17	32.198888	-104.216930	
10,100.00	90.00	0.20	8,960.00	985.83	1,048.41	436,209.34	577,343.52	32.199163	-104.216928	
10,200.00	90.00	0.20	8,960.00	1,085.83	1,048.75	436,309.34	577,343.86	32.199438	-104.216927	
10,300.00	90.00	0.20	8,960.00	1,185.83	1,049.10	436,409.34	577,344.21	32.199713	-104.216925	
10,400.00	90.00	0.20	8,960.00	1,285.83	1,049.44	436,509.33	577,344.55	32.199988	-104.216924	
10,500.00	90.00	0.20	8,960.00	1,385.83	1,049.79	436,609.33	577,344.90	32.200263	-104.216923	
10,600.00	90.00	0.20	8,960.00	1,485.83	1,050.13	436,709.33	577,345.24	32.200538	-104.216921	
10,700.00	90.00	0.20	8,960.00	1,585.83	1,050.48	436,809.33	577,345.59	32.200813	-104.216920	
10,800.00	90.00	0.20	8,960.00	1,685.83	1,050.82	436,909.33	577,345.93	32.201087	-104.216918	
10,900.00	90.00	0.20	8,960.00	1,785.82	1,051.17	437,009.33	577,346.28	32.201362	-104.216917	
11,000.00	90.00	0.20	8,960.00	1,885.82	1,051.51	437,109.33	577,346.62	32.201637	-104.216915	
11,100.00	90.00	0.20	8,960.00	1,985.82	1,051.86	437,209.33	577,346.97	32.201912	-104.216914	
11,200.00	90.00	0.20	8,960.00	2,085.82	1,052.20	437,309.33	577,347.31	32.202187	-104.216912	
11,300.00	90.00	0.20	8,960.00	2,185.82	1,052.55	437,409.33	577,347.66	32.202462	-104.216911	
11,400.00	90.00	0.20	8,960.00	2,285.82	1,052.89	437,509.33	577,348.00	32.202737	-104.216909	
11,500.00	90.00	0.20	8,960.00	2,385.82	1,053.24	437,609.33	577,348.35	32.203012	-104.216908	
11,600.00	90.00	0.20	8,960.00	2,485.82	1,053.58	437,709.33	577,348.69	32.203287	-104.216906	
11,700.00	90.00	0.20	8,960.00	2,585.82	1,053.92	437,809.32	577,349.04	32.203561	-104.216905	
11,800.00	90.00	0.20	8,960.00	2,685.82	1,054.27	437,909.32	577,349.38	32.203836	-104.216903	
11,900.00	90.00	0.20	8,960.00	2,785.82	1,054.61	438,009.32	577,349.73	32.204111	-104.216902	
12,000.00	90.00	0.20	8,960.00	2,885.82	1,054.96	438,109.32	577,350.07	32.204386	-104.216901	
12,100.00	90.00	0.20	8,960.00	2,985.82	1,055.30	438,209.32	577,350.42	32.204661	-104.216899	
12,200.00	90.00	0.20	8,960.00	3,085.82	1,055.65	438,309.32	577,350.76	32.204936	-104.216898	
12,300.00	90.00	0.20	8,960.00	3,185.82	1,055.99	438,409.32	577,351.10	32.205211	-104.216896	
12,400.00	90.00	0.20	8,960.00	3,285.82	1,056.34	438,509.32	577,351.45	32.205486	-104.216895	
12,500.00	90.00	0.20	8,960.00	3,385.82	1,056.68	438,609.32	577,351.79	32.205760	-104.216893	
12,600.00	90.00	0.20	8,960.00	3,485.81	1,057.03	438,709.32	577,352.14	32.206035	-104.216892	
12,700.00	90.00	0.20	8,960.00	3,585.81	1,057.37	438,809.32	577,352.48	32.206310	-104.216890	
12,800.00	90.00	0.20	8,960.00	3,685.81	1,057.72	438,909.32	577,352.83	32.206585	-104.216889	
12,900.00	90.00	0.20	8,960.00	3,785.81	1,058.06	439,009.31	577,353.17	32.206860	-104.216887	
13,000.00	90.00	0.20	8,960.00	3,885.81	1,058.41	439,109.31	577,353.52	32.207135	-104.216886	
13,100.00	90.00	0.20	8,960.00	3,985.81	1,058.75	439,209.31	577,353.86	32.207410	-104.216884	
13,200.00	90.00	0.20	8,960.00	4,085.81	1,059.10	439,309.31	577,354.21	32.207685	-104.216883	
13,300.00	90.00	0.20	8,960.00	4,185.81	1,059.44	439,409.31	577,354.55	32.207960	-104.216882	
13,400.00	90.00	0.20	8,960.00	4,285.81	1,059.79	439,509.31	577,354.90	32.208234	-104.216880	
13,500.00	90.00	0.20	8,960.00	4,385.81	1,060.13	439,609.31	577,355.24	32.208509	-104.216879	
13,600.00	90.00	0.20	8,960.00	4,485.81	1,060.48	439,709.31	577,355.59	32.208784	-104.216877	
13,700.00	90.00	0.20	8,960.00	4,585.81	1,060.82	439,809.31	577,355.93	32.209059	-104.216876	
13,800.00	90.00	0.20	8,960.00	4,685.81	1,061.17	439,909.31	577,356.28	32.209334	-104.216874	
13,900.00	90.00	0.20	8,960.00	4,785.81	1,061.51	440,009.31	577,356.62	32.209609	-104.216873	
14,000.00	90.00	0.20	8,960.00	4,885.81	1,061.86	440,109.31	577,356.97	32.209884	-104.216871	
14,032.00	90.00	0.20	8,960.00	4,917.81	1,061.97	440,141.31	577,357.08	32.209972	-104.216871	
<b>Cross section @ 14032' MD, 0' FSL, 1310' FWL</b>										
14,100.00	90.00	0.20	8,960.00	4,985.81	1,062.20	440,209.31	577,357.31	32.210159	-104.216870	
14,200.00	90.00	0.20	8,960.00	5,085.81	1,062.55	440,309.30	577,357.66	32.210434	-104.216868	
14,300.00	90.00	0.20	8,960.00	5,185.80	1,062.89	440,409.30	577,358.00	32.210708	-104.216867	
14,400.00	90.00	0.20	8,960.00	5,285.80	1,063.24	440,509.30	577,358.35	32.210983	-104.216865	
14,500.00	90.00	0.20	8,960.00	5,385.80	1,063.58	440,609.30	577,358.69	32.211258	-104.216864	
14,600.00	90.00	0.20	8,960.00	5,485.80	1,063.93	440,709.30	577,359.04	32.211533	-104.216862	
14,700.00	90.00	0.20	8,960.00	5,585.80	1,064.27	440,809.30	577,359.38	32.211808	-104.216861	
14,800.00	90.00	0.20	8,960.00	5,685.80	1,064.62	440,909.30	577,359.73	32.212083	-104.216860	
14,900.00	90.00	0.20	8,960.00	5,785.80	1,064.96	441,009.30	577,360.07	32.212358	-104.216858	
15,000.00	90.00	0.20	8,960.00	5,885.80	1,065.31	441,109.30	577,360.42	32.212633	-104.216857	
15,100.00	90.00	0.20	8,960.00	5,985.80	1,065.65	441,209.30	577,360.76	32.212908	-104.216855	

Planning Report - Geographic

<b>Database:</b>	EDM r5000.141_Prod US	<b>Local Co-ordinate Reference:</b>	Well Wyatt Earp 20-17 Fed Com 621H
<b>Company:</b>	WCDCS Permian NM	<b>TVD Reference:</b>	RKB @ 3337.00ft
<b>Project:</b>	Eddy County (NAD 83 NM Eastern)	<b>MD Reference:</b>	RKB @ 3337.00ft
<b>Site:</b>	Sec 20-T24S-R27E	<b>North Reference:</b>	Grid
<b>Well:</b>	Wyatt Earp 20-17 Fed Com 621H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permit Plan 1		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
15,200.00	90.00	0.20	8,960.00	6,085.80	1,066.00	441,309.30	577,361.11	32.213182	-104.216854	
15,300.00	90.00	0.20	8,960.00	6,185.80	1,066.34	441,409.30	577,361.45	32.213457	-104.216852	
15,400.00	90.00	0.20	8,960.00	6,285.80	1,066.68	441,509.30	577,361.80	32.213732	-104.216851	
15,500.00	90.00	0.20	8,960.00	6,385.80	1,067.03	441,609.29	577,362.14	32.214007	-104.216849	
15,600.00	90.00	0.20	8,960.00	6,485.80	1,067.37	441,709.29	577,362.49	32.214282	-104.216848	
15,700.00	90.00	0.20	8,960.00	6,585.80	1,067.72	441,809.29	577,362.83	32.214557	-104.216846	
15,800.00	90.00	0.20	8,960.00	6,685.80	1,068.06	441,909.29	577,363.18	32.214832	-104.216845	
15,900.00	90.00	0.20	8,960.00	6,785.80	1,068.41	442,009.29	577,363.52	32.215107	-104.216843	
16,000.00	90.00	0.20	8,960.00	6,885.79	1,068.75	442,109.29	577,363.86	32.215382	-104.216842	
16,100.00	90.00	0.20	8,960.00	6,985.79	1,069.10	442,209.29	577,364.21	32.215656	-104.216840	
16,200.00	90.00	0.20	8,960.00	7,085.79	1,069.44	442,309.29	577,364.55	32.215931	-104.216839	
16,300.00	90.00	0.20	8,960.00	7,185.79	1,069.79	442,409.29	577,364.90	32.216206	-104.216838	
16,400.00	90.00	0.20	8,960.00	7,285.79	1,070.13	442,509.29	577,365.24	32.216481	-104.216836	
16,500.00	90.00	0.20	8,960.00	7,385.79	1,070.48	442,609.29	577,365.59	32.216756	-104.216835	
16,600.00	90.00	0.20	8,960.00	7,485.79	1,070.82	442,709.29	577,365.93	32.217031	-104.216833	
16,700.00	90.00	0.20	8,960.00	7,585.79	1,071.17	442,809.28	577,366.28	32.217306	-104.216832	
16,800.00	90.00	0.20	8,960.00	7,685.79	1,071.51	442,909.28	577,366.62	32.217581	-104.216830	
16,900.00	90.00	0.20	8,960.00	7,785.79	1,071.86	443,009.28	577,366.97	32.217856	-104.216829	
17,000.00	90.00	0.20	8,960.00	7,885.79	1,072.20	443,109.28	577,367.31	32.218130	-104.216827	
17,100.00	90.00	0.20	8,960.00	7,985.79	1,072.55	443,209.28	577,367.66	32.218405	-104.216826	
17,200.00	90.00	0.20	8,960.00	8,085.79	1,072.89	443,309.28	577,368.00	32.218680	-104.216824	
17,300.00	90.00	0.20	8,960.00	8,185.79	1,073.24	443,409.28	577,368.35	32.218955	-104.216823	
17,400.00	90.00	0.20	8,960.00	8,285.79	1,073.58	443,509.28	577,368.69	32.219230	-104.216821	
17,500.00	90.00	0.20	8,960.00	8,385.79	1,073.93	443,609.28	577,369.04	32.219505	-104.216820	
17,600.00	90.00	0.20	8,960.00	8,485.78	1,074.27	443,709.28	577,369.38	32.219780	-104.216818	
17,700.00	90.00	0.20	8,960.00	8,585.78	1,074.62	443,809.28	577,369.73	32.220055	-104.216817	
17,800.00	90.00	0.20	8,960.00	8,685.78	1,074.96	443,909.28	577,370.07	32.220330	-104.216816	
17,900.00	90.00	0.20	8,960.00	8,785.78	1,075.31	444,009.28	577,370.42	32.220604	-104.216814	
18,000.00	90.00	0.20	8,960.00	8,885.78	1,075.65	444,109.27	577,370.76	32.220879	-104.216813	
18,100.00	90.00	0.20	8,960.00	8,985.78	1,076.00	444,209.27	577,371.11	32.221154	-104.216811	
18,200.00	90.00	0.20	8,960.00	9,085.78	1,076.34	444,309.27	577,371.45	32.221429	-104.216810	
18,300.00	90.00	0.20	8,960.00	9,185.78	1,076.69	444,409.27	577,371.80	32.221704	-104.216808	
18,400.00	90.00	0.20	8,960.00	9,285.78	1,077.03	444,509.27	577,372.14	32.221979	-104.216807	
18,500.00	90.00	0.20	8,960.00	9,385.78	1,077.38	444,609.27	577,372.49	32.222254	-104.216805	
18,600.00	90.00	0.20	8,960.00	9,485.78	1,077.72	444,709.27	577,372.83	32.222529	-104.216804	
18,700.00	90.00	0.20	8,960.00	9,585.78	1,078.07	444,809.27	577,373.18	32.222804	-104.216802	
18,800.00	90.00	0.20	8,960.00	9,685.78	1,078.41	444,909.27	577,373.52	32.223078	-104.216801	
18,900.00	90.00	0.20	8,960.00	9,785.78	1,078.76	445,009.27	577,373.87	32.223353	-104.216799	
19,000.00	90.00	0.20	8,960.00	9,885.78	1,079.10	445,109.27	577,374.21	32.223628	-104.216798	
19,100.00	90.00	0.20	8,960.00	9,985.78	1,079.45	445,209.27	577,374.56	32.223903	-104.216797	
19,200.00	90.00	0.20	8,960.00	10,085.78	1,079.79	445,309.27	577,374.90	32.224178	-104.216795	
19,216.36	90.00	0.20	8,960.00	10,102.14	1,079.85	445,325.62	577,374.96	32.224223	-104.216795	
<b>LTP @ 19216' MD, 100' FNL, 1310' FWL</b>										
19,296.35	90.00	0.20	8,960.00	10,182.12	1,080.12	445,405.61	577,375.23	32.224443	-104.216794	
<b>PBHL; 20' FNL, 1310' FWL</b>										
19,296.36	90.00	0.20	8,960.00	10,182.13	1,080.12	445,405.62	577,375.23	32.224443	-104.216794	

Planning Report - Geographic

<b>Database:</b>	EDM r5000.141_Prod US	<b>Local Co-ordinate Reference:</b>	Well Wyatt Earp 20-17 Fed Com 621H
<b>Company:</b>	WCDCS Permian NM	<b>TVD Reference:</b>	RKB @ 3337.00ft
<b>Project:</b>	Eddy County (NAD 83 NM Eastern)	<b>MD Reference:</b>	RKB @ 3337.00ft
<b>Site:</b>	Sec 20-T24S-R27E	<b>North Reference:</b>	Grid
<b>Well:</b>	Wyatt Earp 20-17 Fed Com 621H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Permit Plan 1		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
PBHL - Wyatt Earp 20-1	0.00	0.00	0.00	10,182.13	1,080.12	445,405.62	577,375.23	32.224443	-104.216794
- plan misses target center by 8960.00ft at 19296.36ft MD (8960.00 TVD, 10182.13 N, 1080.12 E)									
- Point									

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
		+N/-S	+E/-W	
(ft)	(ft)	(ft)	(ft)	
8,495.10	8,387.02	-292.00	1,044.00	KOP @ 8495' MD, 50' FSL, 1310' FWL
8,736.00	8,620.89	-242.11	1,044.17	FTP @ 8736' MD, 100' FSL, 1310' FWL
14,032.00	8,960.00	4,917.81	1,061.97	Cross section @ 14032' MD, 0' FSL, 1310' FWL
19,216.36	8,960.00	10,102.14	1,079.85	LTP @ 19216' MD, 100' FNL, 1310' FWL
19,296.35	8,960.00	10,182.12	1,080.12	PBHL; 20' FNL, 1310' FWL

# Devon Energy

WELL DETAILS: Wyatt Earp 20-17 Fed Com 621H

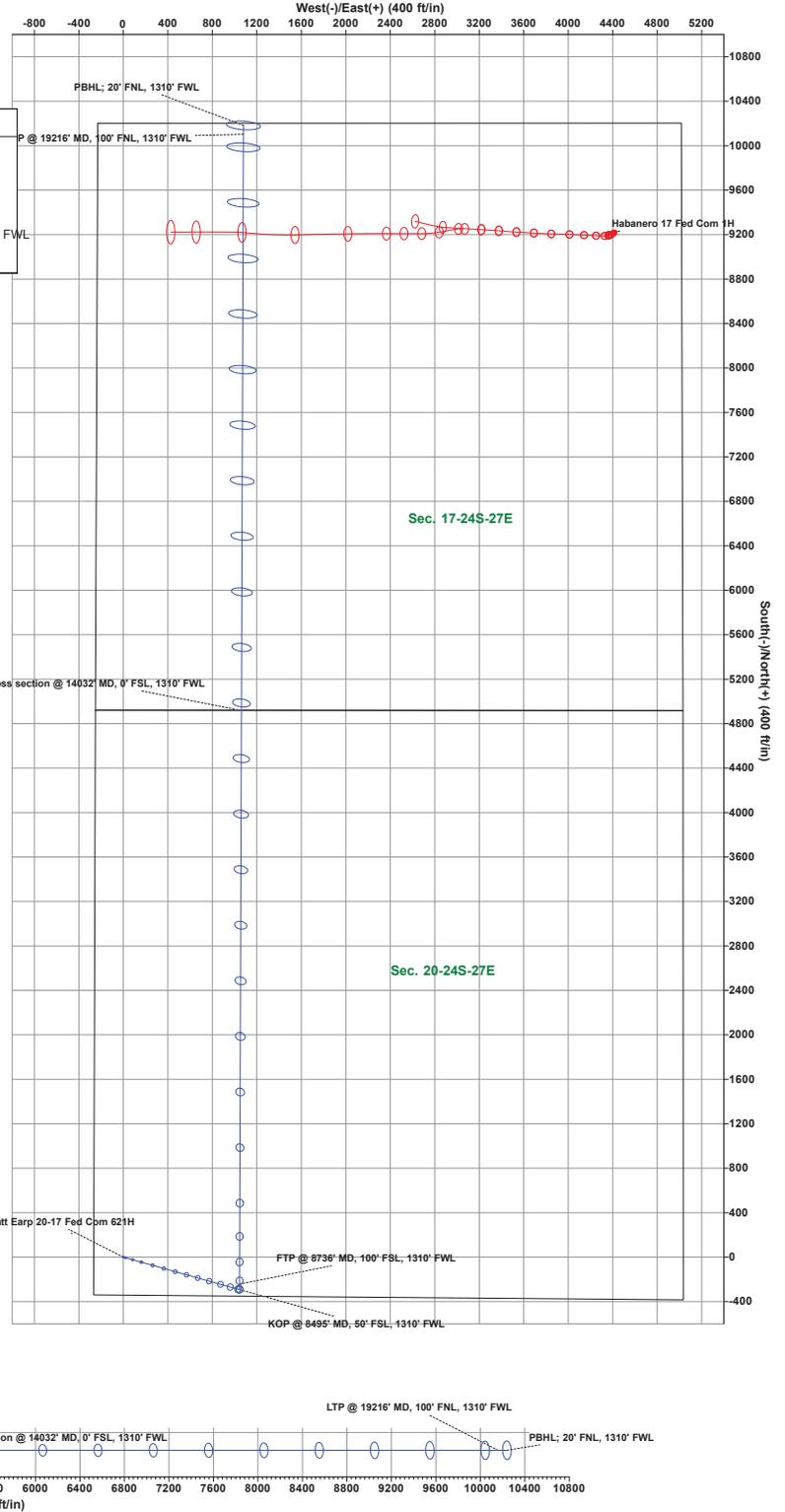
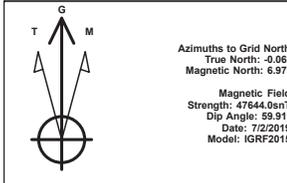
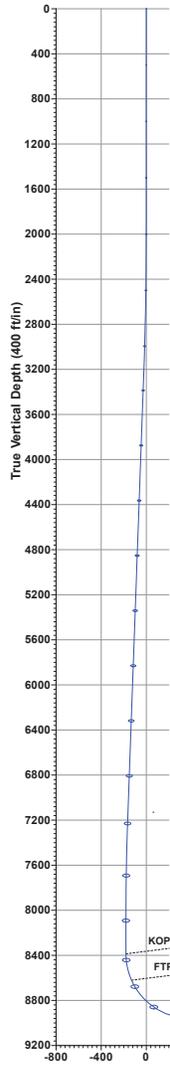
RKB @ 3337.00ft

3312.00

Northing 435223.51 Easting 576295.11 Latitude 32.196456 Longitude -104.220321

## SECTION DETAILS Permit Plan 1

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	Vsect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2000.00	0.00	0.00	2000.00	0.00	0.00	0.00	0.00	
3219.28	12.19	105.63	3210.09	-34.81	124.47	1.00	-21.49	
7332.23	12.19	105.63	7230.27	-268.79	961.02	0.00	-165.92	
8145.08	0.00	0.00	8037.00	-292.00	1044.00	1.50	-180.24	
8495.12	0.00	0.00	8387.04	-292.00	1044.00	0.00	-180.24	KOP @ 8495' MD, 50' FSL, 1310' FWL
9395.12	90.00	0.20	8960.00	280.96	1045.98	10.00	-389.73	
19296.36	90.00	0.20	8960.00	10182.13	1080.12	0.00	10239.26	PBHL; 20' FNL, 1310' FWL



## PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

<b>OPERATOR'S NAME:</b>	<b>Devon Energy Production Company LP</b>
<b>LEASE NO.:</b>	<b>NMNM112269</b>
<b>LOCATION:</b>	Section 20, T.24 S., R.27 E., NMPM
<b>COUNTY:</b>	Eddy County, New Mexico

<b>WELL NAME &amp; NO.:</b>	Wyatt Earp 20-17 Fed Com 331H
<b>SURFACE HOLE FOOTAGE:</b>	342'/S & 236'/W
<b>BOTTOM HOLE FOOTAGE:</b>	20'/N & 330'/W

<b>WELL NAME &amp; NO.:</b>	Wyatt Earp 20-17 Fed Com 621H
<b>SURFACE HOLE FOOTAGE:</b>	342'/S & 266'/W
<b>BOTTOM HOLE FOOTAGE:</b>	20'/N & 1310'/W

COA

H2S	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Potash	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Secretary	<input type="checkbox"/> R-111-P
Cave/Karst Potential	<input type="checkbox"/> Low	<input type="checkbox"/> Medium	<input checked="" type="checkbox"/> High
Cave/Karst Potential	<input type="checkbox"/> Critical		
Variance	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Flex Hose	<input type="checkbox"/> Other
Wellhead	<input type="checkbox"/> Conventional	<input checked="" type="checkbox"/> Multibowl	<input type="checkbox"/> 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 checked="" 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

**OPERATOR IS ONLY APPROVED FOR THE FOLLOWING DESIGN, OTHER DESIGNS SUBMITTED WILL BE VOID.**

### 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

### Alternate Casing Design:

1. The **13-3/8** inch surface casing shall be set at approximately **375 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 **8-5/8** 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 or potash.**  
**Cement excess is less than 25%, more cement might be required.**
  - ❖ In High Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

**Operator has proposed to pump down 13-3/8" X 8-5/8" annulus. Operator must run a CBL from TD of the 8-5/8" casing to surface. Submit results to BLM.**

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:
  - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

## C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'
2. 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 **3000 (3M)** 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 2<sup>nd</sup> 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.



**Devon Energy Center  
333 West Sheridan Avenue  
Oklahoma City, Oklahoma 73102-5015**

# **Hydrogen Sulfide (H<sub>2</sub>S) Contingency Plan**

**For**

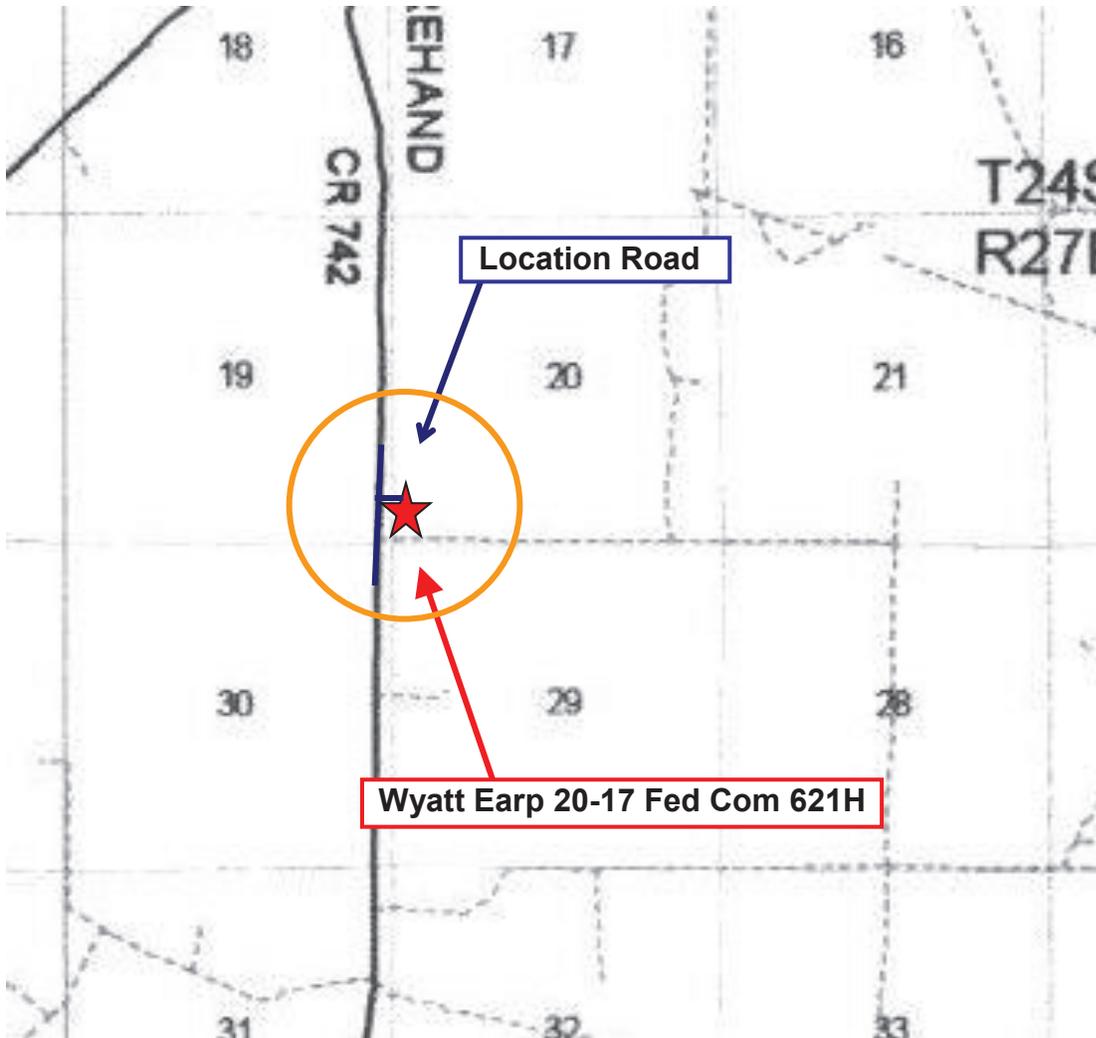
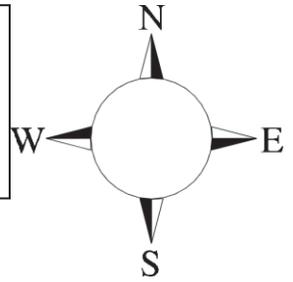
**Wyatt Earp 20-17 Fed Com 621H**

**Sec-20 T-24S R-27E  
342' FSL & 266' FWL  
LAT. = 32.196456' N (NAD83)  
LONG = 104.220321' W**

**Eddy County NM**

## Wyatt Earp 20-17 Fed Com 621H

This is an open drilling site. H<sub>2</sub>S monitoring equipment and emergency response equipment will be used within 500' of zones known to contain H<sub>2</sub>S, including warning signs, wind indicators and H<sub>2</sub>S monitor.



Assumed 100 ppm **ROE = 3000'** (Radius of Exposure)  
100 ppm H<sub>2</sub>S concentration shall trigger activation of this plan.

### Escape

Crews shall escape upwind of escaping gas in the event of an emergency release of gas. Escape can be facilitated from the location entrance road. Crews should then block the entrance to the location from the lease road so as not to allow anyone traversing into a hazardous area. The blockade should be at a safe distance outside of the ROE. There are no homes or buildings in or near the ROE.

**Assumed 100 ppm ROE = 3000'**

## 100 ppm H<sub>2</sub>S concentration shall trigger activation of this plan.

### Emergency Procedures

In the event of a release of gas containing H<sub>2</sub>S, the first responder(s) must

- Isolate the area and prevent entry by other persons into the 100 ppm ROE.
- Evacuate any public places encompassed by the 100 ppm ROE.
- Be equipped with H<sub>2</sub>S monitors and air packs in order to control the release.
- Use the “buddy system” to ensure no injuries occur during the response
- Take precautions to avoid personal injury during this operation.
- Contact operator and/or local officials to aid in operation. See list of phone numbers attached.
- Have received training in the
  - Detection of H<sub>2</sub>S, and
  - Measures for protection against the gas,
  - Equipment used for protection and emergency response.

### **Ignition of Gas Source**

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO<sub>2</sub>). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas

### **Characteristics of H<sub>2</sub>S and SO<sub>2</sub>**

<b>Common Name</b>	<b>Chemical Formula</b>	<b>Specific Gravity</b>	<b>Threshold Limit</b>	<b>Hazardous Limit</b>	<b>Lethal Concentration</b>
<b>Hydrogen Sulfide</b>	H <sub>2</sub> S	1.189 Air = 1	10 ppm	100 ppm/hr	600 ppm
<b>Sulfur Dioxide</b>	SO <sub>2</sub>	2.21 Air = 1	2 ppm	N/A	1000 ppm

### **Contacting Authorities**

Devon Energy Corp. personnel must liaison with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available. The following call list of essential and potential responders has been prepared for use during a release. Devon Energy Corp. Company response must be in coordination with the State of New Mexico’s ‘Hazardous Materials Emergency Response Plan’ (HMER)

# Hydrogen Sulfide Drilling Operation Plan

## I. HYDROGEN SULFIDE (H<sub>2</sub>S) TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

1. The hazards and characteristics of hydrogen sulfide (H<sub>2</sub>S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H<sub>2</sub>S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H<sub>2</sub>S metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H<sub>2</sub>S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H<sub>2</sub>S zone (within 3 days or 500 feet) and weekly H<sub>2</sub>S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan.

## II. HYDROGEN SULFIDE TRAINING

Note: All H<sub>2</sub>S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain H<sub>2</sub>S.

## 1. Well Control Equipment

- A. Flare line
- B. Choke manifold – Remotely Operated
- C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit
- D. Auxiliary equipment may include if applicable: annular preventer and rotating head.
- E. Mud/Gas Separator

## 2. Protective equipment for essential personnel:

30-minute SCBA units located at briefing areas, as indicated on well site diagram, with escape units available in the top doghouse. As it may be difficult to communicate audibly while wearing these units, hand signals shall be utilized.

## 3. H<sub>2</sub>S detection and monitoring equipment:

Portable H<sub>2</sub>S monitors positioned on location for best coverage and response. These units have warning lights which activate when H<sub>2</sub>S levels reach 10 ppm and audible sirens which activate at 15 ppm. Sensor locations:

- Bell nipple
- Possum Belly/Shale shaker
- Rig floor
- Choke manifold
- Cellar

### Visual warning systems:

- A. Wind direction indicators as shown on well site diagram
- B. Caution/ Danger signs shall be posted on roads providing direct access to locations. Signs will be painted a high visibility yellow with black lettering of sufficient size to be reasonable distance from the immediate location. Bilingual signs will be used when appropriate.

#### **4. Mud program:**

The mud program has been designed to minimize the volume of H<sub>2</sub>S circulated to surface. Proper mud weight, safe drilling practices and the use of H<sub>2</sub>S scavengers will minimize hazards when penetrating H<sub>2</sub>S bearing zones.

#### **5. Metallurgy:**

- A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold lines, and valves shall be H<sub>2</sub>S trim.
- B. All elastomers used for packing and seals shall be H<sub>2</sub>S trim.

#### **6. Communication:**

- A. Company personnel have/use cellular telephones in the field.
- B. Land line (telephone) communications at Office

#### **7. Well testing:**

- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safety and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H<sub>2</sub>S environment will use the closed chamber method of testing.
- B. There will be no drill stem testing.

<b><u>Devon Energy Corp. Company Call List</u></b>		
Drilling Supervisor – Basin – Mark Kramer		405-823-4796
EHS Professional – Laura Wright		405-439-8129
<b><u>Agency Call List</u></b>		
<b><u>Lea County (575)</u></b>	<b>Hobbs</b>	
	Lea County Communication Authority	393-3981
	State Police	392-5588
	City Police	397-9265
	Sheriff's Office	393-2515
	<b>Ambulance</b>	<b>911</b>
	Fire Department	397-9308
	LEPC (Local Emergency Planning Committee)	393-2870
	NMOCD	393-6161
	US Bureau of Land Management	393-3612
	<b><u>Eddy County (575)</u></b>	<b>Carlsbad</b>
State Police		885-3137
City Police		885-2111
Sheriff's Office		887-7551
<b>Ambulance</b>		<b>911</b>
Fire Department		885-3125
LEPC (Local Emergency Planning Committee)		887-3798
US Bureau of Land Management		887-6544
NM Emergency Response Commission (Santa Fe)		(505) 476-9600
24 HR		(505) 827-9126
National Emergency Response Center		(800) 424-8802
National Pollution Control Center: Direct		(703) 872-6000
For Oil Spills		(800) 280-7118
<b>Emergency Services</b>		
Wild Well Control		(281) 784-4700
Cudd Pressure Control		(915) 699-0139 (915) 563-3356
Halliburton		(575) 746-2757
B. J. Services		(575) 746-3569
<b><u>Give GPS position:</u></b>	Native Air – Emergency Helicopter – Hobbs (TX & NM)	(800) 642-7828
	Flight For Life - Lubbock, TX	(806) 743-9911
	Aerocare - Lubbock, TX	(806) 747-8923
	Med Flight Air Amb - Albuquerque, NM	(575) 842-4433
	Lifeguard Air Med Svc. Albuquerque, NM	(800) 222-1222
	Poison Control (24/7)	(575) 272-3115
	Oil & Gas Pipeline 24 Hour Service	(800) 364-4366
	NOAA – Website - <a href="http://www.nhc.noaa.gov">www.nhc.noaa.gov</a>	

Prepared in conjunction with  
Dave Small

