

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

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

RECEIVED

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

☐ AMENDED REPORT

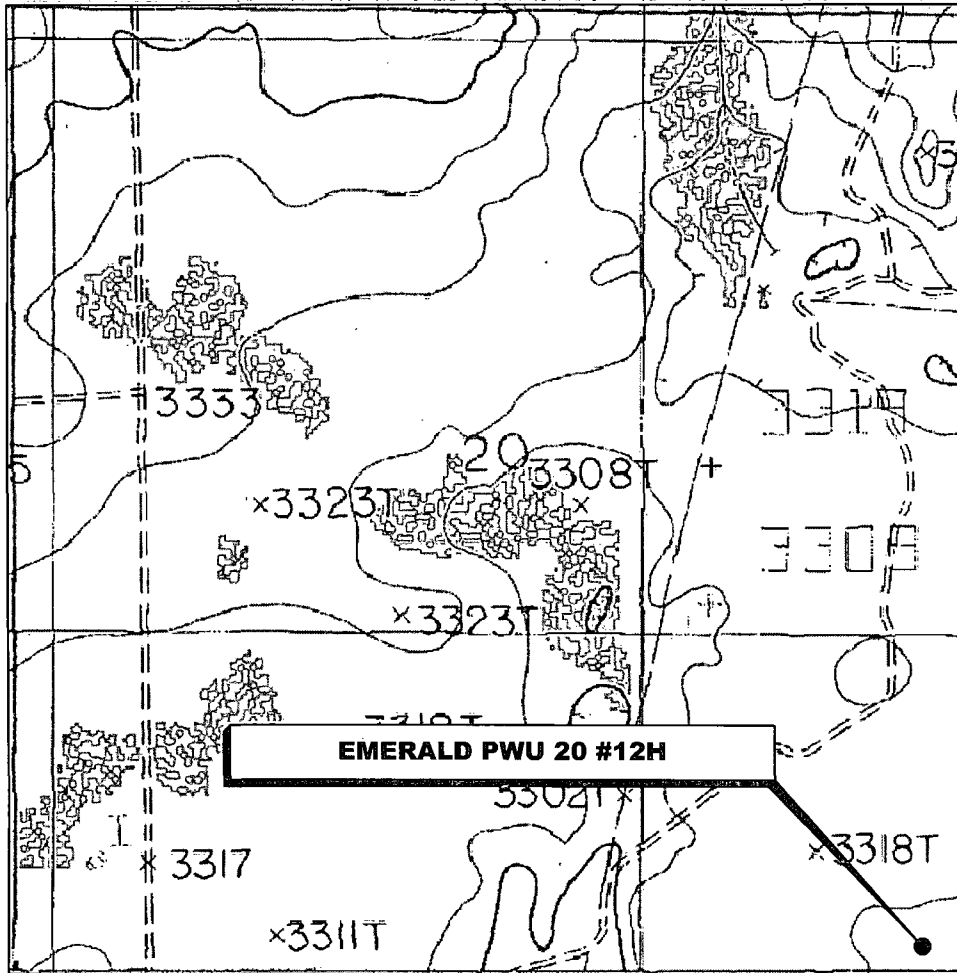
WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number 30-015-43323		2 Pool Code 55510	3 Pool Name Scanlon Draw; Bone Spring	
4 Property Code 38436	5 Property Name EMERALD PWU 20		6 Well Number 12H	
7 GRID NO. 6137	8 Operator Name DEVON ENERGY PRODUCTION CO., L.P.		9 Elevation 3326'	
10 Surface Location				
UL or lot no. P	Section 20	Township 19S	Range 29E	Lot Idn 226
				Feet from the 226
				North/South line SOUTH
				Feet From the 129
				East/West line EAST
				County EDDY
11 Bottom Hole Location If Different From Surface				
UL or lot no. M	Section 20	Township 19S	Range 29E	Lot Idn 370
				Feet from the 370
				North/South line SOUTH
				Feet from the 270
				East/West line WEST
				County EDDY
12 Dedicated Acres 160.00		13 Joint or Infill		14 Consolidation Code
				15 Order No.

No allowable will be assigned to this completion until all interest have been consolidated or a non-standard unit has been approved by the division.

16 CORNER DATA NAD 83 GRID - NM EAST A: FOUND LIMESTONE ROCK N 596321.1 - E 611438.5 B: FOUND LIMESTONE ROCK 12"x4"x4.5" N 598960.3 - E 611433.1 C: FOUND 1/2" REBAR N 601599.9 - E 611427.2 D: FOUND 1/2" REBAR N 601592.7 - E 614073.1 E: FOUND 1/2" REBAR N 601594.9 - E 616731.0 F: FOUND LIMESTONE ROCK 11"x4.5"x6.5" N 598952.1 - E 616727.9 G: FOUND RAILROAD SPIKE N 596311.3 - E 616734.9 H: FOUND LIMESTONE ROCK 7"x8"x3" N 596312.9 - E 614091.7 20 N 88°12'45" W (GRID) 4901.17' (HORIZ.) N 89°49'21" W 2653.86' N 89°57'58" W 2643.78'	17 OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. Signature: <u>Linda Good</u> Date: <u>8/27/15</u> Printed Name: <u>Linda Good</u> E-mail Address: <u>linda.good@dvn.com</u> 18 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. 7-23-2015 Date of Survey Signature and Seal of Professional Surveyor 20451 Certificate Number REV. 08-10-2015
--	---

LOCATION VERIFICATION MAP



SECTION 20, TWP. 19 SOUTH, RGE. 29 EAST,
N. M. P. M., EDDY CO., NEW MEXICO

OPERATOR: Devon Energy Production
Company, L. P.

LEASE: Emerald PWU: 20

WELL NO.: 12H

ELEVATION: 3326'

LOCATION: 226' FSL & 129' FEL

CONTOUR INTERVAL: 10'

USGS TOPO. SOURCE MAP:

Ironhouse Well, NM (P. E. 1984)

Firm. No.: TX 10193838 NM 4655451

Copyright 2015 - All Rights Reserved.

NO.	REVISION	DATE
JOB NO.:	LS1507380	
DWG. NO.:	1507380LVM	

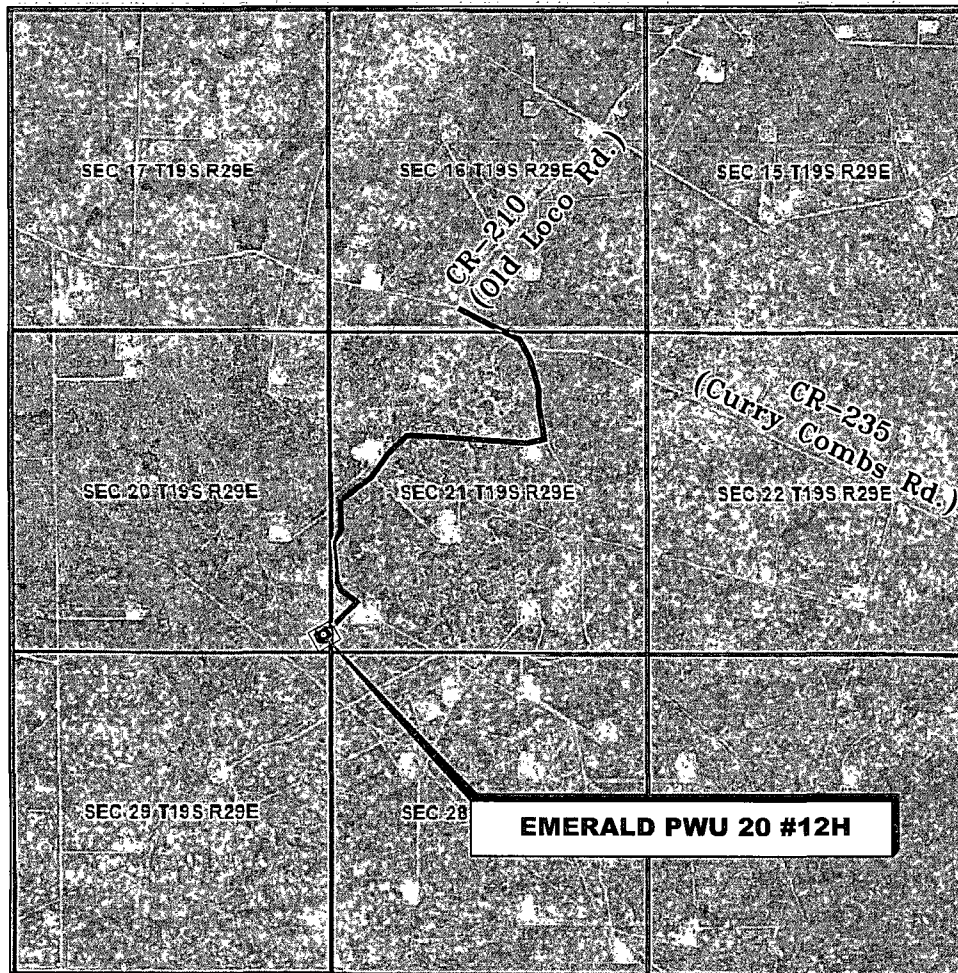
RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: 1"=1000'
DATE: 7-30-2015
SURVEYED BY: ML/ER
DRAWN BY: PDJ
APPROVED BY: REB
SHEET: 1 OF 3

VICINITY MAP

NOT TO SCALE



**SECTION 20, TWP. 19 SOUTH, RGE. 29 EAST,
N. M. P. M., EDDY CO., NEW MEXICO**

OPERATOR: Devon Energy Production
Company, L. P.

LOCATION: 226' FSL & 1:29' FEL
ELEVATION: 3326'

LEASE: Emerald PWU 20
WELL NO.: 12H

Firm No.: TX 10193838 NM 4655451

Copyright 2015, - All Rights Reserved

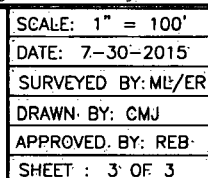
NO.	REVISION	DATE
JOB NO.: LS1507380		
DWG. NO.: 1507380VM		

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

SCALE: NTS
DATE: 7-30-2015
SURVEYED BY: ML/ER
DRAWN BY: RMH
APPROVED BY: REB
SHEET : 2 OF 3

EMERALD PWU 20 #12H
(226' FSL & 129' FEL)
SECTION 20, T19S, R29E,
N. M. P. M., EDDY COUNTY, NEW MEXICO



Devon Energy, Emerald PWU 20 12H

1. Geologic Formations

TVD of target	8,981'	Pilot hole depth	N/A
MD at TD:	13,602'	Deepest expected fresh water:	

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Rustler	0	Barren	
Salt	465	Barren	
Tansil	1130	Barren	
Yates	1265	Barren	
Queen	2165	Oil	
Grayburg	2555	Oil	
Delaware	3445	Oil	
Bone Spring Lm	4975	Oil	
2nd BS Lm	7005	Oil	
3rd BS Lm	7990	Oil	
3rd BS Sd	8620	Oil	
Wolfcamp	9036	Oil	

*H2S, water flows, loss of circulation, abnormal pressures, etc.

Devon Energy, Emerald PWU 20 12H

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	400'	13.375"	48	H-40	STC	3.95	9.24	16.77
12.25"	0	3,350'	9.625"	36	J-55	LTC	1.16	2.02	3.76
8.75"	0	13,602'	5.5"	17	P-110	BTC	1.92	2.73	2.36
BLM Minimum Safety Factor							1.125	1.00	1.6 Dry 1.8 Wet

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Must have table for contingency casing

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

Devon Energy, Emerald PWU 20 12H

3. Cementing Program

String	Number of sx	Weight lbs/gal	Water Volume g/sx	Yield cf/sx	Stage; Lead/Tail	Slurry Description
Surface	395	14.8	6.34	1.35	Tail	Premium Plus C Cement + 0.005 lbs/sack Static Free + 2% bwoc Calcium Chloride + 0.125 lbs/sack Cello Flake + 0.005 gps FP-6L + 56.3% Fresh Water
Intermediate	390	12.8	8.01	1.66	Lead	(60:40) Poz (Fly Ash):Premium Plus C Cement + 0.005 lbs/sack Static Free + 5% bwow Sodium Chloride + 0.25 lbs/sack Cello Flake + 5 lbs/sack LCM-1 + 0.25% bwoc FL-52 + 0.005 gps FP-6L + 1.5% bwoc Sodium Metasilicate + 0.2% bwoc R-3 + 81.5% Fresh Water
	300	13.8	6.40	1.38	Tail	(60:40) Poz (Fly Ash):Premium Plus C Cement + 0.005 lbs/sack Static Free + 5% bwow Sodium Chloride + 0.25 lbs/sack Cello Flake + 0.005 gps FP-6L + 0.25% bwoc Sodium Metasilicate + 0.5% bwoc BA-10A + 4% bwoc MPA-5 + 65.1% Fresh Water
Intermediate 2 Stage	150	12.8	8.01	1.66	1 st Lead	(60:40) Poz (Fly Ash):Premium Plus C Cement + 0.005 lbs/sack Static Free + 5% bwow Sodium Chloride + 0.2% bwoc R-3 + 0.25 lbs/sack Cello Flake + 5 lbs/sack LCM-1 + 0.25% bwoc FL-52 + 0.005 gps FP-6L + 1.5% bwoc Sodium Metasilicate + 81.5% Fresh Water
	300	13.8	6.40	1.38	1 st Tail	(60:40) Poz (Fly Ash):Premium Plus C Cement + 0.005 lbs/sack Static Free + 5% bwow Sodium Chloride + 0.25 lbs/sack Cello Flake + 0.005 gps FP-6L + 0.1% bwoc Sodium Metasilicate + 0.5% bwoc BA-10A + 4% bwoc MPA-5 + 65.1% Fresh Water
	DVT @ 2000'					
	420	12.8	8.01	1.66	2 nd Lead	(60:40) Poz (Fly Ash):Premium Plus C Cement + 0.005 lbs/sack Static Free + 5% bwow Sodium Chloride + 0.2% bwoc R-3 + 0.25 lbs/sack Cello Flake + 5 lbs/sack LCM-1 + 0.25% bwoc FL-52 + 0.005 gps FP-6L + 1.5% bwoc Sodium Metasilicate + 81.5% Fresh Water
	150	13.8	6.41	1.38	2 nd Tail	(60:40) Poz (Fly Ash):Premium Plus C Cement + 0.005 lbs/sack Static Free + 5% bwow Sodium Chloride + 0.25 lbs/sack Cello Flake + 0.005 gps FP-6L + 0.5% bwoc Sodium Metasilicate + 0.5% bwoc BA-10A + 4% bwoc MPA-5 + 65.2% Fresh Water
Production (5 ½")	365	11.8	13.15	2.3	1 st Lead	(50:50) Poz (Fly Ash):Premium Plus H Cement + 0.005 lbs/sack Static Free + 0.5% bwoc FL-52 + 0.3% bwoc ASA-301 + 0.005 gps FP-6L + 10% bwoc Bentonite + 0.35% bwoc R-21 + 130.6% Fresh Water

Devon Energy, Emerald PWU 20 12H

	440	12.5	11.00	2.01	2 nd Lead	(35:65) Poz (Fly Ash):Premium Plus H Cement + 0.005 lbs/sack Static Free + 3% bwow Sodium Chloride + 0.2% bwoc R-3 + 0.125 lbs/sack Cello Flake + 0.7% bwoc FL-52 + 0.3% bwoc ASA- 301 + 0.005 gps FP-6L + 6% bwoc Bentonite + 105.5% Fresh Water
	1440	14.2	5.76	1.28	Tail	(50:50) Poz (Fly Ash):Premium Plus H Cement + 0.005 lbs/sack Static Free + 5% bwow Sodium Chloride + 0.3% bwoc CD-32 + 0.5% bwoc FL-25 + 0.4% bwoc FL-52 + 0.005 gps FP-6L + 0.5% bwoc Sodium Metasilicate + 57.2% Fresh Water
Production 2 Stage (5 ½")	695	12.5	11.01	2.01	1 st Lead	(35:65) Poz (Fly Ash):Premium Plus H Cement + 0.005 gps FP-6L + 3% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 0.3% bwoc ASA-301 + 6% bwoc Bentonite + 0.7% bwoc FL- 52A + 0.005 lbs/sack Static Free + 105.5% Fresh Water
	1415	14.2	5.76=5	1.28	1 st Tail	(50:50) Poz (Fly Ash):Premium Plus H Cement + 5% bwow Sodium Chloride + 0.3% bwoc CD-32 + 0.5% bwoc FL-25 + 0.3% bwoc Sodium Metasilicate + 0.5% bwoc FL-52A + 0.005 gps FP- 6L + 0.005% bwoc Static Free + 57.1% Fresh Water
	DVT @ 3400'					
	240	13.8	6.4	1.37	2 nd Tail	(60:40) Poz (Fly Ash):Premium Plus C Cement + 5% bwow Sodium Chloride + 0.125 lbs/sack Cello Flake + 0.5% bwoc BA-10A + 4% bwoc MPA-5 + 0.005 lbs/sack Static Free + 0.005 gps FP-6L + 65.1% Fresh Water

DV tool depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
13-3/8" Surface	0'	100%
9-5/8" Intermediate	0'	75%
5-1/2" Production Casing Single Stage Option	2350'	25%
5-1/2" Production Casing Two Stage Option	1 st Stage = 3400ft / 2 nd Stage = 2350'	25%

4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
---	--

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
12-1/4"	13-5/8"	3M	Annular	x	50% of working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	x	
			Other*		
8-3/4"	13-5/8"	3M	Annular	x	50% of working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	x	
			Other *		
			Annular		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other *		

*Specify if additional ram is utilized.

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

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 tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

Y	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
---	---

Devon Energy, Emerald PWU 20 12H

Y	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
Y	Are anchors required by manufacturer?
Y	A multibowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. Devon proposes using a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 3000 (3M) psi. • Wellhead will be installed by wellhead vendor representatives. • If the welding is performed by a third party, the wellhead representative will monitor the temperature to verify that it does not exceed the maximum temperature of the seal. • Wellhead representative will install the test plug for the initial BOP test. • Wellhead will install a solid steel body pack-off to completely isolate the lower head after cementing intermediate casing. After installation of the pack-off, the pack-off and the lower flange will be tested to 5M, as shown on the attached schematic. Everything above the pack-off will not have been altered whatsoever from the initial nipple up. Therefore the BOP components will not be retested at that time. • If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head will be cut and top out operations will be conducted. • Devon will pressure test all seals above and below the mandrel (but still above the casing) to full working pressure rating. • Devon will test the casing to 0.22 psi/ft or 1500 psi, whichever is greater, as per Onshore Order #2. After running the 13-3/8" surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 3M will be installed on the wellhead system and will undergo a 250 psi low pressure test followed by a 3,000 psi high pressure test. The 3,000 psi high and 250 psi low test will cover testing requirements a maximum of 30 days, as per Onshore Order #2. If the well is not complete within 30 days of this BOP test, another full BOP test will be conducted, as per Onshore Order #2. After running the 9-5/8" intermediate casing with a mandrel hanger, the 13-5/8" BOP/BOPE system with a minimum rating of 3M will already be installed on the wellhead. The pipe rams will be operated and checked each 24 hour period and each time the drill pipe is out of the hole. These tests will be logged in the daily driller's log. A 2" kill line and 3" choke line will be incorporated into the drilling spool below the ram BOP. In addition to the rams and annular preventer, additional BOP accessories include a kelly cock, floor safety valve, choke lines, and choke manifold rated at 3,000 psi WP.

Devon Energy, Emerald PWU 20 12H

	Devon requests a variance to use a flexible line with flanged ends between the BOP and the choke manifold (choke line). The line will be kept as straight as possible with minimal turns
	See attached schematic.

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	400'	FW Gel	8.6-8.8	28-34	N/C
400'	3,250'	Saturated Brine	10.0-10.2	28-34	N/C
3,250'	13,602'	Cut Brine	8.5-9.3	28-34	N/C

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

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring
---	-----------------------------

6. Logging and Testing Procedures

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

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

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	3893 psi
Abnormal Temperature	No

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

Hydrogen Sulfide (H₂S) monitors will be installed prior to drilling out the surface shoe. If H₂S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.

N	H ₂ S is present
Y	H ₂ S Plan attached

8. Other facets of operation

Is this a walking operation? Yes.

Will be pre-setting casing? No.

Attachments

☒ Directional Plan

☐ Other, describe

devon

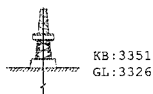
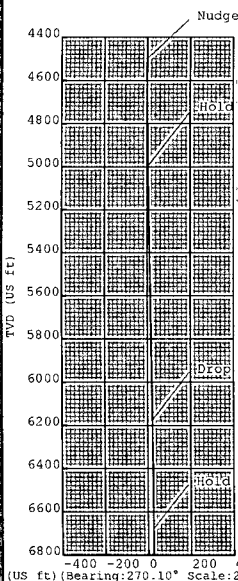
Emerald PWU 20 12H
Eddy Co, NM



Plan Data for Emerald PWU 20 12H

Plan Point Information:

Dogleg Severity Unit: °/100.00ft				Position offsets from Slot centre				VSec	DLS
MD	Inc	Az	TVD	+N/-S	+E/-W	Northing	Easting		
(USft)	(°)	(°)	(USft)	(USft)	(USft)	(USft)	(USft)	(USft)	(DLSU)
0.00	0.00	0.00	-0.00	-0.00	0.00	596537.30	616605.30	-0.00	0.00
4500.00	0.00	0.00	4500.00	-0.00	0.00	596537.30	616605.30	-0.00	0.00
5000.00	5.00	350.00	4999.37	21.47	-3.79	596558.77	616601.51	3.82	1.00
6182.00	5.00	350.00	6176.87	122.92	-21.67	596600.22	616583.63	21.89	0.00
6682.00	0.00	0.00	6676.23	144.40	-25.46	596681.70	616579.84	25.71	1.00
8423.00	0.00	0.00	8417.23	144.40	-25.46	596681.70	616579.84	25.71	0.00
9324.23	90.12	270.10	8990.19	145.44	-599.65	596682.74	616005.65	599.90	10.00
13602.60	90.12	270.10	8981.00	153.22	-4878.00	596690.52	611727.30	4878.26	0.00



Plan Data for Emerald PWU 20 12H

Well: Emerald PWU 20 12H
Type: Main-Well
File Number:

Plan Folder: P1 Plan: P1:V1
Vertical Section: Position offset of origin from Slot centre:
+N/-S: 0.00USft Azimuth: 270.10°
+E/-W: 0.00USft
Magnetic Parameters:
Model: Field Strength: Declination: Dip: Date:
BGGM 48397(nT) 7.52° 60.41° 2015-10-30

Plan Data for Emerald PWU 20 12H

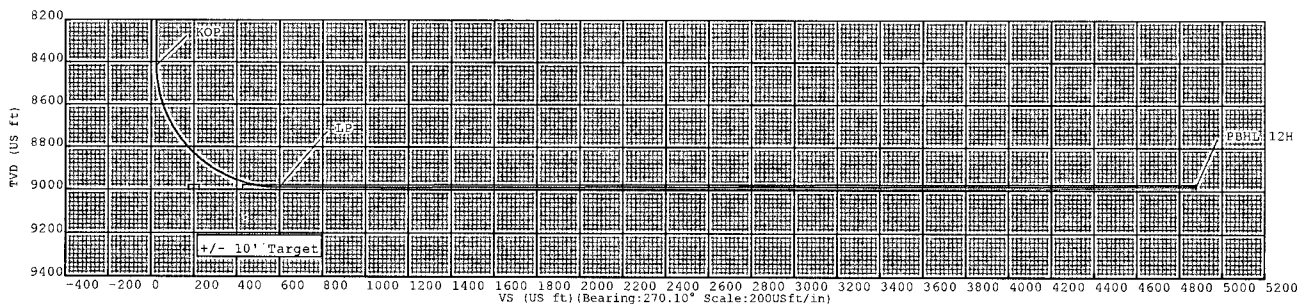
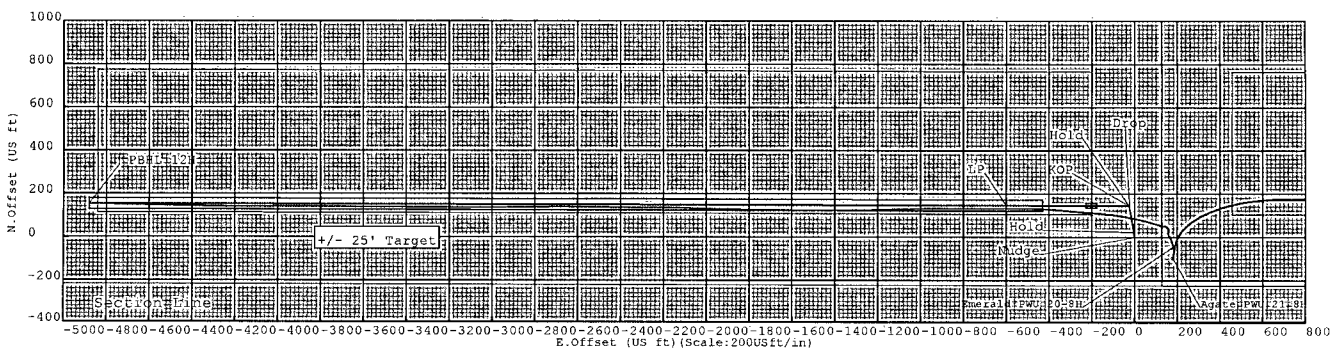
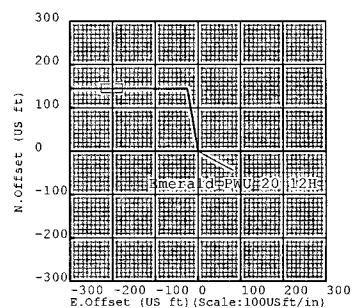
Target Set Information:

Position offsets from Slot centre					
Name	TVD	Elevation	+N/-S	+E/-W	Northing
(USft)	(USft)	(USft)	(USft)	(USft)	(USft)
LP Tgt	8991.00	-5640.00	144.70	-201.57	596682.00
PBHL 12H	8981.00	-5630.00	153.22	-4878.00	596690.52

Plan Data for Emerald PWU 20 12H

Slot: Emerald PWU 20 12H
Position:
Offset is from Site centre
+N/-S: 0.00USft Northing: 596537.30USft Latitude: 32.639692°
+E/-W: 0.00USft Easting: 616605.30USft Longitude: -104.088812°
Elevation Above VRD: 3326.00USft

Emerald PWU 20 12H
20-8H
Agate PWU 21 8H

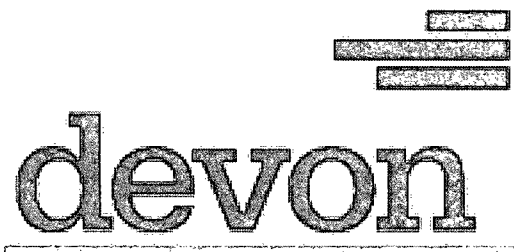


5D Plan Report

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 28 2015

RECEIVED

5D Plan Report

Devon Energy**Field Name:** *Eddy Co, NM (Nad 83 NME)***Site Name:** *Emerald PWU 20 12H***Well Name:** *Emerald PWU 20 12H***Plan:** *P1:V1*

18 August 2015





Emerald PWU 20 12H

Field Name: Eddy Co, NM (Nad 83 NME)	Map Units: US ft		Company Name: Devon Energy	
	Vertical Reference Datum (VRD): Mean Sea Level			
	Projected Coordinate System: NAD83 / New Mexico East (ftUS)			
	Comment:			
Site: Emerald PWU 20 12H	Units: US ft	North Reference: Grid	Convergence Angle: 0.13	
	Position:	Northing: 596537.30US ft	Latitude: 32° 38' 22.89"	
		Easting: 616605.30US ft	Longitude: -104° 5' 19.72"	
	Elevation above MSL: 3326.00 US ft			
	Comment:			
Slot: Emerald PWU 20 12H	Position (Relative to Site Centre)			
	+N/-S: 0.00US ft	Northing: 596537.30US ft	Latitude: 32°38'22.89"	
	+E/-W: 0.00US ft	Easting: 616605.30US ft	Longitude: -104°5'19.72"	
	Slot TVD Reference: Ground Elevation			
	Elevation above MSL: 3326.00US ft			
	Comment:			
Well: Emerald PWU 20 12H	Type: Main well	UWI:	Plan: P1:V1	
	File Number:	Comment:		
	Closure Distance: 4880.41US ft	Closure Azimuth: 271.80°		
	Vertical Section: Position of Origin (Relative to Slot centre)			
	+N/-S: 0.00US ft	+E/-W: 0.00US ft	Az: 270.10°	
	Magnetic Parameters:			
Model: BGGM	Field Strength: 48397.0nT	Declination: 7.52°	Dip: 60.41°	Date: 30/Oct/2015

Drill floor: Plan: P1:V1

Rig Height (Kelly Bushing): Elevation above MSL: 25.00us ft **Inclination:** 0.00° **Azimuth:** 0.00°

Targetset: Emerald PWU 20 12H Comments							
Target Name:	Shape:	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	Northing (USft)	Easting (USft)	Comment
LP Tgt	Cuboid	8991.00	144.70	-201.57	596682.00	616403.73	
PBHL 12H	Cuboid	8981.00	153.22	-4878.00	596690.52	611727.30	

Wellpath created using minimum curvature.

Up Point:					
MD: 0.00USFt	Inclination: 0.00°	Azimuth: 0.00°	TVD: - 0.00USFt	North Offset: - 0.00USFt	East Offset: 0.00USFt

5D Plan Report

Salient Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)											
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	VS (US ft)	DLS (°/100US ft)	B. Rate (°/100US ft)	T. Rate (°/100US ft)	T. Face (°)	Comment
0.00	0.00	0.00	-0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	
4500.00	0.00	0.00	4500.00	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	Nudge
5000.00	5.00	350.00	4999.37	21.47	-3.79	3.82	1.00	1.00	0.00	350.00	Hold
6182.00	5.00	350.00	6176.87	122.92	-21.67	21.89	0.00	0.00	0.00	0.00	Drop
6682.00	0.00	0.00	6676.23	144.40	-25.46	25.71	1.00	-1.00	0.00	180.00	Hold
8423.00	0.00	0.00	8417.23	144.40	-25.46	25.71	0.00	0.00	0.00	0.00	KOP
9324.23	90.12	270.10	8990.19	145.44	-599.65	599.90	10.00	10.00	0.00	270.10	LP
13602.60	90.12	270.10	8981.00	153.22	-4878.00	4878.26	0.00	0.00	0.00	0.00	PBHL

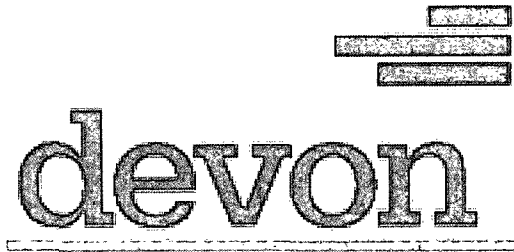
Interpolated Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)											
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	VS (US ft)	DLS (°/100US ft)	Northing (US ft)	Easting (US ft)		Comment
0.00	0.00	0.00	-0.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
100.00	0.00	0.00	100.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
200.00	0.00	0.00	200.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
300.00	0.00	0.00	300.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
400.00	0.00	0.00	400.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
500.00	0.00	0.00	500.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
600.00	0.00	0.00	600.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
700.00	0.00	0.00	700.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
800.00	0.00	0.00	800.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
900.00	0.00	0.00	900.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
1000.00	0.00	0.00	1000.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
1100.00	0.00	0.00	1100.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
1200.00	0.00	0.00	1200.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
1300.00	0.00	0.00	1300.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
1400.00	0.00	0.00	1400.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
1500.00	0.00	0.00	1500.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
1600.00	0.00	0.00	1600.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
1700.00	0.00	0.00	1700.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
1800.00	0.00	0.00	1800.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
1900.00	0.00	0.00	1900.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
2000.00	0.00	0.00	2000.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
2100.00	0.00	0.00	2100.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
2200.00	0.00	0.00	2200.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
2300.00	0.00	0.00	2300.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
2400.00	0.00	0.00	2400.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
2500.00	0.00	0.00	2500.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
2600.00	0.00	0.00	2600.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
2700.00	0.00	0.00	2700.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
2800.00	0.00	0.00	2800.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
2900.00	0.00	0.00	2900.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
3000.00	0.00	0.00	3000.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
3100.00	0.00	0.00	3100.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
3200.00	0.00	0.00	3200.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
3300.00	0.00	0.00	3300.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
3400.00	0.00	0.00	3400.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
3500.00	0.00	0.00	3500.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
3600.00	0.00	0.00	3600.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
3700.00	0.00	0.00	3700.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
3800.00	0.00	0.00	3800.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
3900.00	0.00	0.00	3900.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
4000.00	0.00	0.00	4000.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
4100.00	0.00	0.00	4100.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
4200.00	0.00	0.00	4200.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
4300.00	0.00	0.00	4300.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
4400.00	0.00	0.00	4400.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		
4500.00	0.00	0.00	4500.00	-0.00	0.00	-0.00	0.00	596537.30	616605.30		Nudge
4600.00	1.00	350.00	4599.99	0.86	-0.15	0.15	1.00	596538.16	616605.15		

5D Plan Report

Interpolated Points: (Relative to Slot centre) (TVD relative to Kelly Bushing)										
MD (US ft)	Incl (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	VS (US ft)	DLS (%/100US ft)	Northing (US ft)	Easting (US ft)	Comment
4700.00	2.00	350.00	4699.96	3.44	-0.61	0.61	1.00	596540.74	616604.69	
4800.00	3.00	350.00	4799.86	7.73	-1.36	1.38	1.00	596545.03	616603.94	
4900.00	4.00	350.00	4899.68	13.74	-2.42	2.45	1.00	596551.04	616602.88	
5000.00	5.00	350.00	4999.37	21.47	-3.79	3.82	1.00	596558.77	616601.51	Hold
5100.00	5.00	350.00	5098.99	30.05	-5.30	5.35	0.00	596567.35	616600.00	
5200.00	5.00	350.00	5198.60	38.64	-6.81	6.88	0.00	596575.94	616598.49	
5300.00	5.00	350.00	5298.22	47.22	-8.33	8.41	0.00	596584.52	616596.97	
5400.00	5.00	350.00	5397.84	55.80	-9.84	9.94	0.00	596593.10	616595.46	
5500.00	5.00	350.00	5497.46	64.39	-11.35	11.47	0.00	596601.69	616593.95	
5600.00	5.00	350.00	5597.08	72.97	-12.87	12.99	0.00	596610.27	616592.43	
5700.00	5.00	350.00	5696.70	81.55	-14.38	14.52	0.00	596618.85	616590.92	
5800.00	5.00	350.00	5796.32	90.14	-15.89	16.05	0.00	596627.44	616589.41	
5900.00	5.00	350.00	5895.94	98.72	-17.41	17.58	0.00	596636.02	616587.89	
6000.00	5.00	350.00	5995.56	107.30	-18.92	19.11	0.00	596644.60	616586.38	
6100.00	5.00	350.00	6095.18	115.89	-20.43	20.64	0.00	596653.19	616584.87	
6182.00	5.00	350.00	6176.87	122.92	-21.67	21.89	0.00	596660.22	616583.63	Drop
6200.00	4.82	350.00	6194.80	124.44	-21.94	22.16	1.00	596661.74	616583.36	
6300.00	3.82	350.00	6294.52	131.86	-23.25	23.48	1.00	596669.16	616582.05	
6400.00	2.82	350.00	6394.35	137.56	-24.26	24.50	1.00	596674.86	616581.04	
6500.00	1.82	350.00	6494.26	141.55	-24.96	25.21	1.00	596678.85	616580.34	
6600.00	0.82	350.00	6594.24	143.82	-25.36	25.61	1.00	596681.12	616579.94	
6682.00	0.00	0.00	6676.23	144.40	-25.46	25.71	1.00	596681.70	616579.84	Hold
6700.00	0.00	0.00	6694.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
6800.00	0.00	0.00	6794.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
6900.00	0.00	0.00	6894.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
7000.00	0.00	0.00	6994.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
7100.00	0.00	0.00	7094.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
7200.00	0.00	0.00	7194.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
7300.00	0.00	0.00	7294.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
7400.00	0.00	0.00	7394.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
7500.00	0.00	0.00	7494.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
7600.00	0.00	0.00	7594.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
7700.00	0.00	0.00	7694.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
7800.00	0.00	0.00	7794.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
7900.00	0.00	0.00	7894.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
8000.00	0.00	0.00	7994.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
8100.00	0.00	0.00	8094.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
8200.00	0.00	0.00	8194.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
8300.00	0.00	0.00	8294.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
8400.00	0.00	0.00	8394.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	
8423.00	0.00	0.00	8417.23	144.40	-25.46	25.71	0.00	596681.70	616579.84	KOP
8500.00	7.70	270.10	8494.00	144.41	-30.63	30.88	10.00	596681.71	616574.67	
8600.00	17.70	270.10	8591.43	144.45	-52.58	52.84	10.00	596681.75	616552.72	
8700.00	27.70	270.10	8683.57	144.52	-91.13	91.38	10.00	596681.82	616514.17	
8800.00	37.70	270.10	8767.61	144.61	-145.08	145.33	10.00	596681.91	616460.22	
8900.00	47.70	270.10	8841.01	144.74	-212.81	213.06	10.00	596682.04	616392.49	
9000.00	57.70	270.10	8901.53	144.88	-292.26	292.51	10.00	596682.18	616313.04	
9100.00	67.70	270.10	8947.34	145.04	-381.01	381.26	10.00	596682.34	616224.29	
9200.00	77.70	270.10	8977.04	145.22	-476.36	476.61	10.00	596682.52	616128.94	
9300.00	87.70	270.10	8989.73	145.40	-575.42	575.68	10.00	596682.70	616029.88	
9324.23	90.12	270.10	8990.19	145.44	-599.65	599.90	10.00	596682.74	616005.65	LP
9400.00	90.12	270.10	8990.03	145.58	-675.42	675.67	0.00	596682.88	615929.88	
9500.00	90.12	270.10	8989.81	145.76	-775.42	775.67	0.00	596683.06	615829.88	
9600.00	90.12	270.10	8989.60	145.94	-875.42	875.67	0.00	596683.24	615729.88	
9700.00	90.12	270.10	8989.38	146.12	-975.42	975.67	0.00	596683.42	615629.88	
9800.00	90.12	270.10	8989.17	146.31	-1075.42	1075.67	0.00	596683.61	615529.88	
9900.00	90.12	270.10	8988.95	146.49	-1175.42	1175.67	0.00	596683.79	615429.88	
10000.00	90.12	270.10	8988.74	146.67	-1275.42	1275.67	0.00	596683.97	615329.88	
10100.00	90.12	270.10	8988.52	146.85	-1375.41	1375.67	0.00	596684.15	615229.89	

5D Plan Report

Interpolated Points: (Relative to Slot centre) (TVD relative to Kelly Bushing)										
MD (US ft)	Incl (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	VS (US ft)	DLS (%/100US ft)	Northing (US ft)	Easting (US ft)	Comment
10200.00	90.12	270.10	8988.31	147.03	-1475.41	1475.67	0.00	596684.33	615129.89	
10300.00	90.12	270.10	8988.09	147.21	-1575.41	1575.67	0.00	596684.51	615029.89	
10400.00	90.12	270.10	8987.88	147.40	-1675.41	1675.67	0.00	596684.70	614929.89	
10500.00	90.12	270.10	8987.66	147.58	-1775.41	1775.67	0.00	596684.88	614829.89	
10600.00	90.12	270.10	8987.45	147.76	-1875.41	1875.67	0.00	596685.06	614729.89	
10700.00	90.12	270.10	8987.23	147.94	-1975.41	1975.67	0.00	596685.24	614629.89	
10800.00	90.12	270.10	8987.02	148.12	-2075.41	2075.67	0.00	596685.42	614529.89	
10900.00	90.12	270.10	8986.81	148.31	-2175.41	2175.67	0.00	596685.61	614429.89	
11000.00	90.12	270.10	8986.59	148.49	-2275.41	2275.67	0.00	596685.79	614329.89	
11100.00	90.12	270.10	8986.38	148.67	-2375.41	2375.67	0.00	596685.97	614229.89	
11200.00	90.12	270.10	8986.16	148.85	-2475.41	2475.67	0.00	596686.15	614129.89	
11300.00	90.12	270.10	8985.95	149.03	-2575.41	2575.67	0.00	596686.33	614029.89	
11400.00	90.12	270.10	8985.73	149.21	-2675.41	2675.67	0.00	596686.51	613929.89	
11500.00	90.12	270.10	8985.52	149.40	-2775.41	2775.67	0.00	596686.70	613829.89	
11600.00	90.12	270.10	8985.30	149.58	-2875.41	2875.67	0.00	596686.88	613729.89	
11700.00	90.12	270.10	8985.09	149.76	-2975.41	2975.67	0.00	596687.06	613629.89	
11800.00	90.12	270.10	8984.87	149.94	-3075.41	3075.66	0.00	596687.24	613529.89	
11900.00	90.12	270.10	8984.66	150.12	-3175.41	3175.66	0.00	596687.42	613429.89	
12000.00	90.12	270.10	8984.44	150.31	-3275.41	3275.66	0.00	596687.61	613329.89	
12100.00	90.12	270.10	8984.23	150.49	-3375.41	3375.66	0.00	596687.79	613229.89	
12200.00	90.12	270.10	8984.01	150.67	-3475.41	3475.66	0.00	596687.97	613129.89	
12300.00	90.12	270.10	8983.80	150.85	-3575.41	3575.66	0.00	596688.15	613029.89	
12400.00	90.12	270.10	8983.58	151.03	-3675.41	3675.66	0.00	596688.33	612929.89	
12500.00	90.12	270.10	8983.37	151.22	-3775.41	3775.66	0.00	596688.52	612829.89	
12600.00	90.12	270.10	8983.15	151.40	-3875.40	3875.66	0.00	596688.70	612729.90	
12700.00	90.12	270.10	8982.94	151.58	-3975.40	3975.66	0.00	596688.88	612629.90	
12800.00	90.12	270.10	8982.72	151.76	-4075.40	4075.66	0.00	596689.06	612529.90	
12900.00	90.12	270.10	8982.51	151.94	-4175.40	4175.66	0.00	596689.24	612429.90	
13000.00	90.12	270.10	8982.29	152.12	-4275.40	4275.66	0.00	596689.42	612329.90	
13100.00	90.12	270.10	8982.08	152.31	-4375.40	4375.66	0.00	596689.61	612229.90	
13200.00	90.12	270.10	8981.86	152.49	-4475.40	4475.66	0.00	596689.79	612129.90	
13300.00	90.12	270.10	8981.65	152.67	-4575.40	4575.66	0.00	596689.97	612029.90	
13400.00	90.12	270.10	8981.44	152.85	-4675.40	4675.66	0.00	596690.15	611929.90	
13500.00	90.12	270.10	8981.22	153.03	-4775.40	4775.66	0.00	596690.33	611829.90	
13600.00	90.12	270.10	8981.01	153.22	-4875.40	4875.66	0.00	596690.52	611729.90	
13602.60	90.12	270.10	8981.00	153.22	-4878.00	4878.26	0.00	596690.52	611727.30	PBHL



NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 28 2015

RECEIVED

5D Anti-Collision Report



Devon Energy

Field Name: *Eddy Co, NM (Nad 83 NME)*

Site Name: *Emerald PWU 20 12H*

Well Name: *Emerald PWU 20 12H*



18 August 2015





Emerald PWU 20 12H

Field Name: Eddy Co, NM (Nad 83 NME)	Map Units: US ft		Company Name: Devon Energy	
	Vertical Reference Datum (VRD): Mean Sea Level			
	Projected Coordinate System: NAD83 / New Mexico East (ftUS)			
	Comment:			
Site: Emerald PWU 20 12H	Units: US ft	North Reference: Grid	Convergence Angle: 0.13	
	Position:	Northing: 596537.30US ft	Latitude: 32° 38' 22.89"	
		Easting: 616605.30US ft	Longitude: -104° 5' 19.72"	
	Elevation above MSL: 3326.00 US ft			
	Comment:			
Slot: Emerald PWU 20 12H	Position (Relative to Site Centre)			
	+N/-S: 0.00US ft	Northing: 596537.30US ft	Latitude: 32° 38' 22.89"	
	+E/-W: 0.00US ft	Easting: 616605.30US ft	Longitude: -104° 5' 19.72"	
	Slot TVD Reference: Ground Elevation			
	Elevation above MSL: 3326.00US ft			
	Comment:			
Well: Emerald PWU 20 12H	Type: Main well	UWI:	Plan: Working Plan	
	File Number:	Comment:		
	Closure Distance: 4880.41US ft	Closure Azimuth: 271.80°		
	Vertical Section: Position of Origin (Relative to Slot centre)			
	+N/-S: 0.00US ft	+E/-W: 0.00US ft	Az: 270.10°	
	Magnetic Parameters:			
	Model: BGGM	Field Strength: 48397.0nT	Declination: 7.52°	Dip: 60.41° Date: 30/Oct/2015

Drill floor: Plan: Working Plan

Rig Height (Kelly Bushing): 25.00us ft	Elevation above MSL: 3351.00us ft	Inclination: 0.00°	Azimuth: 0.00°
---	--	---------------------------	-----------------------

Collision / Uncertainty Analysis

Primary Well	Start MD (USFt)	End MD (USFt)	Collision Risk Interval	No. of Std. Deviations in Error Computation
Emerald PWU 20 12H (p)	0.00	13602.60	100.00	2

Secondary Well Names:

20-8H (s)
Exist PWU #5 (s)
Agate PWU 21 8H (p)

Anti-Collision Report Terminology

S.Minor, S.Major: Radii of the ellipse of uncertainty at the current location as seen in the along hole direction.

PHI: Angle between high-side vector and semi-minor axis

TVD Spread: Total TVD range of the ellipsoid of uncertainty at the current location.

ES: Distance between the extremities of the primary and secondary uncertainty ellipsoids in the direction Cr-Cr.

T.Face to Sec: Angle between the Hi-Side vector of the primary well at the current location and line of closest approach between the two wells.

5D Anti-Collision Report

AC Filter Info: No filter has been applied.**Separation factors calculated using Pedal Curve (Independent Uncertainty). Surface Uncertainty (S.U.) Not Applied. Wellpath created using minimum curvature.****Anti-Collision Summary (TVD relative to Kelly Bushing)**

Secondary Well Name	Pl. MD (US ft)	TVD (US ft)	Sec MD (US ft)	ES (US ft)	CC (US ft)	SF	Risk
20-8H (s)	6806.25	6800.48	6843.64	24.29	53.81	1.82	SF(Lo)
Exist PWU #5 (s)	12117.58	8984.19	8600.00	392.17	469.29	6.08	
Agate PWU 21 8H (p)	6646.68	6640.91	6651.43	239.63	270.64	8.73	

Primary Well: Emerald PWU 20 12H (p) (TVD relative to Kelly Bushing) (All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	T-Face to Sec (°)	S-Major (US ft)	S-Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
0.00	-0.00	118.18	0.00	0.00	0.00	Agate PWU 21 8H (p)	201.95	203.48	132.53	
100.00	100.00	118.18	0.11	0.11	4.60	Agate PWU 21 8H (p)	201.64	203.39	116.27	
200.00	200.00	118.18	0.34	0.34	4.62	Agate PWU 21 8H (p)	201.20	203.39	92.80	
300.00	300.00	118.18	0.56	0.56	4.65	Agate PWU 21 8H (p)	200.75	203.39	77.01	
400.00	400.00	118.18	0.79	0.79	4.69	Agate PWU 21 8H (p)	200.30	203.39	65.81	
500.00	500.00	118.18	1.01	1.01	4.75	Agate PWU 21 8H (p)	199.85	203.39	57.46	
600.00	600.00	118.18	1.24	1.24	4.81	Agate PWU 21 8H (p)	199.40	203.39	50.99	
700.00	700.00	118.18	1.46	1.46	4.89	Agate PWU 21 8H (p)	198.95	203.39	45.82	
800.00	800.00	118.18	1.69	1.69	4.97	Agate PWU 21 8H (p)	198.51	203.39	41.61	
900.00	900.00	118.18	1.91	1.91	5.06	Agate PWU 21 8H (p)	198.06	203.39	38.11	
1000.00	1000.00	118.18	2.14	2.14	5.16	Agate PWU 21 8H (p)	197.61	203.39	35.15	
1100.00	1100.00	118.18	2.36	2.36	5.27	Agate PWU 21 8H (p)	197.16	203.39	32.62	
1200.00	1200.00	118.18	2.59	2.59	5.38	Agate PWU 21 8H (p)	196.71	203.39	30.42	
1300.00	1300.00	118.18	2.81	2.81	5.50	Agate PWU 21 8H (p)	196.26	203.39	28.51	
1400.00	1400.00	118.18	3.03	3.03	5.62	Agate PWU 21 8H (p)	195.81	203.39	26.82	
1500.00	1500.00	118.18	3.26	3.26	5.75	Agate PWU 21 8H (p)	195.36	203.39	25.32	
1600.00	1600.00	118.18	3.48	3.48	5.89	Agate PWU 21 8H (p)	194.91	203.39	23.98	
1700.00	1700.00	118.18	3.71	3.71	6.03	Agate PWU 21 8H (p)	194.46	203.39	22.77	
1800.00	1800.00	118.18	3.93	3.93	6.17	Agate PWU 21 8H (p)	194.01	203.39	21.68	
1900.00	1900.00	118.18	4.16	4.16	6.32	Agate PWU 21 8H (p)	193.56	203.39	20.69	
2000.00	2000.00	118.18	4.38	4.38	6.47	Agate PWU 21 8H (p)	193.11	203.39	19.79	
2100.00	2100.00	118.18	4.61	4.61	6.62	Agate PWU 21 8H (p)	192.66	203.39	18.96	
2200.00	2200.00	118.18	4.83	4.83	6.78	Agate PWU 21 8H (p)	192.21	203.39	18.19	
2300.00	2300.00	118.18	5.06	5.06	6.94	Agate PWU 21 8H (p)	191.77	203.39	17.49	
2400.00	2400.00	118.18	5.28	5.28	7.11	Agate PWU 21 8H (p)	191.32	203.39	16.84	
2500.00	2500.00	118.18	5.51	5.51	7.27	Agate PWU 21 8H (p)	190.87	203.39	16.24	
2600.00	2600.00	118.18	5.73	5.73	7.44	Agate PWU 21 8H (p)	190.42	203.39	15.67	

5D Anti-Collision Report

Primary Well: Emerald PWU 20 12H (p) (TVD Relative to Kelly Bushing) (All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	T. Face to Sec (°)	S. Major (US ft)	S. Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF ²	Risk
2700.00	2700.00	118.18	5.96	5.96	7.61	Agate PWU 21 8H (p)	189.97	203.39	15.15	
2800.00	2800.00	118.18	6.18	6.18	7.79	Agate PWU 21 8H (p)	189.52	203.39	14.66	
2900.00	2900.00	118.18	6.41	6.41	7.97	Agate PWU 21 8H (p)	189.07	203.39	14.20	
3000.00	3000.00	118.18	6.63	6.63	8.15	Agate PWU 21 8H (p)	188.62	203.39	13.77	
3100.00	3100.00	118.18	6.86	6.86	8.33	Agate PWU 21 8H (p)	188.17	203.39	13.36	
3200.00	3200.00	97.19	7.08	7.08	8.51	20-8H (s)	162.20	175.84	12.89	
3300.00	3300.00	96.40	7.31	7.31	8.70	20-8H (s)	160.24	174.34	12.37	
3400.00	3400.00	95.45	7.53	7.53	8.89	20-8H (s)	158.34	172.89	11.88	
3500.00	3500.00	94.44	7.76	7.76	9.09	20-8H (s)	156.40	171.42	11.41	
3600.00	3600.00	93.49	7.98	7.98	9.28	20-8H (s)	154.61	170.10	10.98	
3700.00	3700.00	92.64	8.20	8.20	9.48	20-8H (s)	153.11	169.08	10.59	
3800.00	3800.00	91.84	8.43	8.43	9.69	20-8H (s)	151.67	168.11	10.23	
3900.00	3900.00	91.01	8.65	8.65	9.89	20-8H (s)	150.45	167.36	9.90	
4000.00	4000.00	90.30	8.88	8.88	10.10	20-8H (s)	149.09	166.47	9.58	
4100.00	4100.00	89.66	9.10	9.10	10.31	20-8H (s)	147.47	165.32	9.26	
4200.00	4200.00	89.06	9.33	9.33	10.53	20-8H (s)	146.11	164.43	8.98	
4300.00	4300.00	88.61	9.55	9.55	10.74	20-8H (s)	144.89	163.68	8.71	
4400.00	4400.00	88.20	9.78	9.78	10.96	20-8H (s)	143.35	162.61	8.45	
4500.00	4500.00	87.71	10.00	10.00	11.19	20-8H (s)	141.78	161.49	8.19	
4600.00	4599.99	97.36	10.23	10.23	11.42	20-8H (s)	140.22	160.40	7.95	
4700.00	4699.96	97.31	10.45	10.45	11.65	20-8H (s)	138.48	159.14	7.70	
4800.00	4799.86	97.56	10.67	10.67	11.88	20-8H (s)	137.34	158.48	7.49	
4900.00	4899.68	98.34	10.90	10.88	12.12	20-8H (s)	137.41	159.04	7.35	
5000.00	4999.37	99.70	11.12	11.10	12.36	20-8H (s)	138.65	160.73	7.28	
5100.00	5098.99	101.41	11.35	11.32	12.60	20-8H (s)	140.72	163.28	7.24	
5200.00	5198.60	103.25	11.58	11.54	12.85	20-8H (s)	142.98	165.99	7.21	
5300.00	5298.22	105.16	11.80	11.77	13.10	20-8H (s)	145.07	168.56	7.18	
5400.00	5397.84	107.08	12.04	11.99	13.36	20-8H (s)	146.64	170.65	7.11	
5500.00	5497.46	109.04	12.27	12.22	13.62	20-8H (s)	147.25	171.71	7.02	
5600.00	5597.08	111.02	12.50	12.45	13.89	20-8H (s)	146.71	171.61	6.89	
5700.00	5696.70	112.94	12.74	12.67	14.16	20-8H (s)	146.16	171.56	6.75	
5800.00	5796.32	114.84	12.98	12.90	14.43	20-8H (s)	146.69	172.58	6.67	
5900.00	5895.94	116.84	13.22	13.13	14.71	20-8H (s)	147.50	173.84	6.60	
6000.00	5995.56	119.10	13.46	13.35	15.00	20-8H (s)	147.74	174.60	6.50	
6100.00	6095.18	121.72	13.70	13.58	15.28	20-8H (s)	148.03	175.33	6.42	
6200.00	6194.80	124.52	13.93	13.80	15.58	20-8H (s)	148.82	176.51	6.37	
6300.00	6294.52	127.13	14.12	13.98	15.87	20-8H (s)	149.71	177.73	6.34	
6400.00	6394.35	129.30	14.31	14.16	16.18	20-8H (s)	149.89	178.17	6.30	
6500.00	6494.26	131.85	14.49	14.34	16.48	20-8H (s)	142.48	170.42	6.10	
6600.00	6594.24	137.78	14.66	14.51	16.80	20-8H (s)	111.16	138.16	5.12	
6700.00	6694.23	144.07	14.84	14.69	17.11	20-8H (s)	63.91	90.62	3.39	
6800.00	6794.23	186.33	15.06	14.91	17.43	20-8H (s)	24.64	54.11	1.84	SF(L0)
6900.00	6894.23	227.56	15.28	15.13	17.76	20-8H (s)	63.86	89.23	3.52	
7000.00	6994.23	244.37	15.50	15.36	18.09	20-8H (s)	141.43	164.11	7.24	
7100.00	7094.23	251.43	15.73	15.58	18.42	20-8H (s)	227.65	249.21	11.56	
7200.00	7194.23	255.29	15.95	15.80	18.77	20-8H (s)	317.55	338.60	16.09	
7300.00	7294.23	257.58	16.17	16.03	19.11	20-8H (s)	409.66	430.42	20.73	
7400.00	7394.23	259.16	16.39	16.25	19.46	20-8H (s)	503.21	523.87	25.37	
7500.00	7494.23	92.05	16.61	16.48	19.82	Agate PWU 21 8H (p)	730.16	755.37	29.96	
7600.00	7594.23	91.25	16.83	16.70	20.18	Agate PWU 21 8H (p)	815.07	839.92	33.80	
7700.00	7694.23	90.62	17.06	16.92	20.55	Agate PWU 21 8H (p)	901.90	926.51	37.64	
7800.00	7794.23	90.13	17.28	17.15	20.92	Agate PWU 21 8H (p)	990.32	1014.75	41.53	

5D Anti-Collision Report

Primary Well: Emerald PWU 20.12H (p) (TVD relative to Kelly Bushing) (All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
7900.00	7894.23	89.73	17.50	17.37	21.30	Agate PWU 21 8H (p)	1080.07	1104.37	45.44	
8000.00	7994.23	89.41	17.72	17.60	21.68	Agate PWU 21 8H (p)	1170.94	1195.14	49.38	
8100.00	8094.23	89.14	17.94	17.82	22.07	Agate PWU 21 8H (p)	1262.74	1286.89	53.29	
8200.00	8194.23	88.93	18.17	18.04	22.46	Agate PWU 21 8H (p)	1355.32	1379.46	57.13	
8300.00	8294.23	88.75	18.39	18.27	22.86	Agate PWU 21 8H (p)	1448.60	1472.75	60.98	
8400.00	8394.23	88.59	18.61	18.49	23.27	Agate PWU 21 8H (p)	1542.46	1566.65	64.77	
8500.00	8494.00	177.33	18.74	18.69	23.67	Agate PWU 21 8H (p)	1638.26	1662.54	68.49	
8600.00	8591.43	151.32	18.94	18.47	24.06	Agate PWU 21 8H (p)	1737.42	1761.85	72.10	
8700.00	8683.57	3.02	19.19	17.92	24.40	Agate PWU 21 8H (p)	1836.84	1861.48	75.54	
8800.00	8767.61	1.33	19.51	17.09	24.70	Agate PWU 21 8H (p)	1933.66	1958.54	78.73	
8900.00	8841.01	0.78	19.95	16.08	24.96	Agate PWU 21 8H (p)	2025.39	2050.53	81.59	
9000.00	8901.53	9.28	20.60	15.02	25.20	Exist PWU #5 (s)	3054.07	3092.12	81.27	
9100.00	8947.34	12.10	21.49	14.04	25.46	Exist PWU #5 (s)	2970.62	3008.67	79.08	
9200.00	8977.04	17.75	22.67	13.34	25.75	Exist PWU #5 (s)	2879.67	2917.76	76.59	
9300.00	8989.73	32.90	24.09	13.07	26.09	Exist PWU #5 (s)	2783.46	2821.59	74.00	
9400.00	8990.03	40.69	25.72	13.24	26.49	Exist PWU #5 (s)	2684.97	2723.10	71.42	
9500.00	8989.81	40.69	27.53	13.47	26.96	Exist PWU #5 (s)	2586.54	2624.64	68.88	
9600.00	8989.60	40.69	29.49	13.74	27.50	Exist PWU #5 (s)	2488.23	2526.31	66.34	
9700.00	8989.38	40.69	31.56	14.05	28.11	Exist PWU #5 (s)	2390.03	2428.11	63.77	
9800.00	8989.17	40.69	33.74	14.39	28.79	Exist PWU #5 (s)	2291.93	2330.06	61.10	
9900.00	8988.95	40.69	35.99	14.75	29.51	Exist PWU #5 (s)	2193.98	2232.19	58.43	
10000.00	8988.74	40.69	38.31	15.14	30.30	Exist PWU #5 (s)	2096.23	2134.52	55.75	
10100.00	8988.52	40.69	40.68	15.56	31.13	Exist PWU #5 (s)	1998.69	2037.07	53.08	
10200.00	8988.31	40.69	43.10	16.00	32.01	Exist PWU #5 (s)	1901.41	1939.88	50.43	
10300.00	8988.09	40.69	45.56	16.46	32.93	Exist PWU #5 (s)	1804.31	1842.99	47.65	
10400.00	8987.88	40.69	48.05	16.94	33.88	Exist PWU #5 (s)	1707.50	1746.45	44.83	
10500.00	8987.66	40.69	50.57	17.43	34.88	Exist PWU #5 (s)	1611.07	1650.33	42.04	
10600.00	8987.45	40.69	53.11	17.95	35.90	Exist PWU #5 (s)	1515.11	1554.69	39.28	
10700.00	8987.23	40.69	55.67	18.47	36.96	Exist PWU #5 (s)	1419.56	1459.64	36.42	
10800.00	8987.02	40.69	58.25	19.02	38.04	Exist PWU #5 (s)	1324.62	1365.29	33.57	
10900.00	8986.81	40.69	60.85	19.57	39.15	Exist PWU #5 (s)	1230.39	1271.81	30.70	
11000.00	8986.59	40.69	63.46	20.14	40.28	Exist PWU #5 (s)	1137.06	1179.40	27.85	
11100.00	8986.38	40.69	66.08	20.71	41.44	Exist PWU #5 (s)	1044.74	1088.34	24.97	
11200.00	8986.16	40.69	68.71	21.30	42.61	Exist PWU #5 (s)	953.96	998.98	22.19	
11300.00	8985.95	40.69	71.35	21.89	43.80	Exist PWU #5 (s)	864.94	911.84	19.45	
11400.00	8985.73	40.69	74.00	22.50	45.00	Exist PWU #5 (s)	778.16	827.60	16.74	

5D Anti-Collision Report

Primary Well: Emerald PWU 20 12H (p) (TVD relative to Kelly Bushing) (All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
11500.00	8985.52	40.69	76.66	23.11	46.22	Exist PWU #5 (s)	694.94	747.27	14.28	
11600.00	8985.30	40.69	79.32	23.72	47.46	Exist PWU #5 (s)	616.13	672.23	11.98	
11700.00	8985.09	40.69	81.99	24.35	48.70	Exist PWU #5 (s)	544.15	604.47	10.02	
11800.00	8984.87	40.69	84.67	24.98	49.96	Exist PWU #5 (s)	481.49	546.68	8.39	
11900.00	8984.66	40.69	87.35	25.61	51.23	Exist PWU #5 (s)	432.35	502.34	7.18	
12000.00	8984.44	40.69	90.04	26.25	52.52	Exist PWU #5 (s)	401.10	475.22	6.41	
12100.00	8984.23	40.69	92.73	26.90	53.81	Exist PWU #5 (s)	391.46	468.31	6.09	
12200.00	8984.01	40.69	95.42	27.55	55.10	Exist PWU #5 (s)	405.13	482.49	6.24	
12300.00	8983.80	40.69	98.12	28.20	56.41	Exist PWU #5 (s)	439.54	516.03	6.75	
12400.00	8983.58	40.69	100.82	28.86	57.73	Exist PWU #5 (s)	491.22	565.48	7.62	
12500.00	8983.37	40.69	103.52	29.52	59.05	Exist PWU #5 (s)	555.77	627.10	8.79	
12600.00	8983.15	40.69	106.23	30.18	60.38	Exist PWU #5 (s)	629.18	697.66	10.19	
12700.00	8982.94	40.69	108.93	30.85	61.71	Exist PWU #5 (s)	708.81	774.74	11.75	
12800.00	8982.72	40.69	111.65	31.52	63.05	Exist PWU #5 (s)	793.05	856.56	13.49	
12900.00	8982.51	40.69	114.36	32.20	64.40	Exist PWU #5 (s)	880.60	941.90	15.37	
13000.00	8982.29	40.69	117.07	32.87	65.75	Exist PWU #5 (s)	970.37	1029.89	17.30	
13100.00	8982.08	40.69	119.79	33.55	67.11	Exist PWU #5 (s)	1061.82	1119.89	19.28	
13200.00	8981.86	40.69	122.51	34.23	68.47	Exist PWU #5 (s)	1154.68	1211.46	21.34	
13300.00	8981.65	40.69	125.23	34.91	69.83	Exist PWU #5 (s)	1248.65	1304.27	23.45	
13400.00	8981.44	40.69	127.95	35.60	71.20	Exist PWU #5 (s)	1343.50	1398.07	25.62	
13500.00	8981.22	40.69	130.68	36.28	72.58	Exist PWU #5 (s)	1439.04	1492.68	27.83	
13600.00	8981.01	0.01	133.40	36.97	73.95	20-8H (s)	2071.25	2145.44	28.92	
13602.60	8981.00	0.01	133.47	36.99	73.99	20-8H (s)	2071.28	2145.48	28.91	
Secondary Well: 20-8H (s) (TVD relative to Kelly Bushing) (All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
0.00	7.00	0.00	104.41	0.00	0.00	0.00	184.46	185.03	326.54	
100.00	100.88	93.88	104.43	0.12	0.12	2.46	183.88	184.68	231.10	
200.00	201.46	194.46	104.56	0.38	0.38	2.63	182.76	184.04	144.36	
300.00	301.91	294.92	104.90	0.64	0.63	2.63	181.36	183.12	104.33	
400.00	401.52	394.55	105.36	0.89	0.89	2.63	179.93	182.16	81.42	
500.00	501.89	494.94	105.83	1.15	1.15	2.64	178.51	181.24	66.57	
600.00	602.11	595.17	106.28	1.42	1.42	2.65	176.91	180.13	56.05	
700.00	700.72	693.79	106.66	1.68	1.68	2.65	175.63	179.32	48.53	
800.00	799.96	793.03	106.84	1.92	1.91	2.66	174.99	179.15	43.12	
900.00	899.80	892.87	106.92	2.12	2.12	2.67	174.64	179.23	39.06	
1000.00	999.12	992.20	106.87	2.22	2.22	2.68	174.60	179.51	36.53	
1100.00	1098.21	1091.29	106.68	2.26	2.25	2.69	175.08	180.25	34.84	
1200.00	1197.88	1190.97	106.44	2.31	2.31	2.70	175.89	181.34	33.26	
1300.00	1298.04	1291.13	106.14	2.39	2.39	2.71	176.72	182.47	31.70	
1400.00	1399.13	1392.24	105.92	2.49	2.49	2.72	177.19	183.27	30.14	
1500.00	1498.99	1492.10	105.69	2.61	2.61	2.73	177.34	183.76	28.65	
1600.00	1599.08	1592.19	105.42	2.74	2.74	2.74	177.51	184.29	27.18	
1700.00	1699.27	1692.39	105.11	2.89	2.89	2.75	177.59	184.74	25.83	
1800.00	1799.15	1792.28	104.71	3.06	3.06	2.77	177.62	185.16	24.56	

SD Anti-Collision Report

Secondary Well: 20-8H (S)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										Risk
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	
1900.00	1899.57	1892.71	104.28	3.23	3.23	2.78	177.58	185.51	23.38	
2000.00	1999.68	1992.82	103.95	3.42	3.42	2.79	177.36	185.71	22.25	
2100.00	2100.03	2093.19	103.58	3.61	3.61	2.81	177.02	185.79	21.18	
2200.00	2200.88	2194.05	103.17	3.81	3.81	2.82	176.37	185.56	20.20	
2300.00	2301.56	2294.73	102.72	4.01	4.01	2.83	175.27	184.89	19.22	
2400.00	2401.38	2394.58	102.16	4.22	4.21	2.85	174.03	184.08	18.31	
2500.00	2500.86	2494.08	101.61	4.43	4.43	2.86	172.97	183.47	17.48	
2600.00	2601.96	2595.19	101.15	4.64	4.64	2.88	171.80	182.72	16.73	
2700.00	2701.41	2694.65	100.69	4.86	4.86	2.89	170.40	181.77	15.98	
2800.00	2802.50	2795.77	100.09	5.09	5.08	2.91	168.89	180.72	15.28	
2900.00	2902.51	2895.80	99.47	5.31	5.31	2.93	167.06	179.31	14.63	
3000.00	3001.90	2995.22	98.78	5.54	5.53	2.94	165.35	178.07	14.00	
3100.00	3101.75	3095.11	97.96	5.77	5.77	2.96	163.88	177.05	13.44	
3200.00	3202.58	3195.98	97.19	6.01	6.01	2.98	162.20	175.84	12.89	
3300.00	3302.65	3296.09	96.40	6.25	6.24	3.01	160.24	174.34	12.37	
3400.00	3402.34	3395.83	95.45	6.49	6.48	3.03	158.34	172.89	11.88	
3500.00	3502.75	3496.30	94.44	6.73	6.72	3.05	156.40	171.42	11.41	
3600.00	3601.72	3595.32	93.49	6.97	6.97	3.08	154.61	170.10	10.98	
3700.00	3701.80	3695.44	92.64	7.22	7.21	3.10	153.11	169.08	10.59	
3800.00	3801.42	3795.09	91.84	7.46	7.46	3.13	151.67	168.11	10.23	
3900.00	3901.12	3894.81	91.01	7.71	7.71	3.16	150.45	167.36	9.90	
4000.00	4001.90	3995.62	90.30	7.96	7.95	3.19	149.09	166.47	9.58	
4100.00	4101.89	4095.64	89.66	8.21	8.20	3.23	147.47	165.32	9.26	
4200.00	4201.01	4194.78	89.06	8.45	8.44	3.26	146.11	164.43	8.98	
4300.00	4301.54	4295.32	88.61	8.70	8.69	3.30	144.89	163.68	8.71	
4400.00	4401.95	4395.74	88.20	8.94	8.93	3.34	143.35	162.61	8.45	
4500.00	4501.63	4495.44	87.71	9.18	9.17	3.38	141.78	161.49	8.19	
4600.00	4602.29	4596.12	87.36	9.43	9.42	3.42	140.22	160.40	7.95	
4700.00	4702.75	4696.63	87.31	9.68	9.67	3.47	138.48	159.14	7.70	
4800.00	4800.87	4794.83	87.56	9.93	9.92	3.52	137.34	158.48	7.49	
4900.00	4899.61	4893.64	98.34	10.19	10.17	3.57	137.41	159.04	7.35	
5000.00	4997.97	4992.08	99.70	10.43	10.42	3.62	138.65	160.73	7.28	
5100.00	5097.40	5091.58	101.41	10.67	10.66	3.68	140.72	163.28	7.24	
5200.00	5197.46	5191.69	103.25	10.91	10.90	3.74	142.98	165.99	7.21	
5300.00	5297.98	5292.26	105.16	11.16	11.15	3.80	145.07	168.56	7.18	
5400.00	5399.30	5393.62	107.08	11.42	11.41	3.87	146.64	170.65	7.11	
5500.00	5501.69	5496.05	109.04	11.68	11.66	3.94	147.25	171.71	7.02	
5600.00	5603.44	5597.88	111.02	11.93	11.91	4.01	146.71	171.61	6.89	
5700.00	5701.65	5696.17	112.94	12.17	12.15	4.09	146.16	171.56	6.75	
5800.00	5800.02	5794.60	114.84	12.42	12.40	4.17	146.69	172.58	6.67	
5900.00	5901.19	5895.82	116.84	12.67	12.65	4.25	147.50	173.84	6.60	
6000.00	6001.87	5996.56	119.10	12.90	12.88	4.33	147.74	174.60	6.50	
6100.00	6101.71	6096.47	121.72	13.09	13.08	4.42	148.03	175.33	6.42	
6200.00	6200.76	6195.59	124.52	13.27	13.26	4.51	148.82	176.51	6.37	
6300.00	6299.98	6294.88	127.13	13.43	13.41	5.83	149.71	177.73	6.34	
6400.00	6400.10	6395.07	129.30	13.51	13.50	13.69	149.89	178.17	6.30	
6500.00	6536.09	6532.36	131.85	13.55	13.28	16.56	142.48	170.42	6.10	
6600.00	6653.20	6657.70	137.78	13.60	12.63	16.85	111.16	138.16	5.12	
6700.00	6739.08	6759.57	144.07	13.76	11.88	17.03	63.91	90.62	3.39	
6800.00	6798.51	6839.37	186.33	14.03	11.16	17.16	24.64	54.11	1.84	SF(Lo)
6900.00	6836.53	6898.27	227.56	14.34	10.55	17.25	63.86	89.23	3.52	
7000.00	6860.35	6941.19	244.37	14.65	10.10	17.32	141.43	164.11	7.24	
7100.00	6875.59	6973.03	251.43	14.93	9.78	17.38	227.65	249.21	11.56	
7200.00	6886.85	6999.61	255.29	15.19	9.59	17.43	317.55	338.60	16.09	
7300.00	6895.07	7021.21	257.58	15.43	9.45	17.49	409.66	430.42	20.73	
7400.00	6901.44	7039.67	259.16	15.66	9.35	17.54	503.21	523.87	25.37	
7500.00	6906.46	7055.55	260.31	15.86	9.28	17.58	597.86	618.44	30.05	
7600.00	6909.93	7067.47	261.09	16.02	9.22	17.62	693.33	713.90	34.71	

5D Anti-Collision Report

Secondary Well: 20-8H (S) (TVD relative to Kelly Bushing) (All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
7700.00	6912.44	7076.88	261.65	16.15	9.17	17.65	789.50	810.09	39.34	
7800.00	6914.41	7084.90	262.11	16.26	9.13	17.67	886.19	906.86	43.87	
7900.00	6916.02	7091.95	262.49	16.36	9.10	17.70	983.33	1004.09	48.35	
8000.00	6917.53	7098.99	262.85	16.47	9.08	17.72	1080.80	1101.68	52.77	
8100.00	6918.79	7105.23	263.16	16.57	9.07	17.74	1178.54	1199.54	57.13	
8200.00	6919.84	7110.79	263.42	16.65	9.05	17.76	1276.52	1297.64	61.43	
8300.00	6920.74	7115.77	263.65	16.73	9.04	17.78	1374.67	1395.95	65.60	
8400.00	6921.51	7120.26	263.85	16.79	9.04	17.79	1472.98	1494.42	69.70	
8500.00	6922.46	7126.20	356.64	16.89	9.03	17.82	1570.37	1591.98	73.66	
8600.00	6924.07	7137.00	357.97	17.06	9.03	17.86	1663.19	1684.96	77.36	
8700.00	6925.96	7151.42	358.59	17.30	9.03	17.92	1749.24	1771.15	80.82	
8800.00	6928.79	7177.15	358.99	17.74	9.06	18.03	1826.57	1848.62	83.83	
8900.00	6932.43	7217.30	359.29	18.44	9.14	18.21	1893.23	1915.44	86.22	
9000.00	6934.68	7249.55	359.44	19.02	9.20	18.37	1947.86	1970.19	88.20	
9100.00	6936.91	7297.39	359.54	19.93	9.32	18.63	1989.22	2011.80	89.12	
9200.00	6938.92	7369.50	359.60	21.39	9.53	19.07	2015.83	2038.76	88.88	
9300.00	6940.27	7440.24	359.61	22.89	9.76	19.53	2026.28	2049.62	87.81	
9400.00	6940.31	7501.67	359.60	24.24	9.98	19.96	2026.08	2049.84	86.26	
9500.00	6939.35	7594.39	359.59	26.38	10.34	20.68	2026.31	2050.67	84.19	
9600.00	6939.04	7746.88	359.60	30.05	11.00	22.00	2025.52	2050.79	81.15	
9700.00	6940.92	7848.16	359.57	32.50	11.47	22.95	2022.67	2048.72	78.66	
9800.00	6942.62	7963.25	359.48	35.35	12.05	24.09	2020.17	2047.10	76.01	
9900.00	6943.76	8033.35	359.42	37.15	12.41	24.82	2017.68	2045.35	73.92	
10000.00	6943.65	8099.88	359.38	38.87	12.76	25.53	2016.89	2045.31	71.97	
10100.00	6942.43	8170.84	359.35	40.70	13.15	26.31	2017.59	2046.80	70.06	
10200.00	6940.05	8262.80	359.32	43.10	13.66	27.33	2019.00	2049.20	67.86	
10300.00	6937.40	8386.67	359.31	46.37	14.38	28.76	2019.75	2051.11	65.42	
10400.00	6935.97	8498.84	359.33	49.33	15.04	30.09	2019.66	2052.16	63.14	
10500.00	6935.18	8616.28	359.36	52.45	15.76	31.52	2018.95	2052.62	60.98	
10600.00	6935.32	8727.49	359.43	55.42	16.45	32.89	2017.38	2052.25	58.85	
10700.00	6935.30	8810.80	359.49	57.65	16.97	33.94	2016.10	2052.04	57.11	
10800.00	6934.66	8903.47	359.56	60.14	17.55	35.12	2015.38	2052.48	55.32	
10900.00	6933.71	8968.83	359.60	61.88	17.97	35.95	2015.76	2053.78	54.02	
11000.00	6931.38	9035.25	359.61	63.64	18.39	36.81	2017.95	2056.99	52.69	
11100.00	6927.08	9136.62	359.61	66.37	19.04	38.12	2020.78	2061.03	51.21	
11200.00	6922.90	9262.37	359.64	69.77	19.87	39.77	2022.41	2064.10	49.52	
11300.00	6920.17	9396.49	359.69	73.40	20.77	41.55	2022.78	2065.94	47.87	
11400.00	6918.87	9475.22	359.71	75.52	21.29	42.60	2023.09	2067.38	46.68	
11500.00	6917.07	9534.23	359.71	77.09	21.67	43.39	2024.99	2070.25	45.74	
11600.00	6913.92	9594.19	359.70	78.70	22.06	44.19	2029.01	2075.23	44.89	
11700.00	6907.94	9688.53	359.66	81.24	22.69	45.46	2033.87	2081.36	43.83	
11800.00	6901.12	9824.35	359.62	84.93	23.63	47.30	2036.92	2086.02	42.48	
11900.00	6895.54	9962.55	359.61	88.70	24.58	49.19	2039.24	2089.97	41.20	
12000.00	6893.01	10080.67	359.63	91.92	25.40	50.81	2039.66	2091.86	40.07	
12100.00	6891.01	10170.07	359.63	94.35	26.02	52.05	2040.42	2093.87	39.17	
12200.00	6888.74	10264.79	359.64	96.93	26.67	53.36	2041.30	2096.06	38.28	
12300.00	6886.31	10338.81	359.64	98.95	27.18	54.38	2043.23	2099.13	37.55	
12400.00	6882.16	10456.43	359.65	102.16	28.00	56.02	2045.05	2102.45	36.63	
12500.00	6879.31	10565.04	359.67	105.12	28.76	57.54	2046.01	2104.83	35.78	
12600.00	6876.48	10661.21	359.68	107.74	29.43	58.88	2047.40	2107.56	35.03	
12700.00	6874.07	10751.64	359.68	110.20	30.06	60.15	2048.59	2110.04	34.34	
12800.00	6871.40	10815.27	359.67	111.93	30.49	61.04	2051.47	2114.00	33.81	
12900.00	6866.41	10917.80	359.66	114.73	31.21	62.48	2054.74	2118.66	33.14	
13000.00	6862.06	10999.90	359.67	116.99	31.78	63.63	2058.59	2123.74	32.60	
13100.00	6856.19	11105.69	359.70	119.88	32.53	65.12	2062.48	2129.06	31.98	
13200.00	6851.22	11191.94	359.73	122.24	33.13	66.34	2066.76	2134.61	31.46	
13300.00	6844.30	11317.25	359.80	125.67	34.03	68.11	2070.46	2139.91	30.81	
13400.00	6838.45	11473.91	359.88	129.96	35.16	70.33	2072.22	2143.53	30.06	

5D Anti-Collision Report

Secondary Well: 20-8H (S) (TVD relative to Kelly Bushing) (All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
13500.00	6836.60	11603.18	359.95	133.50	36.08	72.17	2071.78	2144.71	29.41	
13600.00	6835.91	11684.00	0.01	135.72	36.66	73.32	2071.25	2145.44	28.92	
13602.60	6835.91	11684.00	0.01	135.72	36.66	73.32	2071.28	2145.48	28.91	

Secondary Well: Exist PWU #3 (S) (TVD relative to Kelly Bushing) (All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
0.00	35.00	0.00	277.86	0.00	0.00	0.00	3218.58	3219.14	5681.05	
100.00	97.92	62.92	277.86	0.08	0.08	1.65	3218.22	3218.98	4240.89	
200.00	197.64	162.64	277.86	0.29	0.29	2.63	3217.87	3219.06	2711.21	
300.00	296.96	261.96	277.86	0.53	0.53	2.63	3217.48	3219.13	1942.06	
400.00	400.12	365.12	277.86	0.75	0.75	2.63	3217.11	3219.21	1535.03	
500.00	499.45	464.45	277.86	0.95	0.95	2.64	3216.66	3219.18	1277.48	
600.00	600.50	565.50	277.87	1.18	1.18	2.64	3216.24	3219.21	1082.83	
700.00	714.27	679.28	277.88	1.41	1.41	2.65	3215.59	3219.03	936.90	
800.00	824.21	789.21	277.88	1.61	1.61	2.66	3214.55	3218.41	833.63	
900.00	927.17	892.18	277.89	1.82	1.82	2.67	3213.31	3217.60	749.83	
1000.00	1025.14	990.16	277.91	2.03	2.03	2.68	3212.06	3216.78	680.65	
1100.00	1123.38	1088.40	277.92	2.26	2.26	2.69	3210.85	3216.03	620.88	
1200.00	1219.45	1184.48	277.93	2.50	2.50	2.70	3209.72	3215.36	570.32	
1300.00	1304.83	1269.86	277.94	2.71	2.71	2.71	3208.88	3214.96	528.66	
1400.00	1400.34	1365.37	277.95	2.96	2.96	2.72	3208.40	3214.95	490.86	
1500.00	1498.98	1464.01	277.96	3.21	3.21	2.73	3207.92	3214.94	458.13	
1600.00	1594.56	1559.60	277.97	3.45	3.45	2.74	3207.54	3215.03	429.36	
1700.00	1686.75	1651.79	277.98	3.65	3.65	2.75	3207.38	3215.30	405.83	
1800.00	1779.39	1744.43	277.99	3.83	3.83	2.76	3207.54	3215.85	386.94	
1900.00	1876.01	1841.05	277.99	4.00	4.00	2.77	3207.84	3216.55	369.00	
2000.00	1975.78	1940.82	278.00	4.19	4.19	2.78	3208.20	3217.32	352.85	
2100.00	2075.19	2040.24	278.00	4.39	4.39	2.80	3208.50	3218.05	336.90	
2200.00	2172.70	2137.75	278.01	4.59	4.59	2.81	3208.91	3218.88	322.66	
2300.00	2273.41	2238.47	278.02	4.81	4.81	2.82	3209.30	3219.72	308.85	
2400.00	2375.02	2340.08	278.03	5.05	5.05	2.84	3209.64	3220.53	295.85	
2500.00	2474.61	2439.68	278.04	5.28	5.28	2.85	3209.94	3221.28	284.02	
2600.00	2570.13	2535.20	278.05	5.50	5.50	2.87	3210.36	3222.14	273.45	
2700.00	2669.71	2634.79	278.06	5.74	5.74	2.88	3210.86	3223.12	263.06	
2800.00	2774.49	2739.58	278.07	5.99	5.99	2.90	3211.23	3223.95	253.52	
2900.00	2871.08	2836.16	278.08	6.22	6.22	2.91	3211.59	3224.76	244.83	
3000.00	2965.91	2931.01	278.09	6.44	6.44	2.93	3212.14	3225.77	236.62	
3100.00	3067.59	3032.68	278.10	6.69	6.69	2.95	3212.70	3226.80	228.86	
3200.00	3167.76	3132.87	278.11	6.93	6.93	2.97	3213.23	3227.79	221.70	
3300.00	3265.82	3230.93	278.12	7.18	7.18	2.99	3213.81	3228.82	215.00	
3400.00	3366.27	3331.39	278.13	7.43	7.43	3.01	3214.39	3229.90	208.32	
3500.00	3470.34	3435.47	278.15	7.69	7.69	3.03	3214.87	3230.86	201.93	
3600.00	3569.76	3534.90	278.16	7.95	7.95	3.06	3215.29	3231.77	196.05	
3700.00	3661.25	3626.40	278.17	8.18	8.18	3.08	3215.85	3232.79	190.79	
3800.00	3742.93	3708.09	278.18	8.38	8.38	3.10	3216.90	3234.27	186.21	
3900.00	3820.05	3785.22	278.19	8.56	8.56	3.12	3218.63	3236.38	182.24	
4000.00	3907.16	3872.37	278.20	8.76	8.75	3.15	3220.91	3239.08	178.24	
4100.00	3992.97	3958.22	278.20	8.94	8.94	3.17	3223.55	3242.15	174.36	
4200.00	4088.09	4053.40	278.20	9.15	9.15	3.20	3226.61	3245.61	170.81	
4300.00	4204.39	4169.76	278.22	9.44	9.43	3.24	3229.35	3248.87	166.42	
4400.00	4322.61	4288.07	278.28	9.74	9.74	3.29	3231.47	3251.51	162.23	
4500.00	4426.35	4391.91	278.35	10.02	10.01	3.33	3233.26	3253.81	158.27	
4600.00	4496.48	4462.12	288.41	10.20	10.19	3.36	3235.28	3256.22	155.52	
4700.00	4573.12	4538.86	288.45	10.40	10.39	3.39	3237.65	3259.01	152.59	
4800.00	4690.23	4656.11	288.45	10.71	10.70	3.45	3239.65	3261.56	148.86	
4900.00	4816.46	4782.42	288.37	11.04	11.03	3.51	3239.91	3262.39	145.10	
5000.00	4922.10	4888.10	288.27	11.31	11.30	3.56	3239.43	3262.37	142.17	
5100.00	5023.11	4989.16	288.15	11.58	11.56	3.62	3238.55	3261.99	139.16	

5D Anti-Collision Report

Secondary Well Exist PWU #5 (S) (TVD Relative to Kelly Bushing) (All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
5200.00	5143.58	5109.66	288.01	11.89	11.88	3.69	3237.33	3261.34	135.80	
5300.00	5267.61	5233.72	287.85	12.22	12.20	3.76	3235.21	3259.77	132.69	
5400.00	5355.78	5321.89	287.74	12.45	12.44	3.82	3233.16	3258.20	130.15	
5500.00	5437.66	5403.80	287.64	12.66	12.65	3.87	3231.66	3257.09	128.04	
5600.00	5504.42	5470.57	287.56	12.83	12.82	3.92	3230.93	3256.80	125.88	
5700.00	5574.46	5540.67	287.47	13.01	13.00	3.97	3231.22	3257.50	123.94	
5800.00	5645.20	5611.47	287.38	13.19	13.17	4.02	3232.39	3259.07	122.17	
5900.00	5707.58	5673.95	287.31	13.34	13.32	4.07	3234.66	3261.69	120.67	
6000.00	5778.27	5744.79	287.23	13.52	13.48	4.12	3237.98	3265.38	119.17	
6100.00	5860.75	5827.48	287.14	13.72	13.68	4.19	3241.99	3269.80	117.56	
6200.00	5957.22	5924.22	287.02	13.96	13.92	4.27	3246.16	3274.47	115.66	
6300.00	6053.34	6020.61	286.87	14.19	14.15	4.36	3250.86	3279.63	114.01	
6400.00	6160.91	6128.47	286.73	14.45	14.41	4.46	3255.99	3285.22	112.41	
6500.00	6277.88	6245.72	286.59	14.71	14.68	4.57	3261.26	3290.93	110.89	
6600.00	6413.87	6381.97	286.47	15.00	14.97	4.71	3266.27	3296.40	109.41	
6700.00	6526.54	6494.81	276.38	15.22	15.19	4.82	3270.92	3301.44	108.16	
6800.00	6636.86	6605.29	276.34	15.43	15.40	4.94	3275.37	3306.36	106.71	
6900.00	6735.91	6704.47	276.31	15.62	15.60	5.05	3279.71	3311.12	105.42	
7000.00	6829.55	6798.24	276.27	15.81	15.78	5.15	3284.19	3316.00	104.24	
7100.00	6937.78	6906.62	276.24	16.02	15.99	5.28	3288.59	3320.83	103.01	
7200.00	7036.83	7005.81	276.20	16.21	16.18	5.40	3292.93	3325.56	101.90	
7300.00	7146.29	7115.42	276.15	16.41	16.38	5.53	3297.06	3330.10	100.82	
7400.00	7234.60	7203.86	276.10	16.58	16.55	5.64	3301.29	3334.71	99.76	
7500.00	7323.75	7293.16	276.06	16.74	16.71	5.76	3305.83	3339.66	98.72	
7600.00	7409.37	7378.95	276.00	16.90	16.86	5.87	3310.75	3344.97	97.75	
7700.00	7570.12	7540.00	275.90	17.18	17.15	6.09	3315.12	3349.86	96.43	
7800.00	7741.39	7711.46	275.79	17.43	17.39	6.33	3317.23	3352.42	95.27	
7900.00	7870.06	7840.24	275.70	17.56	17.52	6.52	3317.94	3353.44	94.45	
8000.00	7983.59	7953.87	275.62	17.66	17.62	6.69	3318.16	3354.02	93.54	
8100.00	8104.48	8074.84	275.55	17.77	17.71	6.87	3317.82	3354.02	92.67	
8200.00	8240.97	8211.38	275.49	17.84	17.78	7.08	3316.66	3353.15	91.89	
8300.00	8336.88	8307.31	275.45	17.88	17.82	7.23	3315.08	3351.84	91.19	
8400.00	8453.40	8423.88	275.41	17.93	17.87	7.42	3313.31	3350.33	90.49	
8500.00	8581.73	8552.29	5.32	17.98	17.91	7.63	3305.82	3343.07	89.74	
8600.00	8629.42	8600.00	5.56	18.00	17.93	7.71	3281.44	3318.92	88.54	
8700.00	8629.42	8600.00	5.97	18.00	17.93	7.71	3243.09	3280.77	87.06	
8800.00	8629.42	8600.00	6.63	18.00	17.93	7.71	3191.72	3229.57	85.33	
8900.00	8629.42	8600.00	7.65	18.00	17.93	7.71	3128.32	3166.27	83.44	
9000.00	8629.42	8600.00	9.28	18.00	17.93	7.71	3054.07	3092.12	81.27	
9100.00	8629.42	8600.00	12.10	18.00	17.93	7.71	2970.62	3008.67	79.08	
9200.00	8629.42	8600.00	17.75	18.00	17.93	7.71	2879.67	2917.76	76.59	
9300.00	8629.42	8600.00	32.90	18.00	17.93	7.71	2783.46	2821.59	74.00	
9400.00	8629.42	8600.00	40.69	18.00	17.93	7.71	2684.97	2723.10	71.42	
9500.00	8629.42	8600.00	40.69	18.00	17.93	7.71	2586.54	2624.64	68.88	
9600.00	8629.42	8600.00	40.69	18.00	17.93	7.71	2488.23	2526.31	66.34	
9700.00	8629.42	8600.00	40.69	18.00	17.93	7.71	2390.03	2428.11	63.77	
9800.00	8629.42	8600.00	40.69	18.00	17.93	7.71	2291.93	2330.06	61.10	
9900.00	8629.42	8600.00	40.69	18.00	17.93	7.71	2193.98	2232.19	58.43	
10000.00	8629.42	8600.00	40.69	18.00	17.93	7.71	2096.23	2134.52	55.75	
10100.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1998.69	2037.07	53.08	
10200.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1901.41	1939.88	50.43	
10300.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1804.31	1842.99	47.65	
10400.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1707.50	1746.45	44.83	
10500.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1611.07	1650.33	42.04	
10600.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1515.11	1554.69	39.28	
10700.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1419.56	1459.64	36.42	
10800.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1324.62	1365.29	33.57	
10900.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1230.39	1271.81	30.70	

5D Anti-Collision Report

Secondary Well: Exist PWU #5 (s) (TVD relative to Kelly Bushing) (All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
11000.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1137.06	1179.40	27.85	
11100.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1044.74	1088.34	24.97	
11200.00	8629.42	8600.00	40.69	18.00	17.93	7.71	953.96	998.98	22.19	
11300.00	8629.42	8600.00	40.69	18.00	17.93	7.71	864.94	911.84	19.45	
11400.00	8629.42	8600.00	40.69	18.00	17.93	7.71	778.16	827.60	16.74	
11500.00	8629.42	8600.00	40.69	18.00	17.93	7.71	694.94	747.27	14.28	
11600.00	8629.42	8600.00	40.69	18.00	17.93	7.71	616.13	672.23	11.98	
11700.00	8629.42	8600.00	40.69	18.00	17.93	7.71	544.15	604.47	10.02	
11800.00	8629.42	8600.00	40.69	18.00	17.93	7.71	481.49	546.68	8.39	
11900.00	8629.42	8600.00	40.69	18.00	17.93	7.71	432.35	502.34	7.18	
12000.00	8629.42	8600.00	40.69	18.00	17.93	7.71	401.10	475.22	6.41	
12100.00	8629.42	8600.00	40.69	18.00	17.93	7.71	391.46	468.31	6.09	
12200.00	8629.42	8600.00	40.69	18.00	17.93	7.71	405.13	482.49	6.24	
12300.00	8629.42	8600.00	40.69	18.00	17.93	7.71	439.54	516.03	6.75	
12400.00	8629.42	8600.00	40.69	18.00	17.93	7.71	491.22	565.48	7.62	
12500.00	8629.42	8600.00	40.69	18.00	17.93	7.71	555.77	627.10	8.79	
12600.00	8629.42	8600.00	40.69	18.00	17.93	7.71	629.18	697.66	10.19	
12700.00	8629.42	8600.00	40.69	18.00	17.93	7.71	708.81	774.74	11.75	
12800.00	8629.42	8600.00	40.69	18.00	17.93	7.71	793.05	856.56	13.49	
12900.00	8629.42	8600.00	40.69	18.00	17.93	7.71	880.60	941.90	15.37	
13000.00	8629.42	8600.00	40.69	18.00	17.93	7.71	970.37	1029.89	17.30	
13100.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1061.82	1119.89	19.28	
13200.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1154.68	1211.46	21.34	
13300.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1248.65	1304.27	23.45	
13400.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1343.50	1398.07	25.62	
13500.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1439.04	1492.68	27.83	
13600.00	8629.42	8600.00	40.69	18.00	17.93	7.71	1535.14	1587.94	30.07	
13602.60	8629.42	8600.00	40.69	18.00	17.93	7.71	1537.65	1590.43	30.13	
Secondary Well: Agate PWU 21 8H (p) (TVD relative to Kelly Bushing) (All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
0.00	6.00	0.00	118.18	0.00	0.00	0.00	201.95	203.48	132.53	
100.00	100.00	94.00	118.18	0.11	0.11	4.32	201.64	203.39	116.27	
200.00	200.00	194.00	118.18	0.32	0.32	4.62	201.20	203.39	92.80	
300.00	300.00	294.00	118.18	0.55	0.55	4.65	200.75	203.39	77.01	
400.00	400.00	394.00	118.18	0.77	0.77	4.69	200.30	203.39	65.81	
500.00	500.00	494.00	118.18	1.00	1.00	4.74	199.85	203.39	57.46	
600.00	600.00	594.00	118.18	1.22	1.22	4.81	199.40	203.39	50.99	
700.00	700.00	694.00	118.18	1.45	1.45	4.88	198.95	203.39	45.82	
800.00	800.00	794.00	118.18	1.67	1.67	4.96	198.51	203.39	41.61	
900.00	900.00	894.00	118.18	1.90	1.90	5.06	198.06	203.39	38.11	
1000.00	1000.00	994.00	118.18	2.12	2.12	5.15	197.61	203.39	35.15	
1100.00	1100.00	1094.00	118.18	2.35	2.35	5.26	197.16	203.39	32.62	
1200.00	1200.00	1194.00	118.18	2.57	2.57	5.37	196.71	203.39	30.42	
1300.00	1300.00	1294.00	118.18	2.80	2.80	5.49	196.26	203.39	28.51	
1400.00	1400.00	1394.00	118.18	3.02	3.02	5.62	195.81	203.39	26.82	
1500.00	1500.00	1494.00	118.18	3.25	3.25	5.75	195.36	203.39	25.32	
1600.00	1600.00	1594.00	118.18	3.47	3.47	5.88	194.91	203.39	23.98	
1700.00	1700.00	1694.00	118.18	3.70	3.70	6.02	194.46	203.39	22.77	
1800.00	1800.00	1794.00	118.18	3.92	3.92	6.16	194.01	203.39	21.68	
1900.00	1900.00	1894.00	118.18	4.15	4.15	6.31	193.56	203.39	20.69	
2000.00	2000.00	1994.00	118.18	4.37	4.37	6.46	193.11	203.39	19.79	
2100.00	2100.00	2094.00	118.18	4.59	4.59	6.61	192.66	203.39	18.96	
2200.00	2200.00	2194.00	118.18	4.82	4.82	6.77	192.21	203.39	18.19	
2300.00	2300.00	2294.00	118.18	5.04	5.04	6.93	191.77	203.39	17.49	
2400.00	2400.00	2394.00	118.18	5.27	5.27	7.09	191.32	203.39	16.84	
2500.00	2500.00	2494.00	118.18	5.49	5.49	7.26	190.87	203.39	16.24	
2600.00	2600.00	2594.00	118.18	5.72	5.72	7.43	190.42	203.39	15.67	

5D Anti-Collision Report

Secondary Well: Agate PWU 2118H (p) (TVD Relative to Kelly Bushing) (All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T-Face to Sec (°)	S-Major (US ft)	S-Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
2700.00	2700.00	2694.00	118.18	5.94	5.94	7.60	189.97	203.39	15.15	
2800.00	2800.00	2794.00	118.18	6.17	6.17	7.78	189.52	203.39	14.66	
2900.00	2900.00	2894.00	118.18	6.39	6.39	7.95	189.07	203.39	14.20	
3000.00	3000.00	2994.00	118.18	6.62	6.62	8.14	188.62	203.39	13.77	
3100.00	3100.00	3094.00	118.18	6.84	6.84	8.32	188.17	203.39	13.36	
3200.00	3200.00	3194.00	118.18	7.07	7.07	8.50	187.72	203.39	12.98	
3300.00	3300.00	3294.00	118.18	7.29	7.29	8.69	187.27	203.39	12.62	
3400.00	3400.00	3394.00	118.18	7.52	7.52	8.88	186.82	203.39	12.27	
3500.00	3500.00	3494.00	118.18	7.74	7.74	9.08	186.37	203.39	11.95	
3600.00	3600.00	3594.00	118.18	7.97	7.97	9.27	185.92	203.39	11.64	
3700.00	3700.00	3694.00	118.18	8.19	8.19	9.47	185.47	203.39	11.35	
3800.00	3800.00	3794.00	118.18	8.42	8.42	9.67	185.03	203.39	11.07	
3900.00	3900.00	3894.00	118.18	8.64	8.64	9.88	184.58	203.39	10.81	
4000.00	4000.00	3994.00	118.18	8.87	8.87	10.09	184.13	203.39	10.56	
4100.00	4100.00	4094.00	118.18	9.09	9.09	10.30	183.68	203.39	10.32	
4200.00	4200.00	4194.00	118.18	9.32	9.32	10.51	183.23	203.39	10.09	
4300.00	4300.00	4294.00	118.18	9.54	9.54	10.73	182.78	203.39	9.87	
4400.00	4400.00	4394.00	118.18	9.76	9.76	10.95	182.33	203.39	9.66	
4500.00	4500.00	4494.00	118.18	9.99	9.99	11.18	181.88	203.39	9.45	
4600.00	4599.99	4593.99	128.37	10.21	10.21	11.40	182.00	203.93	9.30	
4700.00	4699.96	4693.96	128.93	10.44	10.44	11.64	183.18	205.57	9.18	
4800.00	4799.86	4793.86	129.84	10.66	10.66	11.87	185.51	208.34	9.13	
4900.00	4899.68	4893.68	131.08	10.89	10.89	12.11	189.01	212.30	9.11	
5000.00	4999.37	4993.37	132.59	11.11	11.11	12.35	193.80	217.55	9.16	
5100.00	5098.99	5092.99	134.23	11.34	11.34	12.59	199.37	223.55	9.25	
5200.00	5198.60	5192.60	135.79	11.56	11.56	12.84	205.10	229.73	9.33	
5300.00	5298.22	5292.22	137.26	11.78	11.78	13.10	210.97	236.06	9.41	
5400.00	5397.84	5391.84	138.66	12.01	12.01	13.35	216.99	242.55	9.49	
5500.00	5497.46	5491.46	139.98	12.23	12.23	13.61	223.16	249.17	9.58	
5600.00	5597.08	5591.08	141.23	12.46	12.46	13.88	229.49	255.91	9.68	
5700.00	5696.70	5690.70	142.42	12.68	12.68	14.15	235.92	262.78	9.78	
5800.00	5796.32	5790.32	143.55	12.90	12.90	14.42	242.44	269.74	9.88	
5900.00	5895.94	5889.94	144.62	13.13	13.13	14.70	249.07	276.81	9.98	
6000.00	5995.56	5989.56	145.63	13.35	13.35	14.98	255.77	283.97	10.07	
6100.00	6095.18	6089.18	146.60	13.58	13.58	15.27	262.55	291.22	10.16	
6200.00	6194.80	6188.80	147.53	13.80	13.80	15.56	269.39	298.52	10.25	
6300.00	6294.52	6288.52	148.32	14.02	14.02	15.85	275.36	304.90	10.32	
6400.00	6442.42	6438.01	146.49	14.35	14.01	16.27	273.19	302.94	10.18	
6500.00	6558.39	6563.88	138.89	14.63	13.43	16.53	254.22	284.24	9.47	
6600.00	6611.03	6624.39	132.99	14.79	13.36	16.67	240.41	271.20	8.81	
6700.00	6659.12	6681.19	116.69	14.95	13.19	16.81	243.79	274.78	8.87	
6800.00	6701.80	6733.59	110.74	15.12	12.95	16.93	266.34	296.93	9.71	
6900.00	6738.76	6781.20	105.68	15.29	12.67	17.04	306.30	335.95	11.33	
7000.00	6770.14	6823.88	101.65	15.46	12.38	17.13	359.66	388.24	13.59	
7100.00	6796.46	6861.84	98.55	15.64	12.08	17.21	422.70	450.37	16.28	
7200.00	6818.38	6895.45	96.21	15.79	11.80	17.29	492.88	519.74	19.35	
7300.00	6836.60	6925.15	94.43	15.97	11.54	17.36	568.34	594.49	22.73	
7400.00	6851.74	6951.41	93.09	16.14	11.31	17.42	647.72	673.34	26.28	
7500.00	6864.37	6974.68	92.05	16.29	11.10	17.48	730.16	755.37	29.96	
7600.00	6874.94	6995.34	91.25	16.42	10.91	17.53	815.07	839.92	33.80	
7700.00	6883.84	7013.76	90.62	16.57	10.75	17.59	901.90	926.51	37.64	
7800.00	6891.36	7030.24	90.13	16.72	10.61	17.64	990.32	1014.75	41.53	
7900.00	6897.77	7045.04	89.73	16.85	10.48	17.69	1080.07	1104.37	45.44	
8000.00	6903.25	7058.38	89.41	16.97	10.37	17.73	1170.94	1195.14	49.38	
8100.00	6907.97	7070.45	89.14	17.08	10.27	17.77	1262.74	1286.89	53.29	
8200.00	6912.05	7081.41	88.93	17.17	10.18	17.80	1355.32	1379.46	57.13	
8300.00	6915.60	7091.40	88.75	17.25	10.10	17.83	1448.60	1472.75	60.98	
8400.00	6918.71	7100.53	88.59	17.33	10.04	17.86	1542.46	1566.65	64.77	

5D Anti-Collision Report

Secondary Well: Agate PWU 218H (p) (TVD Relative to Kelly Bushing) (All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T. Face to Sec (°)	S. Major (US ft)	S. Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
8500.00	6921.04	7107.68	177.33	17.42	9.98	17.89	1638.26	1662.54	68.49	
8600.00	6921.87	7110.27	151.32	17.45	9.97	17.90	1737.42	1761.85	72.10	
8700.00	6921.36	7108.68	3.02	17.43	9.98	17.90	1836.84	1861.48	75.54	
8800.00	6919.67	7103.46	1.33	17.37	10.01	17.87	1933.66	1958.54	78.73	
8900.00	6916.89	7095.14	0.78	17.29	10.08	17.85	2025.39	2050.53	81.59	
9000.00	6913.08	7084.24	0.50	17.19	10.16	17.81	2109.86	2135.31	83.89	
9100.00	6908.28	7071.26	0.31	17.08	10.26	17.77	2185.32	2211.10	85.75	
9200.00	6902.54	7056.62	0.18	16.96	10.38	17.72	2250.26	2276.41	87.06	
9300.00	6895.93	7040.72	0.06	16.81	10.52	17.67	2303.48	2330.03	87.76	
9400.00	6888.70	7024.31	359.96	16.67	10.66	17.62	2348.53	2375.56	87.86	
9500.00	6881.33	7008.47	359.85	16.53	10.80	17.57	2395.77	2423.35	87.85	
9600.00	6873.90	6993.25	359.75	16.41	10.93	17.53	2445.60	2473.73	87.93	
9700.00	6866.44	6978.63	359.65	16.32	11.06	17.49	2497.92	2526.58	88.16	
9800.00	6858.99	6964.60	359.54	16.23	11.19	17.46	2552.60	2581.77	88.52	
9900.00	6851.60	6951.16	359.44	16.14	11.31	17.42	2609.53	2639.18	89.01	
10000.00	6844.28	6938.28	359.34	16.06	11.43	17.39	2668.59	2698.70	89.63	
10100.00	6837.06	6925.94	359.24	15.98	11.54	17.36	2729.62	2760.21	90.24	
10200.00	6829.97	6914.12	359.15	15.90	11.64	17.33	2792.52	2823.60	90.86	
10300.00	6823.00	6902.82	359.06	15.83	11.74	17.30	2857.23	2888.78	91.56	
10400.00	6816.19	6891.99	358.96	15.77	11.83	17.28	2923.62	2955.63	92.35	
10500.00	6809.53	6881.63	358.88	15.73	11.92	17.26	2991.62	3024.07	93.21	
10600.00	6803.03	6871.71	358.79	15.68	12.00	17.23	3061.13	3094.00	94.14	
10700.00	6796.70	6862.21	358.71	15.64	12.08	17.21	3132.06	3165.34	95.11	
10800.00	6790.55	6853.11	358.63	15.60	12.15	17.19	3204.34	3238.02	96.15	
10900.00	6784.56	6844.40	358.55	15.56	12.22	17.18	3277.95	3311.94	97.43	
11000.00	6778.75	6836.05	358.47	15.52	12.28	17.16	3352.70	3387.05	98.61	
11100.00	6773.10	6828.05	358.40	15.48	12.35	17.14	3428.58	3463.27	99.85	
11200.00	6767.63	6820.37	358.33	15.45	12.40	17.12	3505.59	3540.54	101.30	
11300.00	6762.32	6813.01	358.26	15.41	12.46	17.11	3583.50	3618.80	102.50	
11400.00	6757.17	6805.94	358.20	15.38	12.51	17.09	3662.36	3698.00	103.76	
11500.00	6752.18	6799.16	358.14	15.35	12.55	17.08	3742.13	3778.08	105.09	
11600.00	6747.35	6792.64	358.08	15.32	12.60	17.06	3822.76	3859.00	106.50	
11700.00	6742.66	6786.38	358.02	15.30	12.64	17.05	3904.20	3940.71	107.94	
11800.00	6738.13	6780.36	357.96	15.28	12.68	17.04	3986.39	4023.16	109.43	
11900.00	6733.73	6774.57	357.91	15.27	12.72	17.02	4069.30	4106.31	110.95	
12000.00	6729.47	6769.00	357.85	15.25	12.75	17.01	4152.89	4190.13	112.50	
12100.00	6725.35	6763.63	357.80	15.23	12.78	17.00	4237.12	4274.59	114.07	
12200.00	6721.35	6758.47	357.75	15.21	12.81	16.99	4321.95	4359.64	115.68	
12300.00	6717.48	6753.48	357.70	15.19	12.84	16.98	4407.37	4445.26	117.31	
12400.00	6713.72	6748.68	357.66	15.18	12.87	16.97	4493.33	4531.42	118.96	
12500.00	6710.08	6744.05	357.61	15.16	12.90	16.96	4579.81	4618.09	120.64	
12600.00	6706.55	6739.58	357.57	15.15	12.92	16.95	4666.78	4705.24	122.34	
12700.00	6703.13	6735.26	357.53	15.13	12.95	16.94	4754.22	4792.85	124.05	
12800.00	6699.81	6731.09	357.49	15.12	12.97	16.93	4842.10	4880.90	125.78	
12900.00	6696.59	6727.06	357.45	15.10	12.99	16.92	4930.41	4969.37	127.53	
13000.00	6693.47	6723.17	357.41	15.09	13.01	16.91	5019.12	5058.24	129.30	
13100.00	6690.43	6719.40	357.38	15.07	13.03	16.90	5108.21	5147.48	131.08	
13200.00	6687.49	6715.75	357.34	15.06	13.04	16.89	5197.66	5237.08	132.88	
13300.00	6684.63	6712.22	357.31	15.05	13.06	16.88	5287.47	5327.02	134.69	
13400.00	6681.85	6708.81	357.27	15.04	13.08	16.88	5377.61	5417.29	136.51	
13500.00	6679.15	6705.49	357.24	15.02	13.09	16.87	5468.05	5507.88	138.31	
13600.00	6676.53	6702.28	357.21	15.01	13.11	16.86	5558.80	5598.76	140.12	
13602.60	6676.46	6702.20	357.21	15.01	13.11	16.86	5561.16	5601.12	140.17	

**Weatherford**

Weatherford Drilling Services

GeoDec4 v2.1.0.0

Report Date: August 18, 2015
Job Number: _____
Customer: Devon Energy
Well Name: Emerald PWU 20.12H
API Number: _____
Rig Name: _____
Location: Eddy Co, NM Nad83 NME
Block: _____
Engineer: _____

NAD83 / New Mexico East (ftUS)	NAD83 (1986)
Projected Coordinate System	Geodetic Coordinate System
Datum: North American Datum 1983 (1986)	Datum: North American Datum 1983 (1986)
Ellipsoid: GRS 1980	Ellipsoid: GRS 1980
EPSG: 2257	EPSG: 4269
North: 596537.3 US Survey Foot	Latitude: 32.639692 Degree
East: 616605.3 US Survey Foot	Longitude: -104.088812 Degree
Convergence: 0.13°	
Declination: 7.52°	
Total Correction: 7.39°	
Datum Transformation: none	

Geodetic Location WGS84

MSL Elevation = 0 m
Latitude = 32° 38' 22.89" N
Longitude = 104° 05' 19.72" W

Magnetic Declination = 7.52 deg	[True North Offset]
Local Gravity = .9988 g	Checksum = 6626
Local Field Strength = 48397 nT	Magnetic Vector X = 23689 nT
Magnetic Dip = 60.41 deg	Magnetic Vector Y = 3127 nT
Magnetic Model = bggm2015.dat	Magnetic Vector Z = 42087 nT
Run Date = October 30, 2015	Magnetic Vector H = 23895 nT

Signed: _____ Date: _____