HIGH CAVEKARST Split estate

OCD Artesia

ATS-15-90

Form 3160-3
(March 2012)

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No. NM-18613-A (BHL) SHL FEE

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

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

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone

8. Lease Name and Well No. PARDUE 19 FEDERAL COM 4H

2. Name of Operator LEGEND NATURAL GAS III, LP

9. API Well No. 30-015- 43214

3a. Address 777 MAIN ST., STE. 900 FORT WORTH, TX 76102

3b. Phone No. *(include area code)* 817-872-7822

10. Field and Pool, or Exploratory Willow Lake; Bone Spring (64450)

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface 110 FSL AND 1600 FWL

At proposed prod. zone BH-330 FNL AND 1700 FWL

11. Sec., T. R. M. or Blk. and Survey or Area SECTION 19, T-24S, R-28E

14. Distance in miles and direction from nearest town or post office* APPROX. 4.7 MILES WEST/SOUTHWEST OF MAGALA, NM

12. County or Parish EDDY

13. State NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drlg. unit line, if any) 110 FSL

16. No. of acres in lease 760.24

17. Spacing Unit dedicated to this well 160 ACRES

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. SURFACE-2568' Pardue 19 Fed com 2H SUB-SURFACE 325'(vert) 1410'-(Horiz)

19. Proposed Depth 12480'MD; 7810'TVD

20. BLM/BIA Bond No. on file NMB000525

21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3072'GR Pardue 19 Fed com 2H (Proposed)

22. Approximate date work will start* 01/01/2015

23. Estimated duration 2 MONTHS

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

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

25. Signature Jennifer M. Elrod — Name *(Printed/Typed)* JENNIFER MOSLEY ELROD — Date 10/01/2014

Title SR. REGULATORY ANALYST

Approved by *(Signature)* Steve Caffey — Name *(Printed/Typed)* — Date JUN 30 2015

Title FIELD MANAGER — 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.

APPROVAL FOR TWO YEARS

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.

(Continued on page 2)

*(Instructions on page 2)

Carlsbad Controlled Water Basin

NM OIL CONSERVATION
ARTESIA DISTRICT
JUL 06 2015

RD 7/14/15

Approval Subject to General Requirements & Special Stipulations Attached

RECEIVED

SEE ATTACHED FOR CONDITIONS OF APPROVAL

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

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, 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	Pool Code	Pool Name
30-015-43214	44450	Willow Lake; Bone Spring

Property Code	Property Name	Well Number
40495	PARDUE 19 FEDERAL COM	4H

OGRID No.	Operator Name	Elevation
258894	Trinity River ~~LEGEND NATURAL GAS, LLC~~ Energy Inc	3072'

Surface Location

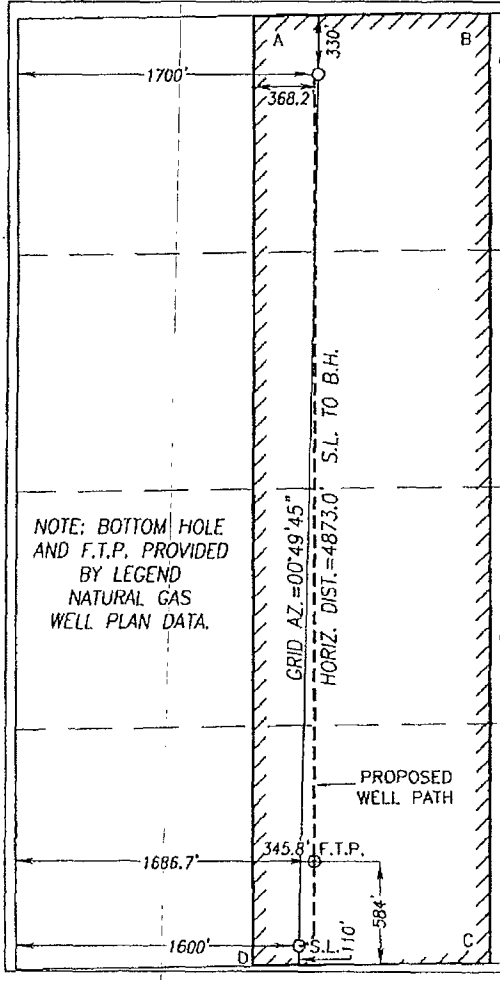
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	19	24-S	28-E		110	SOUTH	1600	WEST	EDDY

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
C	19	24-S	28-E		330	NORTH	1700	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

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



NOTE: BOTTOM HOLE AND F.T.P. PROVIDED BY LEGEND NATURAL GAS WELL PLAN DATA.

NAD 27 NME	NAD 83 NME
BOTTOM HOLE LOCATION	BOTTOM HOLE LOCATION
Y= 439960.6 N	Y= 440018.9 N
X= 563039.5 E	X= 604222.7 E
LAT.=32.209405° N	LAT.=32.209525° N
LONG.=104.129512° W	LONG.=104.130006° W

CORNER COORDINATES TABLE
NAD 27 NME
A - Y= 440286.1 N, X= 562670.1 E
B - Y= 440302.3 N, X= 564002.2 E
C - Y= 434997.1 N, X= 564026.5 E
D - Y= 434974.6 N, X= 562691.4 E

CORNER COORDINATES TABLE
NAD 83 NME
A - Y= 440344.4 N, X= 603853.3 E
B - Y= 440360.6 N, X= 606185.4 E
C - Y= 435055.4 N, X= 605209.8 E
D - Y= 435032.8 N, X= 603874.7 E

GEODETIC COORDINATES NAD 27 NME	GEODETIC COORDINATES NAD 83 NME
FIRST TAKE POINT	FIRST TAKE POINT
Y=435564.4 N	Y=435622.7 N
X= 563034.7 E	X= 604218.0 E
LAT.=32.197319° N	LAT.=32.197441° N
LONG.=104.129555° W	LONG.=104.130049° W
SURFACE LOCATION	SURFACE LOCATION
Y=435089.0 N	Y=435147.2 N
X= 562949.0 E	X= 604132.3 E
LAT.=32.196013° N	LAT.=32.196134° N
LONG.=104.129835° W	LONG.=104.130329° W

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 9/25/2014 Date

Jennifer Elrod
Printed Name

jelrod@nng2.com
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.

AUGUST 28, 2014
Date of Survey

Signature & Seal of Professional Surveyor:

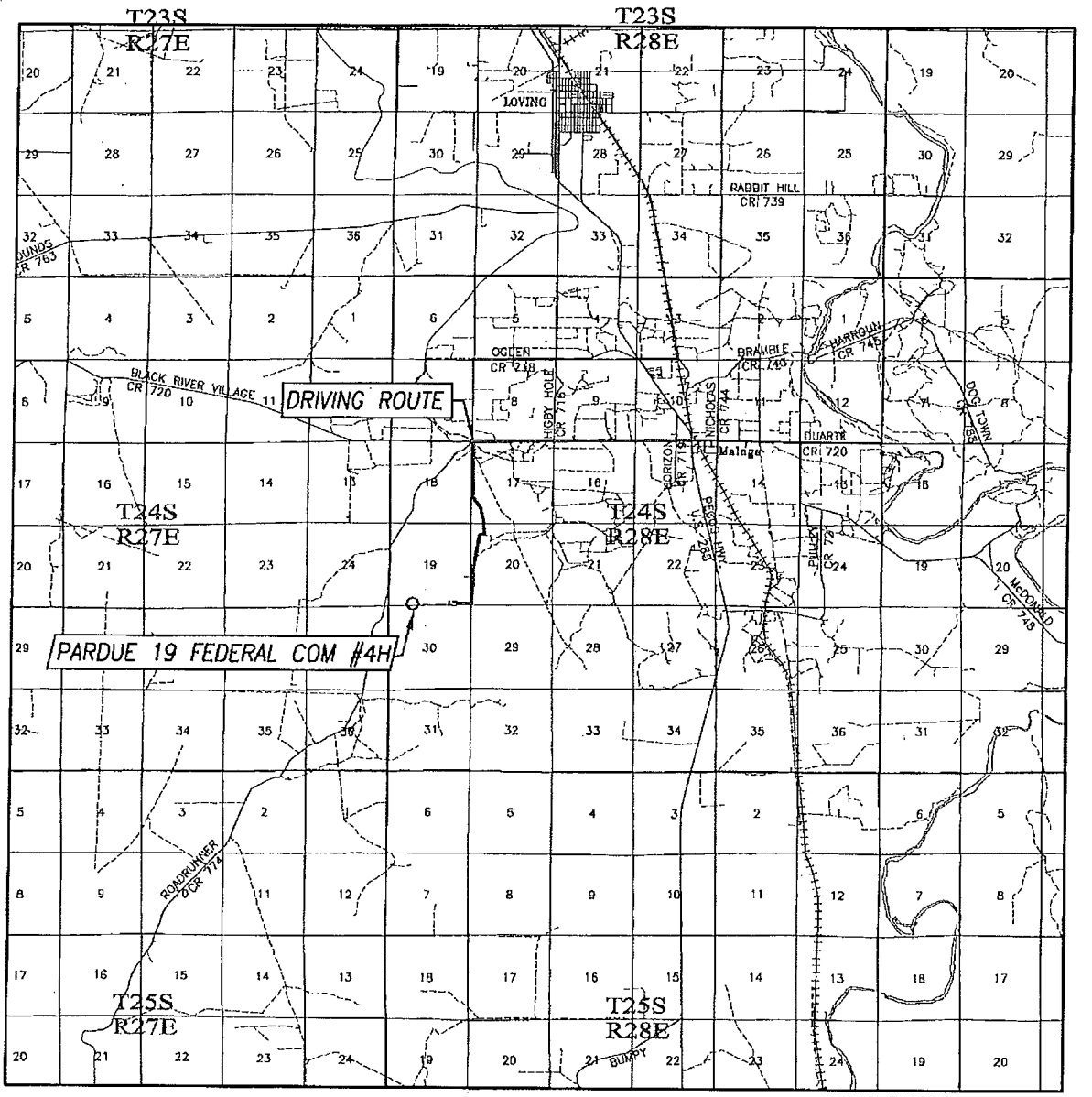
RONALD J. EIDSON NEW MEXICO 3239 REGISTERED PROFESSIONAL SURVEYOR

09/19/2014

Certificate Number: Gary G. Eidson 12641
Ronald J. Eidson 3239

LSL JWSC W.O.: 14.11.0938

VICINITY MAP



SCALE: 1" = 2 MILES

DRIVING ROUTE: SEE LOCATION VERIFICATION MAP

SEC. 19 TWP. 24-S RGE. 28-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 110' FSL & 1600' FEL

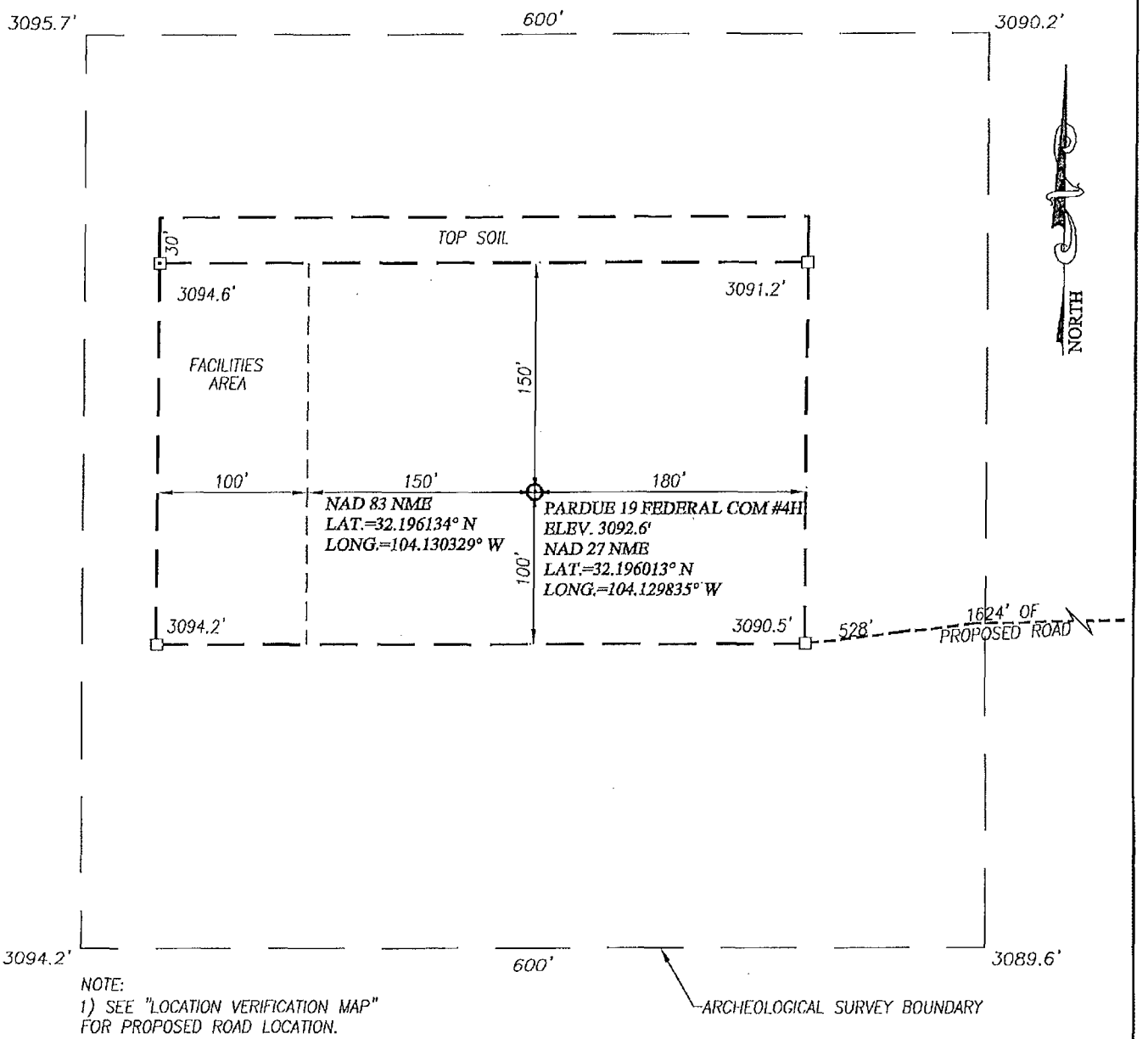
ELEVATION 3093'

OPERATOR LEGEND NATURAL GAS, LLC

LEASE PARDUE 19 FEDERAL COM

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

EXHIBIT #1



NOTE:
1) SEE "LOCATION VERIFICATION MAP" FOR PROPOSED ROAD LOCATION.

DIRECTIONS TO PARDUE 19 FEDERAL COM #4H:

FROM THE INTERSECTION OF HWY 285 AND CO. RD. 720 (BLACK RIVER VILLAGE) GO APPROX 2.7 MILES ON CO. RD. 720 TURN LEFT AND GO SOUTH ON MEANDERING ROAD APPROX. 1.7 MILES TO INTERSECTION CONTINUE SOUTH ON 2-TRACK APPROX. 0.3 MILES, TO ROAD SURVEY LATH FOLLOW ACCESS ROAD SURVEY WEST 940' TO THE #3H PROP. PAD, THEN FROM WEST SIDE WELL PAD GO WEST 2152' TO THIS LOCATION.

100 0 100 200 Feet

Scale: 1"=100'

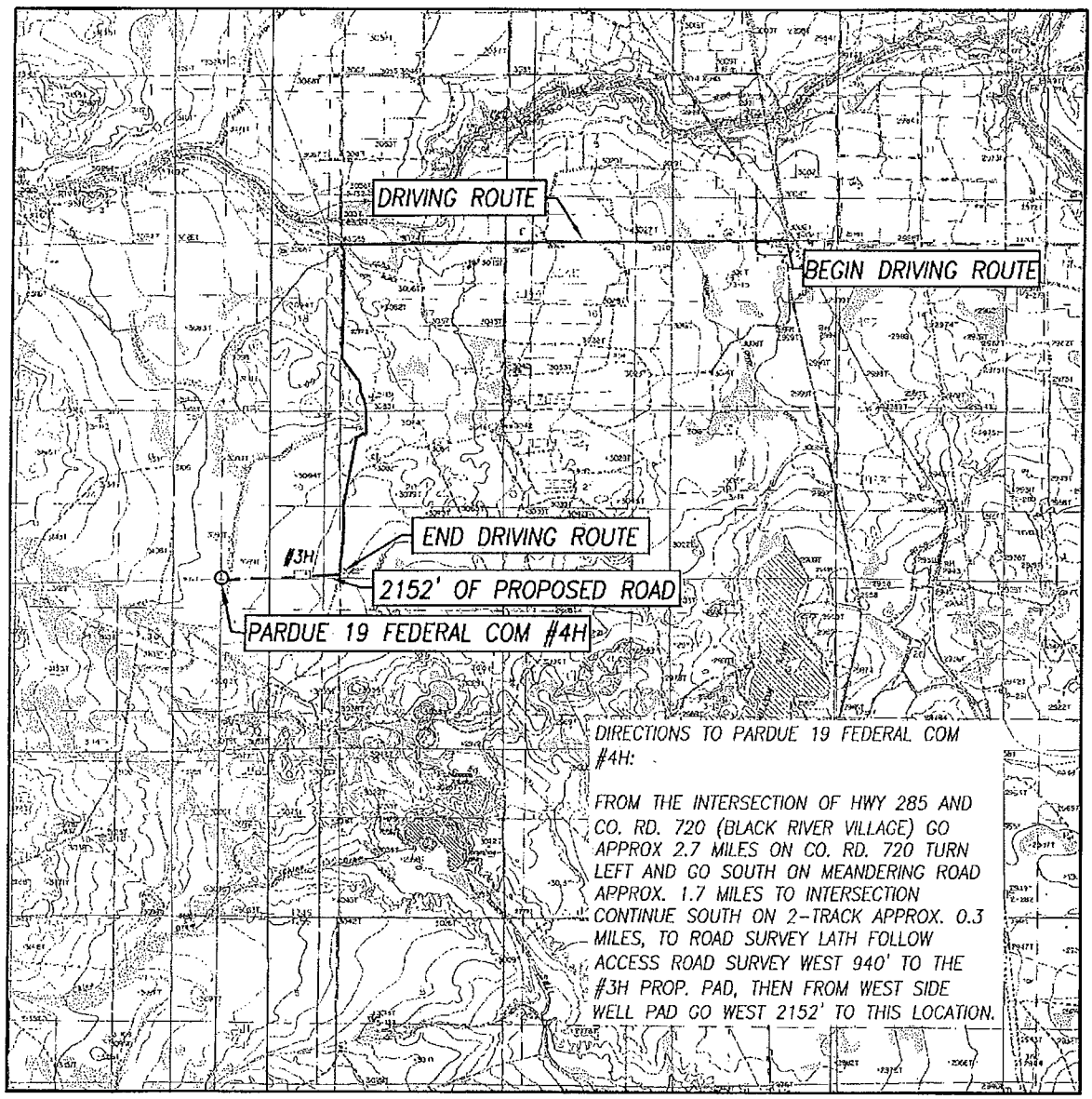
LEGEND NATURAL GAS, LLC

PARDUE 19 FEDERAL COM #4H WELL
LOCATED 110 FEET FROM THE SOUTH LINE
AND 1600 FEET FROM THE WEST LINE OF SECTION 19,
TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 8/28/14	CAD Date: 9/11/14	Drawn By: LSL
W.O. No.: 14110938	Rev: .	Rel. W.O.:	Sheet 1 of 1

LOCATION VERIFICATION MAP



NORTH

SCALE: 1" = 5280'

CONTOUR INTERVAL:
MALAGA, N.M. – 10'
SUPPLEMENTAL CONTOUR INTERVAL – 5'

SEC. 19 TWP. 24-S RGE. 28-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 110' FSL & 1600' FWL

ELEVATION 3093'

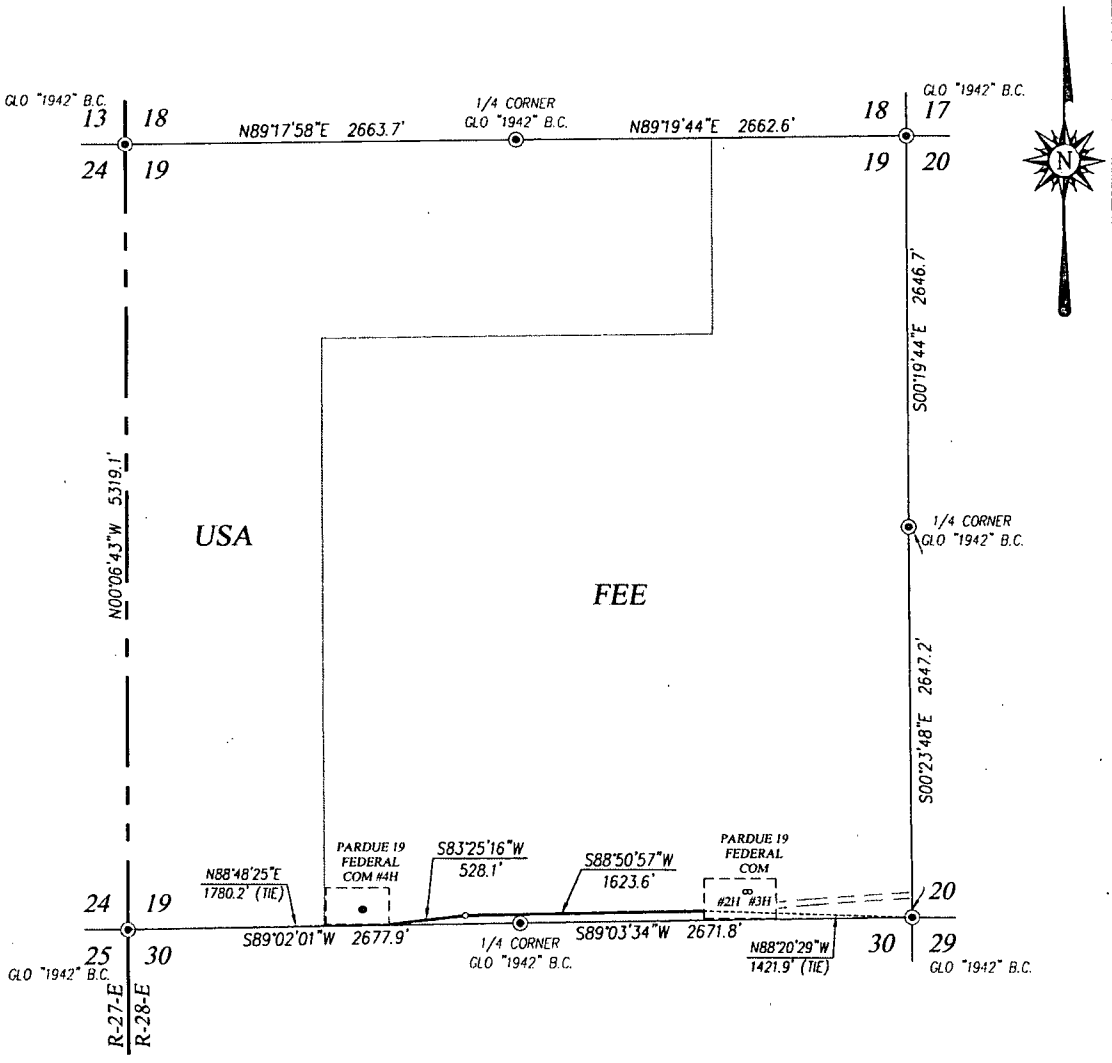
OPERATOR LEGEND NATURAL GAS, LLC

LEASE PARDUE 19 FEDERAL COM

U.S.G.S. TOPOGRAPHIC MAP
MALAGA, N.M.

EXHIBIT #2

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000



DESCRIPTION

SURVEY FOR A PROPOSED ROAD CROSSING SECTION 19, TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT IN THE SOUTHEAST QUARTER, WHICH LIES N88°20'29"W 1421.9 FEET FROM THE SOUTHEAST CORNER; THEN S88°50'57"W 1623.6 FEET; THEN S83°25'16"W 528.1 FEET TO A POINT, WHICH LIES N88°48'25"E 1780.2 FEET FROM THE SOUTHWEST CORNER.

TOTAL LENGTH EQUALS 2151.7 FEET OR 130.41 RODS.

NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON Ronald J. Eidson

NEW MEXICO PROFESSIONAL SURVEYOR

DATE: 04/14/2015

LEGEND

⊙ DENOTES FOUND CORNER AS NOTED

1000 0 1000 2000 FEET

Scale: 1"=1000'

PROVIDING SURVEYING SERVICES SINCE 1946

JOHN WEST SURVEYING COMPANY

412 N. DAL PASO HOBBS, N.M. 88240

(575) 393-3117 www.jwsc.biz

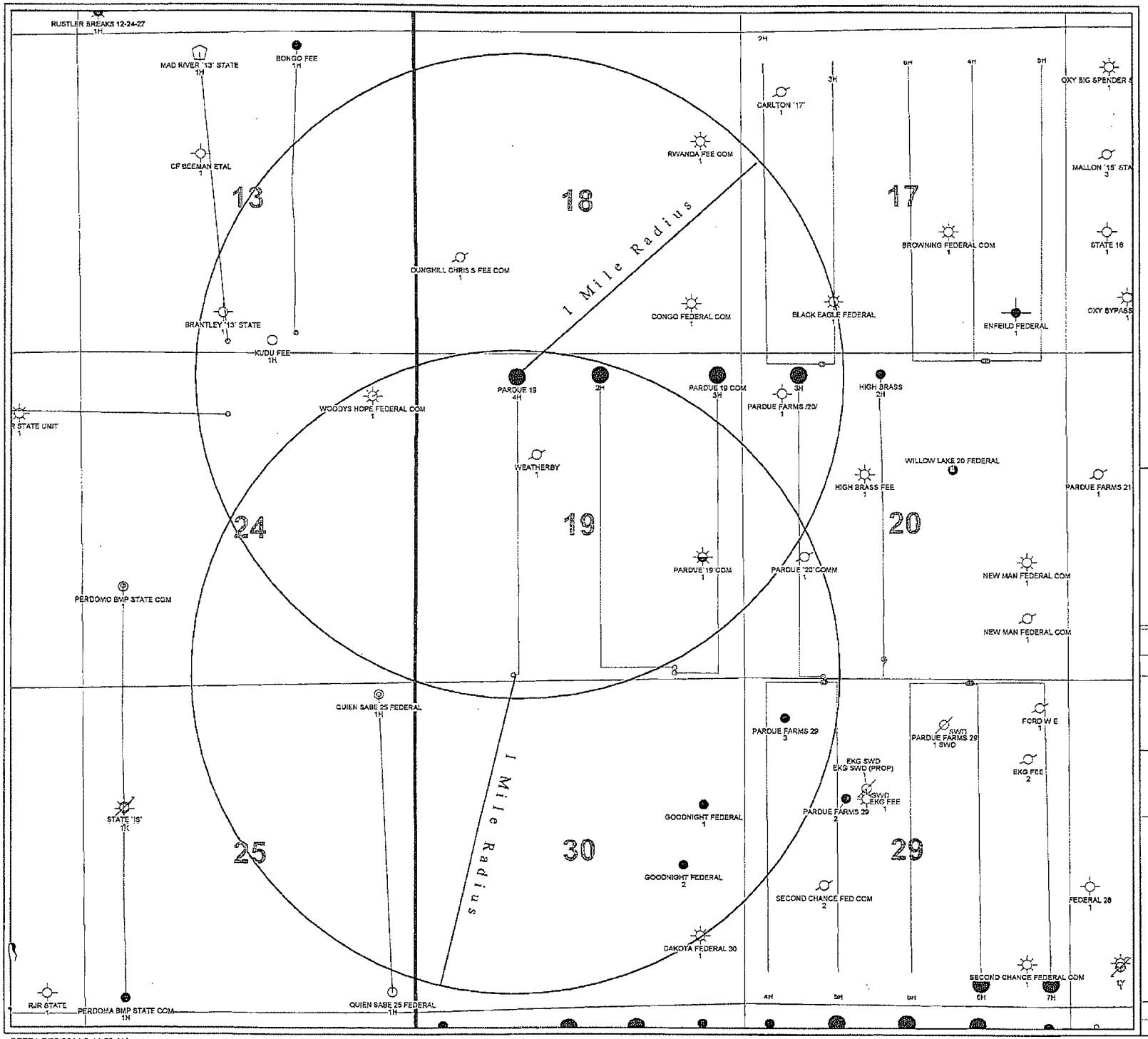
TBPLS# 10021000

LEGEND NATURAL GAS, LLC

SURVEY FOR A PROPOSED ROAD
TO THE PARDUE 19 FEDERAL COM #4H
CROSSING SECTION 19,
TOWNSHIP 24 SOUTH, RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, NEW MEXICO

Survey Date: 8/28/14	CAD Date: 4/14/15	Drawn By: LSL
W.O. No.: 15130477	Rev: .	Rel. W.O.:	Sheet 1 of 1

EXHIBIT # 3



LEGEND NATURAL GAS, LLC

1 Mile Radius

Pardue 19 Com 4H

0 2,151

FEET

POSTED WELL DATA

Well Name
Well Number

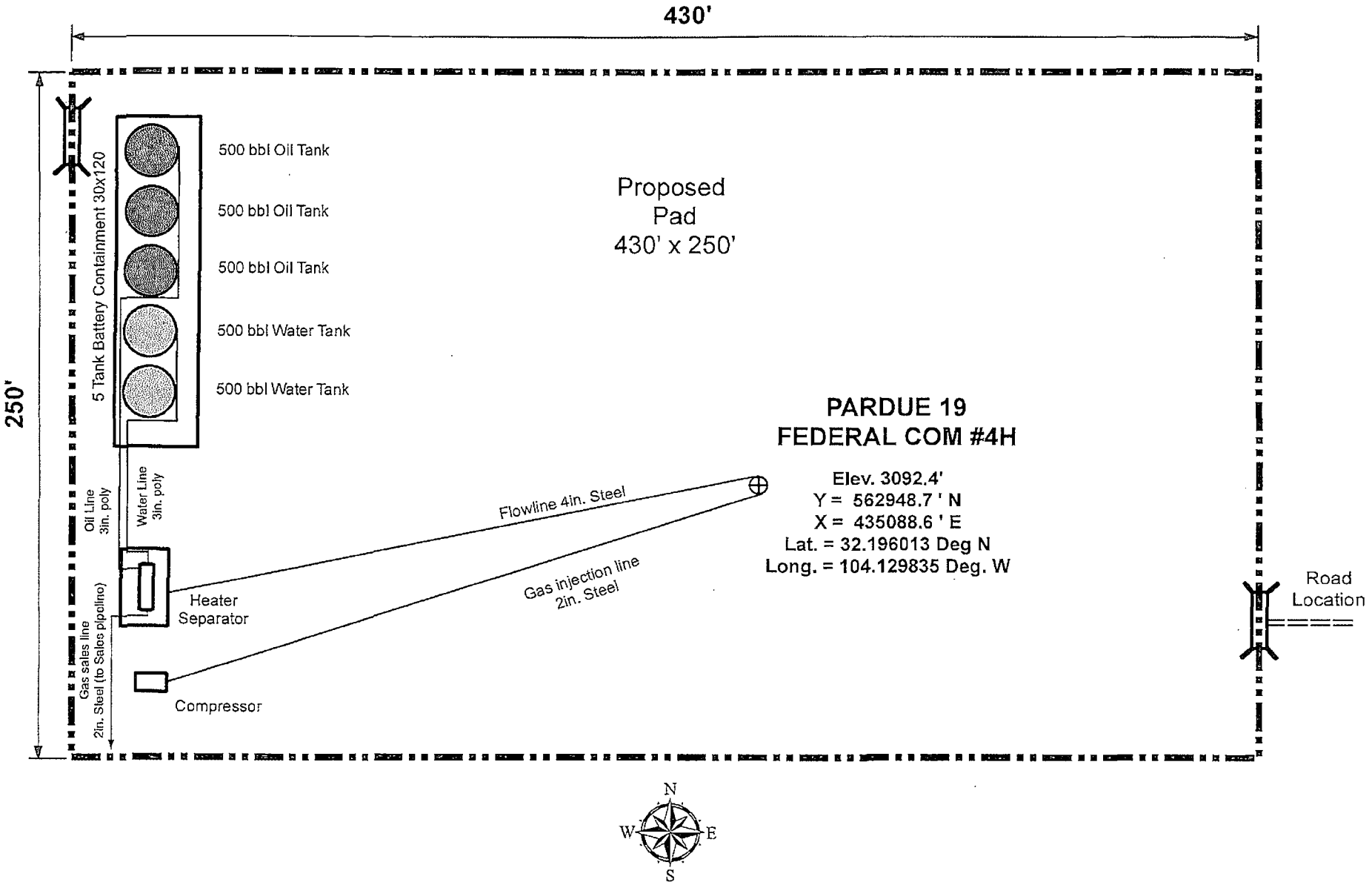
WELL SYMBOLS

- Abandoned Well
- Abandoned Oil Well
- Dry Hole, With Show of Gas
- Dry Hole, With Show of Oil
- Dry Hole
- Gas Well
- Junked
- Large Triangle
- Oil & Gas Well
- Oil Well
- Vernon Symbol Standards - Permit
- Salt Water Disposal
- New Symbol
- NEW DRILL WELL - Injectors

By: JMG

July 23, 2014

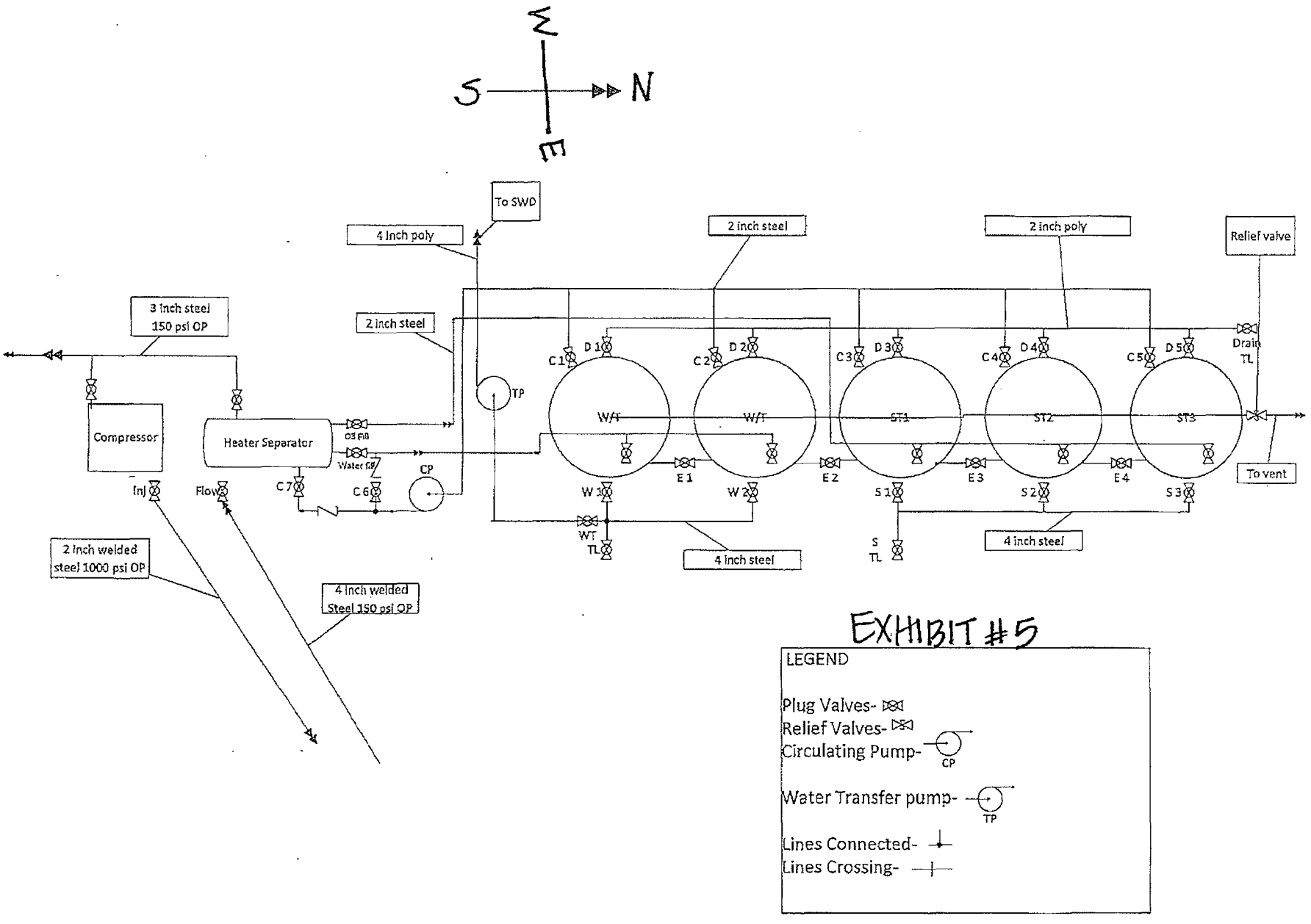
PETRA 7/23/2014 8:44:58 AM



Coordinate System: NAD27 Stateplane New Mexico East FIPS 3001
Projection: Lambert Conformal Conic
Datum: North American 1927
Units: US Feet

EXHIBIT #4

Date: 9/25/2014


W
S
N
E
To SWD
4 Inch poly
2 inch steel
2 inch poly
Relief valve
3 inch steel
150 psi OP
2 inch steel
Drain
TL
C1
D1
C2
D2
C3
D3
C4
D4
C5
D5
TP
Compressor
Heater Separator
Oil Fill
Water fill
CP
W/T
W/T
ST1
ST2
ST3
To vent
Inj
Flow
C7
C6
E1
E2
E3
E4
W1
W2
S1
S2
S3
WT
TL
S
TL
4 inch steel
4 inch steel
2 inch welded
steel 1000 psi OP
4 inch welded
Steel 150 psi OP
EXHIBIT #5
LEGEND
Plug Valves-
Relief Valves-
Circulating Pump-
CP
Water Transfer pump-
TP
Lines Connected-
Lines Crossing-

Legend Natural Gas, III L.P.
DRILLING AND OPERATIONS PROGRAM
Pardue 19 Federal Com 4H
SHL: 110 FSL & 1600 FWL
BHL: 330 FNL & 1700 FWL
SHL: Section 19, T-24S, R-28E
BHL: Section 19, T-24S, R-28E
Eddy County, New Mexico

In conjunction with Form 3160-3, Application for Permit to Drill subject well, Legend Natural Gas, III L.P. submits the following eleven items of pertinent information in accordance with BLM requirements.

1. **Geological Surface Information:** Permian

2. **Formation Tops:**

The estimated tops of geologic markers and estimated depths at which anticipated water and hydrocarbons are expected to be encountered are as follows:

Rustler	0 ft	Out Cropping at Surface
Fresh Water	48 ft	
Top of Salt	690 ft	
Base of Salt / Lamar	2,316 ft	
Bell Canyon	2,560 ft	
Cherry Canyon	3,362 ft	
Brushy Canyon	4,542 ft	Oil/Gas
Bone Spring	6,093 ft	Oil/Gas
1st Bone Spring	7,013 ft	Oil/Gas
2nd Bone Spring	7,743 ft	Oil/Gas

The IHS formation tops data base has indicated that the Rustler formation on our federal acreage is out cropping at the surface. The Federal wells listed below border to the east and west of our federal acreage (Section 19 is in between the listed wells below).

Well Name	Location	Surface Casing Depth
Really Scary Federal Com 4H	Section 33 T24S R28E, Eddy County, NM	425 ft
Really Scary Federal Com 2H	Section 33 T24S R28E, Eddy County, NM	442 ft
Buckwheat 33 Federal 2H	Section 33 T24S R28E, Eddy County, NM	400 ft
Quien Sabe 25 Federal 1H	Section 25 T24S R27E, Eddy County, NM	180 ft

No other formations are expected to give up oil, gas, or fresh water in measurable quantities. Setting 11-3/4" casing at ~~400~~ 220' ft MD/TVD and circulating cement back to surface will protect the surface fresh water sand. The Salt section will be protected by setting 8-5/8" casing at ~~2,500~~ 2430' ft MD and circulating cement back to surface. Any zones below the 8-5/8" casing shoe and above TD that contain commercial quantities of hydrocarbons will have cemented isolation. This isolation will be achieved by cementing the 5-1/2" production casing string from TD to Surface. Each cement job will have an adequate amount of Open Hole excess cement volume to ensure cement is circulated to surface (see proposed cement program for Open Hole excess volumes

below). If wellbore conditions arise that require immediate action and/or a change to this program Legend Natural Gas III L.P. personnel will always react to protect the wellbore and/or environment.

3. Proposed Casing Program:

See COA

Hole Size	Hole Interval MD	Casing Interval	Casing	Weight	Grade	Connection	Safety Factors Collapse / Burst / Tension
14-3/4"	0 - 400' 220'	0 - 400'	11-3/4"	42#	H-40	STC	5.94 / 1.33 / 28.45
							Hole Assumes 8.4 ppg MW
10-5/8"	400' - 2,500' 2430'	0 - 2,500'	8-5/8"	32#	J-55	LTC	1.93 / 1.84 / 6.23
							Hole Assumes 10.0 ppg MW
7-7/8"	2,500' - 12,480'	0 - 12,480'	5-1/2"	17#	P-110	BTC	1.90 / 1.25 / 4.02
							Hole Assumes 9.5 ppg MW

**Note: All casing run in hole will be in NEW condition from the mill
**Note: While running all casing strings in hole, the pipe will be kept at a minimum of 1/3 full at all times to avoid approaching the collapse pressure rating of the casing

4. Proposed Cement Program:

Surface: 14-3/4" Hole, 11-3/4" Casing

Type	Interval	Density	Excess	Hole Volume w/ Excess (cubic-ft)	Yield (cu-ft/sack)	Mix Water (gal/sack)	Sacks	Cement
Lead	0 - 300'	12.9 ppg	125%	293	1.96	10.06	150	(35:65) Poz (Fly Ash): Class C Cement + 0.005 lbs/sack Static Free + 1% bwoc Calcium Chloride + 5% bwoc Sodium Chloride + 0.25 lbs/sack Cello Flake + 3 lbs/sack LCM-1 + 0.1% bwoc FL-52 + 5% bwoc MPA-5 + 6% bwoc Bentonite II + 96.5% Fresh Water
Tail	300' - 400'	14.8 ppg	100%	114	1.35	6.34	85	Class C Cement + 0.005 lbs/sack Static Free + 2% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 56.3% Fresh Water

Intermediate: 10-5/8" Hole, 8-5/8" Casing

Type	Interval	Density	Excess	Hole Volume w/ Excess (cubic-ft)	Yield (cu-ft/sack)	Mix Water (gal/sack)	Sacks	Cement
Lead	0 - 400'	12.9 ppg	0%	106	1.91	9.64	56	(35:65) Poz (Fly Ash): Class C Cement + 0.005 lbs/sack Static Free + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 5 lbs/sack LCM-1 + 0.2% bwoc FL-52 + 0.005 gps FP-6L + 5% bwoc MPA-5 + 4% bwoc Bentonite II + 92.4% Fresh Water
Lead	400' - 1,500'	12.9 ppg	100%	462	1.91	9.64	242	(35:65) Poz (Fly Ash): Class C Cement + 0.005 lbs/sack Static Free + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 5 lbs/sack LCM-1 + 0.2% bwoc FL-52 + 0.005 gps FP-6L + 5% bwoc MPA-5 + 4% bwoc Bentonite II + 92.4% Fresh Water
Tail	1,500' - 2,500'	14.8 ppg	100%	434	1.34	6.35	324	Class C Cement + 0.005 lbs/sack Static Free + 2% bwoc Calcium Chloride + 0.005 gps FP-6L + 56.3% Fresh Water

Production: 7-7/8" Hole, 5-1/2" Casing

Type	Interval	Density	Excess	Hole Volume w/ Excess (cubic-ft)	Yield (cu-ft/sack)	Mix Water (gal/sack)	Sacks	Cement
Lead	0 - 2,500'	12.0 ppg	0%	443	2.11	11.81	210	(60:40) Poz (Fly Ash):Class C Cement + 3% bwow Sodium Chloride + 0.3% bwoc FL-52 + 0.7% bwoc Sodium Metasilicate + 6% bwoc MPA-5 + 120.1% Fresh Water
Lead	2,500' - 4,500'	12.0 ppg	30%	451	2.11	11.81	214	(60:40) Poz (Fly Ash):Class C Cement + 3% bwow Sodium Chloride + 0.3% bwoc FL-52 + 0.7% bwoc Sodium Metasilicate + 6% bwoc MPA-5 + 120.1% Fresh Water
Tail	4,500' - 12,480'	13.2 ppg	30%	1,808	1.57	7.99	1,152	(15:61:11) Poz (Fly Ash):Class C Cement:CSE-2 + 0.005% bwoc Static Free + 0.3% bwoc FL-25 + 0.4% bwoc FL-52 + 0.005 gps FP-6L + 0.5% bwoc BA-10A + 76.6% Fresh Water

See COA

- The above cement volumes could be revised pending on the amount of time the hole is open by adjusting the % excess
- The 8-5/8" Intermediate cement job is designed to circulate cement to surface
- The 5-1/2" Production cement job is designed to circulate cement to surface

5. Well Control Equipment:

See COA

The blowout preventer (BOP) equipment will consist of a double ram-type preventer and annular preventer as provided for in Onshore Order #2. The BOP will be hydraulically operated and the ram type preventers will be equipped with blind rams on top and 5" drill pipe rams on bottom. A 13-5/8" BOP will be used during the drilling of the well. A 13-5/8" permanent multi-bowl (A & B sections) casing head will be installed on the 11-3/4" Surface casing. The BOP and Multi-bowl casing head will be tested to a minimum of 5,000 psi by a third party testing service and used continuously until total depth has been reached. The 8-5/8" casing string will be run using a casing hanger landing system which is run through the 13-5/8" BOPs and landed out in the casing hanger landing profile in the Multi-bowl casing head system. The 8-5/8" pack-off will then be installed once the casing hanger has been landed out and pressure tested to 5,000 psi. Doing this allows us to not have to Nipple down the 13-5/8" BOP stack and allows us to maintain well control integrity throughout the duration. Pipe rams will be operationally checked each 24-hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily drilling reports. Other accessories to the BOP equipment will include the IBOP (Kelly Cock), floor safety valve, choke & kill lines, and a choke manifold rated to 5,000 psi all of which will be tested to working pressure by an independent third party tester. Anytime a component of the BOP stack or choke manifold is changed/replaced or installed the BOP equipment will be re-tested as required.

6. Proposed Mud System:

See COA

Depth (MD)	Mud Type	Weight (ppg)	Viscosity	Water Loss	pH	Chlorides (ppm)
0 - ~~400~~ 320',	SPUD	8.4 - 9.4	32 - 34	N/C	10	1 - 4K
~~400 - 2,500~~ 2430	Brine	9.5 - 10.0	28	N/C	10	186K
~~2,500~~ - 7,500	Cut-Brine	9.0 - 9.5	28	N/C	10	40 - 80K
7,500 - 8,200	Cut-Brine/polymer	9.0 - 9.5	32 - 34	N/C	10	80 - 110K
8,200 - 12,480	Cut-Brine/polymer	9.0 - 9.5	33 - 34	N/C	10	90 - 170K

Sufficient mud materials will be kept at the well site at all times to maintain mud properties, lost circulation if present, and mud weight increase requirements.

Visual or electronic mud monitoring equipment shall be in place to detect losses or gains in drilling fluid volumes.

7. Auxiliary Well Control Equipment and Monitoring Systems:

a. An IBOP (Kelly Cock) will be in the Top Drive System (TDS) at all times
b. A full opening safety valve having the appropriate connections (4-1/2" IF Connection) will be on the rig floor at all times in the ready position.
c. Hydrogen Sulfide (H_2S) detection equipment will be in operation and breathing equipment on standby upon drilling out the 11-3/4" Surface casing shoe and until the 5-1/2" casing string is cemented in place.

8. Testing, Logging, and Coring Program:

a. No open hole or cased hole wireline logs are planned during the drilling phase of the well
b. Gamma Ray will be captured from about 300 ft above KOP and throughout the curve and lateral
c. Mud logging program will consist of lagged 10 ft samples and commence at around 5,000 ft MD (about 2,500 ft above KOP) to total depth of the horizontal hole interval
d. Drill stem testing is not anticipated
e. No conventional coring operations are planned

9. Estimated Bottom Hole Pressure & Temperature:

a. BHP @ Lateral TD: 3,786 psi
b. BHT @ Lateral TD: 137°

10. Abnormal Conditions, Pressures, Temperatures, and Potential Hazards:

No abnormal pressures and temperatures are anticipated. We have determined from wells nearby in the area that any hazardous volumes of H_2S are not anticipated on being encountered. If a large volume of H_2S is encountered, the operator will comply with the provisions of Onshore Oil & Gas Order No. 6. All personnel will be familiar with all aspects of safe operation of equipment being used to drill the well.

See COA

11. Anticipated Starting Date and Duration of Operations:

Location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon as possible after BLM approval. Rig move and drilling operations is anticipated to take 20 days.

LEGEND NATURAL GAS

Project: Eddy County, NM (Nad27)
Site: Sec 19 T24S R 28E
Well: Pardue 19 Federal Com 4H
Wellbore: Wellbore #1
Design: Plan #2 100114
Rig: TBD-KB=25'

PHOENIX TECHNOLOGY SERVICES

Azimuths to Grid North
True North: -0.11°
Magnetic North: 7.33°

Magnetic Field
Strength: 48211.8snT
Dip Angle: 59.98°
Date: 10/1/2014
Model: IGRF2010_14

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	4000.00	0.00	0.00	4000.00	0.00	0.00	0.00	0.00	0.00		Begin 1.00°/100 Build
3	4200.00	2.00	90.00	4199.86	0.00	3.49	1.00	90.00	0.06		Hold 2.00°Inc
4	6501.44	2.00	90.00	6500.00	0.00	83.61	0.00	0.00	1.56		Begin 1.00°/100° Drop
5	6701.44	0.00	0.00	6699.86	0.00	87.30	1.00	180.00	1.62		Begin Vertical Hold
6	7338.02	0.00	0.00	7334.54	0.00	87.30	0.00	0.00	1.62		KOP, 12.00°/100 Build
7	8084.13	89.77	0.28	7812.00	475.57	89.45	12.00	0.26	477.15		LP, Hold 89.77°Inc
8	10108.02	89.77	0.28	7820.00	2499.42	98.62	0.00	0.00	2500.82	Target 1 @ 2500'VS	Begin 1.50°/100° Build
9	10151.98	90.25	359.80	7819.99	2543.38	98.64	1.50	-44.22	2544.77		Hold 90.25°Inc
10	12480.23	90.25	359.80	7810.00	4871.60	90.50	0.00	0.00	4872.44	PBHL_Pardue Fed Com 4H	

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PBHL_Pardue Fed Com 4H - plan hits target center	7810.00	4871.60	90.50	439960.60	563039.50	32° 12' 33.85615 N	104° 7' 48.24403 W	Point
Target 1 @ 2500'VS - plan hits target center	7820.00	2499.42	98.62	437588.42	563047.62	32° 12' 10.38013 N	104° 7' 48.29188 W	Point

WELL DETAILS

Ground Level: 3092.40

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	435089.00	562949.00	32° 11' 45.64678 N	104° 7' 47.40474 W

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

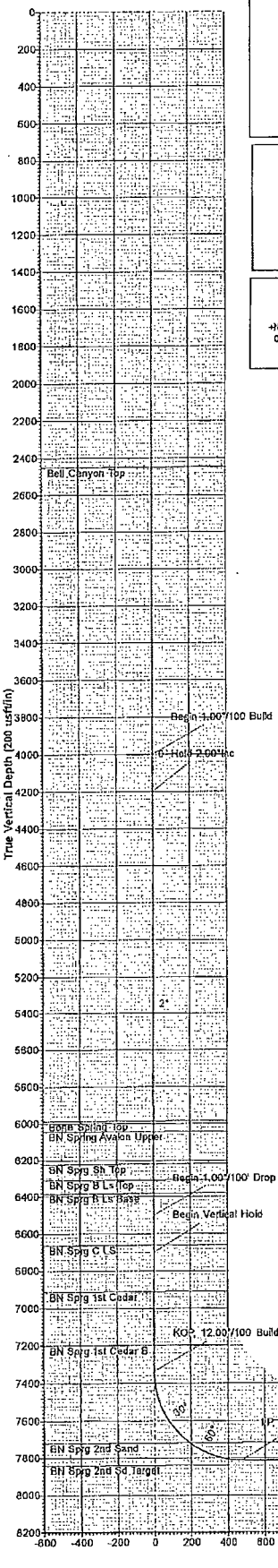
Local Origin: Well Pardue 19 Federal Com 4H, Grid North

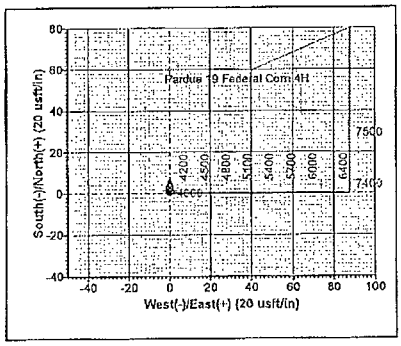
Latitude: 32° 11' 45.64678 N
Longitude: 104° 7' 47.40474 W

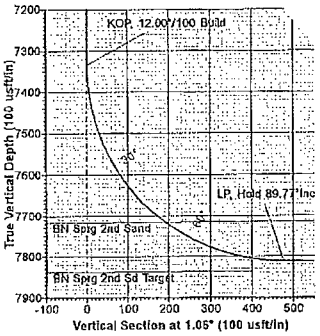
Grid East: 562949.00
Grid North: 435089.00
Scale Factor: 1.000

Geomagnetic Model: IGRF2010_14
Sample Date: 01-Oct-14
Magnetic Declination: 7.44°
Dip Angle from Horizontal: 59.98°
Magnetic Field Strength: 48212

To convert a Magnetic Direction to a Grid Direction, Add 7.33°
To convert a Magnetic Direction to a True Direction, Add 7.44° East
To convert a True Direction to a Grid Direction, Subtract 0.11°

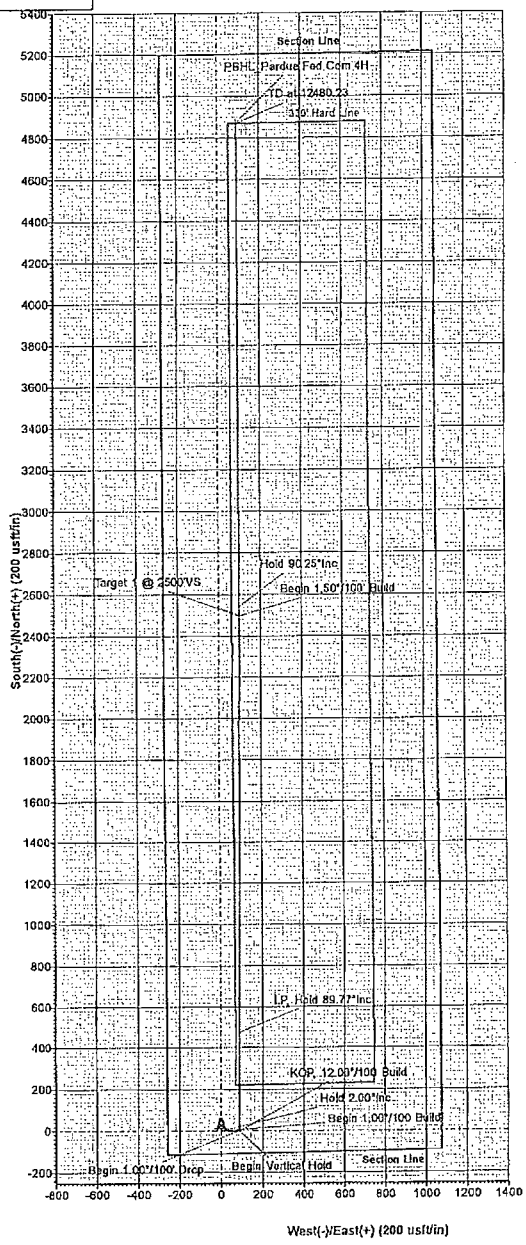


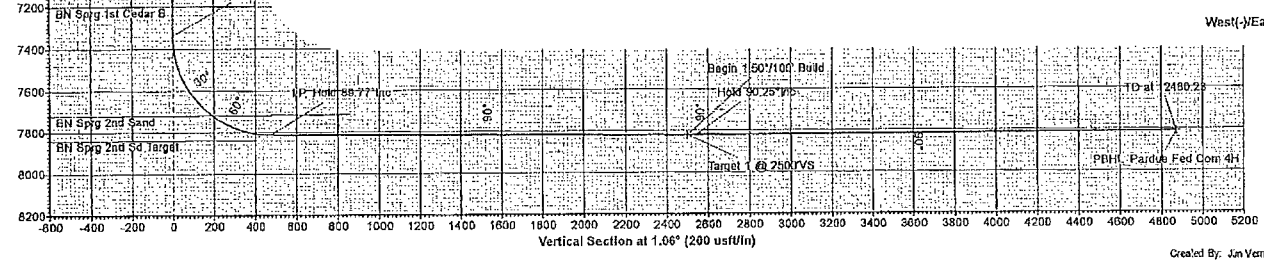




FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
2449.40	2449.40	Bell Canyon Top	-0.24	0.83
5985.40	5986.52	Bone Spring Top	-0.24	0.83
6041.40	6042.56	BN Spring Avalon Upper	-0.24	0.83
6219.40	6220.67	BN Spg Sh Top	-0.24	0.83
6307.40	6308.72	BN Spg B Ls Top	-0.24	0.83
6361.40	6362.77	BN Spg B Ls Base	-0.24	0.83
6659.39	6660.88	BN Spg C LS	-0.24	0.83
6909.39	6910.88	BN Spg 1st Cedar	-0.24	0.83
7197.39	7198.88	BN Spg 1st Cedar B	-0.24	0.83
7715.60	7777.26	BN Spg 2nd Sand	-0.24	0.83





Created By: Jim Vernor Date: 8.08, October 01 2014

LEGEND NATURAL GAS

Legend Natural Gas iV, LP

Eddy County, NM (Nad27)
Sec 19 T24S R 28E
Pardue 19 Federal Com 4H

Wellbore #1

Plan: Plan #2 100114

Standard Survey Report

01 October, 2014

PHOENIX
TECHNOLOGY SERVICES

LEGEND NATURAL GAS

Survey Report

PHOENIX TECHNOLOGY SERVICES

Company:	Legend Natural Gas iV, LP	Local Co-ordinate Reference:	Well Pardue 19 Federal Com 4H
Project:	Eddy County, NM (Nad27)	TVD Reference:	WELL @ 3117.40usft (TBD-KB=25')
Site:	Sec 19 T24S R 28E	MD Reference:	WELL @ 3117.40usft (TBD-KB=25')
Well:	Pardue 19 Federal Com 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #2 100114	Database:	Compass 5000 GCR DB

Project Eddy County, NM (Nad27)

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

Site Sec 19 T24S R 28E

Site Position:		Northing:	435,089.30 usft	Latitude:	32° 11' 45.64938 N
From:	Map	Easting:	562,968.90 usft	Longitude:	104° 7' 47.17314 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.11 °

Well Pardue 19 Federal Com 4H

Well Position	+N/-S	0.00 usft	Northing:	435,089.00 usft	Latitude:	32° 11' 45.64678 N
	+E/-W	0.00 usft	Easting:	562,949.00 usft	Longitude:	104° 7' 47.40474 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,092.40 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	10/1/2014	7.44	59.98	48,212

Design Plan #2 100114

Audit Notes:

Version:		Phase:	PROTOTYPE	Tie On Depth:	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	1.06

Survey Tool Program Date 10/1/2014

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	12,479.92	Plan #2 100114 (Wellbore #1)	MWD	MWD - Standard

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00

Company:	Legend Natural Gas iV, LP	Local Co-ordinate Reference:	Well Pardue 19 Federal Com 4H
Project:	Eddy County, NM (Nad27)	TVD Reference:	WELL @ 3117.40usft (TBD-KB=25')
Site:	Sec 19 T24S R 28E	MD Reference:	WELL @ 3117.40usft (TBD-KB=25')
Well:	Pardue 19 Federal Com 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #2 100114	Database:	Compass 5000 GCR DB

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin 1.00°/100 Build									
4,100.00	1.00	90.00	4,100.00	0.00	0.87	0.02	1.00	1.00	0.00
4,200.00	2.00	90.00	4,199.96	0.00	3.49	0.06	1.00	1.00	0.00
Hold 2.00°Inc									
4,300.00	2.00	90.00	4,299.90	0.00	6.98	0.13	0.00	0.00	0.00
4,400.00	2.00	90.00	4,399.84	0.00	10.47	0.19	0.00	0.00	0.00
4,500.00	2.00	90.00	4,499.78	0.00	13.96	0.26	0.00	0.00	0.00
4,600.00	2.00	90.00	4,599.72	0.00	17.45	0.32	0.00	0.00	0.00
4,700.00	2.00	90.00	4,699.65	0.00	20.94	0.39	0.00	0.00	0.00
4,800.00	2.00	90.00	4,799.59	0.00	24.43	0.45	0.00	0.00	0.00
4,900.00	2.00	90.00	4,899.53	0.00	27.92	0.52	0.00	0.00	0.00
5,000.00	2.00	90.00	4,999.47	0.00	31.41	0.58	0.00	0.00	0.00
5,100.00	2.00	90.00	5,099.41	0.00	34.90	0.65	0.00	0.00	0.00

Company:	Legend Natural Gas IV, LP	Local Co-ordinate Reference:	Well Pardue 19 Federal Com 4H
Project:	Eddy County, NM (Nad27)	TVD Reference:	WELL @ 3117.40usft (TBD-KB=25')
Site:	Sec 19 T24S R 28E	MD Reference:	WELL @ 3117.40usft (TBD-KB=25')
Well:	Pardue 19 Federal Com 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #2 100114	Database:	Compass 5000 GCR DB

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,200.00	2.00	90.00	5,199.35	0.00	38.39	0.71	0.00	0.00	0.00
5,300.00	2.00	90.00	5,299.29	0.00	41.88	0.78	0.00	0.00	0.00
5,400.00	2.00	90.00	5,399.23	0.00	45.37	0.84	0.00	0.00	0.00
5,500.00	2.00	90.00	5,499.17	0.00	48.86	0.91	0.00	0.00	0.00
5,600.00	2.00	90.00	5,599.11	0.00	52.35	0.97	0.00	0.00	0.00
5,700.00	2.00	90.00	5,699.05	0.00	55.84	1.04	0.00	0.00	0.00
5,800.00	2.00	90.00	5,798.98	0.00	59.33	1.10	0.00	0.00	0.00
5,900.00	2.00	90.00	5,898.92	0.00	62.82	1.17	0.00	0.00	0.00
6,000.00	2.00	90.00	5,998.86	0.00	66.31	1.23	0.00	0.00	0.00
6,100.00	2.00	90.00	6,098.80	0.00	69.80	1.30	0.00	0.00	0.00
6,200.00	2.00	90.00	6,198.74	0.00	73.29	1.36	0.00	0.00	0.00
6,300.00	2.00	90.00	6,298.68	0.00	76.78	1.43	0.00	0.00	0.00
6,400.00	2.00	90.00	6,398.62	0.00	80.27	1.49	0.00	0.00	0.00
6,500.00	2.00	90.00	6,498.56	0.00	83.76	1.56	0.00	0.00	0.00
6,501.44	2.00	90.00	6,500.00	0.00	83.81	1.56	0.00	0.00	0.00
Begin 1.00°/100' Drop									
6,600.00	1.01	90.00	6,598.52	0.00	86.40	1.60	1.00	-1.00	0.00
6,700.00	0.01	90.00	6,698.52	0.00	87.30	1.62	1.00	-1.00	0.00
6,701.44	0.00	0.00	6,699.96	0.00	87.30	1.62	1.00	-1.00	0.00
Begin Vertical Hold									
6,800.00	0.00	0.00	6,798.52	0.00	87.30	1.62	0.00	0.00	0.00
6,900.00	0.00	0.00	6,898.52	0.00	87.30	1.62	0.00	0.00	0.00
7,000.00	0.00	0.00	6,998.52	0.00	87.30	1.62	0.00	0.00	0.00
7,100.00	0.00	0.00	7,098.52	0.00	87.30	1.62	0.00	0.00	0.00
7,200.00	0.00	0.00	7,198.52	0.00	87.30	1.62	0.00	0.00	0.00
7,300.00	0.00	0.00	7,298.52	0.00	87.30	1.62	0.00	0.00	0.00
7,336.02	0.00	0.00	7,334.54	0.00	87.30	1.62	0.00	0.00	0.00
KOP, 12.00°/100 Build									
7,400.00	7.68	0.26	7,398.33	4.28	87.32	5.90	12.00	12.00	0.00
7,500.00	19.68	0.26	7,495.31	27.88	87.43	29.50	12.00	12.00	0.00
7,600.00	31.68	0.26	7,585.27	71.13	87.62	72.75	12.00	12.00	0.00
7,700.00	43.68	0.26	7,664.27	132.14	87.90	133.75	12.00	12.00	0.00
7,800.00	55.68	0.26	7,728.86	208.24	88.24	209.85	12.00	12.00	0.00
7,900.00	67.68	0.26	7,776.22	296.11	88.64	297.71	12.00	12.00	0.00
8,000.00	79.68	0.26	7,804.27	391.91	89.07	393.49	12.00	12.00	0.00
8,084.13	89.77	0.26	7,812.00	475.57	89.45	477.15	12.00	12.00	0.00
LP, Hold 89.77°Inc									
8,100.00	89.77	0.26	7,812.06	491.44	89.53	493.02	0.00	0.00	0.00
8,200.00	89.77	0.26	7,812.46	591.44	89.98	593.01	0.00	0.00	0.00
8,300.00	89.77	0.26	7,812.85	691.44	90.43	693.00	0.00	0.00	0.00
8,400.00	89.77	0.26	7,813.25	791.43	90.88	792.99	0.00	0.00	0.00
8,500.00	89.77	0.26	7,813.64	891.43	91.34	892.98	0.00	0.00	0.00
8,600.00	89.77	0.26	7,814.04	991.43	91.79	992.96	0.00	0.00	0.00
8,700.00	89.77	0.26	7,814.43	1,091.43	92.24	1,092.95	0.00	0.00	0.00

Company:	Legend Natural Gas iV, LP	Local Co-ordinate Reference:	Well Pardue 19 Federal Com 4H
Project:	Eddy County, NM (Nad27)	TVD Reference:	WELL @ 3117.40usft (TBD-KB=25')
Site:	Sec 19 T24S R 28E	MD Reference:	WELL @ 3117.40usft (TBD-KB=25')
Well:	Pardue 19 Federal Com 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #2 100114	Database:	Compass 5000 GCR DB

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,800.00	89.77	0.26	7,814.83	1,191.43	92.70	1,192.94	0.00	0.00	0.00
8,900.00	89.77	0.26	7,815.22	1,291.43	93.15	1,292.93	0.00	0.00	0.00
9,000.00	89.77	0.26	7,815.62	1,391.42	93.60	1,392.92	0.00	0.00	0.00
9,100.00	89.77	0.26	7,816.02	1,491.42	94.05	1,492.91	0.00	0.00	0.00
9,200.00	89.77	0.26	7,816.41	1,591.42	94.51	1,592.90	0.00	0.00	0.00
9,300.00	89.77	0.26	7,816.81	1,691.42	94.96	1,692.89	0.00	0.00	0.00
9,400.00	89.77	0.26	7,817.20	1,791.42	95.41	1,792.88	0.00	0.00	0.00
9,500.00	89.77	0.26	7,817.60	1,891.41	95.87	1,892.87	0.00	0.00	0.00
9,600.00	89.77	0.26	7,817.99	1,991.41	96.32	1,992.86	0.00	0.00	0.00
9,700.00	89.77	0.26	7,818.39	2,091.41	96.77	2,092.85	0.00	0.00	0.00
9,800.00	89.77	0.26	7,818.78	2,191.41	97.22	2,192.84	0.00	0.00	0.00
9,900.00	89.77	0.26	7,819.18	2,291.41	97.68	2,292.83	0.00	0.00	0.00
10,000.00	89.77	0.26	7,819.57	2,391.41	98.13	2,392.82	0.00	0.00	0.00
10,100.00	89.77	0.26	7,819.97	2,491.40	98.58	2,492.80	0.00	0.00	0.00
10,108.02	89.77	0.26	7,820.00	2,499.42	98.62	2,500.82	0.00	0.00	0.00
Begin 1.50°/100' Build									
10,151.98	90.25	359.80	7,819.99	2,543.38	98.64	2,544.77	1.50	1.07	-1.05
Hold 90.25°Inc									
10,200.00	90.25	359.80	7,819.79	2,591.40	98.47	2,592.78	0.00	0.00	0.00
10,300.00	90.25	359.80	7,819.36	2,691.40	98.12	2,692.76	0.00	0.00	0.00
10,400.00	90.25	359.80	7,818.93	2,791.40	97.77	2,792.73	0.00	0.00	0.00
10,500.00	90.25	359.80	7,818.50	2,891.40	97.43	2,892.71	0.00	0.00	0.00
10,600.00	90.25	359.80	7,818.07	2,991.40	97.08	2,992.68	0.00	0.00	0.00
10,700.00	90.25	359.80	7,817.64	3,091.39	96.73	3,092.66	0.00	0.00	0.00
10,800.00	90.25	359.80	7,817.21	3,191.39	96.38	3,192.63	0.00	0.00	0.00
10,900.00	90.25	359.80	7,816.78	3,291.39	96.03	3,292.61	0.00	0.00	0.00
11,000.00	90.25	359.80	7,816.35	3,391.39	95.68	3,392.58	0.00	0.00	0.00
11,100.00	90.25	359.80	7,815.92	3,491.39	95.33	3,492.56	0.00	0.00	0.00
11,200.00	90.25	359.80	7,815.50	3,591.39	94.98	3,592.53	0.00	0.00	0.00
11,300.00	90.25	359.80	7,815.07	3,691.39	94.63	3,692.51	0.00	0.00	0.00
11,400.00	90.25	359.80	7,814.64	3,791.38	94.28	3,792.48	0.00	0.00	0.00
11,500.00	90.25	359.80	7,814.21	3,891.38	93.93	3,892.46	0.00	0.00	0.00
11,600.00	90.25	359.80	7,813.78	3,991.38	93.58	3,992.43	0.00	0.00	0.00
11,700.00	90.25	359.80	7,813.35	4,091.38	93.23	4,092.41	0.00	0.00	0.00
11,800.00	90.25	359.80	7,812.92	4,191.38	92.88	4,192.38	0.00	0.00	0.00
11,900.00	90.25	359.80	7,812.49	4,291.38	92.53	4,292.35	0.00	0.00	0.00
12,000.00	90.25	359.80	7,812.06	4,391.37	92.18	4,392.33	0.00	0.00	0.00
12,100.00	90.25	359.80	7,811.63	4,491.37	91.83	4,492.30	0.00	0.00	0.00
12,200.00	90.25	359.80	7,811.20	4,591.37	91.48	4,592.28	0.00	0.00	0.00
12,300.00	90.25	359.80	7,810.77	4,691.37	91.13	4,692.25	0.00	0.00	0.00
12,400.00	90.25	359.80	7,810.34	4,791.37	90.78	4,792.23	0.00	0.00	0.00
12,480.23	90.25	359.80	7,810.00	4,871.60	90.50	4,872.44	0.00	0.00	0.00
TD at 12480.23									

Company:	Legend Natural Gas iV, LP	Local Co-ordinate Reference:	Well Pardue 19 Federal Com 4H
Project:	Eddy County, NM (Nad27)	TVD Reference:	WELL @ 3117.40usft (TBD-KB=25')
Site:	Sec 19 T24S R 28E	MD Reference:	WELL @ 3117.40usft (TBD-KB=25')
Well:	Pardue 19 Federal Com 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Plan #2 100114	Database:	Compass 5000 GCR DB

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
PBHL_Pardue Fed Com - plan hits target center - Point	0.00	0.00	7,810.00	4,871.60	90.50	439,960.60	563,039.50	32° 12' 33.85617 N	104° 7' 46.24403 W
Target 1 @ 2500'VS - plan hits target center - Point	0.00	0.00	7,820.00	2,499.42	98.62	437,588.42	563,047.62	32° 12' 10.38013 N	104° 7' 46.20188 W

Formations

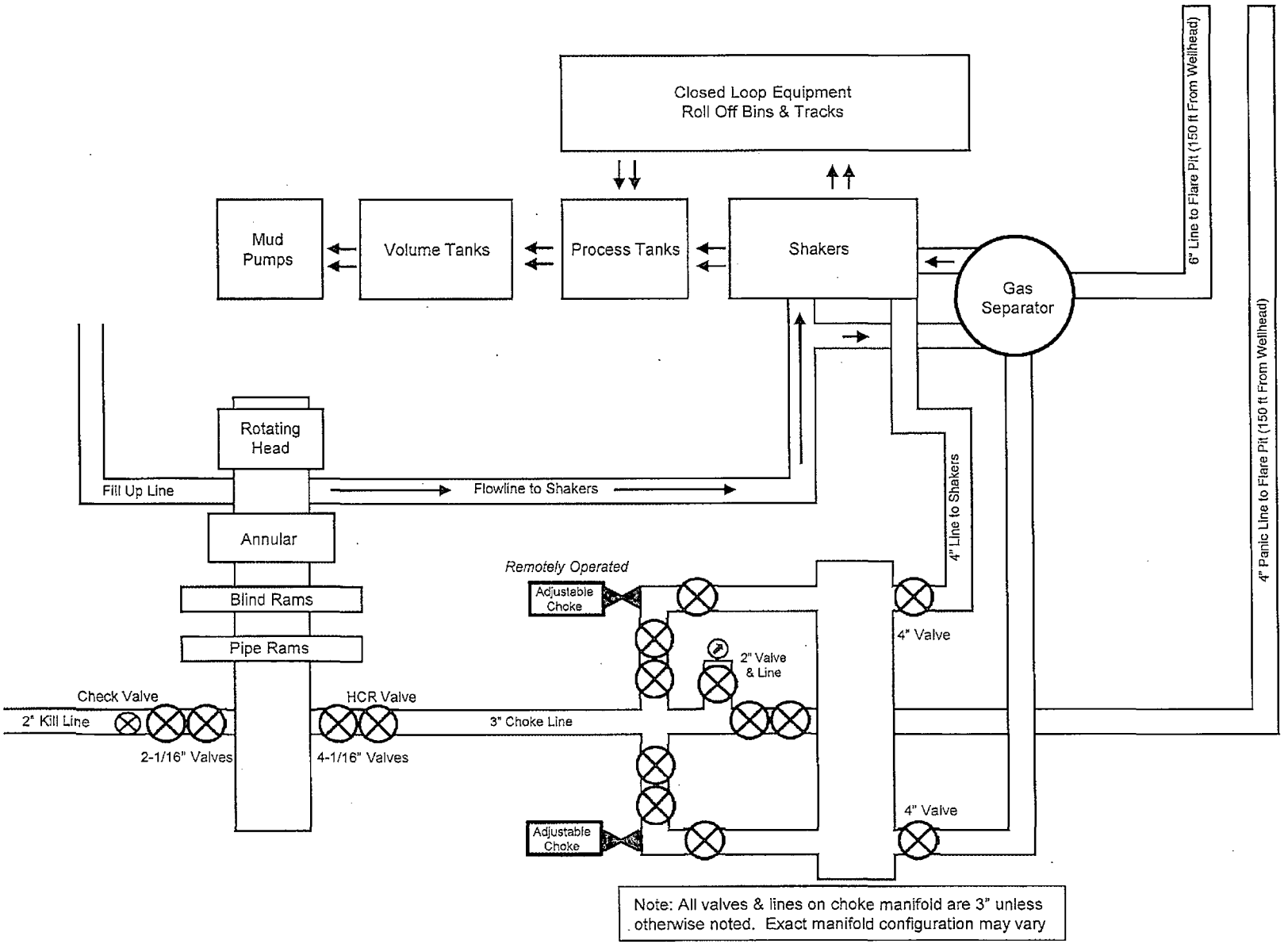
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,449.40	2,449.40	Bell Canyon Top		-0.24	0.83
5,986.53	5,985.40	*Bone Spring Top*		-0.24	0.83
6,042.56	6,041.40	BN Spring Avalon Upper		-0.24	0.83
6,220.67	6,219.40	BN Sprg Sh Top		-0.24	0.83
6,308.72	6,307.40	BN Sprg B Ls Top		-0.24	0.83
6,382.77	6,381.40	BN Sprg B Ls Base		-0.24	0.83
6,660.88	6,659.39	BN Sprg C LS		-0.24	0.83
6,910.88	6,909.39	BN Sprg 1st Cedar		-0.24	0.83
7,198.88	7,197.39	BN Sprg 1st Cedar B		-0.24	0.83
7,777.26	7,715.60	BN Sprg 2nd Sand		-0.24	0.83

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
4000	4000	0	0	Begin 1.00°/100 Build
4200	4200	0	3	Hold 2.00°Inc
6501	6500	0	84	Begin 1.00°/100' Drop
6701	6700	0	87	Begin Vertical Hold
7336	7335	0	87	KOP, 12.00°/100 Build
8084	7812	476	89	LP, Hold 89.77°Inc
10,108	7820	2499	99	Begin 1.50°/100' Build
10,152	7820	2543	99	Hold 90.25°Inc
12,480	7810	4872	90	TD at 12480.23

Checked By: _____ Approved By: _____ Date: _____

13-5/8" 5M BOPE & Closed Loop Equipment Schematic



Notes Regarding Blowout Preventers

Legend Natural Gas, III LP
Pardue 19 Federal Com 4H

1. The drilling nipple will be constructed so it can be removed mechanically without the aid of a welder. The minimum internal diameter will equal BOP bore.

2. Wear ring will be properly installed in head.

3. Blowout preventer and all associated fittings will be in operable condition to withstand 5,000 psi working pressure.

4. A full bore safety valve tested to a minimum of 5,000 psi working pressure with proper thread connections will be on the rig floor at all times.

5. All choke lines will be anchored to prevent movement.

6. Hand wheels and extensions will be properly installed and tested

7. Hydraulic BOP control panel will be located as near in proximity to drillers controls as possible

8. All BOP equipment will meet Onshore Order #2 regulations and requirements.

Design Plan
Operating and Maintenance Plan
Closure Plan

Pardue 19 Federal Com 4H
SHL: 110 FSL & 1600 FWL
BHL: 330 FNL & 1700 FWL
SHL: Section 19, T-24S, R-28E
BHL: Section 19, T-24S, R-28E
Eddy County, New Mexico

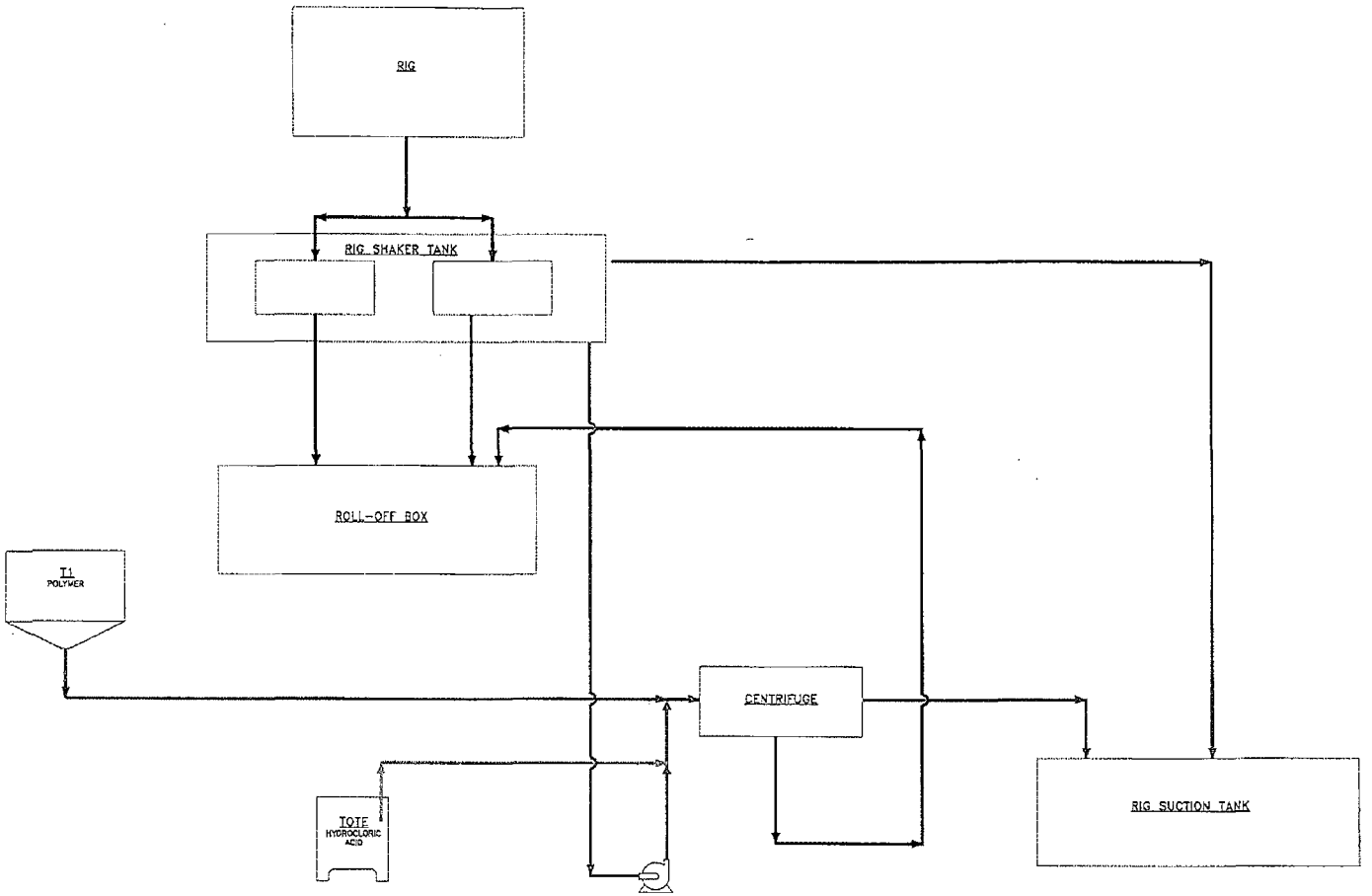
Legend Natural Gas, III L.P. will be using all above ground steel pits for fluid and cuttings while drilling. If a tank develops a leak we will have immediate visual discovery, we would then transfer the fluid to another tank then remove any contaminated soil and dispose of it in the cuttings bins for transportation. All leaks should be kept to less than 5 barrels. Rig crews will monitor the tanks at all times.

Equipment List:
2- Shale Shakers
1- 5500 Centrifuge
3-Roll Off Bins w/ Tracks
1-Rig steel pits (1,000 bbl capacity)
2-500 bbl Frac Tanks

During drilling operations all drilling fluids waste and cuttings will be hauled off via CRI (Controlled Recovery Inc.) Permit R-9166.

Dewatering Process:
CRS Reprocessing Services dewatering process will include the use of the H&H 5500 centrifuge that has a 16" x 56" rotating assembly. Mud will be pulled from the sand trap on the rig pits and pumped to the centrifuge using a 2x3 centrifugal pump. We will introduce our coagulant for the flocculation process on the downstream side of the 2x3 centrifugal pump. For this application we will be using hydrochloric acid as our coagulant. The acid will be located in the same area as our equipment and will be in a 300 gallon chemical tote. We will inject the acid into the mud using an LMI chemical injection pump. This pump has a max processing rate of 10 gallons per hour. After the acid has been introduced we will inject polymer mixture using an electrical positive displacement pump. The polymer we will use is packaged in 55# bags stored on a pallet located next to our operating area. We will mix the polymer in a 5 to 6 bbls tank using fresh water on the first batch. Once the dewatering process starts we will recycle our effluent from the centrifuge to build new batches of polymer. Once the acid and polymer are injected into the mud on the downstream side of the 2x3 centrifugal pump the mud will then enter the centrifuge. The flocculation process will occur by the hydrochloric acid clinging to the solids suspended in the fluid and the polymer causing the solids to clump together. This process plus the g-force of the centrifuge strips the fluid of all suspended solids and returns a clear clean effluent to the active pits. The solids are discharged down the centrifuge discharge slide into the roll off bin and the effluent is returned through a 6" pvc pipe to the rig suction tank.

See CRS Dewatering Process Diagram



LEGEND

- DIRTY WATER
- POLYMER
- HYDROCLORIC ACID
- CLEAN WATER
- WASTE/SOLIDS
- EFFLUENT

REV	DESCRIPTION	BY	DATE
A	ISSUE FOR REVIEW	KC	1/17/14

CRS
REPROCESSING SERVICES
13551 TRITON PARK BLVD., SUITE 1200, LOUISVILLE, KENTUCKY 40223

CHECK BY	DATE	APPRVD BY	DATE

DRAWN BY	DATE	SCALE
KC	1/17/14	NTS

TITLE

DEWATERING DIAGRAM USING ROLL-OFF BOX

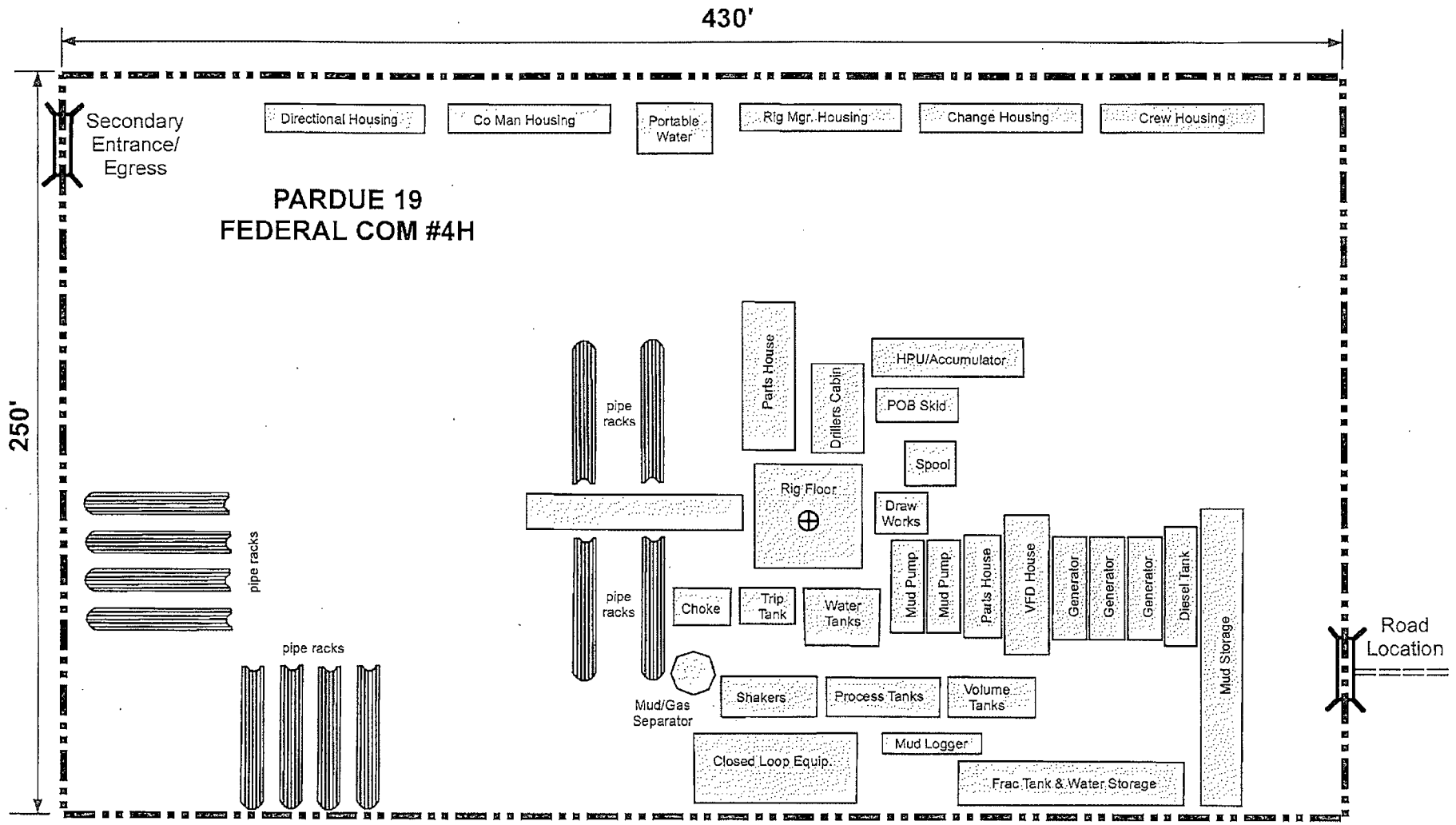
CUST:

SITE:

CAPX:	REV
	A

DRAWING NUMBER

THW-XX-XXX-201



LEGEND NATURAL GAS
Rig Location Layout

N
W E
S

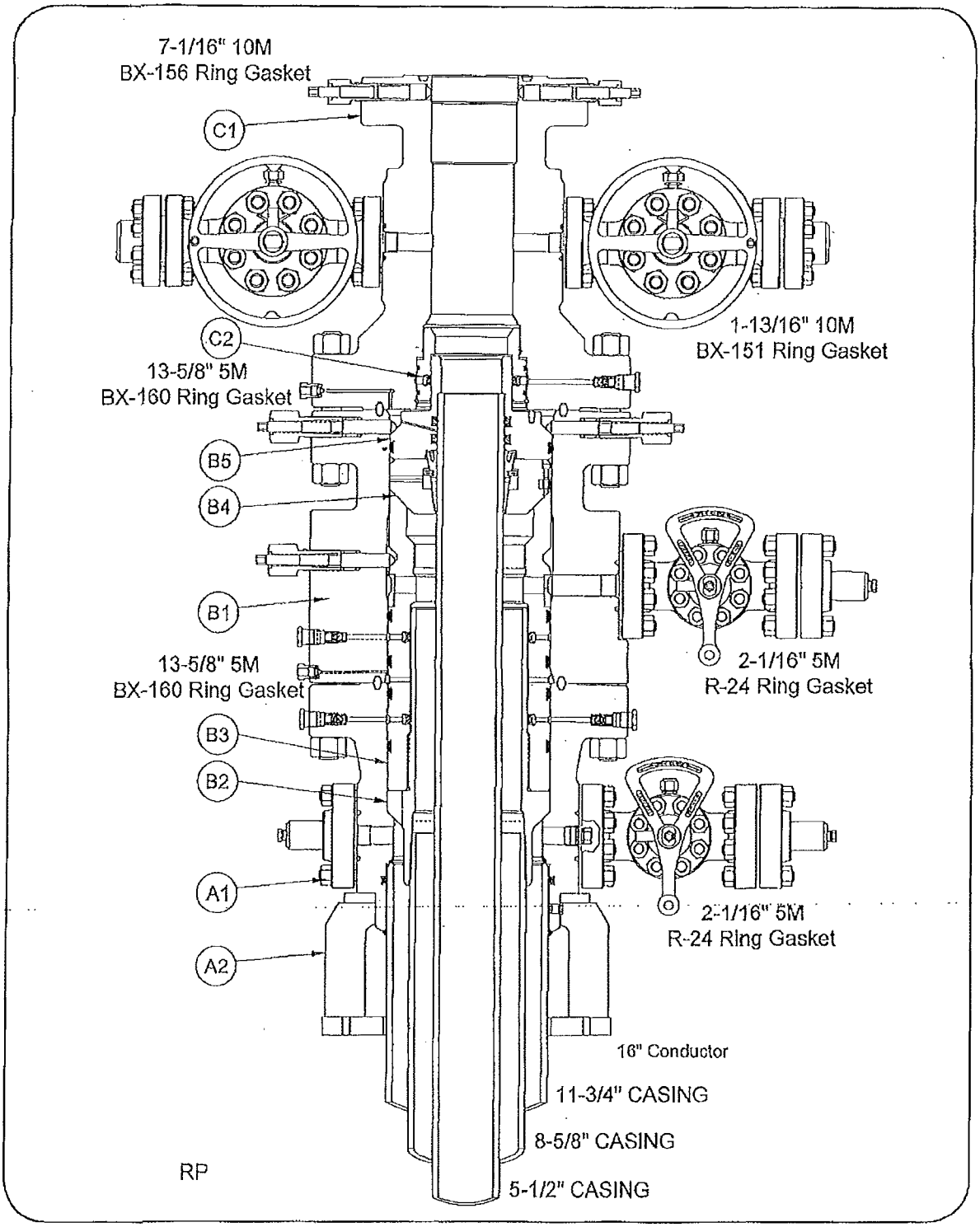
1 inch = 50 feet 1:600

0 50 100 200 Feet

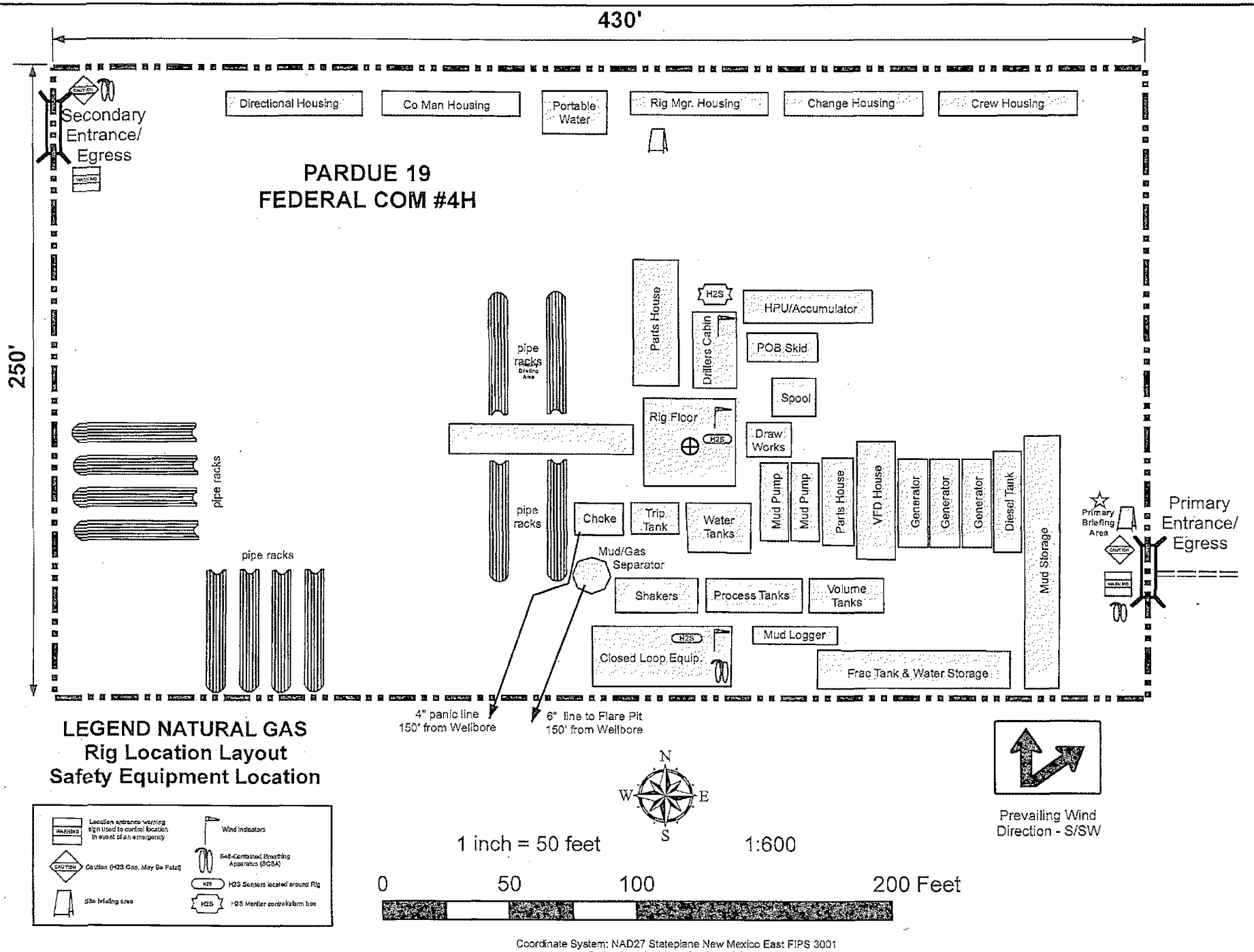
Coordinate System: NAD27 Stateplane New Mexico East FIPS 3001
Projection: Lambert Conformal Conic
Datum: North American 1927
Units: US Feet

Date: 7/22/2014

System Drawing



	13-5/8" 5M MBS System 11-3/4" x 8-5/8" x 5-1/2"	CAMERON



Coordinate System: NAD27 Stateplane New Mexico East FIPS 3001
Projection: Lambert Conformal Conic
Datum: North American 1927
Units: US Feet

Date: 7/22/2014

Legend Natural Gas III, LP

777 Main Street
Suite 900
Fort Worth, TX 76102
Legal Description:
Pardue 19 Federal Com 4H
Eddy County NM
Lat 32.196013°N
Long 104.129835°W

H_2S

"Contingency 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 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 H2S concentration shall trigger activation of this plan.

Emergency Procedures

In the event of a release of gas containing H_2S, the first responder(s) must

- Isolate the area and prevent entry by other persons into the 100 ppm ROE.
- Evacuate;my public places encompassed by the 100 ppm ROE.
- Be equipped with H_2S 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 for local officials to aid in operation. See list of phone numbers attached.
- Have received training in the
  - Detection of H_2S, 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 (S02). 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_2S and $S0_2$

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H_2S	1.189 Air = 1	10ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO2	2.21 Air = 1	2ppm	N/A	1000ppm

Contacting Authorities

Legend Natural Gas III, LP 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. Legend Natural Gas III, LP 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_2S) 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_2S)

2. The proper use and maintenance of personal protective equipment and life support systems.

3. The proper use of H_2S 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_2S metal components. If high tensile tubular 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_2S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H_2S zone (within 3 days or 500 feet) and weekly H_2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H_2S Drilling Operations Plan and the Public Protection Plan.

II. HYDROGEN SULFIDE TRAINING

Note: All H_2S 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 reasonable expected to contain H_2S.

1. Well Control Equipment

A. Flare line

B. Choke manifold -With Remotely Operated Choke

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:

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

3. H_2S detection and monitoring equipment:

A. Portable H_2S monitors positioned on location for best coverage and response. These unites have warning lights and audible sirens when H_2S levels of 20 PPM are reached. These units are usually capable of detecting S02, which is a byproduct of burning H_2S.

4. 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.

5. Mud program:

A. The mud program has been designed to minimize the volume of H_2S circulated to surface. Proper mud weight, safe drilling practices and the use of H_2S scavengers will minimize hazards when penetrating H_2S-bearing zones.

6. Metallurgy:

A. B lowout preventer, drilling spool, kill lines, choke manifold lines, and valves shall be H_2S trim.

B. All elastomers used for packing and seals shall be H_2S trim.

7. Communication:

A. Radio communications in company vehicles including cellular telephones and 2-way radio

B. Land line (telephone) communications at Office

8. 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_2S environment will use the closed chamber method of testing.

B. There will be no drill stem testing.

Emergency Assistance Telephone List

PUBLIC SAFETY:			**911 or**
Eddy County Sheriff's Department		Number:	(575)887-7551
Fire Department:			
	Loco Hills	Number:	(575)677-2349
	Artesia	Number:	(575)746-5051
	Carlsbad	Number:	(575)885-3125
	Happy Valley Carlsbad	Number:	(575)887-6353
	Loving	Number:	(575)745-3600
	Hope	Number:	(575)484-3222
Ambulance:	Artesia	Number:	(575)746-5050
	Carlsbad	Number:	(575)885-2111
	Careplus	Number:	(575)887-5969
	Loving	Number:	(575)887-1191
Hospitals:	Artesia General Hospital	Number:	(575)748-3333
AirMed:	Medevac	Number:	(888)303-9112
Dept. of Public Safety		Number:	(575)887-7551
New Mexico Oil Conservation		Number:	(575)476-3440
U.S. Dept. of Labor		Number:	(866)487-2365
Highway Department		Number:	(575)885-3281

Legend Natural Gas, Inc.

LEGEND NATURAL GAS			Office:	(817)-872-7808
Company Drilling Consultants:				
Name:			Number:	
Name:			Number:	
EHS Coordinator 24hr. Emergency Contact				
Name:	Jody Fontenot	jfontenot@LNG2.com	Number:	(940)-210-0430
Drilling Manager				
Name:	David Dunn	ddunn@LNG2.com	Number:	(817)944-1023
Drilling Superintendent				
Name:	David Dunn	ddunn@LNG2.com	Number:	(817)944-1023
Drilling Company				
Name:			Number:	
Name:			Number:	
Tool Pusher:				
Name:			Number:	
Name:			Number:	
Safety Consultants				
Cliff Strasner			Cell	(432) 894-9789
Craig Strasner			Cell	(432) 894-0341

Legend Natural Gas III, LP
Multi-Point Surface Use Plan of Operations

Pardue 19 Federal Com 4H
SHL: 110 FSL & 1600 FWL
BHL: 330 FNL & 1700 FWL
SHL: Section 19, T-24S, R-28E
BHL: Section 19, T-24S, R-28E
Eddy County, New Mexico

The plan is submitted with Form 3160-3, Application for Permit to Drill, covering the above described well: The purpose of this plan is to describe the location of the proposed well, the proposed construction activities and operations plan, the magnitude of the surface disturbance involved and the procedures to be followed in rehabilitating the surface after completion of the operations so that a complete appraisal can be made of the environmental effect associated with the operations.

1. **Existing Roads**:
   a. The well site and elevation plat for the proposed well are reflected on the well site layout Form C-102. The well was staked by John West Surveying Company.
   b. **Exhibit #2** is a portion of a topographic map showing the well and roads in the vicinity of the location. The well site is indicated on **Exhibit #2**
   c. Routine grading and maintenance of existing roads will be conducted as necessary to maintain their condition as long as any operations continue with this lease.

   Directions:
   From the intersection of U.S. Hwy. 285 and Co. Rd. 720 (Black River Village Rd.) go West on Co. Rd. 720 approximately 2.7 miles, turn left and go South on Meandering Road approximately 1.7 miles to the intersection, continue South on 2-track approximately 0.3 miles. Follow prop. Access Rd. 945' West to Pad of Pardue 19 Fed Com #2H, continue from West side of pad West, 2128' to this pad.

2. **Planned Access Road:**
   Legend Natural Gas III, LP will be using existing caliche road to access the Pardue 19 Federal Com 4H well, and additional 2151.7 feet will be added to extend the road from the Pardue 19 Federal Com 2H pad site to the new 4H location. Width of the road is 14' wide with a crown design. The maximum with of surface disturbance needed to construct the road is 25 feet. The road is crowned and ditched with a 2% slope from the tip of the crown to the edge of the driving surface. The ditches are 3 feet wide with 3:1 slopes.

3. **Location of Existing Facilities: (Exhibit #3)**
   Wells within a mile radius of proposed surface-hole and bottom-hole locations include:
   - Rwanda Fee Com 1
   - Congo Federal Com 1
   - Black Eagle Federal 1
   - Dunghill Chris S Fee Com 1
   - Pardue Farms 20 1
   - Browning Federal Com 2H
   - Browning Federal Com 3H
   - Pardue 19 Federal Com 3H
   - High Brass 3H
   - Pardue '20' Com 1
   - Pardue 19 Com 1
   - Pardue Farms 29 3
   - Pardue 29 Fed Com 4H
   - Goodnight Federal 1
   - Goodnight Federal 2
   - Dakota Federal 30 1
   - Pardue 19 Federal Com 2H
   - Quien Sabe 25 Federal 1H
   - Woody's Hoe Federal Com 1H
   - Brantley '13' State 1
   - Kudu Fee 1H
   - Bongo Fee 1H
   - Mad River '13' State 1H

4. **Location of Existing and/or Proposed Facilities:**
   a. In the event the well is found productive, a tank battery and other surface facilities will be constructed onsite (**See Exhibit C-102 & Exhibit#4 & #5**)
   b. Pardue 19 Federal Com 4H pad will consist of a 200' 4" sales line (stated L11) tying into installed pipeline route owned and operated by Crestwood New Mexico Pipeline, LLC. All natural gas will be sold to Crestwood on location. This gas line does not extend outside the boundaries of the well pad.
   c. 1-4" poly waterline on surface with an operating PSI of 120 or less is proposed for salt water gathering.
   d. A buried flow line from the well head to the separator is proposed and will be 150' of 4" welded steel line carrying oil, gas, and water with less than 150 psi.
   e. All flow lines will adhere to API Standards
   f. An Onsite Inspection was conducted with BLM representative, Indra Dahal on **August 28, 2014**.

5. **Location and Types of Water Supply:**
   This well will be drilled using a combination of water mud systems (outlined in the Drilling Program). The water will be obtained from commercial water stations in the area and hauled to a location by transport truck using the existing and proposed roads shown in **Exhibit #2**. On occasion, water will be obtained from a pre-existing water well, running a pump directly to the drill rig. In these cases where a poly pipeline is used to transport water for drilling purposes, the existing and proposed road shown in **Exhibit #2** will be utilized.

6. **Construction Materials**
   All caliche utilized for the drilling pad and proposed access road will be obtained from an existing pit or from prevailing deposits found under the location. All roads will be constructed of 6" rolled and compacted caliche. Where BLM recommends use of extra caliche, will obtain from other locations close by for roads, if available.

7. **Methods of Handling Waste Material:**
   a. All trash, junk, and other waste material will be removed from the well site within 30 days after finishing drilling and/or completion operations. All waste material will be contained in trash cages or trash bins to prevent scattering. When the job is completed, all contents will be removed and disposed of in an approved sanitary landfill.
   b. The supplier will pick up slats, including broken sacks, remaining after the completion of the well.
   c. A port-o-john will be provided for the rig crews. This equipment will be properly maintained during the drilling and completion operations and will be removed when all operations are complete.
   d. Disposal of fluids to be transported by an approved disposal company.

8. **Ancillary Facilities:**
   No campsite or other facilities will be constructed as a result of this well

9. **Well Site Layout:**
   a. **Exhibit #1** shows the proposed well site layout with dimensions of the pad layout.
   b. Mud pits in the active circulating system will be steel pits and a closed loop system will be utilized.

10. **Plans for Surface Reclamation:**
    Surface is privately owned; per discussion with the landowner we will keep the pad the same size for future drilling and completion operations off this same pad to minimize the footprint.

11. Surface Ownership:

The surface is owned by Pardue Limited. PO Box 2018 (126 N. Canyon), Carlsbad, New Mexico 88220. Phone number is 547-887-9525. A Surface Use Agreement between Pardue Limited and Legend Natural Gas III, LP has been executed. A copy of the Multi-Point Surface Use and Operations Plan has been mailed to Pardue Limited.

12. Other Information

a. The area surrounding the well site is grassland. The vegetation is moderately sparse with native prairie grass and mesquite bushes. No wildlife was observed but is likely that deer, rabbits, coyotes, and rodents traverse the area.
b. There is no permanent or live water in the general proximity of the location.

13. Operator's Representatives:

Drilling: David Dunn: 817-872-7805
Operations: Jason Vining: 817-872-7845
Operations: Ron Dahle: 817-872-7811
Land: John McCauley: 281-644-5972
Geology: Dan Emmers: 817-872-7853
Regulatory: Jennifer Elrod: 817-872-7822
Environmental: Brad Bingham: 817-872-7808
HSE- Jody Fontenot: 817-872-7809

LEGEND NATURAL GAS, III L.P.
777 Main Street, Suite 900
Fort Worth, Texas 76102

Operator Certification

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exists; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in the APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

Executed this 1st day of OCTOBER, 2014.

Signed: _____

Name: Jennifer Mosley Elrod
Title: Sr. Regulatory Analyst
Address: 777 Main Street, Suite 900, Fort Worth, Texas 76102
Phone: (817) 872-7822

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Legend Natural Gas III, L.P.**
LEASE NO.:	**NMNM-18613A**
WELL NAME & NO.:	**Pardue 19 Federal Com 4H**
SURFACE HOLE FOOTAGE:	**0110' FSL & 1600' FWL**
BOTTOM HOLE FOOTAGE	**0330' FNL & 1700' FWL**
LOCATION:	**Section 19, T. 24 S., R 28 E., NMPM**
COUNTY:	**Eddy County, New Mexico**

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Construction:
In the advent that any underground voids are opened up during construction activities, construction activities will be halted and the BLM will be notified immediately.

Tank Battery Liners and Berms:
Tank battery locations and all facilities will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

Communitization Agreement
A Communitization Agreement covering the acreage dedicated to this well must be filed for approval with the BLM. The effective date of the agreement shall be prior to any sales. In addition, the well sign shall include the surface and bottom hole lease numbers. If the Communitization Agreement number is known, it shall also be on the sign. If not, it shall be placed on the sign when the sign is replaced.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation.The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing
The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

G. ON LEASE ACCESS ROADS

Road Width
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

Surfacing
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Ditching
Ditching shall be required on both sides of the road.

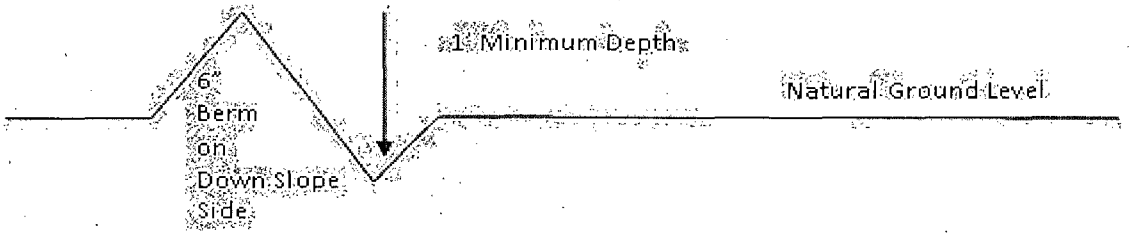
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

400 foot road with 4% road slope: $\frac{400'}{4\%} + 100' = 200'$ lead-off ditch interval

Cattleguards

An appropriately sized cattleguard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattleguards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguards that are in place and are utilized during lease operations.

Fence Requirement

Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Public Access

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Construction Steps

1. Salvage topsoil
2. Construct road
3. Redistribute topsoil
4. Revegetate slopes

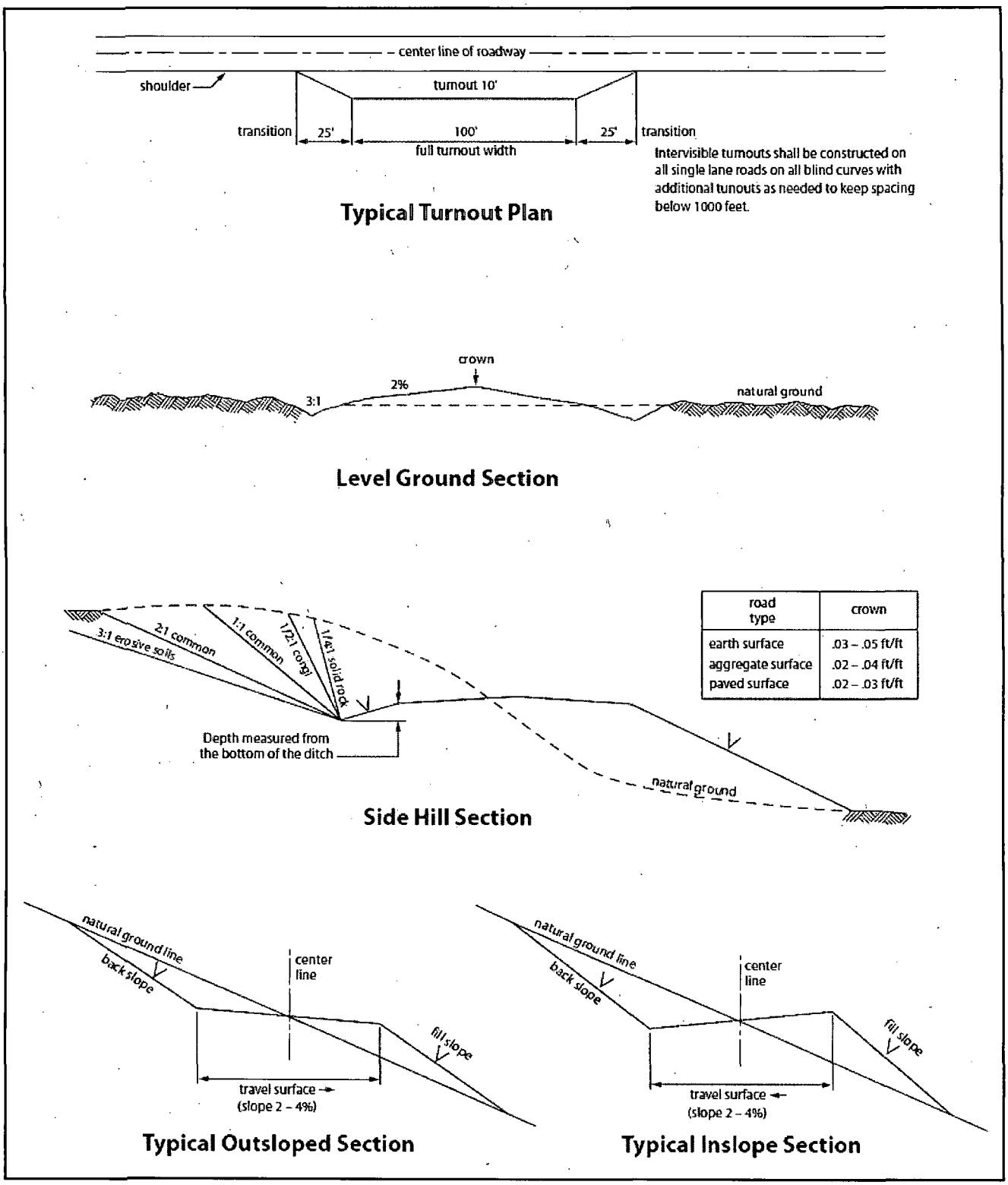


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. DRILLING

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)

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

1. **Although Hydrogen Sulfide has not been reported in the area, it is always a potential hazard. Operator has stated that they will have monitoring equipment in place prior to drilling out of the surface shoe. If Hydrogen Sulfide is encountered, report measured amounts 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 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.

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

Medium Cave/Karst
Possibility of water flows in the Salado and Castile.
Possibility of lost circulation in the Rustler and Delaware.

1. The **11-3/4** inch surface casing shall be set at approximately **220** feet 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.

Formation below the 11-3/4" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.

2. The minimum required fill of cement behind the **8-5/8** inch intermediate casing, which shall be set at approximately **2430** feet (**Lamar Limestone**), 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.**

Formation below the 8-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.

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 **5-1/2** inch production casing is:

   ☒ Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Excess calculates to 24% - Additional cement may be required.**

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. **Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 5000 (5M) psi.**
    a. **Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.**
    b. **If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.**
    c. **Manufacturer representative shall install the test plug for the initial BOP test.**
    d. **Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.**
    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.**

5M 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.

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**.

    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.

JAM 063015

VIII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities
Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Exclosure Netting (Open-top Tanks)
Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

Chemical and Fuel Secondary Containment and Exclosure Screening
The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

Open-Vent Exhaust Stack Exclosures
The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

Containment Structures
Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the

largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

Painting Requirement
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

IX. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

X. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Seed Mixture 1, for Loamy Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (small/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Plains lovegrass (Eragrostis intermedia)	0.5
Sand dropseed (Sporobolus cryptandrus)	1.0
Sideoats grama (Bouteloua curtipendula)	5.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed