

Submit 1 Copy To Appropriate District Office.

District I - (575) 393-6161

1625 N. French Dr., Hobbs, NM 88240

District II - (575) 748-1283

811 S. First St., Artesia, NM 88210

District III - (505) 334-6178

1000 Rio Brazos Rd., Aztec, NM 87410

District IV - (505) 476-3460

1220 S. St. Francis Dr., Santa Fe, NM

87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.

Santa Fe, NM 87505

Form C-103

Revised July 18, 2013

WELL API NO.

30-015-43371

5. Indicate Type of Lease

STATE ☒ FEE ☐

6. State Oil & Gas Lease No.

7. Lease Name or Unit Agreement Name

Emerald PWU 20

8. Well Number

11H

9. OGRID Number

6137

10. Pool name or Wildcat

Scanlon Draw; Bone Spring

SUNDRY NOTICES AND REPORTS ON WELLS

(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

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

2. Name of Operator

Devon Energy Production Company, LP

405-228-7203

3. Address of Operator

333 West. Sheridan Avenue

Oklahoma City, OK 73102-5015

405-228-7203

4. Well Location

Lot Number L : 2434 feet from the SOUTH line and 284 feet from the WEST line

Section 20

Township 19S

Range 29E

NMPM

Eddy County

11. Elevation (Show whether DR, RKB, RT, GR, etc.)

3331' GL

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:

PERFORM REMEDIAL WORK ☐

PLUG AND ABANDON ☐

TEMPORARILY ABANDON ☐

CHANGE PLANS ☐

PULL OR ALTER CASING ☐

MULTIPLE COMPL ☐

DOWNHOLE COMMINGLE ☐

CLOSED-LOOP SYSTEM ☐

OTHER: Casing Chg/Directional Survey Update ☒

SUBSEQUENT REPORT OF:

REMEDIAL WORK ☐

ALTERING CASING ☐

COMMENCE DRILLING OPNS ☐

P AND A ☐

CASING/CEMENT JOB ☐

OTHER: ☐

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

Devon respectfully proposes to change the surface and intermediate casing depths to 350' and 3,300' respectively. Also, the directional plan has been updated to match the SHL and BHL on the C-102 of the approved drilling permit.

NM OIL CONSERVATION

ARTESIA DISTRICT

OCT 13 2015

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

RECEIVED

SIGNATURE

Trina C. Couch

TITLE: Regulatory Analyst

DATE 10/9/2015

Type or print name:

Trina C. Couch

E-mail address: trina.couch@dvn.com

PHONE: 405-228-7203

For State Use Only

APPROVED BY:

Dr. Dade

TITLE

Dr. H. P. Pender

DATE

10/13/2015

Conditions of Approval (if any):

Devon Energy, Emerald PWU 20-11H

1. Geologic Formations

TVD of target	8,974'	Pilot hole depth	N/A
MD at TD:	13,721'	Deepest expected fresh water:	

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Rustler	0	Barren	
Salt	468	Barren	
Tansil	948	Barren	
Yates	1233	Barren	
Queen	1968	Oil	
Grayburg	2608	Oil	
Delaware	3448	Oil	
Bone Spring Lm	4828	Oil	
2nd BS Lm	6978	Oil	
3rd BS Lm	7953	Oil	
3rd BS Sd	8588	Oil	

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

Devon Energy, Emerald PWU 20-11H

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	350'	13.375"	48	H-40	STC	7.06	17.05	47.65
12.25"	0	3,300'	9.625"	40	J-55	LTC	1.36	2.09	4.77
8.75"	0	13,721'	5.5"	17	P-110RY	CDC-HTQ	1.60	2.28	2.34
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 20-11H

3. Cementing Program

Casing	# Sk	Wt lb/ gal	H ₂ O gal/sk	Yld ft ³ / sack	500# Comp. Strength (hours)	Slurry Description
13-3/8" Surface	470	14.8	6.32	1.33	6	Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake
9-5/8" Inter.	740	12.9	9.81	1.85	14	Lead: (65:35) Class C Cement: Poz (Fly Ash): 6% BWOC Bentonite + 5% BWOW Sodium Chloride + 0.125 lbs/sack Poly-E-Flake
	330	14.8	6.32	1.33	6	Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake
9-5/8" Inter. Two Stage	650	12.9	9.81	1.85	14	Lead: (65:35) Class C Cement: Poz (Fly Ash): 6% BWOC Bentonite + 5% BWOW Sodium Chloride + 0.125 lbs/sack Poly-E-Flake
	330	14.8	6.32	1.33	6	Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake
	DV Tool = 475ft					
	130	14.8	6.32	1.33	6	Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake
5-1/2" Prod Two Stage	670	11.9	12.89	2.31	n/a	1 st Stage Lead: (50:50) Class H Cement: Poz (Fly Ash) + 10% BWOC Bentonite + 1 lb/sk of Kol-Seal + 0.3% BWOC HR-601 + 0.5lb/sk D-Air 5000
	1420	14.5	5.31	1.2	25	1 st Stage Tail: (50:50) Class H Cement: Poz (Fly Ash) + 0.5% bwoc HALAD-344 + 0.4% bwoc CFR-3 + 0.2% BWOC HR-601 + 2% bwoc Bentonite
	DV Tool = 3450ft					
	20	11	14.81	2.55	22	2 nd Stage Lead: Tuned Light® Cement + 0.125 lb/sk Pol-E-Flake
	30	14.8	6.32	1.33	6	2 nd Stage Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake
5-1/2" Prod Single Stage	700	11.9	12.89	2.31	n/a	Lead: (50:50) Class H Cement: Poz (Fly Ash) + 10% BWOC Bentonite + 1 lb/sk of Kol-Seal + 0.3% BWOC HR-601 + 0.5lb/sk D-Air 5000
	1420	14.5	5.31	1.2	25	Tail: (50:50) Class H Cement: Poz (Fly Ash) + 0.5% bwoc HALAD-344 + 0.4% bwoc CFR-3 + 0.2% BWOC HR-601 + 2% bwoc Bentonite

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%
9-5/8" Intermediate Two Stage Option	1 st Stage = 475' / 2 nd Stage = 0'	75%
5-1/2" Production Casing Two Stage Option	1 st Stage = 3450' / 2 nd Stage = 3100'	25%
5-1/2" Production Casing Single Stage Option	3100'	25%

4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
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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% testing 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.
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Devon Energy, Emerald PWU 20-11H

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 is being 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 (FMC Uni-head). 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 FMC's representatives. • If the welding is performed by a third party, the FMC's representative will monitor the temperature to verify that it does not exceed the maximum temperature of the seal. • FMC representative will install the test plug for the initial BOP test. • FMC 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 3M, 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 FMC Uni-head 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 FMC Uni-head. 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 20-11H

	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	350'	FW Gel	8.6-8.8	28-34	N/C
350'	3,300'	Saturated Brine	10.0-10.2	28-34	N/C
3,300'	13,721'	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
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6. Logging and Testing Procedures

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

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

Devon Energy, Emerald PWU 20-11H

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	3879 psi
Abnormal Temperature	No

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

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

8. Other facets of operation

Is this a walking operation? No.

Will be pre-setting casing? No.

Attachments

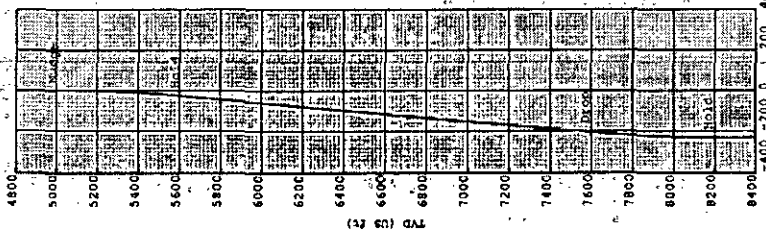
☒ Directional Plan--

☐ Other, describe

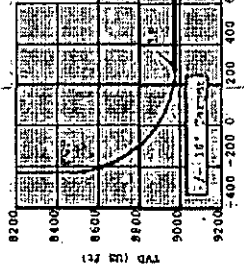
devon

Emerald PMU 20 11H
Eddy Co, NM

RB-3356
GL-3331



VS (US 21) (Bearing: 90.10°) Scale: 2000ft/1in



VS (US 21) (Bearing: 90.10°) Scale: 2000ft/1in

Plan Data for Emerald PMU 20 11H

Plan Point Information:
Dogleg Severity Unit: "100.00ft" Position Offsets from Slot Centre
MS
WD Inc Az TWD +/-S +/-W Northing Easting VSc (mS)
(USft) ("") (USft) (USft) (USft) (USft) (USft) (USft) (USft)
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
5000.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
5000.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
7000.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
8000.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
8456.28 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
9204.46 90.00 90.10 8974.00 -150.06 4724.74 598603.94 616442.34 4724.99 0.00
13720.73 90.00 90.10 8974.00 -150.06 4724.74 598603.94 616442.34 4724.99 0.00

Plan Data for Emerald PMU 20 11H

Slot: Emerald PMU 20 11H
Position:
Offset is from Site Centre
+N/-S: 0.00USft Northing: 598754.00USft Latitude: 32.645814°
+E/-W: 0.00USft Easting: 61717.60USft Longitude: -104.104675°
Elevation Above WVD: 3331.00USft

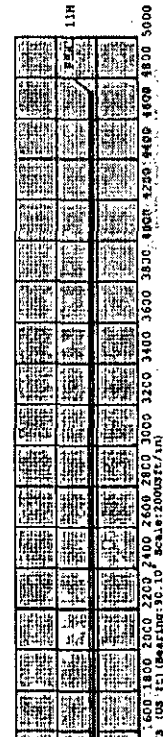
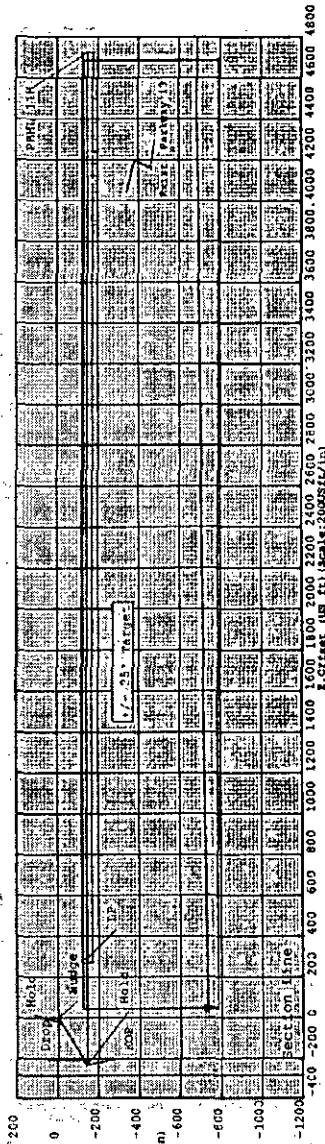
Plan Data for Emerald PMU 20 11H

Well: Emerald PMU 20 11H
Type: Main-Well
File Number:
Plan Folder: P1
Plan: P1:VA
Vertical Section: Position Offset of origin from Slot centre:
+N/-S: -0.00USft
+E/-W: -0.00USft
Model: Field Strength: Magnetic Parameters:
Dip: Date:
BEG=2015 48394(nT) 7.52° 60.42° 2015-11-15

Plan Data for Emerald PMU 20 11H

Target Set Information:
Name: Emerald PMU 20 11H Tgt
Position Offsets from Slot Centre
Name TWD Elevation +/-S +/-W Northing Easting
(USft) (USft) (USft) (USft) (USft) (USft)
LP Tgt 8974.00 -5618.00 -163.54 44.90 598599.46 61762.50
PBHL 11H old 8974.00 -5618.00 -172.06 4724.74 598581.94 616442.34
PBHL 11H 8974.00 -5618.00 -150.06 4724.74 598603.94 616442.34

Emerald PMU 20 11H
Partway 13
#7



VS (US 21) (Bearing: 90.10°) Scale: 2000ft/1in



Weatherford



SD Plan Report

Devon Energy

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

Site Name: *Emerald PWU 20 11H*

Well Name: *Emerald PWU 20 11H*

Plan: *P1:V4*

6 October 2015



Weatherford®



Emerald PWU 20 11H

Field Name:	Map Units: US ft		Company Name: Devon Energy	
Eddy Co, NM (Nad 83 NME)	Vertical Reference Datum (VRD): Mean Sea Level			
	Projected Coordinate System: NAD83 / New Mexico East (ftUS)			
	Comment:			
Site: Emerald PWU 20 11H	Units: US ft	North Reference: Grid	Convergence Angle: 0.12	
	Position:	Northings: 598754.00US ft	Latitude: 32° 38' 44.93"	
	Easting: 611717.60US ft	Longitude: -104° 6' 16.83"		
	Elevation above MSL: 3331.00 US ft			
	Comment:			
Slot: Emerald PWU 20 11H	Position (Relative to Site Centre)			
	+N/-S: 0.00US ft	Northings: 598754.00US ft	Latitude: 32° 38' 44.93"	
	+E/-W: 0.00US ft	Easting: 611717.60US ft	Longitude: -104° 6' 16.83"	
	Slot TVD Reference: Ground Elevation			
	Elevation above MSL: 3331.00US ft			
	Comment:			
Well: Emerald PWU 20 11H	Type: Main well	UWI:	Plan: P1:V4	
	File Number:	Comment:		
	Closure Distance: 4727.12US ft	Closure Azimuth: 91.82°		
	Vertical Section: Position of Origin (Relative to Slot centre)			
	+N/-S: -0.00US ft	+E/-W: -0.00US ft	Az: 90.10°	
	Magnetic Parameters:			
Model: bggm2015	Field Strength: 48394.1nT	Declination: 7.52°	Dip: 60.42°	Date: 15/Nov/2015

Drill floor: Plan: P1:V4

Rig Height (Kelly Bushing): Elevation above MSL: 25.00us ft **Inclination:** 0.00° **Azimuth:** 0.00°
3356.00us ft

Target set: Emerald PWU 20 11H Tgt Comment:						
Target Name:	Shape:	TVD (US ft)	N Offset (US ft)	E Offset (US ft)	Northing (US ft)	Easting (US ft)
LP Tgt	Point	8974.00	-163.54	44.90	598590.46	611762.50
PBHL 11H old	Cuboid	8974.00	-172.06	4724.74	598581.94	616442.34
PBHL 11H	Cuboid	8974.00	-150.06	4724.74	598603.94	616442.34

Wellpath created using minimum curvature.

SD Plan Report

Tie Point:
MD: 0.00USFt **Inclination: 0.00°** **Azimuth: 0.00°** **TVD: 0.00USFt** **North Offset: 0.00USFt** **East Offset: 0.00USFt**

Salient 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)	B.Rate (°/100US ft)	T.Plate (°/100US ft)	L.Fate (°)	Comment
0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	
5000.00	0.00	0.00	5000.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	Nudge
5600.00	6.00	238.75	5598.90	-16.28	-26.83	-26.80	1.00	1.00	0.00	238.75	Hold
7600.00	6.00	238.75	7587.95	-124.74	-205.56	-205.34	0.00	0.00	0.00	0.00	Drop
8200.00	0.00	0.00	8186.85	-141.02	-232.39	-232.15	1.00	-1.00	0.00	180.00	Hold
8466.28	0.00	0.00	8453.13	-141.02	-232.39	-232.15	0.00	0.00	0.00	0.00	KOP
9284.46	90.00	90.10	8974.00	-141.97	288.48	288.72	11.00	11.00	0.00	90.10	LP
13720.73	90.00	90.10	8974.00	-150.06	4724.74	4724.99	0.00	0.00	0.00	0.00	PBHL 11H

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
0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
100.00	0.00	0.00	100.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
200.00	0.00	0.00	200.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
300.00	0.00	0.00	300.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
400.00	0.00	0.00	400.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
500.00	0.00	0.00	500.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
600.00	0.00	0.00	600.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
700.00	0.00	0.00	700.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
800.00	0.00	0.00	800.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
900.00	0.00	0.00	900.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
1000.00	0.00	0.00	1000.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
1100.00	0.00	0.00	1100.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
1200.00	0.00	0.00	1200.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
1300.00	0.00	0.00	1300.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
1400.00	0.00	0.00	1400.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
1500.00	0.00	0.00	1500.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
1600.00	0.00	0.00	1600.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
1700.00	0.00	0.00	1700.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
1800.00	0.00	0.00	1800.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
1900.00	0.00	0.00	1900.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
2000.00	0.00	0.00	2000.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
2100.00	0.00	0.00	2100.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
2200.00	0.00	0.00	2200.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
2300.00	0.00	0.00	2300.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
2400.00	0.00	0.00	2400.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
2500.00	0.00	0.00	2500.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
2600.00	0.00	0.00	2600.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
2700.00	0.00	0.00	2700.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
2800.00	0.00	0.00	2800.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
2900.00	0.00	0.00	2900.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
3000.00	0.00	0.00	3000.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
3100.00	0.00	0.00	3100.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
3200.00	0.00	0.00	3200.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
3300.00	0.00	0.00	3300.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
3400.00	0.00	0.00	3400.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
3500.00	0.00	0.00	3500.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
3600.00	0.00	0.00	3600.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
3700.00	0.00	0.00	3700.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
3800.00	0.00	0.00	3800.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
3900.00	0.00	0.00	3900.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
4000.00	0.00	0.00	4000.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
4100.00	0.00	0.00	4100.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		
4200.00	0.00	0.00	4200.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60		

5D Plan Report

Interpolated Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	H. Offset (US ft)	E. Offset (US ft)	VS (US ft)	DLS (%/100US ft)	Northing (US ft)	Eastng (US ft)	Comment
4300.00	0.00	0.00	4300.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60	
4400.00	0.00	0.00	4400.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60	
4500.00	0.00	0.00	4500.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60	
4600.00	0.00	0.00	4600.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60	
4700.00	0.00	0.00	4700.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60	
4800.00	0.00	0.00	4800.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60	
4900.00	0.00	0.00	4900.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60	
5000.00	0.00	0.00	5000.00	-0.00	-0.00	-0.00	0.00	598754.00	611717.60	Nudge
5100.00	1.00	238.75	5099.99	-0.45	-0.75	-0.75	1.00	598753.55	611716.85	
5200.00	2.00	238.75	5199.96	-1.81	-2.98	-2.98	1.00	598752.19	611714.62	
5300.00	3.00	238.75	5299.86	-4.07	-6.71	-6.71	1.00	598749.93	611710.89	
5400.00	4.00	238.75	5399.68	-7.24	-11.93	-11.92	1.00	598746.76	611705.67	
5500.00	5.00	238.75	5499.37	-11.31	-18.64	-18.62	1.00	598742.69	611698.96	
5600.00	6.00	238.75	5598.90	-16.28	-26.83	-26.80	1.00	598737.72	611690.77	Hold
5700.00	6.00	238.75	5698.36	-21.71	-35.77	-35.73	0.00	598732.29	611681.83	
5800.00	6.00	238.75	5797.81	-27.13	-44.71	-44.66	0.00	598726.87	611672.89	
5900.00	6.00	238.75	5897.26	-32.55	-53.64	-53.59	0.00	598721.45	611663.96	
6000.00	6.00	238.75	5996.71	-37.97	-62.58	-62.51	0.00	598716.03	611655.02	
6100.00	6.00	238.75	6096.16	-43.40	-71.51	-71.44	0.00	598710.60	611646.09	
6200.00	6.00	238.75	6195.62	-48.82	-80.45	-80.37	0.00	598705.18	611637.15	
6300.00	6.00	238.75	6295.07	-54.24	-89.39	-89.29	0.00	598699.76	611628.21	
6400.00	6.00	238.75	6394.52	-59.66	-98.32	-98.22	0.00	598694.34	611619.28	
6500.00	6.00	238.75	6493.97	-65.09	-107.26	-107.15	0.00	598688.91	611610.34	
6600.00	6.00	238.75	6593.43	-70.51	-116.20	-116.07	0.00	598683.49	611601.40	
6700.00	6.00	238.75	6692.88	-75.93	-125.13	-125.00	0.00	598678.07	611592.47	
6800.00	6.00	238.75	6792.33	-81.35	-134.07	-133.93	0.00	598672.65	611583.53	
6900.00	6.00	238.75	6891.78	-86.78	-143.00	-142.85	0.00	598667.22	611574.60	
7000.00	6.00	238.75	6991.23	-92.20	-151.94	-151.78	0.00	598661.80	611565.66	
7100.00	6.00	238.75	7090.69	-97.62	-160.88	-160.71	0.00	598656.38	611556.72	
7200.00	6.00	238.75	7190.14	-103.05	-169.81	-169.63	0.00	598650.95	611547.79	
7300.00	6.00	238.75	7289.59	-108.47	-178.75	-178.56	0.00	598645.53	611538.85	
7400.00	6.00	238.75	7389.04	-113.89	-187.69	-187.49	0.00	598640.11	611529.91	
7500.00	6.00	238.75	7488.50	-119.31	-196.62	-196.41	0.00	598634.69	611520.98	
7600.00	6.00	238.75	7587.95	-124.74	-205.56	-205.34	0.00	598629.26	611512.04	Drop
7700.00	5.00	238.75	7687.49	-129.71	-213.75	-213.53	1.00	598624.29	611503.85	
7800.00	4.00	238.75	7787.18	-133.78	-220.46	-220.23	1.00	598620.22	611497.14	
7900.00	3.00	238.75	7886.99	-136.95	-225.68	-225.44	1.00	598617.05	611491.92	
8000.00	2.00	238.75	7986.89	-139.21	-229.41	-229.16	1.00	598614.79	611488.19	
8100.00	1.00	238.75	8086.86	-140.57	-231.65	-231.40	1.00	598613.43	611485.95	
8200.00	0.00	0.00	8186.85	-141.02	-232.39	-232.15	1.00	598612.98	611485.21	Hold
8300.00	0.00	0.00	8286.85	-141.02	-232.39	-232.15	0.00	598612.98	611485.21	
8400.00	0.00	0.00	8386.85	-141.02	-232.39	-232.15	0.00	598612.98	611485.21	
8466.28	0.00	0.00	8453.13	-141.02	-232.39	-232.15	0.00	598612.98	611485.21	KOP
8500.00	3.71	90.10	8486.83	-141.02	-231.30	-231.05	11.00	598612.98	611486.30	
8600.00	14.71	90.10	8585.39	-141.05	-215.32	-215.07	11.00	598612.95	611502.28	
8700.00	25.71	90.10	8679.09	-141.11	-180.83	-180.58	11.00	598612.89	611536.77	
8800.00	36.71	90.10	8764.48	-141.21	-129.09	-128.85	11.00	598612.79	611588.51	
8900.00	47.71	90.10	8838.44	-141.33	-62.01	-61.76	11.00	598612.67	611655.59	
9000.00	58.71	90.10	8898.24	-141.48	17.95	18.20	11.00	598612.52	611735.55	
9100.00	69.71	90.10	8941.68	-141.64	107.85	108.10	11.00	598612.36	611825.45	
9200.00	80.71	90.10	8967.17	-141.82	204.39	204.63	11.00	598612.18	611921.99	
9284.46	90.00	90.10	8974.00	-141.97	288.48	288.72	11.00	598612.03	612006.08	LP
9300.00	90.00	90.10	8974.00	-142.00	304.02	304.26	0.00	598612.00	612021.62	
9400.00	90.00	90.10	8974.00	-142.18	404.02	404.26	0.00	598611.82	612121.62	
9500.00	90.00	90.10	8974.00	-142.36	504.02	504.26	0.00	598611.64	612221.62	
9600.00	90.00	90.10	8974.00	-142.54	604.02	604.26	0.00	598611.46	612321.62	
9700.00	90.00	90.10	8974.00	-142.73	704.02	704.26	0.00	598611.27	612421.62	
9800.00	90.00	90.10	8974.00	-142.91	804.02	804.26	0.00	598611.09	612521.62	
9900.00	90.00	90.10	8974.00	-143.09	904.02	904.26	0.00	598610.91	612621.62	

5D Plan Report

Interpolated Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)										
Hp (US ft)	Incl (°)	Az (°)	TVD (US ft)	H.Offset (US ft)	E.Offset (US ft)	VS (US ft)	DLS (%/100US ft)	Northing (US ft)	Easting (US ft)	Comment
10000.00	90.00	90.10	8974.00	-143.27	1004.02	1004.26	0.00	598610.73	612721.62	
10100.00	90.00	90.10	8974.00	-143.46	1104.02	1104.26	0.00	598610.54	612821.62	
10200.00	90.00	90.10	8974.00	-143.64	1204.02	1204.26	0.00	598610.36	612921.62	
10300.00	90.00	90.10	8974.00	-143.82	1304.02	1304.26	0.00	598610.18	613021.62	
10400.00	90.00	90.10	8974.00	-144.00	1404.02	1404.26	0.00	598610.00	613121.62	
10500.00	90.00	90.10	8974.00	-144.19	1504.02	1504.26	0.00	598609.81	613221.62	
10600.00	90.00	90.10	8974.00	-144.37	1604.01	1604.26	0.00	598609.63	613321.61	
10700.00	90.00	90.10	8974.00	-144.55	1704.01	1704.26	0.00	598609.45	613421.61	
10800.00	90.00	90.10	8974.00	-144.73	1804.01	1804.26	0.00	598609.27	613521.61	
10900.00	90.00	90.10	8974.00	-144.92	1904.01	1904.26	0.00	598609.08	613621.61	
11000.00	90.00	90.10	8974.00	-145.10	2004.01	2004.26	0.00	598608.90	613721.61	
11100.00	90.00	90.10	8974.00	-145.28	2104.01	2104.26	0.00	598608.72	613821.61	
11200.00	90.00	90.10	8974.00	-145.46	2204.01	2204.26	0.00	598608.54	613921.61	
11300.00	90.00	90.10	8974.00	-145.64	2304.01	2304.26	0.00	598608.36	614021.61	
11400.00	90.00	90.10	8974.00	-145.83	2404.01	2404.26	0.00	598608.17	614121.61	
11500.00	90.00	90.10	8974.00	-146.01	2504.01	2504.26	0.00	598607.99	614221.61	
11600.00	90.00	90.10	8974.00	-146.19	2604.01	2604.26	0.00	598607.81	614321.61	
11700.00	90.00	90.10	8974.00	-146.37	2704.01	2704.26	0.00	598607.63	614421.61	
11800.00	90.00	90.10	8974.00	-146.56	2804.01	2804.26	0.00	598607.44	614521.61	
11900.00	90.00	90.10	8974.00	-146.74	2904.01	2904.26	0.00	598607.26	614621.61	
12000.00	90.00	90.10	8974.00	-146.92	3004.01	3004.26	0.00	598607.08	614721.61	
12100.00	90.00	90.10	8974.00	-147.10	3104.01	3104.26	0.00	598606.90	614821.61	
12200.00	90.00	90.10	8974.00	-147.29	3204.01	3204.26	0.00	598606.71	614921.61	
12300.00	90.00	90.10	8974.00	-147.47	3304.01	3304.26	0.00	598606.53	615021.61	
12400.00	90.00	90.10	8974.00	-147.65	3404.01	3404.26	0.00	598606.35	615121.61	
12500.00	90.00	90.10	8974.00	-147.83	3504.01	3504.26	0.00	598606.17	615221.61	
12600.00	90.00	90.10	8974.00	-148.02	3604.01	3604.26	0.00	598605.98	615321.61	
12700.00	90.00	90.10	8974.00	-148.20	3704.01	3704.26	0.00	598605.80	615421.61	
12800.00	90.00	90.10	8974.00	-148.38	3804.01	3804.26	0.00	598605.62	615521.61	
12900.00	90.00	90.10	8974.00	-148.56	3904.01	3904.26	0.00	598605.44	615621.61	
13000.00	90.00	90.10	8974.00	-148.75	4004.01	4004.26	0.00	598605.25	615721.61	
13100.00	90.00	90.10	8974.00	-148.93	4104.01	4104.26	0.00	598605.07	615821.61	
13200.00	90.00	90.10	8974.00	-149.11	4204.01	4204.26	0.00	598604.89	615921.61	
13300.00	90.00	90.10	8974.00	-149.29	4304.01	4304.26	0.00	598604.71	616021.61	
13400.00	90.00	90.10	8974.00	-149.48	4404.01	4404.26	0.00	598604.52	616121.61	
13500.00	90.00	90.10	8974.00	-149.66	4504.01	4504.26	0.00	598604.34	616221.61	
13600.00	90.00	90.10	8974.00	-149.84	4604.01	4604.26	0.00	598604.16	616321.61	
13700.00	90.00	90.10	8974.00	-150.02	4704.01	4704.26	0.00	598603.98	616421.61	
13720.73	90.00	90.10	8974.00	-150.06	4724.74	4724.99	0.00	598603.94	616442.34	PBHL 11H


devon

5D Anti-Collision Report

Devon Energy

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

Site Name: *Emerald PWU 20 11H*

Well Name: *Emerald PWU 20 11H*

6 October 2015



Weatherford®



devon

Emerald PWU 20 11H

Field Name:	Map Units: US ft Vertical Reference Datum (VRD): Mean Sea Level Projected Coordinate System: NAD83 / New Mexico East (ftUS) Comment:	Company Name: Devon Energy
Site:	Units: US ft North Reference: Grid Convergence Angle: 0.12 Position: Northing: 598754.00US ft Latitude: 32° 38' 44.93" Easting: 611717.60US ft Longitude: -104° 6' 16.83" Elevation above MSL: 3331.00 US ft Comment:	
Slot:	Position (Relative to Site Centre) +N/-S: 0.00US ft Northing: 598754.00US ft Latitude: 32° 38' 44.93" +E/-W: 0.00US ft Easting: 611717.60US ft Longitude: -104° 6' 16.83" Slot TVD Reference: Ground Elevation Elevation above MSL: 3331.00US ft Comment:	
Well:	Type: Main well UWI: Plan: Working Plan File Number: Comment: Closure Distance: 4727.12US ft Closure Azimuth: 91.82° Vertical Section: Position of Origin (Relative to Slot centre) +N/-S: -0.00US ft +E/-W: -0.00US ft Az: 90.10° Magnetic Parameters: Model: bggm2015 Field Strength: 48394.1nT Declination: 7.52° Dip: 60.42° Date: 15/Nov/2015	
Drill floor: Plan: Working Plan Rig Height (Kelly Bushing): Elevation above MSL: 25.00us ft 3356.00us 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 11H (p)	0.00	30000.00	100.00	2

Secondary Well Names:

7 (s)
 Parkway 13 (s)
 Emerald PWU 20 #3H (s)
 Emerald PWU 20 10H (p)
 Emerald PWU 20 10H (s)
 Emerald PWU 20 66H (p)
 Agate PWU 21-7H (s)

5D Anti-Collision Report:

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.

AC Filter Info: the following filter has been applied: Depth Range:

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	Pr MD (US ft)	TVD (US ft)	Sec MD (US ft)	ES (US ft)	CC (US ft)	SF	Risk
Parkway 13 (s)	13112.30	8974.00	8960.78	72.90	209.18	1.53	SF(Lo)
Emerald PWU 20 66H (p)	13720.73	8974.00	13715.75	262.23	528.16	1.99	SF(Lo)
Emerald PWU 20 10H (p)	13720.73	8974.00	13721.91	463.11	731.73	2.72	
#7 (s)	6841.02	6833.12	11505.00	507.48	650.02	4.56	
Emerald PWU 20 #3H (s)	6444.92	6439.20	6427.50	165.30	193.37	6.89	
Emerald PWU 20 10H (s)	5106.64	5106.63	5094.39	409.09	430.02	20.55	
Agate PWU 21-7H (s)	13720.73	8974.00	7083.28	2149.30	2213.56	34.45	

Primary Well: Emerald PWU 20 11H (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	170.91	0.00	0.00	0.00	Emerald PWU 20 #3H (s)	292.80	293.37	517.73	
100.00	100.00	170.88	0.11	0.11	4.60	Emerald PWU 20 #3H (s)	291.69	292.49	363.67	
200.00	200.00	170.81	0.34	0.34	4.62	Emerald PWU 20 #3H (s)	289.59	290.89	224.46	
300.00	300.00	170.67	0.56	0.56	4.65	Emerald PWU 20 #3H (s)	286.62	288.41	160.95	
400.00	400.00	170.43	0.79	0.79	4.69	Emerald PWU 20 #3H (s)	283.09	285.37	125.10	
500.00	500.00	170.16	1.01	1.01	4.75	Emerald PWU 20 #3H (s)	279.70	282.46	102.08	
600.00	600.00	169.84	1.24	1.24	4.81	Emerald PWU 20 #3H (s)	276.71	279.96	86.14	
700.00	700.00	169.41	1.46	1.46	4.89	Emerald PWU 20 #3H (s)	274.19	277.91	74.65	
800.00	800.00	168.83	1.69	1.69	4.97	Emerald PWU 20 #3H (s)	272.08	276.27	65.93	
900.00	900.00	168.22	1.91	1.91	5.06	Emerald PWU 20 #3H (s)	270.08	274.74	58.94	
1000.00	1000.00	167.62	2.14	2.14	5.16	Emerald PWU 20 #3H (s)	268.17	273.31	53.21	
1100.00	1100.00	167.10	2.36	2.36	5.27	Emerald PWU 20 #3H (s)	266.33	271.94	48.50	
1200.00	1200.00	166.68	2.59	2.59	5.38	Emerald PWU 20 #3H (s)	264.65	270.74	44.45	
1300.00	1300.00	166.35	2.81	2.81	5.50	Emerald PWU 20 #3H (s)	263.18	269.76	41.02	
1400.00	1400.00	166.07	3.03	3.03	5.62	Emerald PWU 20 #3H (s)	261.81	268.87	38.06	
1500.00	1500.00	165.85	3.26	3.26	5.75	Emerald PWU 20 #3H (s)	260.61	268.16	35.53	
1600.00	1600.00	165.64	3.48	3.48	5.89	Emerald PWU 20 #3H (s)	259.75	267.77	33.36	
1700.00	1700.00	165.44	3.71	3.71	6.03	Emerald PWU 20 #3H (s)	258.85	267.36	31.42	
1800.00	1800.00	165.25	3.93	3.93	6.17	Emerald PWU 20 #3H (s)	257.92	266.91	29.68	
1900.00	1900.00	165.07	4.16	4.16	6.32	Emerald PWU 20 #3H (s)	256.90	266.38	28.10	
2000.00	2000.00	164.89	4.38	4.38	6.47	Emerald PWU 20 #3H (s)	256.01	265.98	26.69	

SD Anti-Collision Report

Primary Well: Emerald PWU 20 11H (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
2100.00	2100.00	164.71	4.61	4.61	6.62	Emerald PWU 20 #3H (s)	255.12	265.57	25.41	
2200.00	2200.00	164.56	4.83	4.83	6.78	Emerald PWU 20 #3H (s)	254.07	265.02	24.22	
2300.00	2300.00	164.42	5.06	5.06	6.94	Emerald PWU 20 #3H (s)	253.09	264.52	23.14	
2400.00	2400.00	164.26	5.28	5.28	7.11	Emerald PWU 20 #3H (s)	252.04	263.96	22.14	
2500.00	2500.00	164.09	5.51	5.51	7.27	Emerald PWU 20 #3H (s)	250.95	263.35	21.23	
2600.00	2600.00	163.92	5.73	5.73	7.44	Emerald PWU 20 #3H (s)	250.11	263.00	20.40	
2700.00	2700.00	163.75	5.96	5.96	7.61	Emerald PWU 20 #3H (s)	249.30	262.68	19.64	
2800.00	2800.00	163.60	6.18	6.18	7.79	Emerald PWU 20 #3H (s)	248.51	262.37	18.93	
2900.00	2900.00	163.44	6.41	6.41	7.97	Emerald PWU 20 #3H (s)	247.72	262.06	18.27	
3000.00	3000.00	163.27	6.63	6.63	8.15	Emerald PWU 20 #3H (s)	246.88	261.71	17.65	
3100.00	3100.00	163.10	6.86	6.86	8.33	Emerald PWU 20 #3H (s)	246.01	261.33	17.06	
3200.00	3200.00	162.94	7.08	7.08	8.51	Emerald PWU 20 #3H (s)	245.23	261.02	16.52	
3300.00	3300.00	162.76	7.31	7.31	8.70	Emerald PWU 20 #3H (s)	244.53	260.82	16.02	
3400.00	3400.00	162.61	7.53	7.53	8.89	Emerald PWU 20 #3H (s)	243.88	260.65	15.54	
3500.00	3500.00	162.54	7.76	7.76	9.09	Emerald PWU 20 #3H (s)	243.37	260.59	15.13	
3600.00	3600.00	162.56	7.98	7.98	9.28	Emerald PWU 20 #3H (s)	243.08	260.62	14.86	
3700.00	3700.00	162.62	8.21	8.21	9.48	Emerald PWU 20 #3H (s)	242.85	260.60	14.68	
3800.00	3800.00	162.71	8.43	8.43	9.69	Emerald PWU 20 #3H (s)	242.43	260.45	14.45	
3900.00	3900.00	162.69	8.65	8.65	9.89	Emerald PWU 20 #3H (s)	241.06	259.45	14.11	
4000.00	4000.00	162.52	8.88	8.88	10.10	Emerald PWU 20 #3H (s)	238.67	257.49	13.68	
4100.00	4100.00	162.33	9.10	9.10	10.31	Emerald PWU 20 #3H (s)	235.83	255.12	13.23	
4200.00	4200.00	162.29	9.33	9.33	10.52	Emerald PWU 20 #3H (s)	232.93	252.66	12.81	
4300.00	4300.00	162.40	9.55	9.55	10.74	Emerald PWU 20 #3H (s)	229.90	250.03	12.42	
4400.00	4400.00	162.65	9.78	9.78	10.96	Emerald PWU 20 #3H (s)	226.64	247.17	12.04	
4500.00	4500.00	163.01	10.00	10.00	11.19	Emerald PWU 20 #3H (s)	223.29	244.22	11.67	
4600.00	4600.00	163.39	10.23	10.23	11.42	Emerald PWU 20 #3H (s)	219.98	241.27	11.34	
4700.00	4700.00	163.76	10.45	10.45	11.65	Emerald PWU 20 #3H (s)	216.67	238.36	10.99	
4800.00	4800.00	164.21	10.68	10.68	11.88	Emerald PWU 20 #3H (s)	213.26	235.34	10.66	
4900.00	4900.00	164.64	10.90	10.90	12.12	Emerald PWU 20 #3H (s)	209.60	232.05	10.34	
5000.00	5000.00	165.00	11.13	11.13	12.36	Emerald PWU 20 #3H (s)	205.98	228.87	10.00	
5100.00	5099.99	286.37	11.33	11.33	12.61	Emerald PWU 20 #3H (s)	202.40	225.72	9.68	
5200.00	5199.96	286.08	11.51	11.51	12.86	Emerald PWU 20 #3H (s)	198.72	222.40	9.39	
5300.00	5299.86	285.33	11.70	11.68	13.11	Emerald PWU 20 #3H (s)	195.22	219.22	9.13	
5400.00	5399.68	284.07	11.88	11.86	13.37	Emerald PWU 20 #3H (s)	191.49	215.87	8.85	
5500.00	5499.37	282.32	12.07	12.03	13.62	Emerald PWU 20 #3H (s)	187.33	212.10	8.56	
5600.00	5598.90	280.13	12.27	12.21	13.89	Emerald PWU 20 #3H (s)	183.15	208.29	8.29	

SD Anti-Collision Report

Primary Well: Emerald PWU 20 11H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
MD (US ft)	IVD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	EC (US ft)	SF	Risk
5700.00	5698.36	277.78	12.47	12.39	14.15	Emerald PWU 20 #3H (s)	178.87	204.36	8.01	
5800.00	5797.81	275.48	12.67	12.58	14.43	Emerald PWU 20 #3H (s)	174.55	200.41	7.75	
5900.00	5897.26	273.13	12.88	12.78	14.71	Emerald PWU 20 #3H (s)	170.49	196.72	7.50	
6000.00	5996.71	270.69	13.09	12.97	14.99	Emerald PWU 20 #3H (s)	167.15	193.78	7.28	
6100.00	6096.16	268.18	13.30	13.16	15.28	Emerald PWU 20 #3H (s)	164.86	191.86	7.11	
6200.00	6195.62	265.65	13.52	13.36	15.57	Emerald PWU 20 #3H (s)	163.71	191.05	6.99	
6300.00	6295.07	263.15	13.74	13.56	15.86	Emerald PWU 20 #3H (s)	163.71	191.36	6.92	
6400.00	6394.52	284.81	13.96	13.76	16.16	#7 (s)	670.36	793.44	6.45	
6500.00	6493.97	284.81	14.19	13.96	16.47	#7 (s)	610.88	740.61	5.71	
6600.00	6593.43	284.81	14.42	14.16	16.78	#7 (s)	562.68	698.18	5.15	
6700.00	6692.88	284.81	14.65	14.36	17.10	#7 (s)	528.02	668.14	4.77	
6800.00	6792.33	284.81	14.88	14.56	17.42	#7 (s)	509.74	652.21	4.58	
6900.00	6891.78	284.81	15.12	14.77	17.74	#7 (s)	509.72	651.41	4.60	
7000.00	6991.23	284.81	15.35	14.97	18.07	#7 (s)	527.92	665.80	4.83	
7100.00	7090.69	284.81	15.59	15.18	18.41	#7 (s)	562.26	694.44	5.25	
7200.00	7190.14	284.81	15.83	15.38	18.75	#7 (s)	610.42	735.66	5.87	
7300.00	7289.59	284.81	16.08	15.59	19.09	#7 (s)	669.96	787.50	6.70	
7400.00	7389.04	243.73	16.32	15.80	19.44	Emerald PWU 20 #3H (s)	204.80	235.52	7.67	
7500.00	7488.50	240.28	16.57	16.01	19.80	Emerald PWU 20 #3H (s)	223.85	254.55	8.29	
7600.00	7587.95	237.27	16.82	16.22	20.16	Emerald PWU 20 #3H (s)	254.70	284.81	9.46	
7700.00	7687.49	234.62	17.06	16.44	20.53	Emerald PWU 20 #3H (s)	298.49	327.64	11.24	
7800.00	7787.18	282.26	17.28	16.66	20.90	#7 (s)	1061.11	1147.19	13.33	
7900.00	7886.99	280.73	17.50	16.88	21.28	#7 (s)	1149.33	1231.37	15.01	
8000.00	7986.89	317.84	17.71	17.09	21.66	Emerald PWU 20 66H (p)	505.07	541.44	14.89	
8100.00	8086.86	317.68	17.92	17.30	22.05	Emerald PWU 20 66H (p)	502.74	539.51	14.67	
8200.00	8186.85	196.37	18.12	17.50	22.45	Emerald PWU 20 66H (p)	501.68	538.87	14.49	
8300.00	8286.85	195.92	18.33	17.71	22.84	Emerald PWU 20 66H (p)	500.33	537.93	14.31	
8400.00	8386.85	193.15	18.54	17.93	23.25	Emerald PWU 20 66H (p)	494.55	532.43	14.06	
8500.00	8486.83	98.80	18.74	18.11	23.66	Emerald PWU 20 66H (p)	486.49	524.71	13.73	
8600.00	8585.39	94.91	18.83	17.98	24.05	Emerald PWU 20 66H (p)	480.97	519.52	13.48	
8700.00	8679.09	91.20	18.89	17.45	24.39	Emerald PWU 20 66H (p)	478.52	517.42	13.30	
8800.00	8764.48	87.78	18.98	16.59	24.69	Emerald PWU 20 66H (p)	478.42	517.71	13.17	
8900.00	8838.44	84.75	19.16	15.52	24.94	Emerald PWU 20 66H (p)	479.78	519.62	13.04	
9000.00	8898.24	82.20	19.52	14.42	25.17	Emerald PWU 20 66H (p)	481.71	522.32	12.86	
9100.00	8941.68	80.20	20.14	13.50	25.42	Emerald PWU 20 66H (p)	483.07	525.11	12.49	
9200.00	8967.17	78.81	21.06	12.99	25.70	Emerald PWU 20 66H (p)	483.49	527.38	12.02	
9300.00	8974.00	78.21	22.27	13.02	26.04	Emerald PWU 20 66H (p)	482.08	528.41	11.40	
9400.00	8974.00	78.21	23.72	13.22	26.45	Emerald PWU 20 66H (p)	479.05	528.41	10.71	
9500.00	8974.00	78.21	25.39	13.47	26.94	Emerald PWU 20 66H (p)	475.64	528.40	10.01	
9600.00	8974.00	78.21	27.24	13.74	27.49	Emerald PWU 20 66H (p)	471.92	528.40	9.36	

SD Anti-Collision Report

Primary Well: Emerald PWU 20 11H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
ID (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)	SI	Risk
9700.00	8974.00	78.21	29.23	14.05	28.11	Emerald PWU 20 66H (p)	467.95	528.39	8.74	
9800.00	8974.00	78.21	31.34	14.39	28.79	Emerald PWU 20 66H (p)	463.78	528.39	8.18	
9900.00	8974.00	78.21	33.54	14.76	29.53	Emerald PWU 20 66H (p)	459.44	528.38	7.66	
10000.00	8974.00	78.21	35.82	15.16	30.32	Emerald PWU 20 66H (p)	454.93	528.37	7.19	
10100.00	8974.00	78.21	38.16	15.58	31.16	Emerald PWU 20 66H (p)	450.30	528.37	6.77	
10200.00	8974.00	78.21	40.56	16.02	32.05	Emerald PWU 20 66H (p)	445.57	528.36	6.38	
10300.00	8974.00	78.21	43.00	16.49	32.97	Emerald PWU 20 66H (p)	440.77	528.36	6.03	
10400.00	8974.00	78.20	45.47	16.97	33.94	Emerald PWU 20 66H (p)	435.90	528.35	5.71	
10500.00	8974.00	78.20	47.97	17.47	34.94	Emerald PWU 20 66H (p)	430.97	528.35	5.43	
10600.00	8974.00	78.20	50.51	17.98	35.97	Emerald PWU 20 66H (p)	425.99	528.34	5.16	
10700.00	8974.00	78.20	53.06	18.52	37.03	Emerald PWU 20 66H (p)	420.98	528.33	4.92	
10800.00	8974.00	78.20	55.63	19.06	38.12	Emerald PWU 20 66H (p)	415.93	528.33	4.70	
10900.00	8974.00	78.20	58.22	19.62	39.24	Emerald PWU 20 66H (p)	410.84	528.32	4.50	
11000.00	8974.00	78.20	60.83	20.18	40.37	Emerald PWU 20 66H (p)	405.73	528.32	4.31	
11100.00	8974.00	78.20	63.45	20.76	41.53	Emerald PWU 20 66H (p)	400.60	528.31	4.14	
11200.00	8974.00	78.20	66.07	21.35	42.70	Emerald PWU 20 66H (p)	395.44	528.31	3.98	
11300.00	8974.00	78.20	68.71	21.95	43.90	Emerald PWU 20 66H (p)	390.27	528.30	3.83	
11400.00	8974.00	78.20	71.36	22.55	45.11	Emerald PWU 20 66H (p)	385.07	528.30	3.69	
11500.00	8974.00	78.20	74.02	23.16	46.33	Emerald PWU 20 66H (p)	379.87	528.29	3.56	
11600.00	8974.00	78.20	76.68	23.78	47.57	Emerald PWU 20 66H (p)	374.65	528.28	3.44	
11700.00	8974.00	78.20	79.35	24.41	48.82	Emerald PWU 20 66H (p)	369.41	528.28	3.33	
11800.00	8974.00	78.20	82.03	25.04	50.08	Emerald PWU 20 66H (p)	364.17	528.27	3.22	
11900.00	8974.00	78.20	84.71	25.68	51.35	Emerald PWU 20 66H (p)	358.92	528.27	3.12	
12000.00	8974.00	78.20	87.39	26.32	52.64	Emerald PWU 20 66H (p)	353.66	528.26	3.03	
12100.00	8974.00	78.20	90.08	26.96	53.93	Emerald PWU 20 66H (p)	348.38	528.26	2.94	
12200.00	8974.00	78.20	92.77	27.61	55.23	Emerald PWU 20 66H (p)	343.11	528.25	2.85	
12300.00	8974.00	78.20	95.47	28.27	56.54	Emerald PWU 20 66H (p)	337.82	528.24	2.77	
12400.00	8974.00	78.20	98.17	28.93	57.86	Emerald PWU 20 66H (p)	332.53	528.24	2.70	
12500.00	8974.00	78.20	100.88	29.59	59.18	Emerald PWU 20 66H (p)	327.23	528.23	2.63	
12600.00	8974.00	78.20	103.58	30.26	60.51	Emerald PWU 20 66H (p)	321.93	528.23	2.56	
12700.00	8974.00	78.20	106.29	30.92	61.85	Emerald PWU 20 66H (p)	316.62	528.22	2.50	
12800.00	8974.00	78.20	109.00	31.60	63.19	Emerald PWU 20 66H (p)	311.31	528.22	2.44	
12900.00	8974.00	78.20	111.72	32.27	64.54	Emerald PWU 20 66H (p)	305.99	528.21	2.38	
13000.00	8974.00	91.19	114.43	32.95	65.89	Parkway 13 (s)	114.23	234.44	1.95	SF(Lo)
13100.00	8974.00	90.43	117.15	33.62	67.25	Parkway 13 (s)	73.36	209.18	1.54	SF(Lo)
13200.00	8974.00	89.67	119.87	34.31	68.61	Parkway 13 (s)	100.42	229.20	1.78	SF(Lo)

SD Anti-Collision Report

Primary Well: Emerald PWU 20 11H (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
13300.00	8974.00	78.20	122.59	34.99	69.98	Emerald PWU 20 66H (p)	284.69	528.19	2.17	
13400.00	8974.00	78.20	125.31	35.67	71.35	Emerald PWU 20 66H (p)	279.36	528.18	2.12	
13500.00	8974.00	78.20	128.04	36.36	72.72	Emerald PWU 20 66H (p)	274.02	528.18	2.08	
13600.00	8974.00	78.20	130.76	37.05	74.10	Emerald PWU 20 66H (p)	268.68	528.17	2.04	
13700.00	8974.00	78.20	133.49	37.74	75.48	Emerald PWU 20 66H (p)	263.34	528.16	1.99	SF(Lo)
13720.73	8974.00	78.20	134.06	37.88	75.77	Emerald PWU 20 66H (p)	262.23	528.16	1.99	SF(Lo)

Secondary Well: #7 (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	13.00	0.00	98.51	0.00	0.00	0.00	5016.41	5017.94	3268.18	
100.00	111.92	98.92	98.51	0.13	0.13	2.60	5016.05	5017.82	2827.12	
200.00	185.19	172.19	98.51	0.27	0.27	2.63	5015.72	5017.85	2352.79	
300.00	309.31	296.31	98.51	0.45	0.45	2.63	5015.55	5018.10	1973.10	
400.00	416.23	403.23	98.51	0.65	0.65	2.64	5014.86	5017.83	1689.56	
500.00	505.11	492.11	98.51	0.85	0.85	2.64	5014.22	5017.61	1478.83	
600.00	598.99	585.99	98.51	1.00	1.00	2.65	5013.81	5017.58	1330.42	
700.00	702.79	689.79	98.51	1.17	1.17	2.65	5013.41	5017.57	1205.34	
800.00	776.82	763.83	98.50	1.31	1.31	2.66	5013.23	5017.75	1110.35	
900.00	850.89	837.90	98.49	1.44	1.44	2.67	5013.60	5018.48	1027.62	
1000.00	930.35	917.37	98.48	1.60	1.59	2.67	5014.43	5019.68	955.06	
1100.00	1019.53	1006.57	98.47	1.77	1.77	2.68	5015.54	5021.20	887.26	
1200.00	1139.98	1127.03	98.46	2.03	2.03	2.69	5016.34	5022.49	816.92	
1300.00	1243.38	1230.45	98.44	2.28	2.28	2.70	5017.19	5023.80	759.14	
1400.00	1394.36	1381.46	98.41	2.64	2.64	2.72	5017.02	5024.22	697.66	
1500.00	1537.74	1524.87	98.38	2.99	2.98	2.74	5016.06	5023.83	646.64	
1600.00	1635.30	1622.45	98.36	3.21	3.21	2.75	5014.87	5023.10	610.52	
1700.00	1729.56	1716.73	98.34	3.44	3.44	2.76	5013.77	5022.45	579.26	
1800.00	1820.61	1807.78	98.33	3.66	3.65	2.77	5012.86	5021.97	551.18	
1900.00	6829.88	11505.00	176.30	131.28	35.41	70.90	4936.02	4980.55	111.83	
2000.00	6829.88	11505.00	176.30	131.28	35.41	70.90	4836.80	4881.59	108.98	
2100.00	6829.88	11505.00	176.30	131.28	35.41	70.90	4737.62	4782.67	106.15	
2200.00	6829.88	11505.00	176.30	131.28	35.41	70.90	4638.47	4683.80	103.33	
2300.00	6829.88	11505.00	176.30	131.28	35.41	70.90	4539.36	4584.98	100.52	
2400.00	6829.88	11505.00	176.30	131.28	35.41	70.90	4440.30	4486.21	97.73	
2500.00	6829.88	11505.00	176.30	131.28	35.41	70.90	4341.28	4387.49	94.95	
2600.00	6829.88	11505.00	176.30	131.28	35.41	70.90	4242.31	4288.83	92.19	
2700.00	6829.88	11505.00	176.30	131.28	35.41	70.90	4143.39	4190.24	89.44	
2800.00	6829.88	11505.00	176.30	131.28	35.41	70.90	4044.52	4091.71	86.70	
2900.00	6829.88	11505.00	176.30	131.28	35.41	70.90	3945.71	3993.26	83.98	
3000.00	6829.88	11505.00	176.30	131.28	35.41	70.90	3846.97	3894.89	81.27	
3100.00	6829.88	11505.00	176.30	131.28	35.41	70.90	3748.25	3796.60	78.51	
3200.00	6829.88	11505.00	176.30	131.28	35.41	70.90	3649.55	3698.41	75.70	
3300.00	6829.88	11505.00	176.30	131.28	35.41	70.90	3550.93	3600.31	72.91	
3400.00	6829.88	11505.00	176.30	131.28	35.41	70.90	3452.40	3502.32	70.15	
3500.00	6829.88	11505.00	176.30	131.28	35.41	70.90	3353.96	3404.45	67.42	
3600.00	6829.88	11505.00	176.30	131.28	35.41	70.90	3255.61	3306.71	64.72	
3700.00	6829.88	11505.00	176.30	131.28	35.41	70.90	3157.38	3209.10	62.04	
3800.00	6829.88	11505.00	176.30	131.28	35.41	70.90	3059.26	3111.65	59.40	
3900.00	6829.88	11505.00	176.30	131.28	35.41	70.90	2961.28	3014.36	56.79	
4000.00	6829.88	11505.00	176.30	131.28	35.41	70.90	2863.45	2917.26	54.21	
4100.00	6829.88	11505.00	176.30	131.28	35.41	70.90	2765.77	2820.36	51.66	
4200.00	6829.88	11505.00	176.30	131.28	35.41	70.90	2668.25	2723.68	49.13	
4300.00	6829.88	11505.00	176.30	131.28	35.41	70.90	2570.77	2627.26	46.51	
4400.00	6829.88	11505.00	176.30	131.28	35.41	70.90	2473.50	2531.11	43.94	

SD Anti-Collision Report

Secondary Well: #7 (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)	SP	Risk
4500.00	6829.88	11505.00	176.30	131.28	35.41	70.90	2376.47	2435.27	41.42	
4600.00	6829.88	11505.00	176.30	131.28	35.41	70.90	2279.70	2339.78	38.95	
4700.00	6829.88	11505.00	176.30	131.28	35.41	70.90	2183.23	2244.68	36.53	
4800.00	6829.88	11505.00	176.30	131.28	35.41	70.90	2087.11	2150.02	34.18	
4900.00	6829.88	11505.00	176.30	131.28	35.41	70.90	1991.39	2055.87	31.88	
5000.00	6829.88	11505.00	176.30	131.28	35.41	70.90	1896.08	1962.31	29.63	
5100.00	6829.88	11505.00	295.27	131.28	35.41	70.90	1800.91	1869.25	27.35	
5200.00	6829.88	11505.00	293.04	131.28	35.41	70.90	1706.08	1776.67	25.17	
5300.00	6829.88	11505.00	290.86	131.28	35.41	70.90	1611.67	1684.65	23.08	
5400.00	6829.88	11505.00	288.75	131.28	35.41	70.90	1517.79	1593.33	21.09	
5500.00	6829.88	11505.00	286.73	131.28	35.41	70.90	1424.59	1502.87	19.20	
5600.00	6829.88	11505.00	284.81	131.28	35.41	70.90	1332.23	1413.47	17.40	
5700.00	6829.88	11505.00	284.81	131.28	35.41	70.90	1240.70	1325.46	15.64	
5800.00	6829.88	11505.00	284.81	131.28	35.41	70.90	1150.50	1239.28	13.96	
5900.00	6829.88	11505.00	284.81	131.28	35.41	70.90	1062.12	1155.32	12.40	
6000.00	6829.88	11505.00	284.81	131.28	35.41	70.90	976.05	1074.11	10.95	
6100.00	6829.88	11505.00	284.81	131.28	35.41	70.90	892.88	996.33	9.63	
6200.00	6829.88	11505.00	284.81	131.28	35.41	70.90	813.46	922.84	8.44	
6300.00	6829.88	11505.00	284.81	131.28	35.41	70.90	738.64	854.74	7.36	
6400.00	6829.88	11505.00	284.81	131.28	35.41	70.90	670.36	793.44	6.45	
6500.00	6829.88	11505.00	284.81	131.28	35.41	70.90	610.88	740.61	5.71	
6600.00	6829.88	11505.00	284.81	131.28	35.41	70.90	562.68	698.18	5.15	
6700.00	6829.88	11505.00	284.81	131.28	35.41	70.90	528.02	668.14	4.77	
6800.00	6829.88	11505.00	284.81	131.28	35.41	70.90	509.74	652.21	4.58	
6900.00	6829.88	11505.00	284.81	131.28	35.41	70.90	509.72	651.41	4.60	
7000.00	6829.88	11505.00	284.81	131.28	35.41	70.90	527.92	665.80	4.83	
7100.00	6829.88	11505.00	284.81	131.28	35.41	70.90	562.26	694.44	5.25	
7200.00	6829.88	11505.00	284.81	131.28	35.41	70.90	610.42	735.66	5.87	
7300.00	6829.88	11505.00	284.81	131.28	35.41	70.90	669.96	787.50	6.70	
7400.00	6829.88	11505.00	284.81	131.28	35.41	70.90	738.20	848.01	7.72	
7500.00	6829.88	11505.00	284.81	131.28	35.41	70.90	812.54	915.46	8.90	
7600.00	6829.88	11505.00	284.81	131.28	35.41	70.90	891.79	988.45	10.23	
7700.00	6829.88	11505.00	283.62	131.28	35.41	70.90	974.89	1065.96	11.71	
7800.00	6829.88	11505.00	282.26	131.28	35.41	70.90	1061.11	1147.19	13.33	
7900.00	6829.88	11505.00	280.73	131.28	35.41	70.90	1149.33	1231.37	15.01	
8000.00	6829.88	11505.00	279.02	131.28	35.41	70.90	1239.24	1317.93	16.75	
8100.00	6829.88	11505.00	277.14	131.28	35.41	70.90	1330.64	1406.40	18.56	
8200.00	6829.88	11505.00	153.84	131.28	35.41	70.90	1423.22	1496.41	20.45	
8300.00	6829.88	11505.00	153.84	131.28	35.41	70.90	1516.73	1587.65	22.39	
8400.00	6829.88	11505.00	153.84	131.28	35.41	70.90	1610.66	1679.89	24.27	
8500.00	6829.88	11505.00	55.78	131.28	35.41	70.90	1705.05	1772.77	26.18	
8600.00	6829.88	11505.00	38.97	131.28	35.41	70.90	1796.50	1862.91	28.05	
8700.00	6829.88	11505.00	29.32	131.28	35.41	70.90	1881.86	1947.12	29.83	
8800.00	6829.88	11505.00	23.56	131.28	35.41	70.90	1958.92	2023.25	31.45	
8900.00	6829.88	11505.00	19.94	131.28	35.41	70.90	2025.91	2089.52	32.85	
9000.00	6833.29	11440.19	17.38	129.50	34.96	69.98	2080.99	2143.52	34.28	
9100.00	6835.45	11388.45	15.91	128.12	34.61	69.25	2120.48	2182.30	35.30	
9200.00	6837.91	11295.37	15.11	125.59	33.96	67.93	2143.78	2204.73	36.17	
9300.00	6840.44	11199.58	14.97	122.97	33.28	66.57	2148.75	2209.05	36.63	
9400.00	6842.66	11109.84	15.02	120.49	32.64	65.30	2147.23	2207.10	36.87	
9500.00	6845.43	11000.33	15.11	117.49	31.87	63.76	2145.94	2205.27	37.17	
9600.00	6847.10	10922.78	15.15	115.40	31.33	62.66	2144.53	2203.63	37.29	
9700.00	6847.75	10845.88	15.17	113.30	30.79	61.58	2144.13	2203.04	37.40	
9800.00	6850.19	10680.05	15.23	108.77	29.61	59.25	2144.24	2202.11	38.05	
9900.00	6856.34	10538.14	15.30	104.91	28.60	57.26	2141.04	2198.17	38.48	
10000.00	6861.49	10441.02	15.34	102.28	27.92	55.91	2136.30	2193.17	38.57	
10100.00	6866.45	10341.03	15.38	99.56	27.23	54.53	2131.76	2188.35	38.67	
10200.00	6872.65	10222.24	15.38	96.34	26.40	52.88	2126.82	2182.96	38.88	

5D Anti-Collision Report

Secondary Well: #7 (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
10300.00	6877.29	10137.56	15.40	94.04	25.82	51.71	2121.41	2177.53	38.80	
10400.00	6879.75	10076.49	15.40	92.38	25.42	50.87	2117.05	2173.42	38.56	
10500.00	6881.62	9989.53	15.37	90.02	24.83	49.68	2114.46	2170.73	38.58	
10600.00	6884.07	9882.39	15.33	87.12	24.09	48.21	2112.04	2167.96	38.77	
10700.00	6892.56	9718.07	15.35	82.69	22.95	45.97	2107.11	2162.22	39.23	
10800.00	6895.85	9652.14	15.35	80.90	22.52	45.08	2101.72	2157.06	38.98	
10900.00	6897.87	9589.39	15.34	79.21	22.11	44.24	2097.91	2153.56	38.70	
11000.00	6900.80	9475.23	15.32	76.13	21.33	42.70	2095.44	2150.75	38.88	
11100.00	6903.79	9374.94	15.30	73.42	20.67	41.36	2092.23	2147.49	38.86	
11200.00	6910.17	9215.16	15.29	69.13	19.58	39.25	2089.13	2143.57	39.37	
11300.00	6917.19	9111.40	15.35	66.35	18.91	37.90	2082.76	2137.16	39.28	
11400.00	6922.70	9022.54	15.39	63.97	18.34	36.76	2076.55	2131.13	39.05	
11500.00	6927.50	8933.12	15.39	61.58	17.77	35.61	2070.93	2125.61	38.87	
11600.00	6930.26	8868.06	15.38	59.84	17.37	34.78	2066.02	2121.05	38.54	
11700.00	6931.53	8803.38	15.34	58.11	16.98	33.96	2063.01	2118.34	38.28	
11800.00	6932.11	8703.59	15.24	55.45	16.35	32.71	2061.46	2116.69	38.33	
11900.00	6934.91	8577.77	15.13	52.16	15.57	31.16	2058.59	2113.37	38.58	
12000.00	6936.97	8484.59	15.08	49.72	15.01	30.04	2055.64	2110.51	38.46	
12100.00	6939.29	8384.59	15.02	47.09	14.42	28.85	2052.84	2107.59	38.49	
12200.00	6940.95	8294.67	14.95	44.74	13.90	27.81	2050.05	2104.92	38.36	
12300.00	6941.61	8228.32	14.89	43.03	13.52	27.05	2047.86	2103.12	38.06	
12400.00	6941.07	8179.81	14.86	41.80	13.26	26.51	2047.73	2103.56	37.67	
12500.00	6938.90	8105.03	14.83	39.89	12.85	25.68	2049.94	2106.08	37.51	
12600.00	6936.10	7957.73	14.83	36.15	12.06	24.12	2052.39	2108.20	37.77	
12700.00	6935.63	7866.65	14.87	33.87	11.60	23.20	2052.97	2109.07	37.60	
12800.00	6935.19	7752.21	14.91	31.07	11.06	22.11	2053.65	2109.88	37.52	
12900.00	6939.51	7568.32	15.06	26.71	10.27	20.54	2052.29	2108.23	37.69	
13000.00	6942.08	7492.93	15.10	25.00	9.98	19.96	2048.66	2105.19	37.24	
13100.00	6943.28	7422.56	15.10	23.46	9.73	19.47	2046.31	2103.45	36.81	
13200.00	6943.55	7328.50	15.04	21.49	9.43	18.86	2044.97	2102.49	36.55	
13300.00	6942.55	7270.84	14.93	20.33	9.28	18.53	2044.46	2102.57	36.18	
13400.00	6940.99	7242.29	14.85	19.79	9.23	18.38	2046.64	2105.54	35.75	
13500.00	6938.30	7211.78	14.76	19.25	9.19	18.23	2052.22	2111.85	35.42	
13600.00	6935.40	7186.86	14.70	18.85	9.17	18.11	2061.18	2121.56	35.14	
13700.00	6931.73	7161.36	14.65	18.43	9.17	18.00	2073.66	2134.75	34.95	
13720.73	6930.88	7156.07	14.64	18.34	9.17	17.97	2076.68	2137.91	34.92	

Secondary Well: Parkway 13 (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	17.00	0.00	96.34	0.00	0.00	0.00	4179.92	4180.57	6431.91	
100.00	112.48	95.48	96.34	0.13	0.13	2.51	4179.52	4180.41	4725.95	
200.00	215.70	198.70	96.35	0.39	0.39	2.63	4178.70	4180.07	3050.33	
300.00	316.46	299.46	96.35	0.65	0.65	2.63	4177.82	4179.68	2247.17	
400.00	405.74	388.74	96.36	0.88	0.88	2.63	4177.11	4179.42	1811.49	
500.00	494.65	477.65	96.37	1.07	1.07	2.64	4176.69	4179.41	1534.10	
600.00	595.49	578.50	96.37	1.28	1.28	2.65	4176.41	4179.56	1324.94	
700.00	684.61	667.62	96.37	1.44	1.44	2.65	4176.22	4179.76	1180.59	
800.00	763.64	746.65	96.37	1.54	1.54	2.66	4176.49	4180.36	1080.30	
900.00	842.97	825.99	96.37	1.63	1.63	2.66	4177.32	4181.51	999.72	
1000.00	932.81	915.84	96.36	1.74	1.74	2.67	4178.48	4183.00	926.56	
1100.00	1030.00	1013.05	96.35	1.89	1.89	2.68	4179.79	4184.68	856.19	
1200.00	1150.66	1133.72	96.34	2.08	2.08	2.69	4180.73	4186.03	788.97	
1300.00	1260.46	1243.54	96.32	2.26	2.26	2.70	4181.44	4187.15	734.12	
1400.00	1365.47	1348.56	96.29	2.44	2.44	2.72	4181.83	4187.94	685.96	
1500.00	1469.67	1452.78	96.27	2.63	2.63	2.73	4182.28	4188.81	642.18	
1600.00	1580.90	1564.02	96.25	2.84	2.84	2.74	4182.39	4189.34	602.05	
1700.00	1704.11	1687.26	96.21	3.07	3.07	2.75	4182.19	4189.60	565.44	
1800.00	1801.89	1785.05	96.19	3.25	3.25	2.77	4181.67	4189.49	535.72	

5D Anti-Collision Report

Secondary Well: Parkway 13 (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pr 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
1900.00	1905.94	1889.13	96.16	3.46	3.46	2.78	4181.17	4189.42	507.79	
2000.00	2004.51	1987.71	96.13	3.66	3.66	2.79	4180.60	4189.28	482.47	
2100.00	2101.74	2084.96	96.11	3.87	3.87	2.80	4180.10	4189.21	459.88	
2200.00	2200.93	2184.16	96.09	4.09	4.09	2.82	4179.63	4189.18	438.63	
2300.00	2294.50	2277.75	96.07	4.31	4.31	2.83	4179.23	4189.22	419.12	
2400.00	2385.46	2368.72	96.05	4.53	4.52	2.84	4179.02	4189.46	401.37	
2500.00	2478.44	2461.70	96.04	4.75	4.75	2.86	4179.01	4189.90	384.76	
2600.00	2578.68	2561.95	96.03	5.00	5.00	2.87	4179.08	4190.44	368.84	
2700.00	2674.23	2657.50	96.02	5.24	5.24	2.89	4179.14	4190.96	354.59	
2800.00	2770.07	2753.34	96.01	5.48	5.47	2.90	4179.38	4191.66	341.53	
2900.00	2869.43	2852.70	96.01	5.72	5.72	2.92	4179.64	4192.37	329.21	
3000.00	2970.33	2953.62	96.00	5.97	5.97	2.94	4179.89	4193.10	317.28	
3100.00	3071.84	3055.12	95.99	6.23	6.22	2.96	4180.08	4193.78	306.12	
3200.00	3180.81	3164.10	95.98	6.50	6.50	2.98	4180.19	4194.40	295.33	
3300.00	3289.38	3272.67	95.97	6.78	6.77	3.00	4180.02	4194.72	285.34	
3400.00	3390.99	3374.28	95.96	7.03	7.03	3.02	4179.77	4194.95	276.36	
3500.00	3494.81	3478.11	95.95	7.29	7.29	3.05	4179.47	4195.13	267.92	
3600.00	3591.83	3575.14	95.93	7.53	7.53	3.07	4179.15	4195.27	260.31	
3700.00	3690.80	3674.12	95.91	7.78	7.78	3.09	4178.91	4195.49	253.04	
3800.00	3783.20	3766.52	95.90	8.01	8.01	3.12	4178.73	4195.77	246.24	
3900.00	3882.13	3865.47	95.87	8.26	8.26	3.15	4178.71	4196.23	239.53	
4000.00	3978.57	3961.92	95.85	8.51	8.51	3.18	4178.67	4196.66	233.25	
4100.00	4077.57	4060.94	95.83	8.77	8.76	3.21	4178.74	4197.22	227.21	
4200.00	4177.92	4161.30	95.81	9.02	9.02	3.24	4178.78	4197.73	221.43	
4300.00	4269.98	4253.38	95.79	9.26	9.26	3.28	4178.90	4198.32	216.19	
4400.00	4360.63	4344.04	95.77	9.50	9.49	3.31	4179.29	4199.17	211.26	
4500.00	4457.50	4440.93	95.75	9.75	9.74	3.35	4179.82	4200.16	206.41	
4600.00	4561.30	4544.75	95.72	10.02	10.02	3.39	4180.31	4201.15	201.60	
4700.00	4666.36	4649.82	95.70	10.30	10.29	3.44	4180.66	4201.99	196.96	
4800.00	4778.85	4762.34	95.67	10.59	10.58	3.49	4180.85	4202.70	192.33	
4900.00	4917.09	4900.60	95.63	10.93	10.93	3.56	4180.38	4202.81	187.37	
5000.00	4991.36	4974.89	95.61	11.12	11.11	3.60	4179.86	4202.71	183.98	
5100.00	5073.72	5057.26	216.84	11.33	11.32	3.65	4180.56	4203.85	180.51	
5200.00	5154.97	5138.53	216.82	11.54	11.53	3.70	4183.09	4206.77	177.69	
5300.00	5228.14	5211.73	216.80	11.73	11.72	3.74	4187.60	4211.62	175.38	
5400.00	5289.01	5272.63	216.80	11.88	11.87	3.78	4194.29	4218.67	173.08	
5500.00	5384.44	5368.12	216.76	12.12	12.11	3.84	4203.06	4227.81	170.81	
5600.00	5489.50	5473.24	216.71	12.39	12.38	3.91	4212.84	4238.09	167.87	
5700.00	5589.54	5573.33	216.60	12.64	12.63	3.98	4223.35	4249.06	165.25	
5800.00	5728.93	5712.80	216.43	13.01	12.99	4.09	4233.47	4259.73	162.23	
5900.00	5962.68	5946.63	216.16	13.55	13.54	4.28	4240.98	4267.93	158.34	
6000.00	6125.19	6109.24	215.97	13.84	13.84	4.42	4246.63	4274.08	155.67	
6100.00	6213.16	6197.28	215.87	13.99	13.98	4.50	4251.86	4279.70	153.72	
6200.00	6326.21	6310.40	215.74	14.17	14.16	4.60	4257.06	4285.29	151.63	
6300.00	6421.53	6405.77	215.65	14.31	14.30	4.70	4262.24	4290.80	150.29	
6400.00	6514.83	6499.12	215.55	14.44	14.43	4.79	4267.57	4296.44	148.85	
6500.00	6626.52	6610.87	215.44	14.60	14.59	4.91	4272.75	4302.02	146.99	
6600.00	6734.82	6719.23	215.34	14.75	14.74	5.02	4277.75	4307.39	145.32	
6700.00	6855.15	6839.64	215.22	14.91	14.90	5.16	4282.47	4312.46	143.81	
6800.00	6962.38	6946.96	215.13	15.04	15.03	5.28	4286.75	4317.04	142.50	
6900.00	7057.87	7042.52	215.05	15.15	15.14	5.39	4291.11	4321.78	140.95	
7000.00	7154.27	7138.99	214.96	15.27	15.27	5.51	4295.47	4326.48	139.53	
7100.00	7237.33	7222.10	214.89	15.38	15.37	5.61	4300.17	4331.49	138.30	
7200.00	7321.19	7306.01	214.82	15.49	15.48	5.72	4305.27	4336.89	137.18	
7300.00	7413.93	7398.79	214.75	15.60	15.59	5.84	4310.60	4342.55	135.95	
7400.00	7527.34	7512.26	214.65	15.75	15.75	5.99	4315.78	4348.12	134.44	
7500.00	7627.93	7612.89	214.57	15.90	15.90	6.13	4320.83	4353.55	133.06	
7600.00	7727.14	7712.16	214.48	16.05	16.05	6.27	4325.89	4358.97	131.77	

5D Anti-Collision Report

Secondary Well: Parkway 13 (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)									
Pr 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)	CF (US ft)	SF
7700.00	7821.28	7806.35	214.38	16.21	16.20	6.41	4330.32	4363.74	130.54
7800.00	7897.90	7883.00	214.30	16.34	16.33	6.52	4333.68	4367.43	129.41
7900.00	8008.84	7993.98	214.23	16.52	16.51	6.68	4335.73	4369.90	127.89
8000.00	8109.79	8094.97	214.18	16.68	16.68	6.84	4336.14	4370.70	126.45
8100.00	8209.72	8194.95	214.16	16.84	16.84	6.99	4335.11	4370.05	125.07
8200.00	8309.65	8294.92	92.91	17.01	17.00	7.15	4332.66	4367.96	123.71
8300.00	8409.57	8394.88	92.90	17.18	17.17	7.31	4329.48	4365.15	122.37
8400.00	8509.49	8494.84	92.89	17.35	17.34	7.48	4326.31	4362.34	121.07
8500.00	8609.35	8594.74	2.79	17.52	17.51	7.65	4322.03	4358.44	119.71
8600.00	8707.39	8692.82	2.90	17.69	17.68	7.82	4302.94	4339.72	118.01
8700.00	8800.05	8785.52	3.15	17.86	17.85	7.98	4265.55	4302.65	115.99
8800.00	8883.94	8869.44	3.60	18.01	18.00	8.13	4211.20	4248.59	113.63
8900.00	8955.97	8941.50	4.40	18.14	18.13	8.26	4141.87	4179.54	110.96
9000.00	9013.49	8999.05	5.88	18.24	18.23	8.36	4060.14	4098.03	108.15
9100.00	9054.40	9039.97	9.24	18.32	18.31	8.44	3969.07	4007.06	105.45
9200.00	9077.18	9062.77	21.78	18.36	18.35	8.48	3871.89	3909.98	102.65
9300.00	9081.24	9066.82	117.23	18.37	18.36	8.49	3772.24	3810.34	99.99
9400.00	9078.46	9064.04	116.62	18.36	18.35	8.48	3672.43	3710.54	97.38
9500.00	9075.68	9061.26	116.01	18.36	18.35	8.48	3572.64	3610.74	94.77
9600.00	9072.90	9058.48	115.38	18.35	18.34	8.47	3472.85	3510.95	92.16
9700.00	9070.12	9055.70	114.75	18.35	18.34	8.47	3373.08	3411.17	89.55
9800.00	9067.34	9052.92	114.12	18.34	18.33	8.46	3273.32	3311.40	86.94
9900.00	9064.56	9050.13	113.48	18.34	18.33	8.46	3173.57	3211.65	84.34
10000.00	9061.78	9047.35	112.83	18.33	18.32	8.45	3073.84	3111.90	81.76
10100.00	9059.00	9044.57	112.18	18.33	18.32	8.45	2974.13	3012.18	79.17
10200.00	9056.21	9041.79	111.52	18.32	18.31	8.44	2874.38	2912.46	76.47
10300.00	9053.43	9039.01	110.85	18.32	18.31	8.43	2774.62	2812.77	73.73
10400.00	9050.65	9036.23	110.18	18.31	18.30	8.43	2674.89	2713.10	71.01
10500.00	9047.87	9033.44	109.50	18.31	18.30	8.42	2575.23	2613.44	68.40
10600.00	9045.09	9030.66	108.82	18.30	18.29	8.42	2475.47	2513.82	65.56
10700.00	9042.31	9027.88	108.13	18.30	18.29	8.41	2375.81	2414.21	62.87
10800.00	9039.53	9025.10	107.44	18.29	18.28	8.41	2276.20	2314.65	60.21
10900.00	9036.75	9022.32	106.74	18.29	18.28	8.40	2176.58	2215.11	57.49
11000.00	9033.97	9019.53	106.03	18.28	18.27	8.40	2076.94	2115.62	54.69
11100.00	9031.19	9016.75	105.32	18.28	18.27	8.39	1977.33	2016.17	51.92
11200.00	9028.41	9013.97	104.61	18.27	18.26	8.39	1877.76	1916.78	49.13
11300.00	9025.63	9011.19	103.89	18.27	18.26	8.38	1778.21	1817.44	46.33
11400.00	9022.85	9008.41	103.17	18.26	18.25	8.38	1678.70	1718.18	43.51
11500.00	9020.07	9005.63	102.44	18.26	18.25	8.37	1579.18	1619.01	40.65
11600.00	9017.29	9002.84	101.71	18.25	18.24	8.37	1479.69	1519.94	37.76
11700.00	9014.51	9000.06	100.98	18.25	18.23	8.36	1380.25	1421.00	34.87
11800.00	9011.72	8997.28	100.24	18.24	18.23	8.36	1280.87	1322.21	31.99
11900.00	9008.94	8994.50	99.50	18.24	18.22	8.35	1181.44	1223.60	29.02
12000.00	9006.16	8991.72	98.75	18.23	18.22	8.35	1082.03	1125.24	26.04
12100.00	9003.38	8988.94	98.01	18.23	18.21	8.34	982.74	1027.19	23.11
12200.00	9000.60	8986.15	97.26	18.22	18.21	8.34	883.39	929.55	20.14
12300.00	8997.82	8983.37	96.50	18.21	18.20	8.33	784.02	832.45	17.19
12400.00	8995.04	8980.59	95.75	18.21	18.20	8.33	684.84	736.12	14.36
12500.00	8992.26	8977.81	94.99	18.20	18.19	8.32	585.43	640.91	11.55
12600.00	8989.48	8975.03	94.24	18.20	18.19	8.32	486.38	547.39	8.97
12700.00	8986.70	8972.24	93.48	18.19	18.18	8.31	387.41	456.60	6.60
12800.00	8983.92	8969.46	92.72	18.19	18.18	8.31	289.60	370.58	4.58
12900.00	8981.14	8966.68	91.96	18.18	18.17	8.30	195.00	293.52	2.98
13000.00	8978.36	8963.90	91.19	18.18	18.17	8.30	114.23	234.44	1.95
13100.00	8975.58	8961.12	90.43	18.17	18.16	8.29	73.36	209.18	1.54
13200.00	8972.80	8958.34	89.67	18.17	18.16	8.29	100.42	229.20	1.78
13300.00	8970.02	8955.55	88.91	18.16	18.15	8.28	174.44	285.13	2.58
13400.00	8967.24	8952.77	88.15	18.16	18.15	8.28	266.23	360.62	3.82

5D Anti-Collision Report

Secondary Well: Parkway 13 (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pr 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)	SP	Risk
13500.00	8964.45	8949.99	87.39	18.15	18.14	8.27	363.35	445.84	5.40	
13600.00	8961.67	8947.21	86.63	18.15	18.14	8.27	461.91	536.18	7.22	
13700.00	8958.89	8944.43	85.87	18.14	18.13	8.26	561.17	629.44	9.22	
13720.73	8958.32	8943.85	85.71	18.14	18.13	8.26	581.80	649.02	9.65	

Secondary Well: Emerald PWU 20 #3H (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pr 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)	SP	Risk
0.00	13.00	0.00	170.91	0.00	0.00	0.00	292.80	293.37	517.73	
100.00	103.88	90.89	170.88	0.13	0.12	2.63	291.69	292.49	363.67	
200.00	205.72	192.73	170.81	0.39	0.39	2.63	289.59	290.89	224.46	
300.00	308.26	295.31	170.67	0.67	0.67	2.63	286.62	288.41	160.95	
400.00	408.68	395.79	170.43	0.93	0.93	2.63	283.09	285.37	125.10	
500.00	507.65	494.80	170.16	1.20	1.19	2.64	279.70	282.46	102.08	
600.00	606.45	593.65	169.84	1.46	1.45	2.65	276.71	279.96	86.14	
700.00	704.91	692.15	169.41	1.70	1.70	2.65	274.19	277.91	74.65	
800.00	804.45	791.75	168.83	1.95	1.94	2.66	272.08	276.27	65.93	
900.00	903.93	891.28	168.22	2.19	2.19	2.67	270.08	274.74	58.94	
1000.00	1004.01	991.41	167.62	2.45	2.44	2.68	268.17	273.31	53.21	
1100.00	1103.41	1090.86	167.10	2.70	2.69	2.69	266.33	271.94	48.50	
1200.00	1203.08	1190.55	166.68	2.96	2.95	2.70	264.65	270.74	44.45	
1300.00	1302.30	1289.79	166.35	3.22	3.21	2.71	263.18	269.76	41.02	
1400.00	1402.36	1389.86	166.07	3.48	3.47	2.73	261.81	268.87	38.06	
1500.00	1501.46	1488.97	165.85	3.74	3.73	2.74	260.61	268.16	35.53	
1600.00	1600.85	1588.36	165.64	3.99	3.98	2.75	259.75	267.77	33.36	
1700.00	1701.22	1688.74	165.44	4.25	4.24	2.76	258.85	267.36	31.42	
1800.00	1801.28	1788.80	165.25	4.51	4.50	2.77	257.92	266.91	29.68	
1900.00	1901.33	1888.86	165.07	4.78	4.77	2.79	256.90	266.38	28.10	
2000.00	2000.99	1988.53	164.89	5.04	5.03	2.80	256.01	265.98	26.69	
2100.00	2101.29	2088.83	164.71	5.30	5.29	2.81	255.12	265.57	25.41	
2200.00	2201.41	2188.95	164.56	5.57	5.56	2.83	254.07	265.02	24.22	
2300.00	2301.34	2288.88	164.42	5.83	5.82	2.84	253.09	264.52	23.14	
2400.00	2401.69	2389.24	164.26	6.10	6.09	2.85	252.04	263.96	22.14	
2500.00	2501.20	2488.75	164.09	6.36	6.35	2.87	250.95	263.35	21.23	
2600.00	2600.87	2588.42	163.92	6.62	6.61	2.88	250.11	263.00	20.40	
2700.00	2700.84	2688.40	163.76	6.88	6.87	2.90	249.30	262.68	19.64	
2800.00	2800.77	2788.33	163.60	7.14	7.13	2.92	248.51	262.37	18.93	
2900.00	2900.86	2888.42	163.44	7.41	7.40	2.93	247.72	262.06	18.27	
3000.00	3000.97	2988.54	163.27	7.67	7.66	2.95	246.88	261.71	17.65	
3100.00	3101.04	3088.61	163.10	7.94	7.92	2.97	246.01	261.33	17.06	
3200.00	3200.58	3188.16	162.94	8.20	8.19	2.99	245.23	261.02	16.52	
3300.00	3300.49	3288.07	162.76	8.45	8.44	3.01	244.53	260.82	16.02	
3400.00	3400.35	3387.93	162.61	8.71	8.70	3.03	243.88	260.65	15.54	
3500.00	3500.00	3487.58	162.54	8.94	8.93	3.05	243.37	260.59	15.13	
3600.00	3599.94	3587.52	162.56	9.02	9.01	3.08	243.08	260.62	14.86	
3700.00	3700.14	3687.73	162.62	9.02	9.01	3.10	242.85	260.60	14.68	
3800.00	3801.21	3788.80	162.71	9.07	9.06	3.13	242.43	260.45	14.45	
3900.00	3903.96	3891.55	162.69	9.21	9.20	3.16	241.06	259.45	14.11	
4000.00	4005.77	3993.38	162.52	9.40	9.39	3.19	238.67	257.49	13.68	
4100.00	4106.17	4093.82	162.33	9.64	9.63	3.22	235.83	255.12	13.23	
4200.00	4206.38	4194.05	162.29	9.85	9.84	3.26	232.93	252.66	12.81	
4300.00	4306.91	4294.62	162.40	10.05	10.04	3.30	229.90	250.03	12.42	
4400.00	4407.23	4394.99	162.65	10.22	10.21	3.34	226.64	247.17	12.04	
4500.00	4507.21	4495.02	163.01	10.38	10.38	3.38	223.29	244.22	11.67	
4600.00	4607.14	4595.01	163.39	10.55	10.54	3.42	219.98	241.27	11.34	
4700.00	4706.74	4694.67	163.76	10.72	10.71	3.47	216.67	238.36	10.99	
4800.00	4807.69	4795.68	164.21	10.89	10.88	3.52	213.26	235.34	10.66	
4900.00	4907.65	4895.71	164.64	11.07	11.06	3.57	209.60	232.05	10.34	
5000.00	5007.00	4995.12	165.00	11.26	11.25	3.62	205.98	228.87	10.00	

SD Anti-Collision Report

Secondary Well: Emerald PWU 20 #3H (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)	JS (US ft)	CT (US ft)	SF	Risk
5100.00	5106.19	5094.36	286.37	11.45	11.44	3.68	202.40	225.72	9.68	
5200.00	5205.24	5193.45	286.08	11.64	11.62	3.74	198.72	222.40	9.39	
5300.00	5303.71	5291.95	285.33	11.81	11.80	3.80	195.22	219.22	9.13	
5400.00	5403.70	5391.97	284.07	11.99	11.98	3.87	191.49	215.87	8.85	
5500.00	5503.56	5491.86	282.32	12.18	12.16	3.93	187.33	212.10	8.56	
5600.00	5603.13	5591.45	280.13	12.35	12.34	4.00	183.15	208.29	8.29	
5700.00	5703.50	5691.87	277.78	12.52	12.51	4.08	178.87	204.36	8.01	
5800.00	5803.53	5791.97	275.48	12.68	12.67	4.16	174.55	200.41	7.75	
5900.00	5902.74	5891.24	273.13	12.85	12.84	4.24	170.49	196.72	7.50	
6000.00	6001.20	5989.75	270.69	13.02	13.00	4.32	167.15	193.78	7.28	
6100.00	6099.42	6088.01	268.18	13.17	13.15	4.40	164.86	191.86	7.11	
6200.00	6197.54	6186.16	265.65	13.30	13.28	4.49	163.71	191.05	6.99	
6300.00	6296.05	6284.69	263.15	13.39	13.37	4.58	163.71	191.36	6.92	
6400.00	6394.61	6383.27	260.72	13.47	13.45	4.68	164.61	192.53	6.89	
6500.00	6493.01	6481.70	258.40	13.53	13.50	4.78	166.43	194.66	6.90	
6600.00	6592.19	6580.91	256.19	13.58	13.56	4.88	169.07	197.59	6.93	
6700.00	6691.12	6679.89	254.20	13.63	13.60	4.98	172.21	201.00	6.98	
6800.00	6790.31	6779.17	252.50	13.69	13.66	5.09	175.90	204.97	7.05	
6900.00	6890.21	6879.16	250.88	13.75	13.72	5.20	179.83	209.16	7.13	
7000.00	6989.07	6978.11	249.40	13.81	13.78	5.32	184.02	213.60	7.22	
7100.00	7091.32	7080.48	248.06	13.88	13.87	5.44	187.91	217.81	7.29	
7200.00	7191.35	7180.66	246.94	13.97	13.94	5.56	191.09	221.32	7.32	
7300.00	7285.65	7275.14	246.07	14.06	14.04	5.68	195.07	225.62	7.39	
7400.00	7366.03	7355.71	243.73	14.16	14.05	5.78	204.80	235.52	7.67	
7500.00	7440.27	7431.09	240.28	14.27	13.91	5.87	223.85	254.55	8.29	
7600.00	7498.46	7491.69	237.27	14.36	13.54	5.92	254.70	284.81	9.46	
7700.00	7544.04	7541.38	234.62	14.43	12.90	5.94	298.49	327.64	11.24	
7800.00	7589.93	7594.29	231.99	14.51	12.36	5.97	351.52	379.90	13.39	
7900.00	7626.48	7638.69	229.88	14.57	11.74	6.00	411.33	438.74	16.01	
8000.00	7653.48	7673.80	228.18	14.63	11.04	6.02	477.50	503.90	19.09	
8100.00	7678.33	7708.38	226.59	14.69	10.45	6.05	548.44	573.96	22.49	
8200.00	7704.72	7747.58	103.78	14.77	10.03	6.09	622.58	647.53	25.95	
8300.00	7783.10	7861.32	101.51	15.00	10.81	14.81	692.17	718.58	27.21	
8400.00	7799.55	7885.40	101.08	15.02	10.17	15.26	765.25	790.80	30.96	
8500.00	7812.07	7904.94	9.88	15.04	9.63	15.28	841.32	866.21	34.81	
8600.00	7823.60	7924.30	8.03	15.07	9.08	15.29	911.25	935.31	38.88	
8700.00	7834.15	7943.63	6.85	15.12	8.52	15.30	971.30	994.56	42.75	
8800.00	7843.53	7962.76	6.06	15.18	7.98	15.31	1020.83	1043.26	46.51	
8900.00	7850.93	7980.06	5.54	15.25	7.50	15.31	1059.28	1081.00	49.78	
9000.00	7857.40	7997.97	5.20	15.33	7.15	15.31	1086.29	1107.42	52.42	
9100.00	7862.86	8016.58	5.00	15.44	6.95	15.32	1101.39	1122.17	53.99	
9200.00	7867.05	8035.37	4.93	15.56	6.94	15.35	1104.39	1125.06	54.41	
9300.00	7869.98	8054.79	4.95	15.70	7.10	15.39	1095.42	1116.29	53.50	
9400.00	7872.57	8085.89	4.87	15.97	7.40	15.46	1086.02	1107.36	51.89	
9500.00	7878.21	8190.79	4.54	17.17	7.57	15.82	1079.71	1101.46	50.64	
9600.00	7882.94	8279.65	4.25	18.45	7.83	16.23	1073.34	1095.63	49.17	
9700.00	7887.05	8370.61	4.01	19.99	8.13	16.74	1067.83	1090.73	47.63	
9800.00	7891.42	8469.64	3.79	21.87	8.47	17.40	1062.42	1086.01	46.04	
9900.00	7892.76	8530.11	3.69	23.10	8.88	17.85	1059.13	1083.52	44.42	
10000.00	7892.05	8593.01	3.59	24.45	9.34	18.35	1059.18	1084.46	42.89	
10100.00	7889.22	8655.94	3.51	25.81	9.80	18.86	1062.58	1088.82	41.49	
10200.00	7883.86	8726.38	3.42	27.40	10.27	19.48	1069.04	1096.27	40.26	
10300.00	7874.72	8910.57	3.30	31.74	10.68	21.24	1073.16	1101.17	39.32	
10400.00	7874.04	9015.02	3.25	34.29	11.20	22.33	1072.71	1101.76	37.93	
10500.00	7874.49	9128.90	3.18	37.13	11.77	23.58	1071.14	1101.22	36.60	
10600.00	7875.57	9236.38	3.09	39.85	12.35	24.81	1068.94	1100.13	35.27	
10700.00	7875.90	9319.67	3.02	41.98	12.91	25.79	1067.36	1099.62	34.08	
10800.00	7876.04	9426.56	2.89	44.73	13.52	27.07	1065.95	1099.37	32.89	

5D Anti-Collision Report

Secondary Well: Emerald PWU 20 #3H (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pr 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
10900.00	7875.52	9506.79	2.80	46.81	14.08	28.05	1065.34	1099.90	31.83	
11000.00	7873.67	9592.47	2.72	49.05	14.66	29.11	1066.25	1101.98	30.84	
11100.00	7870.73	9678.20	2.66	51.29	15.25	30.18	1068.40	1105.35	29.92	
11200.00	7866.61	9802.96	2.59	54.58	15.95	31.77	1070.49	1108.70	29.02	
11300.00	7866.34	9928.44	2.45	57.90	16.68	33.40	1069.25	1108.69	28.11	
11400.00	7866.39	10019.52	2.33	60.32	17.31	34.59	1067.89	1108.53	27.27	
11500.00	7865.61	10110.87	2.21	62.75	17.94	35.80	1067.32	1109.28	26.43	
11600.00	7864.33	10202.77	2.09	65.21	18.57	37.02	1067.45	1110.60	25.74	
11700.00	7861.91	10302.97	2.03	67.88	19.24	38.37	1068.51	1112.96	25.03	
11800.00	7861.78	10432.63	1.94	71.36	20.03	40.12	1067.11	1112.90	24.31	
11900.00	7862.62	10530.31	1.87	73.99	20.70	41.45	1064.94	1112.00	23.63	
12000.00	7862.90	10622.85	1.79	76.48	21.36	42.71	1063.31	1111.65	23.00	
12100.00	7862.63	10718.01	1.73	79.05	22.02	44.02	1062.31	1111.89	22.43	
12200.00	7862.24	10820.82	1.70	81.82	22.72	45.44	1061.40	1112.25	21.87	
12300.00	7862.81	10935.11	1.59	84.92	23.48	47.02	1059.46	1111.69	21.28	
12400.00	7863.72	11033.38	1.45	87.58	24.17	48.39	1057.16	1110.69	20.75	
12500.00	7864.55	11131.61	1.31	90.23	24.86	49.76	1054.89	1109.77	20.22	
12600.00	7865.04	11229.18	1.21	92.88	25.55	51.13	1052.96	1109.22	19.72	
12700.00	7865.84	11333.01	1.12	95.69	26.27	52.58	1050.79	1108.42	19.23	
12800.00	7866.58	11428.63	1.04	98.29	26.95	53.93	1048.62	1107.61	18.78	
12900.00	7866.61	11518.64	0.91	100.73	27.61	55.19	1047.20	1107.54	18.36	
13000.00	7865.78	11611.23	0.74	103.23	28.28	56.50	1046.70	1108.37	17.97	
13100.00	7864.59	11708.27	0.53	105.86	28.97	57.87	1046.53	1109.56	17.60	
13200.00	7863.09	11802.31	0.34	108.43	29.64	59.20	1046.71	1111.13	17.25	
13300.00	7861.00	11897.20	0.21	111.01	30.32	60.55	1047.49	1113.32	16.91	
13400.00	7858.62	12004.06	0.08	113.92	31.07	62.06	1048.30	1115.54	16.59	
13500.00	7857.23	12112.85	359.98	116.88	31.83	63.61	1048.15	1116.82	16.26	
13600.00	7856.29	12211.88	359.92	119.57	32.53	65.02	1047.69	1117.77	15.95	
13700.00	7855.34	12303.00	359.89	122.06	33.18	66.32	1047.38	1118.85	15.65	
13720.73	7855.34	12303.00	359.89	122.06	33.18	66.32	1047.72	1119.42	15.61	

Secondary Well: Emerald PWU 20 10H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pr 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	0.59	8.59	359.73	0.01	0.01	0.43	452.12	452.70	785.65	
100.00	106.44	114.45	359.73	0.16	0.15	4.60	450.95	451.79	541.09	
200.00	206.60	214.62	359.70	0.37	0.37	4.62	449.06	450.33	354.86	
300.00	306.13	314.15	359.65	0.58	0.58	4.66	447.18	448.89	263.33	
400.00	405.27	413.31	359.62	0.78	0.78	4.70	445.51	447.64	210.34	
500.00	505.13	513.18	359.61	0.99	0.98	4.76	443.93	446.49	174.67	
600.00	604.30	612.35	359.61	1.19	1.19	4.82	442.40	445.38	149.08	
700.00	704.46	712.51	359.62	1.40	1.40	4.90	441.06	444.47	130.03	
800.00	804.83	812.89	359.68	1.61	1.61	4.98	439.55	443.40	115.03	
900.00	904.13	912.20	359.77	1.82	1.82	5.07	438.08	442.37	103.14	
1000.00	1003.96	1012.03	359.85	2.03	2.03	5.17	436.75	441.47	93.59	
1100.00	1104.25	1112.32	359.92	2.24	2.23	5.28	435.39	440.54	85.48	
1200.00	1203.73	1211.81	359.95	2.45	2.44	5.39	434.04	439.63	78.66	
1300.00	1302.81	1310.89	359.95	2.66	2.66	5.51	432.87	438.90	72.85	
1400.00	1403.36	1411.45	359.93	2.88	2.87	5.64	431.79	438.25	67.91	
1500.00	1506.36	1514.46	359.89	3.10	3.09	5.77	430.24	437.15	63.31	
1600.00	1608.81	1616.92	359.86	3.31	3.30	5.91	428.01	435.35	59.27	
1700.00	1709.66	1717.79	359.86	3.53	3.51	6.05	425.42	433.20	55.67	
1800.00	1809.37	1817.53	359.82	3.74	3.73	6.20	422.75	430.97	52.43	
1900.00	1908.25	1916.44	359.76	3.95	3.94	6.34	420.25	428.90	49.55	
2000.00	2007.40	2015.60	359.67	4.17	4.15	6.49	418.00	427.09	46.99	
2100.00	2106.73	2114.94	359.57	4.38	4.36	6.65	415.91	425.43	44.69	
2200.00	2206.48	2214.72	359.46	4.59	4.57	6.81	413.94	423.89	42.61	
2300.00	2305.96	2314.21	359.35	4.80	4.78	6.97	412.02	422.41	40.66	
2400.00	2405.48	2413.74	359.24	5.01	4.99	7.13	410.23	421.06	38.89	

SD Anti-Collision Report

Secondary Well: Emerald PWU 20 10M (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	I.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	ST	Risk
2500.00	2505.37	2513.64	359.13	5.23	5.20	7.30	408.50	419.76	37.25	
2600.00	2605.04	2613.32	359.03	5.43	5.41	7.47	406.83	418.53	35.77	
2700.00	2705.02	2713.31	358.96	5.64	5.61	7.64	405.19	417.32	34.40	
2800.00	2804.95	2813.25	358.89	5.85	5.82	7.81	403.57	416.14	33.12	
2900.00	2904.86	2913.16	358.83	6.06	6.03	7.99	401.93	414.92	31.93	
3000.00	3004.73	3013.05	358.68	6.27	6.24	8.17	400.39	413.81	30.82	
3100.00	3105.22	3113.55	358.58	6.48	6.45	8.36	398.74	412.59	29.78	
3200.00	3201.54	3209.87	358.52	6.68	6.65	8.53	397.31	411.58	28.83	
3300.00	3300.00	3308.34	358.52	6.89	6.85	8.72	396.83	411.54	27.98	
3400.00	3400.00	3408.34	358.52	7.10	7.07	8.91	396.39	411.54	27.18	
3500.00	3500.00	3508.34	358.52	7.31	7.28	9.11	395.96	411.54	26.41	
3600.00	3600.00	3608.34	358.52	7.53	7.50	9.30	395.52	411.54	25.69	
3700.00	3700.00	3708.34	358.52	7.74	7.71	9.50	395.08	411.54	25.00	
3800.00	3800.00	3808.34	358.52	7.96	7.93	9.70	394.64	411.54	24.35	
3900.00	3900.00	3908.34	358.52	8.17	8.15	9.91	394.20	411.54	23.74	
4000.00	4000.00	4008.34	358.52	8.39	8.36	10.12	393.76	411.54	23.15	
4100.00	4100.00	4108.34	358.52	8.61	8.58	10.33	393.32	411.54	22.59	
4200.00	4200.00	4208.34	358.52	8.82	8.80	10.54	392.88	411.54	22.06	
4300.00	4300.00	4308.34	358.52	9.04	9.02	10.76	392.44	411.54	21.55	
4400.00	4400.00	4408.34	358.52	9.26	9.24	10.98	392.00	411.54	21.06	
4500.00	4499.65	4507.98	358.52	9.48	9.45	11.21	391.56	411.54	20.59	
4600.00	4595.24	4603.58	358.42	9.68	9.66	11.42	391.73	412.16	20.17	
4700.00	4690.75	4699.13	358.15	9.89	9.87	11.64	392.98	413.85	19.83	
4800.00	4786.09	4794.56	357.72	10.09	10.07	11.86	395.35	416.64	19.57	
4900.00	4881.19	4889.82	357.13	10.28	10.28	12.09	398.83	420.54	19.37	
5000.00	4975.96	4984.88	356.39	10.49	10.48	12.32	403.48	425.60	19.24	
5100.00	5070.37	5079.69	116.81	10.70	10.67	12.55	409.73	432.24	19.19	
5200.00	5168.29	5178.14	116.05	10.92	10.88	12.79	417.59	440.53	19.21	
5300.00	5267.26	5277.66	115.50	11.14	11.09	13.04	426.33	449.64	19.29	
5400.00	5366.20	5377.15	115.16	11.37	11.31	13.29	435.81	459.53	19.37	
5500.00	5465.09	5476.58	115.02	11.61	11.53	13.55	445.98	470.16	19.45	
5600.00	5563.89	5575.92	115.05	11.84	11.74	13.81	456.95	481.52	19.59	
5700.00	5662.63	5675.21	115.28	12.08	11.96	14.08	468.24	493.26	19.72	
5800.00	5761.38	5774.50	115.50	12.31	12.18	14.35	479.54	505.00	19.84	
5900.00	5860.13	5873.79	115.71	12.56	12.40	14.62	490.88	516.75	19.97	
6000.00	5958.87	5973.08	115.91	12.80	12.62	14.90	502.17	528.51	20.07	
6100.00	6057.62	6072.37	116.10	13.04	12.84	15.19	513.48	540.27	20.17	
6200.00	6156.36	6171.66	116.28	13.29	13.06	15.48	524.81	552.04	20.27	
6300.00	6255.11	6270.95	116.46	13.53	13.28	15.77	536.14	563.82	20.37	
6400.00	6353.86	6370.24	116.63	13.78	13.50	16.07	547.46	575.60	20.46	
6500.00	6452.60	6469.53	116.79	14.03	13.73	16.37	558.77	587.38	20.53	
6600.00	6551.35	6568.82	116.94	14.29	13.95	16.68	570.09	599.17	20.61	
6700.00	6650.09	6668.11	117.09	14.54	14.17	16.99	581.41	610.96	20.68	
6800.00	6748.84	6767.40	117.23	14.80	14.40	17.30	592.74	622.76	20.75	
6900.00	6847.59	6866.69	117.37	15.05	14.62	17.62	604.07	634.56	20.81	
7000.00	6946.33	6965.98	117.50	15.31	14.84	17.95	615.40	646.36	20.87	
7100.00	7045.08	7065.27	117.63	15.57	15.07	18.28	626.73	658.17	20.93	
7200.00	7143.82	7164.56	117.76	15.83	15.30	18.62	638.06	669.98	20.99	
7300.00	7242.99	7269.26	117.91	16.09	15.53	18.98	649.13	681.54	21.03	
7400.00	7355.54	7377.19	118.18	16.32	15.75	19.36	659.07	691.95	21.04	
7500.00	7463.39	7485.26	118.56	16.55	15.97	19.74	667.79	701.16	21.02	
7600.00	7571.42	7593.41	119.07	16.76	16.18	20.13	675.34	709.18	20.96	
7700.00	7679.61	7701.64	119.67	16.98	16.39	20.53	681.32	715.61	20.87	
7800.00	7787.18	7809.21	120.24	17.14	16.55	20.93	685.35	720.04	20.76	
7900.00	7886.99	7909.02	120.69	17.34	16.76	21.30	688.03	723.14	20.60	
8000.00	7986.89	8008.92	121.00	17.55	16.97	21.69	689.85	725.38	20.42	
8100.00	8086.86	8108.89	121.19	17.76	17.19	22.07	690.78	726.73	20.22	
8200.00	8186.85	8208.88	0.00	17.97	17.41	22.47	690.82	727.18	20.00	

5D Anti-Collision Report

Secondary Well: Emerald PWU 20 10H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pr ID (US ft)	TVD (US ft)	Sec ID (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	EC (US ft)	CC (US ft)	SI	Risk
8300.00	8286.85	8308.88	0.00	18.19	17.62	22.87	690.40	727.18	19.77	
8400.00	8386.85	8408.88	0.00	18.40	17.84	23.27	689.97	727.18	19.54	
8500.00	8486.84	8508.91	269.94	18.59	18.01	23.68	689.56	727.18	19.33	
8600.00	8585.05	8608.79	270.05	18.69	17.84	24.07	689.27	727.20	19.17	
8700.00	8677.94	8708.41	270.16	18.76	17.29	24.41	689.09	727.23	19.07	
8800.00	8762.17	8807.79	270.26	18.85	16.43	24.70	688.92	727.28	18.96	
8900.00	8834.79	8906.96	270.35	19.04	15.39	24.95	688.62	727.35	18.78	
9000.00	8893.26	9005.93	270.43	19.41	14.32	25.18	688.02	727.43	18.46	
9100.00	8935.58	9104.76	270.49	20.03	13.45	25.42	686.79	727.51	17.87	
9200.00	8960.31	9203.49	270.54	20.95	12.97	25.71	685.07	727.60	17.10	
9300.00	8966.95	9302.40	270.56	22.16	13.01	26.04	682.76	727.70	16.19	
9400.00	8967.38	9402.39	270.52	23.63	13.22	26.46	679.92	727.78	15.21	
9500.00	8967.81	9502.39	270.49	25.31	13.46	26.94	676.65	727.87	14.21	
9600.00	8968.24	9602.39	270.45	27.17	13.74	27.50	673.02	727.95	13.25	
9700.00	8968.67	9702.39	270.42	29.17	14.05	28.12	669.10	728.04	12.35	
9800.00	8969.10	9802.39	270.39	31.29	14.39	28.81	664.96	728.13	11.53	
9900.00	8969.53	9902.39	270.35	33.50	14.76	29.55	660.63	728.21	10.78	
10000.00	8969.96	10002.39	270.32	35.78	15.16	30.34	656.15	728.30	10.09	
10100.00	8970.39	10102.39	270.28	38.13	15.58	31.19	651.55	728.39	9.48	
10200.00	8970.83	10202.39	270.25	40.53	16.03	32.07	646.84	728.48	8.92	
10300.00	8971.26	10302.39	270.22	42.97	16.49	33.00	642.05	728.56	8.42	
10400.00	8971.69	10402.39	270.18	45.45	16.97	33.97	637.18	728.65	7.97	
10500.00	8972.12	10502.38	270.15	47.96	17.47	34.97	632.25	728.74	7.55	
10600.00	8972.55	10602.38	270.11	50.49	17.99	36.00	627.27	728.83	7.16	
10700.00	8972.98	10702.38	270.08	53.05	18.52	37.07	622.25	728.92	6.83	
10800.00	8973.41	10802.38	270.05	55.63	19.07	38.16	617.19	729.01	6.52	
10900.00	8973.84	10902.38	270.01	58.22	19.62	39.27	612.10	729.10	6.23	
11000.00	8974.27	11002.38	269.98	60.83	20.19	40.41	606.98	729.19	5.97	
11100.00	8974.71	11102.38	269.94	63.45	20.77	41.56	601.83	729.28	5.72	
11200.00	8975.14	11202.38	269.91	66.08	21.36	42.74	596.66	729.37	5.50	
11300.00	8975.57	11302.38	269.88	68.72	21.96	43.94	591.47	729.46	5.29	
11400.00	8976.00	11402.38	269.84	71.37	22.56	45.15	586.26	729.55	5.09	
11500.00	8976.43	11502.37	269.81	74.03	23.17	46.37	581.04	729.64	4.91	
11600.00	8976.86	11602.37	269.78	76.69	23.79	47.61	575.80	729.73	4.74	
11700.00	8977.29	11702.37	269.74	79.36	24.42	48.86	570.56	729.82	4.58	
11800.00	8977.72	11802.37	269.71	82.04	25.05	50.12	565.30	729.91	4.43	
11900.00	8978.16	11902.37	269.67	84.72	25.69	51.40	560.03	730.01	4.29	
12000.00	8978.59	12002.37	269.64	87.40	26.33	52.68	554.75	730.10	4.16	
12100.00	8979.02	12102.37	269.61	90.10	26.97	53.97	549.46	730.19	4.04	
12200.00	8979.45	12202.37	269.57	92.79	27.63	55.27	544.17	730.28	3.92	
12300.00	8979.88	12302.37	269.54	95.49	28.28	56.58	538.87	730.38	3.81	
12400.00	8980.31	12402.37	269.51	98.19	28.94	57.90	533.56	730.47	3.71	
12500.00	8980.74	12502.36	269.47	100.89	29.60	59.23	528.25	730.56	3.61	
12600.00	8981.17	12602.36	269.44	103.60	30.27	60.56	522.93	730.66	3.52	
12700.00	8981.60	12702.36	269.40	106.31	30.94	61.89	517.61	730.75	3.43	
12800.00	8982.04	12802.36	269.37	109.02	31.61	63.24	512.28	730.85	3.34	
12900.00	8982.47	12902.36	269.34	111.74	32.28	64.58	506.95	730.94	3.26	
13000.00	8982.90	13002.36	269.30	114.45	32.96	65.94	501.61	731.04	3.19	
13100.00	8983.33	13102.36	269.27	117.17	33.64	67.30	496.28	731.13	3.11	
13200.00	8983.76	13202.36	269.24	119.89	34.32	68.66	490.93	731.23	3.04	
13300.00	8984.19	13302.36	269.20	122.61	35.00	70.03	485.59	731.32	2.98	
13400.00	8984.62	13402.36	269.17	125.33	35.69	71.40	480.24	731.42	2.91	
13500.00	8985.05	13502.35	269.13	128.06	36.37	72.77	474.89	731.51	2.85	
13600.00	8985.48	13602.35	269.10	130.78	37.06	74.15	469.54	731.61	2.79	
13700.00	8985.92	13702.35	269.07	133.51	37.75	75.53	464.19	731.71	2.74	
13720.73	8986.00	13721.91	269.06	134.05	37.89	75.80	463.11	731.73	2.72	

SD Anti-Collision Report

Secondary Well: Emerald PWU 20 10H (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)									
Pr HD (US ft)	TVD (US ft)	Sec HD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	Risk
0.00	0.59	8.59	359.73	0.01	0.01	0.25	452.12	452.70	783.39
100.00	106.44	114.45	359.73	0.18	0.18	2.63	450.93	451.79	525.08
200.00	206.60	214.62	359.70	0.45	0.45	2.63	448.99	450.33	334.76
300.00	306.13	314.15	359.65	0.71	0.71	2.63	447.06	448.89	244.89
400.00	405.27	413.31	359.62	0.97	0.97	2.64	445.32	447.64	192.92
500.00	505.13	513.18	359.61	1.24	1.24	2.64	443.68	446.49	158.92
600.00	604.30	612.35	359.61	1.50	1.50	2.65	442.09	445.38	135.17
700.00	704.46	712.51	359.62	1.76	1.76	2.66	440.70	444.47	117.74
800.00	804.83	812.89	359.68	2.01	2.01	2.66	439.14	443.40	104.18
900.00	904.13	912.20	359.77	2.25	2.25	2.67	437.65	442.37	93.67
1000.00	1003.96	1012.03	359.85	2.50	2.50	2.68	436.28	441.47	85.16
1100.00	1104.25	1112.32	359.92	2.75	2.75	2.69	434.87	440.54	77.71
1200.00	1203.73	1211.81	359.95	3.01	3.01	2.70	433.47	439.63	71.42
1300.00	1302.81	1310.89	359.95	3.27	3.27	2.71	432.26	438.90	66.12
1400.00	1403.36	1411.45	359.93	3.53	3.53	2.72	431.13	438.25	61.59
1500.00	1506.36	1514.46	359.89	3.79	3.79	2.74	429.55	437.15	57.53
1600.00	1608.81	1616.92	359.86	4.06	4.06	2.75	427.26	435.35	53.77
1700.00	1709.66	1717.79	359.86	4.33	4.32	2.76	424.61	433.20	50.43
1800.00	1809.37	1817.53	359.82	4.59	4.59	2.77	421.89	430.97	47.46
1900.00	1908.25	1916.44	359.76	4.85	4.84	2.78	419.34	428.90	44.85
2000.00	2007.40	2015.60	359.67	5.10	5.10	2.80	417.05	427.09	42.54
2100.00	2106.73	2114.94	359.57	5.35	5.35	2.81	414.93	425.43	40.49
2200.00	2206.48	2214.72	359.46	5.60	5.59	2.82	412.92	423.89	38.65
2300.00	2305.96	2314.21	359.35	5.85	5.84	2.84	410.96	422.41	36.89
2400.00	2405.48	2413.74	359.24	6.10	6.09	2.85	409.13	421.06	35.29
2500.00	2505.37	2513.64	359.13	6.35	6.34	2.87	407.35	419.76	33.83
2600.00	2605.04	2613.32	359.03	6.60	6.59	2.88	405.64	418.53	32.48
2700.00	2705.02	2713.31	358.96	6.86	6.85	2.90	403.95	417.32	31.22
2800.00	2804.95	2813.25	358.89	7.12	7.11	2.92	402.28	416.14	30.04
2900.00	2904.86	2913.16	358.83	7.37	7.37	2.93	400.59	414.92	28.95
3000.00	3004.73	3013.05	358.68	7.62	7.61	2.95	399.02	413.81	27.97
3100.00	3105.22	3113.55	358.58	7.87	7.86	2.97	397.33	412.59	27.03
3200.00	3206.20	3214.54	358.50	8.06	8.05	2.98	395.58	411.24	26.25
3300.00	3307.35	3315.70	358.43	8.09	8.08	2.99	393.65	409.57	25.72
3400.00	3407.64	3416.01	358.34	8.10	8.09	2.99	391.60	407.75	25.24
3500.00	3507.01	3515.41	358.23	8.12	8.11	2.99	389.41	405.81	24.76
3600.00	3602.88	3611.29	358.20	8.13	8.13	2.99	388.03	404.67	24.33
3700.00	3701.66	3710.07	358.23	8.16	8.15	2.99	387.25	404.14	23.93
3800.00	3801.50	3809.91	358.22	8.19	8.18	2.99	386.62	403.76	23.56
3900.00	3902.29	3910.70	358.07	8.23	8.22	2.99	385.93	403.34	23.16
4000.00	4000.14	4008.57	357.80	8.27	8.26	2.99	385.09	402.78	22.77
4100.00	4094.44	4102.90	357.52	8.31	8.30	2.99	385.56	403.51	22.47
4200.00	4191.64	4200.14	357.21	8.36	8.35	2.99	387.17	405.36	22.28
4300.00	4291.18	4299.73	356.85	8.41	8.41	2.99	388.97	407.48	22.02
4400.00	4390.86	4399.50	356.37	8.48	8.47	2.99	390.92	409.68	21.83
4500.00	4490.69	4499.44	355.77	8.55	8.54	2.99	392.86	411.93	21.60
4600.00	4590.40	4599.29	355.11	8.62	8.62	2.99	394.86	414.21	21.40
4700.00	4689.77	4698.81	354.44	8.70	8.69	2.99	396.93	416.59	21.19
4800.00	4788.89	4798.07	353.79	8.78	8.77	2.99	399.18	419.14	21.00
4900.00	4888.52	4897.84	353.17	8.87	8.85	2.99	401.54	421.85	20.78
5000.00	4984.35	4993.84	352.54	8.97	8.94	2.99	404.36	424.96	20.63
5100.00	5078.42	5088.14	113.14	9.06	9.02	2.99	408.73	429.64	20.55
5200.00	5171.90	5181.95	112.63	9.17	9.11	2.99	415.22	436.38	20.62
5300.00	5268.36	5278.79	112.35	9.28	9.21	2.99	423.44	444.89	20.74
5400.00	5366.58	5377.42	112.26	9.40	9.31	2.99	432.69	454.41	20.91
5500.00	5465.78	5477.05	112.37	9.52	9.42	2.99	442.62	464.68	21.06
5600.00	5565.10	5576.76	112.69	9.65	9.53	2.99	453.23	475.55	21.31
5700.00	5665.96	5678.00	113.25	9.78	9.64	2.99	463.87	486.55	21.45

5D Anti-Collision Report

Secondary Well: Emerald PWU 20 10H (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pr 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)	5"	Risk
5800.00	5762.21	5774.59	113.80	9.91	9.75	14.36	474.67	497.68	21.63	
5900.00	5863.47	5876.19	114.38	10.05	9.88	14.64	485.52	508.86	21.80	
6000.00	5962.01	5975.07	114.88	10.20	10.00	14.92	496.19	519.86	21.97	
6100.00	6058.31	6071.81	115.21	10.35	10.12	15.19	507.29	531.32	22.11	
6200.00	6161.16	6175.14	115.50	10.52	10.26	15.49	518.04	542.47	22.21	
6300.00	6259.74	6274.18	115.73	10.68	10.39	15.79	528.62	553.42	22.32	
6400.00	6359.53	6374.42	115.96	10.85	10.53	16.09	539.10	564.28	22.41	
6500.00	6457.67	6473.00	116.20	11.01	10.67	16.39	549.58	575.13	22.51	
6600.00	6557.71	6573.49	116.44	11.19	10.81	16.70	560.22	586.16	22.60	
6700.00	6660.42	6676.64	116.64	11.37	10.96	17.02	570.19	596.52	22.65	
6800.00	6764.02	6780.64	116.87	11.55	11.12	17.36	579.71	606.45	22.68	
6900.00	6863.15	6880.06	117.15	11.72	11.26	17.68	588.54	615.65	22.70	
7000.00	6962.63	6979.84	117.46	11.90	11.42	18.01	597.72	625.22	22.73	
7100.00	7055.12	7072.63	117.71	12.07	11.55	18.32	607.13	634.99	22.79	
7200.00	7149.82	7167.77	117.86	12.26	11.70	18.64	617.71	645.96	22.87	
7300.00	7243.16	7261.60	117.97	12.45	11.85	18.96	628.82	657.45	22.96	
7400.00	7349.27	7368.24	118.16	12.66	12.03	19.33	640.17	669.25	23.01	
7500.00	7465.51	7484.93	118.34	12.89	12.22	19.75	649.32	678.89	22.96	
7600.00	7556.52	7576.22	118.54	13.06	12.37	20.08	657.91	687.87	22.96	
7700.00	7655.46	7675.39	118.90	13.24	12.53	20.44	666.74	697.11	22.95	
7800.00	7764.84	7784.90	119.34	13.43	12.71	20.85	674.02	704.82	22.88	
7900.00	7872.41	7892.52	119.76	13.61	12.88	21.25	679.16	710.36	22.77	
8000.00	7978.29	7998.41	120.15	13.77	13.05	21.66	682.67	714.26	22.61	
8100.00	8081.78	8101.91	120.43	13.93	13.22	22.06	684.38	716.34	22.41	
8200.00	8184.17	8204.31	359.34	14.09	13.38	22.46	685.14	717.46	22.20	
8300.00	8290.78	8310.92	359.42	14.25	13.56	22.88	684.69	717.38	21.94	
8400.00	8359.86	8380.00	359.44	14.35	13.67	23.16	684.46	717.45	21.75	
8500.00	8359.86	8380.00	269.91	14.35	13.67	23.16	695.18	728.11	22.11	
8600.00	8359.86	8380.00	272.61	14.35	13.67	23.16	719.35	751.96	23.06	
8700.00	8359.86	8380.00	276.73	14.35	13.67	23.16	754.93	787.04	24.51	
8800.00	8359.86	8380.00	282.00	14.35	13.67	23.16	799.10	830.73	26.27	
8900.00	8359.86	8380.00	288.06	14.35	13.67	23.16	848.98	880.29	28.12	
9000.00	8359.86	8380.00	294.44	14.35	13.67	23.16	901.97	933.10	29.97	
9100.00	8359.86	8380.00	300.65	14.35	13.67	23.16	955.54	986.88	31.50	
9200.00	8359.86	8380.00	306.35	14.35	13.67	23.16	1007.83	1039.64	32.69	
9300.00	8359.86	8380.00	310.59	14.35	13.67	23.16	1057.40	1089.87	33.57	
9400.00	8359.86	8380.00	310.59	14.35	13.67	23.16	1109.90	1143.13	34.40	
9500.00	8359.86	8380.00	310.59	14.35	13.67	23.16	1168.46	1202.37	35.46	
9600.00	8359.86	8380.00	310.59	14.35	13.67	23.16	1232.22	1266.74	36.69	
9700.00	8359.86	8380.00	310.59	14.35	13.67	23.16	1300.37	1335.50	38.02	
9800.00	8359.86	8380.00	310.59	14.35	13.67	23.16	1372.30	1408.01	39.42	
9900.00	8359.86	8380.00	310.59	14.35	13.67	23.16	1447.47	1483.73	40.93	
10000.00	8359.86	8380.00	310.59	14.35	13.67	23.16	1525.42	1562.17	42.51	
10100.00	8359.86	8380.00	310.59	14.35	13.67	23.16	1605.78	1642.96	44.19	
10200.00	8359.86	8380.00	310.59	14.35	13.67	23.16	1688.23	1725.76	45.98	
10300.00	8359.86	8380.00	310.59	14.35	13.67	23.16	1772.50	1810.30	47.89	
10400.00	8359.86	8380.00	310.59	14.35	13.67	23.16	1858.28	1896.35	49.81	
10500.00	8359.86	8380.00	310.59	14.35	13.67	23.16	1945.33	1983.70	51.69	
10600.00	8359.86	8380.00	310.59	14.35	13.67	23.16	2033.65	2072.20	53.75	
10700.00	8359.86	8380.00	310.59	14.35	13.67	23.16	2122.85	2161.70	55.64	
10800.00	8359.86	8380.00	310.59	14.35	13.67	23.16	2213.09	2252.09	57.75	
10900.00	8359.86	8380.00	310.59	14.35	13.67	23.16	2304.11	2343.25	59.86	
11000.00	8359.86	8380.00	310.59	14.35	13.67	23.16	2395.69	2435.11	61.76	
11100.00	8359.86	8380.00	310.59	14.35	13.67	23.16	2488.08	2527.59	63.97	
11200.00	8359.86	8380.00	310.59	14.35	13.67	23.16	2581.01	2620.62	66.15	
11300.00	8359.86	8380.00	310.59	14.35	13.67	23.16	2674.35	2714.15	68.20	
11400.00	8359.86	8380.00	310.59	14.35	13.67	23.16	2768.18	2808.12	70.30	
11500.00	8359.86	8380.00	310.59	14.35	13.67	23.16	2862.44	2902.49	72.46	

SD Anti-Collision Report

Secondary Well: Emerald PWU 20 10H (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)	Sr	Risk
11600.00	8359.86	8380.00	310.59	14.35	13.67	23.16	2957.09	2997.23	74.66	
11700.00	8359.86	8380.00	310.59	14.35	13.67	23.16	3052.08	3092.31	76.88	
11800.00	8359.86	8380.00	310.59	14.35	13.67	23.16	3147.38	3187.68	79.11	
11900.00	8359.86	8380.00	310.59	14.35	13.67	23.16	3242.97	3283.33	81.36	
12000.00	8359.86	8380.00	310.59	14.35	13.67	23.16	3338.81	3379.23	83.62	
12100.00	8359.86	8380.00	310.59	14.35	13.67	23.16	3434.89	3475.36	85.88	
12200.00	8359.86	8380.00	310.59	14.35	13.67	23.16	3531.17	3571.70	88.13	
12300.00	8359.86	8380.00	310.59	14.35	13.67	23.16	3627.65	3668.24	90.38	
12400.00	8359.86	8380.00	310.59	14.35	13.67	23.16	3724.31	3764.96	92.63	
12500.00	8359.86	8380.00	310.59	14.35	13.67	23.16	3821.14	3861.85	94.87	
12600.00	8359.86	8380.00	310.59	14.35	13.67	23.16	3918.12	3958.89	97.10	
12700.00	8359.86	8380.00	310.59	14.35	13.67	23.16	4015.24	4056.07	99.33	
12800.00	8359.86	8380.00	310.59	14.35	13.67	23.16	4112.50	4153.39	101.57	
12900.00	8359.86	8380.00	310.59	14.35	13.67	23.16	4209.89	4250.84	103.80	
13000.00	8359.86	8380.00	310.59	14.35	13.67	23.16	4307.39	4348.40	106.03	
13100.00	8359.86	8380.00	310.59	14.35	13.67	23.16	4404.99	4446.07	108.24	
13200.00	8359.86	8380.00	310.59	14.35	13.67	23.16	4502.70	4543.84	110.45	
13300.00	8359.86	8380.00	310.59	14.35	13.67	23.16	4600.50	4641.70	112.67	
13400.00	8359.86	8380.00	310.59	14.35	13.67	23.16	4698.40	4739.65	114.88	
13500.00	8359.86	8380.00	310.59	14.35	13.67	23.16	4796.38	4837.69	117.09	
13600.00	8359.86	8380.00	310.59	14.35	13.67	23.16	4894.43	4935.81	119.30	
13700.00	8359.86	8380.00	310.59	14.35	13.67	23.16	4992.56	5034.00	121.49	
13720.73	8359.86	8380.00	310.59	14.35	13.67	23.16	5012.91	5054.36	121.94	

Secondary Well: Emerald PWU 20 66H (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)	Sr	Risk
0.00	9.00	0.00	182.81	0.00	0.00	0.00	708.74	709.31	1251.78	
100.00	100.00	91.00	182.81	0.10	0.10	4.19	708.48	709.25	912.69	
200.00	200.00	191.00	182.81	0.32	0.32	4.62	708.04	709.25	583.34	
300.00	300.00	291.00	182.81	0.54	0.54	4.65	707.59	709.25	426.00	
400.00	400.00	391.00	182.81	0.77	0.77	4.69	707.14	709.25	335.51	
500.00	500.00	491.00	182.81	0.99	0.99	4.74	706.69	709.25	276.73	
600.00	600.00	591.00	182.81	1.22	1.22	4.81	706.24	709.25	235.47	
700.00	700.00	691.00	182.81	1.44	1.44	4.88	705.79	709.25	204.92	
800.00	800.00	791.00	182.81	1.67	1.67	4.96	705.34	709.25	181.39	
900.00	900.00	891.00	182.81	1.89	1.89	5.05	704.90	709.25	162.70	
1000.00	1000.00	991.00	182.81	2.12	2.12	5.15	704.45	709.25	147.51	
1100.00	1100.00	1091.00	182.81	2.34	2.34	5.26	704.00	709.25	134.91	
1200.00	1200.00	1191.00	182.81	2.56	2.56	5.37	703.55	709.25	124.29	
1300.00	1300.00	1291.00	182.81	2.79	2.79	5.49	703.10	709.25	115.23	
1400.00	1400.00	1391.00	182.81	3.01	3.01	5.61	702.65	709.25	107.39	
1500.00	1500.00	1491.00	182.81	3.24	3.24	5.74	702.20	709.25	100.55	
1600.00	1600.00	1591.00	182.81	3.46	3.46	5.88	701.75	709.25	94.54	
1700.00	1700.00	1691.00	182.81	3.69	3.69	6.01	701.30	709.25	89.20	
1800.00	1800.00	1791.00	182.81	3.91	3.91	6.16	700.85	709.25	84.43	
1900.00	1900.00	1891.00	182.81	4.14	4.14	6.30	700.40	709.25	80.15	
2000.00	2000.00	1991.00	182.81	4.36	4.36	6.45	699.96	709.25	76.27	
2100.00	2100.00	2091.00	182.81	4.59	4.59	6.61	699.51	709.25	72.76	
2200.00	2200.00	2191.00	182.81	4.81	4.81	6.77	699.06	709.25	69.56	
2300.00	2300.00	2291.00	182.81	5.04	5.04	6.93	698.61	709.25	66.62	
2400.00	2400.00	2391.00	182.81	5.26	5.26	7.09	698.16	709.25	63.93	
2500.00	2500.00	2491.00	182.81	5.49	5.49	7.26	697.71	709.25	61.44	
2600.00	2600.00	2591.00	182.81	5.71	5.71	7.43	697.26	709.25	59.14	
2700.00	2700.00	2691.00	182.81	5.94	5.94	7.60	696.81	709.25	57.00	
2800.00	2800.00	2791.00	182.81	6.16	6.16	7.77	696.36	709.25	55.02	
2900.00	2900.00	2891.00	182.81	6.39	6.39	7.95	695.91	709.25	53.17	
3000.00	3000.00	2991.00	182.81	6.61	6.61	8.13	695.47	709.25	51.44	
3100.00	3100.00	3091.00	182.81	6.84	6.84	8.31	695.02	709.25	49.81	

5D Anti-Collision Report

Secondary Well: Emerald PWU 20 66H (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)	SI	Risk
3200.00	3200.00	3191.00	182.81	7.06	7.06	8.50	694.57	709.25	48.29	
3300.00	3300.00	3291.00	182.81	7.29	7.29	8.69	694.12	709.25	46.86	
3400.00	3400.00	3391.00	182.81	7.51	7.51	8.88	693.67	709.25	45.51	
3500.00	3500.00	3491.00	182.81	7.73	7.73	9.07	693.22	709.25	44.23	
3600.00	3600.00	3591.00	182.81	7.96	7.96	9.27	692.77	709.25	43.03	
3700.00	3700.00	3691.00	182.81	8.18	8.18	9.47	692.32	709.25	41.89	
3800.00	3800.00	3791.00	182.81	8.41	8.41	9.67	691.87	709.25	40.81	
3900.00	3900.00	3891.00	182.81	8.63	8.63	9.87	691.42	709.25	39.78	
4000.00	4000.00	3991.00	182.81	8.86	8.86	10.08	690.97	709.25	38.80	
4100.00	4100.00	4091.00	182.81	9.08	9.08	10.29	690.53	709.25	37.87	
4200.00	4200.00	4191.00	182.81	9.31	9.31	10.51	690.08	709.25	36.98	
4300.00	4300.00	4291.00	182.81	9.53	9.53	10.72	689.63	709.25	36.14	
4400.00	4400.00	4391.00	182.81	9.76	9.76	10.95	689.18	709.25	35.33	
4500.00	4500.00	4491.00	182.81	9.98	9.98	11.17	688.73	709.25	34.56	
4600.00	4600.00	4591.00	182.81	10.21	10.21	11.40	688.28	709.25	33.82	
4700.00	4700.00	4691.00	182.81	10.43	10.43	11.63	687.83	709.25	33.11	
4800.00	4800.00	4791.00	182.81	10.66	10.66	11.86	687.38	709.25	32.43	
4900.00	4900.00	4891.00	182.81	10.88	10.88	12.10	686.93	709.25	31.78	
5000.00	5000.00	4991.00	182.81	11.11	11.11	12.34	686.48	709.25	31.15	
5100.00	5101.06	5092.07	304.06	11.32	11.32	12.59	685.49	708.70	30.53	
5200.00	5202.19	5193.22	304.07	11.53	11.52	12.84	683.39	707.00	29.95	
5300.00	5303.21	5294.34	304.10	11.73	11.72	13.10	680.18	704.16	29.37	
5400.00	5404.08	5395.39	304.14	11.94	11.91	13.36	675.80	700.17	28.73	
5500.00	5504.75	5496.37	304.20	12.15	12.11	13.62	670.27	695.05	28.04	
5600.00	5605.15	5597.23	304.28	12.37	12.30	13.88	663.64	688.80	27.37	
5700.00	5705.27	5697.99	304.50	12.59	12.49	14.15	656.30	681.91	26.62	
5800.00	5805.02	5798.60	304.88	12.82	12.67	14.42	648.86	674.89	25.92	
5900.00	5903.97	5898.62	305.39	13.05	12.87	14.70	641.36	667.80	25.26	
6000.00	6002.43	5998.18	305.94	13.29	13.08	14.98	633.85	660.74	24.57	
6100.00	6100.89	6097.73	306.49	13.53	13.29	15.26	626.39	653.75	23.89	
6200.00	6199.35	6197.28	307.06	13.77	13.50	15.55	618.99	646.82	23.24	
6300.00	6297.81	6296.83	307.63	14.02	13.71	15.85	611.67	639.95	22.62	
6400.00	6396.27	6396.39	308.22	14.28	13.92	16.15	604.41	633.15	22.02	
6500.00	6494.73	6495.94	308.83	14.54	14.13	16.45	597.22	626.42	21.45	
6600.00	6593.19	6595.49	309.44	14.80	14.35	16.76	590.10	619.76	20.89	
6700.00	6691.65	6695.05	310.07	15.07	14.56	17.07	583.06	613.17	20.36	
6800.00	6790.11	6794.60	310.72	15.34	14.78	17.39	576.05	606.66	19.82	
6900.00	6888.57	6894.15	311.37	15.61	15.00	17.71	569.12	600.23	19.29	
7000.00	6987.03	6993.70	312.04	15.89	15.22	18.04	562.27	593.87	18.79	
7100.00	7085.49	7093.26	312.73	16.16	15.43	18.37	555.50	587.60	18.30	
7200.00	7183.95	7192.81	313.43	16.45	15.65	18.71	548.80	581.42	17.82	
7300.00	7282.41	7292.36	314.14	16.73	15.88	19.06	542.19	575.32	17.36	
7400.00	7380.86	7391.92	314.87	17.02	16.10	19.40	535.68	569.32	16.92	
7500.00	7479.32	7491.47	315.62	17.31	16.32	19.76	529.26	563.41	16.50	
7600.00	7577.78	7591.02	316.38	17.60	16.54	20.12	522.95	557.60	16.09	
7700.00	7678.85	7693.00	317.11	17.86	16.79	20.49	517.20	552.33	15.73	
7800.00	7780.90	7795.55	317.61	18.09	17.02	20.88	512.36	547.91	15.41	
7900.00	7883.46	7898.31	317.86	18.30	17.23	21.27	508.33	544.29	15.14	
8000.00	7986.23	8001.13	317.84	18.50	17.42	21.66	505.07	541.44	14.89	
8100.00	8086.86	8101.75	317.68	18.69	17.62	22.05	502.74	539.51	14.67	
8200.00	8186.85	8201.75	196.37	18.90	17.84	22.44	501.68	538.87	14.49	
8300.00	8304.19	8319.26	195.92	19.11	17.95	22.90	500.33	537.93	14.31	
8400.00	8425.73	8443.88	193.15	19.23	17.64	23.36	494.55	532.43	14.06	
8500.00	8528.07	8555.17	98.80	19.29	17.02	23.73	486.49	524.71	13.73	
8600.00	8614.50	8657.89	94.91	19.37	16.23	24.03	480.97	519.52	13.48	
8700.00	8687.41	8755.51	91.20	19.53	15.37	24.30	478.52	517.42	13.30	
8800.00	8747.35	8849.29	87.78	19.83	14.51	24.55	478.42	517.71	13.17	
8900.00	8794.74	8940.18	84.75	20.30	13.76	24.80	479.78	519.62	13.04	

5D Anti-Collision Report

Secondary Well: Emerald PWU 20' 66H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pri ID (US ft)	TVD (US ft)	Sec ID (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
9000.00	8829.92	9028.90	82.20	20.98	13.19	25.08	481.71	522.32	12.86	
9100.00	8853.13	9116.06	80.20	21.86	12.87	25.39	483.07	525.11	12.49	
9200.00	8864.61	9202.15	78.81	22.93	12.85	25.73	483.49	527.38	12.02	
9300.00	8866.00	9295.02	78.21	24.29	13.08	26.16	482.08	528.41	11.40	
9400.00	8866.00	9395.02	78.21	25.95	13.34	26.69	479.05	528.41	10.71	
9500.00	8866.00	9495.02	78.21	27.79	13.64	27.28	475.64	528.40	10.01	
9600.00	8866.00	9595.02	78.21	29.76	13.97	27.94	471.92	528.40	9.36	
9700.00	8866.00	9695.02	78.21	31.86	14.33	28.66	467.95	528.39	8.74	
9800.00	8866.00	9795.02	78.21	34.05	14.72	29.44	463.78	528.39	8.18	
9900.00	8866.00	9895.02	78.21	36.31	15.13	30.27	459.44	528.38	7.66	
10000.00	8866.00	9995.02	78.21	38.64	15.57	31.14	454.93	528.37	7.19	
10100.00	8866.00	10095.02	78.21	41.03	16.03	32.06	450.30	528.37	6.77	
10200.00	8866.00	10195.02	78.21	43.45	16.51	33.02	445.57	528.36	6.38	
10300.00	8866.00	10295.02	78.21	45.92	17.00	34.01	440.77	528.36	6.03	
10400.00	8866.00	10395.02	78.20	48.41	17.52	35.04	435.90	528.35	5.71	
10500.00	8866.00	10495.02	78.20	50.94	18.05	36.10	430.97	528.35	5.43	
10600.00	8866.00	10595.02	78.20	53.48	18.59	37.18	425.99	528.34	5.16	
10700.00	8866.00	10695.02	78.20	56.05	19.14	38.29	420.98	528.33	4.92	
10800.00	8866.00	10795.02	78.20	58.63	19.71	39.43	415.93	528.33	4.70	
10900.00	8866.00	10895.02	78.20	61.23	20.29	40.58	410.84	528.32	4.50	
11000.00	8866.00	10995.02	78.20	63.84	20.88	41.76	405.73	528.32	4.31	
11100.00	8866.00	11095.02	78.20	66.47	21.47	42.95	400.60	528.31	4.14	
11200.00	8866.00	11195.02	78.20	69.10	22.08	44.16	395.44	528.31	3.98	
11300.00	8866.00	11295.02	78.20	71.74	22.69	45.39	390.27	528.30	3.83	
11400.00	8866.00	11395.02	78.20	74.40	23.31	46.62	385.07	528.30	3.69	
11500.00	8866.00	11495.02	78.20	77.05	23.94	47.88	379.87	528.29	3.56	
11600.00	8866.00	11595.02	78.20	79.72	24.57	49.14	374.65	528.28	3.44	
11700.00	8866.00	11695.02	78.20	82.39	25.21	50.41	369.41	528.28	3.33	
11800.00	8866.00	11795.02	78.20	85.07	25.85	51.70	364.17	528.27	3.22	
11900.00	8866.00	11895.02	78.20	87.75	26.49	52.99	358.92	528.27	3.12	
12000.00	8866.00	11995.02	78.20	90.44	27.15	54.30	353.66	528.26	3.03	
12100.00	8866.00	12095.02	78.20	93.13	27.80	55.61	348.38	528.26	2.94	
12200.00	8866.00	12195.02	78.20	95.82	28.46	56.93	343.11	528.25	2.85	
12300.00	8866.00	12295.02	78.20	98.52	29.12	58.25	337.82	528.24	2.77	
12400.00	8866.00	12395.02	78.20	101.22	29.79	59.58	332.53	528.24	2.70	
12500.00	8866.00	12495.02	78.20	103.92	30.46	60.92	327.23	528.23	2.63	
12600.00	8866.00	12595.02	78.20	106.63	31.13	62.27	321.93	528.23	2.56	
12700.00	8866.00	12695.02	78.20	109.34	31.81	63.62	316.62	528.22	2.50	
12800.00	8866.00	12795.02	78.20	112.05	32.48	64.97	311.31	528.22	2.44	
12900.00	8866.00	12895.02	78.20	114.77	33.16	66.33	305.99	528.21	2.38	
13000.00	8866.00	12995.02	78.20	117.48	33.85	67.69	300.67	528.20	2.32	
13100.00	8866.00	13095.02	78.20	120.20	34.53	69.06	295.35	528.20	2.27	
13200.00	8866.00	13195.02	78.20	122.92	35.22	70.44	290.02	528.19	2.22	
13300.00	8866.00	13295.02	78.20	125.64	35.90	71.81	284.69	528.19	2.17	
13400.00	8866.00	13395.02	78.20	128.36	36.59	73.19	279.36	528.18	2.12	
13500.00	8866.00	13495.02	78.20	131.09	37.29	74.57	274.02	528.18	2.08	
13600.00	8866.00	13595.02	78.20	133.81	37.98	75.96	268.68	528.17	2.04	
13700.00	8866.00	13695.02	78.20	136.54	38.67	77.35	263.34	528.16	1.99	SF(Lo)
13720.73	8866.00	13715.75	78.20	137.10	38.82	77.64	262.23	528.16	1.99	SF(Lo)

Secondary Well: Agate PWU 21'-7H (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pri ID (US ft)	TVD (US ft)	Sec ID (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	9.00	0.00	99.44	0.00	0.00	0.00	4832.68	4833.25	8529.53	
100.00	79.29	70.29	99.44	0.08	0.08	2.89	4832.68	4833.43	6403.85	
200.00	156.52	147.52	99.44	0.21	0.21	4.61	4832.99	4834.10	4371.04	
300.00	233.97	224.98	99.44	0.38	0.38	4.63	4833.73	4835.23	3215.26	
400.00	353.38	344.39	99.44	0.63	0.62	4.67	4834.47	4836.44	2452.97	
500.00	478.15	469.17	99.45	0.88	0.87	4.73	4834.62	4837.06	1976.45	

5D Anti-Collision Report

Secondary Well: Agate PWU 21-7H (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pri ID (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
600.00	570.87	561.89	99.46	1.07	1.06	4.79	4834.67	4837.53	1690.40	
700.00	657.97	649.00	99.46	1.25	1.25	4.85	4835.01	4838.28	1479.13	
800.00	755.17	746.20	99.46	1.46	1.45	4.92	4835.52	4839.22	1307.22	
900.00	852.72	843.76	99.46	1.66	1.66	5.01	4836.01	4840.14	1172.09	
1000.00	941.23	932.28	99.46	1.86	1.85	5.09	4836.67	4841.22	1064.58	
1100.00	1018.25	1009.30	99.45	2.02	2.02	5.17	4837.68	4842.62	980.25	
1200.00	1086.96	1078.03	99.44	2.18	2.17	5.24	4839.33	4844.64	912.05	
1300.00	1159.11	1150.21	99.43	2.34	2.33	5.32	4841.56	4847.26	850.90	
1400.00	1242.41	1233.57	99.42	2.52	2.51	5.42	4844.26	4850.36	794.87	
1500.00	1468.54	1459.79	99.37	2.99	2.97	5.70	4845.53	4852.32	714.89	
1600.00	1548.64	1539.91	99.34	3.16	3.14	5.81	4845.99	4853.18	675.27	
1700.00	1680.02	1671.33	99.30	3.43	3.41	5.99	4846.12	4853.80	631.96	
1800.00	1798.07	1789.42	99.27	3.67	3.65	6.15	4845.96	4854.11	595.57	
1900.00	1898.38	1889.75	99.25	3.88	3.86	6.30	4845.48	4854.06	565.73	
2000.00	2027.80	2019.18	99.23	4.15	4.13	6.50	4844.75	4853.83	534.38	
2100.00	2102.77	2094.16	99.22	4.31	4.29	6.61	4844.05	4853.51	512.88	
2200.00	2186.70	2178.10	99.20	4.49	4.47	6.75	4843.77	4853.63	492.09	
2300.00	2317.51	2308.92	99.18	4.76	4.74	6.96	4843.11	4853.47	468.44	
2400.00	2376.99	2368.41	99.17	4.89	4.86	7.05	4842.81	4853.53	452.98	
2500.00	2522.33	2513.75	99.15	5.19	5.17	7.30	4842.47	4853.72	431.53	
2600.00	2648.92	2640.36	99.14	5.45	5.43	7.51	4841.16	4852.89	413.83	
2700.00	2732.12	2723.57	99.12	5.62	5.60	7.65	4839.87	4851.99	400.48	
2800.00	2834.81	2826.27	99.11	5.84	5.81	7.83	4838.87	4851.43	386.25	
2900.00	2927.28	2918.74	99.10	6.03	6.01	8.00	4837.73	4850.71	373.48	
3000.00	3040.40	3031.87	99.09	6.27	6.24	8.20	4836.67	4850.12	360.53	
3100.00	3128.43	3119.90	99.08	6.45	6.43	8.37	4835.52	4849.38	349.91	
3200.00	3223.12	3214.60	99.07	6.65	6.63	8.54	4834.59	4848.87	339.59	
3300.00	3369.07	3360.57	99.06	6.95	6.94	8.82	4832.98	4847.78	327.55	
3400.00	3457.66	3449.16	99.06	7.14	7.12	8.99	4831.21	4846.44	318.35	
3500.00	3545.00	3536.51	99.04	7.33	7.31	9.16	4829.79	4845.43	309.81	
3600.00	3634.71	3626.25	99.02	7.52	7.50	9.34	4828.44	4844.49	301.76	
3700.00	3693.76	3685.32	99.00	7.65	7.62	9.45	4827.79	4844.20	295.34	
3800.00	3860.55	3852.19	98.94	8.00	7.97	9.79	4826.74	4843.71	285.43	
3900.00	4040.95	4032.71	98.88	8.37	8.35	10.17	4823.89	4841.47	275.49	
4000.00	4149.96	4141.80	98.85	8.60	8.57	10.40	4820.39	4838.42	268.38	
4100.00	4254.86	4246.77	98.82	8.82	8.79	10.63	4816.80	4835.27	261.69	
4200.00	4354.63	4346.62	98.80	9.03	9.00	10.85	4813.19	4832.07	255.94	
4300.00	4436.03	4428.05	98.79	9.20	9.17	11.03	4809.74	4829.04	250.19	
4400.00	4527.07	4519.15	98.77	9.40	9.36	11.23	4806.62	4826.35	244.63	
4500.00	4653.52	4645.66	98.76	9.66	9.62	11.52	4803.32	4823.53	238.76	
4600.00	4792.77	4785.00	98.74	9.95	9.91	11.85	4799.17	4819.88	232.66	
4700.00	4882.03	4874.34	98.73	10.14	10.10	12.06	4794.73	4815.87	227.80	
4800.00	4977.03	4969.42	98.71	10.35	10.30	12.29	4790.73	4812.29	223.23	
4900.00	5078.63	5071.12	98.68	10.57	10.51	12.54	4786.52	4808.49	218.85	
5000.00	5152.05	5144.60	98.66	10.73	10.67	12.72	4782.62	4804.99	214.83	
5100.00	5217.06	5209.65	219.88	10.87	10.80	12.88	4780.17	4802.87	211.67	
5200.00	5287.35	5279.97	219.84	11.02	10.95	13.06	4779.73	4802.75	208.64	
5300.00	5350.35	5343.00	219.82	11.15	11.09	13.22	4781.27	4804.65	205.56	
5400.00	5425.34	5418.00	219.79	11.31	11.24	13.42	4784.95	4808.66	202.84	
5500.00	5518.07	5510.76	219.74	11.51	11.44	13.66	4790.03	4814.11	199.92	
5600.00	5582.95	5575.66	219.72	11.65	11.58	13.83	4797.05	4821.46	197.47	
5700.00	5653.81	5646.57	219.64	11.80	11.73	14.03	4805.43	4830.15	195.39	
5800.00	5722.65	5715.46	219.55	11.94	11.87	14.21	4814.37	4839.45	192.92	
5900.00	5817.41	5810.29	219.44	12.15	12.07	14.47	4823.81	4849.33	190.03	
6000.00	5927.33	5920.31	219.30	12.38	12.30	14.78	4832.84	4858.81	187.12	
6100.00	6035.83	6028.93	219.16	12.62	12.53	15.09	4841.94	4868.33	184.46	
6200.00	6222.01	6215.31	218.91	13.03	12.92	15.63	4849.52	4876.49	180.78	
6300.00	6338.54	6331.94	218.77	13.28	13.17	15.98	4856.32	4883.74	178.13	

SD Anti-Collision Report

Secondary Well: Agate PWU 21-7H (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pr ID (US ft)	TVD (US ft)	Sec ID (US ft)	I-Face to Sec (°)	S-Major (US ft)	S-Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
6400.00	6354.16	6347.57	218.75	13.31	13.20	16.03	4864.23	4891.87	176.96	
6500.00	6368.14	6361.55	218.74	13.34	13.23	16.07	4873.86	4901.73	175.92	
6600.00	6380.19	6373.60	218.73	13.36	13.25	16.11	4885.27	4913.34	174.99	
6700.00	6392.18	6385.61	218.72	13.38	13.28	16.14	4898.44	4926.72	174.20	
6800.00	6402.44	6395.90	218.71	13.39	13.29	16.17	4913.38	4941.86	173.54	
6900.00	6412.42	6405.92	218.71	13.40	13.31	16.20	4930.11	4958.77	173.02	
7000.00	6422.33	6415.88	218.70	13.41	13.32	16.23	4948.60	4977.44	172.62	
7100.00	6432.08	6425.72	218.70	13.42	13.33	16.26	4968.82	4997.84	172.23	
7200.00	6441.72	6435.46	218.69	13.43	13.33	16.28	4990.73	5019.96	171.72	
7300.00	6451.26	6445.12	218.69	13.44	13.33	16.31	5014.34	5043.78	171.32	
7400.00	6461.10	6455.12	218.69	13.46	13.33	16.34	5039.64	5069.28	171.05	
7500.00	6471.24	6465.46	218.68	13.47	13.32	16.36	5066.60	5096.41	170.91	
7600.00	6481.25	6475.70	218.68	13.49	13.31	16.39	5095.18	5125.17	170.91	
7700.00	6491.41	6486.14	218.49	13.51	13.30	16.42	5124.71	5154.86	170.96	
7800.00	6501.92	6496.99	218.29	13.53	13.28	16.44	5154.48	5184.81	170.92	
7900.00	6512.32	6507.76	218.10	13.55	13.26	16.47	5184.52	5215.02	171.01	
8000.00	6523.34	6519.24	217.91	13.57	13.24	16.50	5214.82	5245.46	171.21	
8100.00	6534.91	6531.36	217.72	13.59	13.21	16.53	5245.34	5276.10	171.56	
8200.00	6546.87	6543.96	96.28	13.62	13.18	16.55	5276.07	5306.92	172.08	
8300.00	6558.38	6556.15	96.30	13.64	13.16	16.58	5307.56	5338.55	172.27	
8400.00	6568.00	6566.41	96.31	13.66	13.13	16.61	5340.56	5371.67	172.66	
8500.00	6577.49	6576.58	6.08	13.68	13.10	16.63	5374.04	5405.24	173.22	
8600.00	6586.33	6586.13	5.85	13.70	13.06	16.65	5394.73	5425.99	173.54	
8700.00	6595.19	6595.77	5.83	13.72	13.01	16.68	5398.15	5429.47	173.38	
8800.00	6603.85	6605.27	6.01	13.74	12.97	16.70	5384.20	5415.57	172.61	
8900.00	6614.13	6616.63	6.43	13.76	12.92	16.72	5353.28	5384.69	171.41	
9000.00	6624.34	6628.01	7.16	13.79	12.88	16.74	5306.33	5337.67	170.30	
9100.00	6633.31	6638.08	8.37	13.81	12.83	16.76	5244.51	5275.89	168.10	
9200.00	6641.04	6646.82	10.45	13.83	12.80	16.78	5169.86	5201.21	165.93	
9300.00	6647.03	6653.65	13.59	13.84	12.77	16.80	5084.72	5116.03	163.41	
9400.00	6652.40	6659.79	13.65	13.86	12.74	16.81	4996.60	5027.85	160.90	
9500.00	6657.86	6666.07	13.72	13.87	12.71	16.82	4908.81	4940.06	158.11	
9600.00	6663.36	6672.44	13.79	13.88	12.68	16.83	4821.46	4852.69	155.42	
9700.00	6668.77	6678.72	13.86	13.90	12.65	16.85	4734.58	4765.76	152.87	
9800.00	6674.28	6685.16	13.93	13.92	12.62	16.86	4648.06	4679.28	149.87	
9900.00	6679.88	6691.76	14.01	13.93	12.59	16.87	4562.01	4593.30	146.80	
10000.00	6685.59	6698.52	14.08	13.95	12.55	16.89	4476.50	4507.83	143.92	
10100.00	6690.95	6704.92	14.16	13.97	12.51	16.90	4391.57	4422.89	141.23	
10200.00	6695.61	6710.51	14.23	13.98	12.48	16.91	4307.12	4338.54	138.09	
10300.00	6700.39	6716.28	14.30	14.00	12.44	16.92	4223.18	4254.80	134.56	
10400.00	6705.28	6722.23	14.37	14.01	12.40	16.93	4139.95	4171.70	131.39	
10500.00	6710.29	6728.37	14.44	14.03	12.36	16.94	4057.43	4089.30	128.31	
10600.00	6715.41	6734.70	14.52	14.05	12.32	16.95	3975.49	4007.62	124.75	
10700.00	6720.60	6741.16	14.60	14.07	12.28	16.96	3894.30	3926.70	121.21	
10800.00	6725.93	6747.85	14.68	14.10	12.24	16.98	3813.94	3846.59	117.80	
10900.00	6731.42	6754.80	14.77	14.12	12.19	16.99	3734.38	3767.34	114.30	
11000.00	6737.07	6762.01	14.86	14.14	12.14	17.00	3655.67	3689.00	110.70	
11100.00	6742.23	6768.67	14.94	14.17	12.09	17.01	3577.82	3611.62	106.84	
11200.00	6747.10	6775.01	15.02	14.20	12.04	17.02	3501.96	3535.28	103.33	
11300.00	6752.12	6781.62	15.10	14.22	11.98	17.03	3425.19	3460.03	99.32	
11400.00	6757.28	6788.51	15.19	14.25	11.91	17.04	3350.54	3385.95	95.60	
11500.00	6762.60	6795.69	15.28	14.28	11.85	17.06	3277.11	3313.11	92.03	
11600.00	6768.01	6803.09	15.37	14.31	11.78	17.07	3204.84	3241.59	88.22	
11700.00	6773.58	6810.83	15.47	14.35	11.70	17.08	3133.97	3171.45	84.61	
11800.00	6779.31	6818.93	15.57	14.39	11.63	17.09	3064.58	3102.80	81.18	
11900.00	6785.20	6827.40	15.67	14.43	11.54	17.11	2996.63	3035.71	77.68	
12000.00	6791.43	6836.53	15.78	14.48	11.45	17.12	2930.24	2970.28	74.18	
12100.00	6797.81	6846.07	15.89	14.53	11.36	17.13	2865.58	2906.60	70.85	

SD Anti-Collision Report

Secondary Well: Agate PWU 21-7H (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
12200.00	6804.32	6856.03	16.01	14.59	11.26	17.15	2802.73	2844.78	67.66	
12300.00	6810.77	6866.15	16.13	14.65	11.16	17.17	2741.82	2784.92	64.61	
12400.00	6817.23	6876.55	16.26	14.72	11.05	17.18	2682.79	2727.15	61.48	
12500.00	6823.79	6887.43	16.38	14.79	10.94	17.20	2625.93	2671.58	58.52	
12600.00	6830.52	6898.98	16.52	14.87	10.82	17.22	2571.37	2618.33	55.75	
12700.00	6837.35	6911.11	16.65	14.96	10.70	17.24	2519.22	2567.52	53.16	
12800.00	6844.19	6923.75	16.79	15.06	10.57	17.27	2469.63	2519.28	50.74	
12900.00	6850.68	6936.29	16.93	15.17	10.43	17.29	2422.72	2473.73	48.50	
13000.00	6857.12	6949.38	17.07	15.28	10.29	17.31	2378.40	2431.01	46.21	
13100.00	6864.77	6965.85	17.24	15.44	10.16	17.35	2336.96	2391.21	44.07	
13200.00	6872.98	6984.64	17.41	15.62	10.02	17.39	2298.42	2354.33	42.11	
13300.00	6880.62	7003.49	17.58	15.82	9.88	17.44	2262.92	2320.47	40.32	
13400.00	6887.72	7022.57	17.73	16.03	9.74	17.49	2230.53	2289.73	38.68	
13500.00	6893.97	7041.11	17.87	16.25	9.60	17.55	2201.44	2262.23	37.21	
13600.00	6899.64	7059.97	18.00	16.49	9.48	17.61	2175.71	2238.09	35.88	
13700.00	6904.55	7078.71	18.11	16.73	9.36	17.67	2153.47	2217.41	34.68	
13720.73	6905.64	7083.28	18.13	16.79	9.34	17.68	2149.30	2213.56	34.45	

**Weatherford****Weatherford Drilling Services**

GeoDec4 v2.1.0.0

Report Date: October 06, 2015
Job Number: _____
Customer: Devon Energy
Well Name: Emerald PWU 20,11H
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: 598754.00 US Survey Foot	Latitude: 32.645815 Degree
East: 611717.60 US Survey Foot	Longitude: -104.104675 Degree
Convergence: 0.12°	
Declination: 7.52°	
Total Correction: 7.40°	
Datum Transformation: none	

Geodetic Location WGS84

MSL Elevation = 0 m
Latitude = 32° 38' 44.93" N
Longitude = 104° 06' 16.83" W

Magnetic Declination = 7.52 deg	[True North Offset]
Local Gravity = .9988 g	Checksum = 6546
Local Field Strength = 48394 nT	Magnetic Vector X = 23687 nT
Magnetic Dip = 60.42 deg	Magnetic Vector Y = 3129 nT
Magnetic Model = bggm2015.dat	Magnetic Vector Z = 42085 nT
Run Date = November 15, 2015	Magnetic Vector H = 23892 nT

Signed: _____ Date: _____

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